AV500

PRODUCT REFERENCE GUIDE

2D CAMERA

DATALOGIC

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Software version

This manual refers to software version 1.0.0 and later.

Patents

This product is covered by one or more of the following patents: Utility patents: EP1128315B1, EP1396811B1, EP1413971B1, EP2517148B1, EP2649555B1, FR2909442B1, GB2444409B, IT1404187, JP4435343B2, JP4571258B2, JP5947819B2, US6512218, US6616039, US6808114, US6997385, US7387246, US7433590, US8058600, US8360318, US8368000, US8888003, US8915443, US9230142, US9268982, US9349047, US9430689, US9589165, US9785817, US9798948, US9870498, US10229301, ZL200980163411.X, ZL201080071124.9, ZL201280010789.8
See www.patents.datalogic.com for patent lists.

TABLE OF CONTENTS

PREFACE

ABOUT THIS MANUAL

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product can be downloaded free of charge from the website listed on the back cover of this manual.

Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in the manual to notify the reader of key issues or procedures that must be observed when using the camera.

This symbol draws attention to details or procedures that may be useful in improving, maintaining, or enhancing the performance of the hardware or software being discussed.

This symbol identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage. It is also used to bring the user's attention to details that are considered IMPORTANT.

This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock.

This symbol alerts the user they are about to perform an action involving possible exposure to laser light radiation.

This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

TECHNICAL SUPPORT

Support Through The Website

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Hover over the Support & Service menu for access to Services and Technical Support.

Reference Documentation

The documentation related to the AV500 camera system management is listed below:

- AS1 Series Instruction Manual
- CBX100 Reference Manual
- CBX510 Reference Manual
- CBX800 Reference Manual
- DM3610 Reference Manual
- LCC 75XX Light Curtain Instruction Manual
- PWR-480B Installation Manual

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Any dispute arising out of or in connection with this contract, including any question regarding its existence, validity or termination, shall be referred to and finally resolved by arbitration administered by the Singapore International Arbitration Centre (“SIAC”) in accordance with the Arbitration Rules of the Singapore International Arbitration Centre ("SIAC Rules") for the time being in force, which rules are deemed to be incorporated by reference in this clause. The seat of the arbitration shall be Singapore.

The number of arbitrators will be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties will appoint a third arbitrator who will act as chairman of the proceedings. Vacancies in the post of chairman will be filled by the president of the SIAC. Other vacancies will be filled by the respective nominating party. Proceedings will continue from the stage they were at when the vacancy occurred. If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator will be the sole arbitrator, provided that the arbitrator was validly and properly appointed. All proceedings will be conducted, including all documents presented in such proceedings, in the English language. The English language version of these terms and conditions prevails over any other language version.

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– END –

COMPLIANCE

LASER SAFETY

This product conforms to the applicable requirements of IEC60825-1 (Ed. 3). and complies with 21 CFR 10 except for deviations pursuant to laser notice N° 56, date January 19, 2018. This product is classified as a Class 2 laser product according to IEC 60825-1 regulations. The targeting lasers are pulsed 416Hz with a 400us on time which results in a 16.67% duty cycle with an angular subtense of 1.5mRad. Average power is less than 1.0mW.

ELECTRICAL SAFETY

This product conforms to the applicable requirements contained in the European Standard for electrical safety EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 at the date of manufacture.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous visible laser light.

Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to hazardous laser light. The laser beams are intended for initial alignment and positioning.

LED SAFETY

These camera bar code readers include illumination that use high powered light emitting diodes (LEDs). LED emission according to IEC 62471, Risk Group 0.

White Light Illuminations

RISK GROUP 0 LED emission according to IEC 62471.

Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to LED light. The LED can be switched on or off through a software command.

Power Supply

This product is intended to be installed by **Qualified Personnel** only.

This product is intended to be supplied with a UL listed or CSA Certified LPS Power unit of 24 volt, 2 amp minimum (24 VDC Nominal, +/-20%).

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since Datalogic promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through Datalogic commercial reference contacts. Since April 20th, 2016 the main European directives applicable to Datalogic products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. Datalogic products are mainly designed for integration purposes into more complex systems. For this reason it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.

Customs Union:

The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian Mark of conformity.

FCC Compliance

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual,

may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

UL Listing

Bureau Of Indian Standards (BIS)

Self Declaration – Conforming to IS 13252 (Part 1):2010, R-41009288

Laser Safety and Serial Labels

Handling

The AV500 is designed to be used in an industrial environment and is built to withstand vibration and shock when correctly installed. However, it is also a precision product and must be handled correctly before and during installation to avoid damage.

Do not drop the reader.

NO!

Do not fine tune positioning of the reader by striking it or its mounting bracket.

NO!

Do not weld the reader into position, which can cause electrostatic, heat or reading window damage.

NO!

Do not spray paint near the reader which can cause damage to the lens and illumination window.

NO!

CHAPTER 1
INTRODUCTION

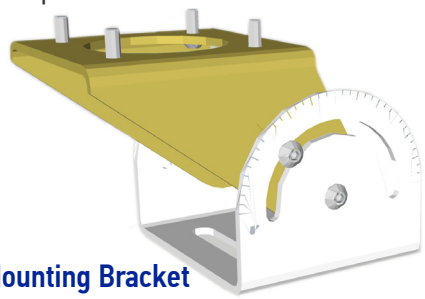
ABOUT THE CAMERA

The AV500 is a high performance camera with an integrated image processing system dedicated to automatic code identification on moving parcels.

The Sync-NET reader clustering permits extending the reading area for single-side and multi-side applications. Captured images are stored on-board and optionally transferred to external supports through the integrated Ethernet connectivity. Rugged metal construction, IP65 enclosure rate and operative temperature up to 50°C guarantee a long life cycle even in harsh industrial environments.

AV500 2D Camera

A universal mounting bracket shown below comes with each AV500 and allows you to mount the unit in its required position with ease.



Mounting Bracket

AV500 has been developed for use in numerous applications:

- Manual Parcel Sorting
- Manual Presentation Scanning
- Loading and Unloading
- Airport Baggage Handling
- Automated Parcel Sorting

Quick, automatic focus, positioning, calibration and code setting of the image can be accomplished using the X-PRESS button and LEDs on top of the reader without the necessity of a PC.

DYNAMICFOCUS

Excellent Performance

- 5.0 M Pixels
- Adjustable focus through C-Mount lenses
- Powerful Illumination Lighting Systems
- Outstanding decoding capability on 1D, 2D, Stacked, Postal symbolizes
- Omni-directional reading
- Frame Rate up to 32 frames/sec
- Image Cropping for higher frame rate
- Up to 100 readable codes in a single frame

Ease of Setup

- e-Genius is a web browser based software to configure the reader parameters via PC Ethernet interface
- User-defined database of Image Acquisition Settings (parameter sets)

Ease of Use

- X-PRESS interface LEDs provide operational and performance feedback
- Green Spot for immediate Good Read feedback
- Different operating modes to suit various application requirements
- Multi Image Acquisition Settings for higher reader flexibility
- Image saving and storage with buffering capability
- Diagnostic software tools

Flexible Solution

- Complete set of Accessories like mirrors, connection boxes, cables and photocells
- Ethernet Connectivity with TCP/IP socket for reader parameter configuration, data and image transfer, FTP client, etc.
- Three serial communication interfaces (Host Net, Image Net, Sync Net)
- General purpose opt-coupled I/Os

Industrial Strength

- Industrial compact 2D reader
- Rugged full metal construction
- Sealed circular connectors
- IP65 protection class
- 50 °C max operating temperature
- Supply voltage ranges 24 VDC Nominal, +/-20%

This chapter introduces the basic concepts necessary for camera installation and setup.

GENERAL VIEW

1 Serial and Warning Labels

2 Bracket Mounting Holes

3 Lens

4 Illumination

5 HMI X-Press Interface

6 Power On Connector and LED - stays blue when receiving power

7 Sync Out Connector and LED

8 Sync In Connector and LED - flashes orange

9 Host Net Connector and LED

10 Image Net Connector and LED - flashes green and orange, orange if receiving data

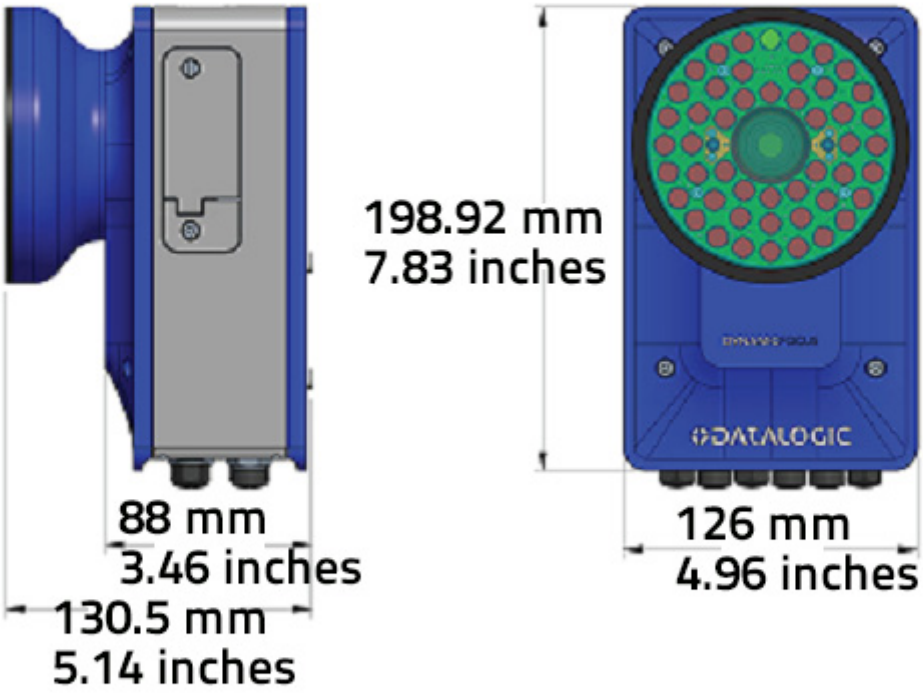
11 I/O Connector and LED

Power and Sync Out LEDs Lit

LED Indicators

#	LED	Description
1	POWER	Solid Blue – Power LED indicating all internal power supplies are at the correct voltage. Can be out if external power is supplied and an internal supply is out of range.
2	I/O	Solid Green – Indicates CBX box connected has the ID+ to GND jumper and this camera is the controller for the tunnel. The Tachometer/Encoder must be connected to this unit.
4	HOST NET	Green - Host Network Link at Gbit speed **Red** – Host Network Data activity **NOTE:** With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
5	IMAGE NET	Green - Image Network Link at Gbit speed **Red** – Image Network Data activity **NOTE:** With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
6	SYNC IN	Green - SyncNet Link at 100Mbit speed **Red** – SyncNet Data activity **NOTE:** With a 100Mbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
9	SYNC OUT	Green - SyncNet Link at 100Mbit speed **Red** – SyncNet Data activity **NOTE:** With a 100Mbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.

AV500 DIMENSIONS



APPLICATIONS OVERVIEW

An AV500 reading system consists of a reader/camera for acquiring images and reading the codes on a target. Because of the reading area of the AV500 it is good choice for stationary presentation scanning systems, as well as systems over moving conveyor.

Applications

The AV500 cameras are specifically designed for industrial applications requiring high reading performance such as:

- Low aspect ratio barcodes
- Codes covered by plastic film
- Codes located within a large depth of field
- Codes within a wide field of view
- High resolution codes positioned at far distances from the barcode reader
- Fast moving objects

The AV500 is designed for multi-head arrays, single side or multi side tunnels and hybrid configurations. It can also be used as a stand alone unit.

Stand Alone Presentation Scanning

Manual Presentation Scanning

In Manual Material Handling or Parcel Scanning applications, manual presentation scanning is often the preferred method for item identification. Maximum productivity and **operational efficiency** is maintained, while the stationary overhead reader continuously scans the working area, the operator can easily and quickly handle objects of various dimensions and weights. Since no point-and-shot is required for scanning, no extra tools or infrastructure is necessary in the working area; no extra operations for part identification other than passing the object through the scanning zone. No training is required for users. The large coverage area and fast acquisition rate – by **AV500** – permits rapidly handling objects in sequence with great tolerance. **White illumination and continuous high power mode** enable top performance with the maximum comfort for operators.

Single or Multi-Unit Tunnels and Arrays

Many AV500 reading system applications will read over a moving conveyor and use a network of multiple devices.

- **Optical Encoder Wheel (Tachometer):** Used underneath a conventional conveyor. The encoder generates a pulse per specified distance (mm [in]) of conveyor travel.
- **Internal Tach:** This is a software-generated pulse mimicking an encoder/tachometer.

A position sensor (DM3610, light curtain or S85 Position Sensor) is often used as a trigger source. When the height or left/right focus data measured by the sensor goes over a certain threshold, a package is entering the image valid start, and when it goes under the threshold, the package is providing the image valid stop. Sometimes this sensor is not sufficiently precise and an additional Presence Sensor input is used. When the codes are located on more than one face of the parcel, more than one reader is necessary (multi-camera reading station). In this case, one of the bar code readers (the Controller) collects the information from all the sensors and distributes it to the other readers using a dedicated Ethernet connection. A CBX connection box is used to simplify the connection of the camera to the other system components.

Airport Baggage Handling

Baggage handling system airport arrays use multiple scanners and controllers as necessary to properly cover conveyors carrying passenger luggage through an airport baggage handling system. Several cameras, a CBX and an SC5000 Controller are required. Sometimes a Redundant System is required to provide duplicate controller and scanner stations for improved reliability and performance.

Automated Parcel Sorting

Easy installation, maintenance, superior performance, and longer life-cycle make AV500 a compelling solution for over-the-belt reading.

5.0 megapixel image captures where each single shot frames the entire area. One-reader-one-shot obtains maximum reading throughput. Image capture is associated with the data of each sorted item and for any reporting or analysis purposes. Other devices can be used for scanning applications of large conveyors or multi-sided reading, through ID-NET clustering, multiple readers can be effectively combined to extend the scanning area.

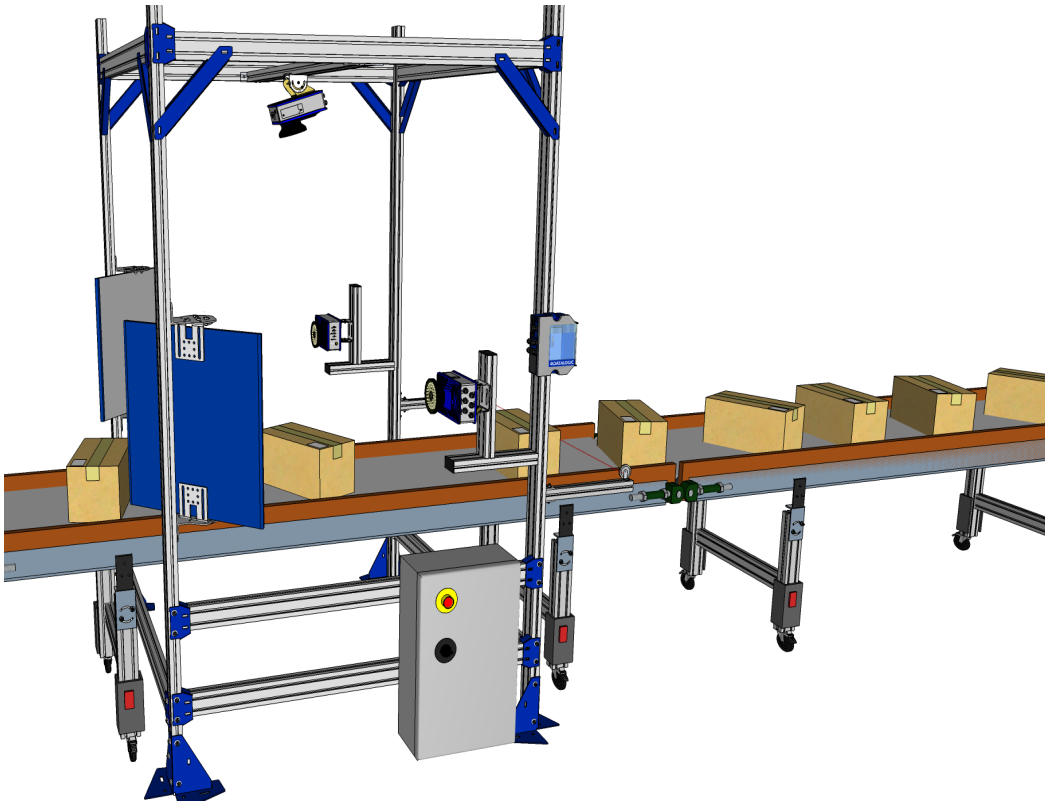


Image Acquisition

The AV500 contains both the acquisition device or “imager,” which works in strict real time to acquire the best possible images and the decoding device or “decoder” in one chassis. These parts of the AV500 interpret the data received.

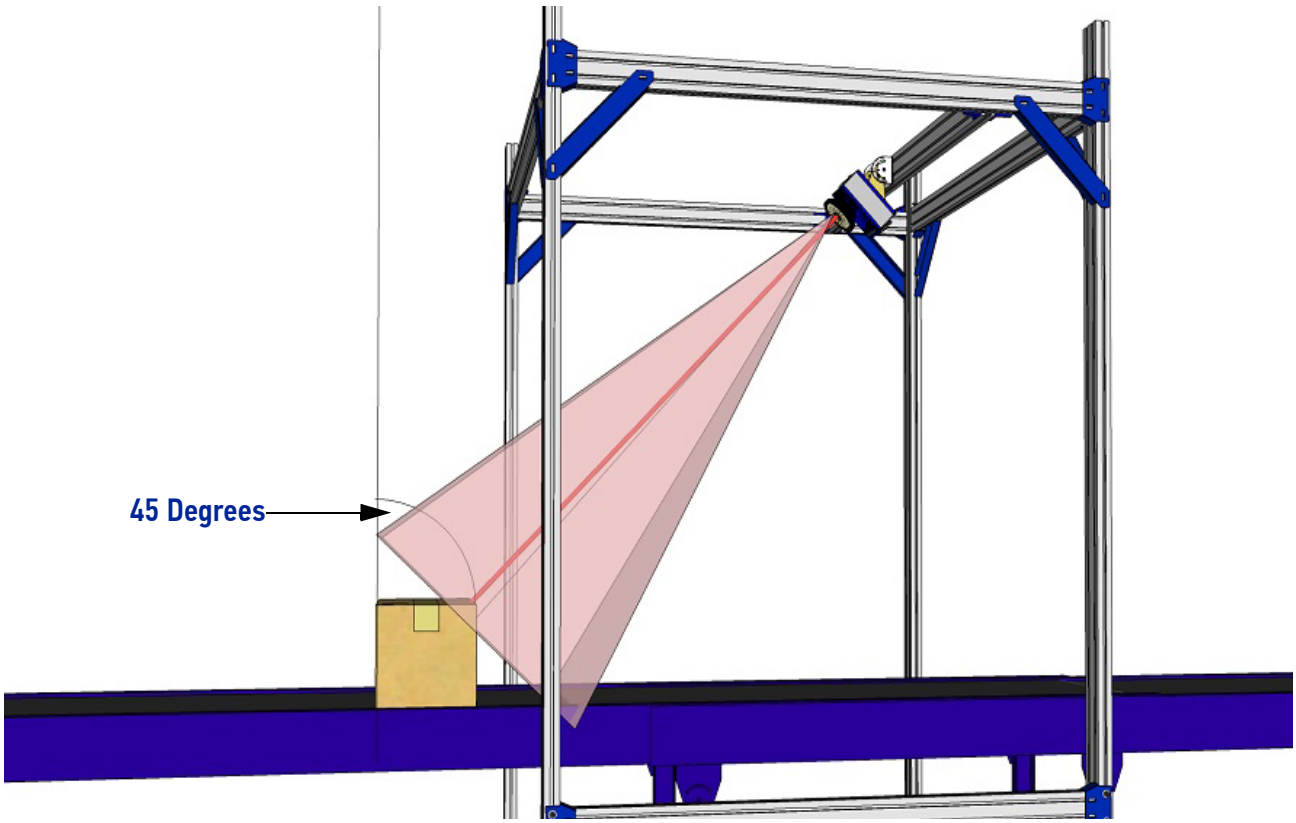
The camera can use several kinds of external sensors:

- **Speed Sensor:** If mounted over moving conveyor, the camera needs to know the speed of the objects to be acquired. The speed sensor is usually an encoder/ tachometer connected to the belt, or an internal software tachometer.
- **Height/Side Position Sensor:** The focusing position is computed by the camera based on the position of the parcel measured by a height sensor. Sensors may be a DM3610 Dimensioner, AREAscan™ DS2 Light Array (LCC-75xx Light Curtain Kit) or S85.
- **Trigger Source:** In multiple camera systems, each package has to be uniquely identified by all the cameras. For this reason, all of the cameras in a reading station share a unique trigger source.

All the sensors are connected to the Controller camera that interprets the information and distributes it to the Client cameras.The start and stop of an acquisition are triggered by a start/stop event generated by the trigger device (position sensor, photo sensor, read now signal). The acquisition of a package doesn’t start when the trigger source detects it, but with a certain delay depending on:

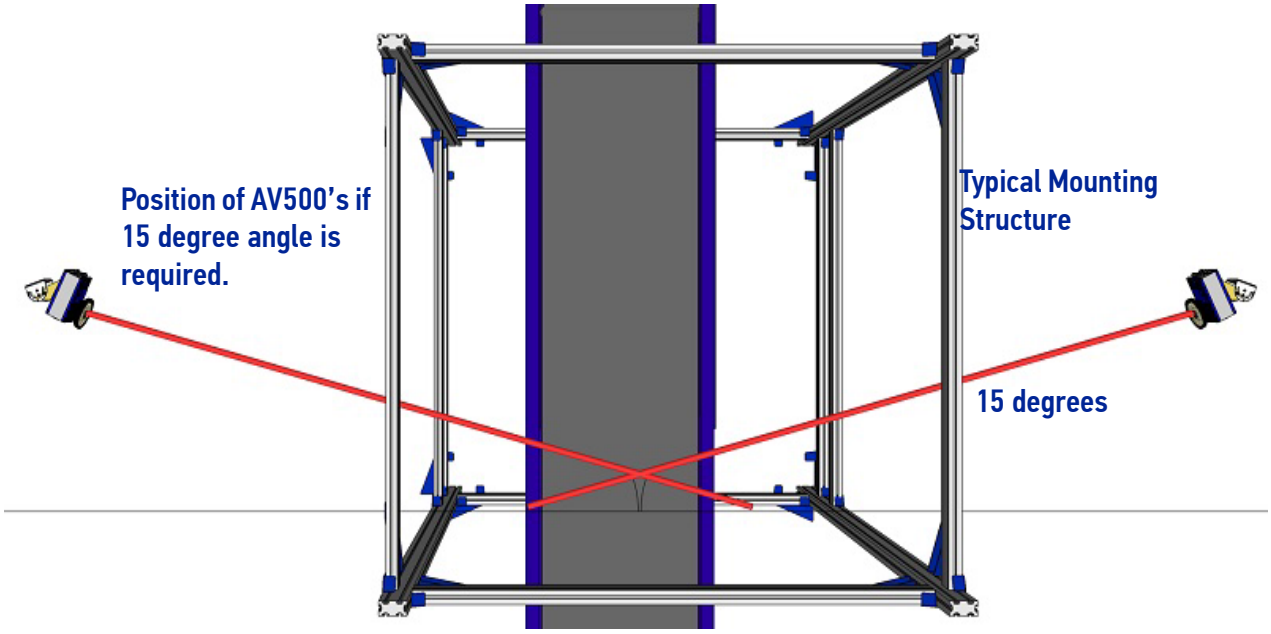
- the distance between the trigger device and the view line at belt level
- the view line angle (alpha) of the camera
- the speed of the object
- the height of the package

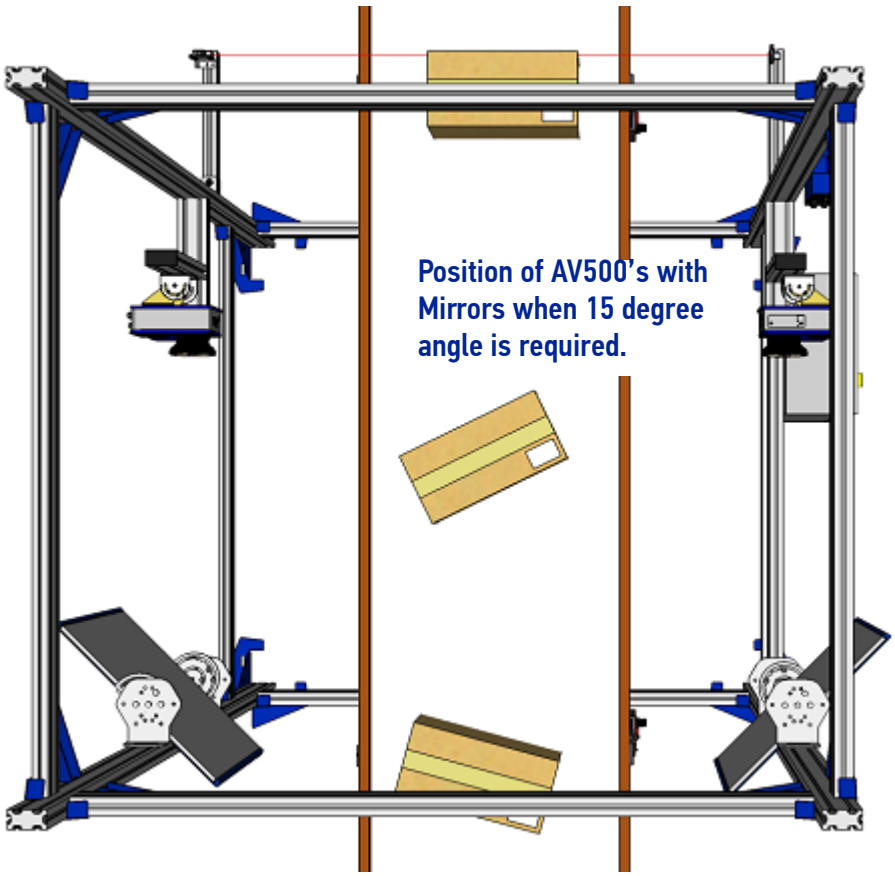
Based on the AV500 mounting position, the unit tries to acquire one (reading angle alpha = 15°) or two faces of the parcel (alpha = +/-45°).



A typical reading station may also include:

- **Power Supply Systems:** The AV500 requires a 24 Vic power supply. Usually each camera has its own power supply system (i. e. PWR-480B).
- **External Mirrors:** To cover the requested reading field, the cameras must be positioned at a given distance from their targets. In order to create reading stations as small as possible, a deflection mirror is often inserted between the target and the camera. See examples below.





AV500 Versions

AV500 cameras are available in versions that differ depending on the optical resolution (focus range), F-stop and illumination color.

Table 1. AV500 Models

P/N	Focusing	Lens	F-stop	Illumination Color
938000007	Dynamic Focus	16 mm	F/6	White
938000017	Dynamic Focus	16 mm	F/6	Red
938000005	Dynamic Focus	25 mm	F/7	White
938000015	Dynamic Focus	25 mm	F/7	Red
938000006	Dynamic Focus	25 mm	F/8	White
938000016	Dynamic Focus	25 mm	F/8	Red
938000001	Dynamic Focus	35 mm	F/7	White
930000011	Dynamic Focus	35 mm	F/7	Red
938000002	Dynamic Focus	35 mm	F/8	White
938000012	Dynamic Focus	35 mm	F/8	Red

HMI – HUMAN MACHINE INTERFACE

The AV500 camera includes one external button that can be used to perform specific tasks without the need of connecting to **e-Genius** *(AV500 browser-based user interface).*

NOTE

Some of these functions may be performed using e-Genius. See Chapter 4.

LED Functionality

#	LED	Description
1	STATUS	Solid **Red** – active error exists
2	COMM	Solid **Yellow** when transmitting host message (serial or Ethernet)
3	TRIGGER	Lights **Yellow** when getting a trigger input from either the CBX or message on the Ethernet interface. Always on in continuous mode.
4	GOOD	Lights **Green** with good read at time host message is transmitted.
5	READY	Solid **Green –** Good status when camera is running

The AV500 LED Boot Sequence

1. All LEDs will turn off after the FPGA is loaded
2. STATUS, COM, GOOD, and TRIGGER LEDs will turn ON after the RTP boots (READY will turn OFF)
3. STATUS LED will turn off after the controller camera status is determined
4. COM, GOOD, and TRIGGER LEDs will blink while the camera is waiting for the controller to start it's DHCP server
5. COM will turn off, GOOD and TRIGGER will turn ON, after the COMe boots
6. STATUS LED will turn ON if the camera is the active controller
7. TRIGGER will turn off after the RTP configures its network interface
8. GOOD LED will blink until the RTP gets an IP address from the controller camera
9. GOOD LED will turn ON after an IP address is obtained
10. GOOD LED will turn OFF after the handshake between the RTP and COMe completes
11. READY LED will turn ON after the RTP gets parameters from the COMe and the STATUS LED will indicate the cameras status and not the controller state.

The camera is ready for normal operation.

Green Spot

Green Spot' technology provides visual confirmation of a 'good read', improving the user's experience and increasing the speed of scanning operations, which is especially helpful when working in noisy environments. A green LED will illuminate the object.

X-PRESS FUNCTIONALITY

X-PRESS is the intuitive Human Machine Interface designed to improve ease of installation and maintenance. Status information is clearly presented by means of the five colored LEDs, and a single push button gives immediate access to the following relevant functions:

- Test with bar graph visualization to check static reading performance
- Focus/Locate the Focus LED will blink.
- Setup to perform Exposure Time and Gain calibration.
- Learn to self-detect and auto-configure for reading unknown codes

1 – **Press** the button (the Status LED will give a visual feedback).

2 – **Hold** the button until the specific function LED is on (Test, Focus, Setup or Learn).

3 – **Release** the button to enter the specific function.

Once in a mode, if you press and hold the button again, it will exit and discard any data from that mode and continue the scrolling sequence to select a mode.

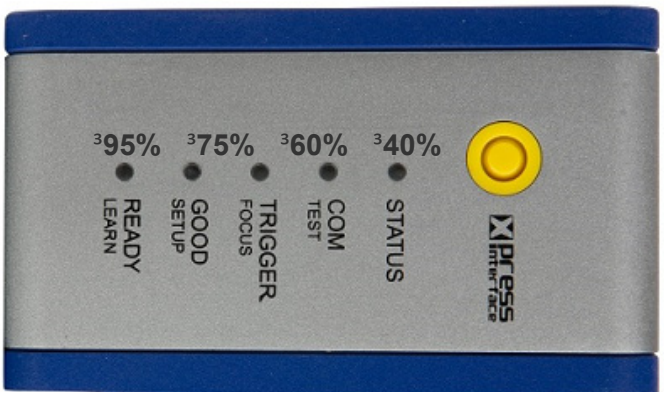
Once button is pressed, the cycle of LEDs activation is as follows:

NOTE

If the Xpress web interface is active, the LEDs will flash four times indicating it is disabling the active interface. The hardware interface returns to its initial state for regular access.

Test Mode

Once entered, the Bar Graph on the five LEDs is activated and if the camera starts reading codes the Bar-Graph shows the Good Read Rate. The Bar Graph has the following meaning:



In case of a NO READ, only the Status LED is on and it is blinking. To exit the Test Mode, press the X-PRESS push button once.

Test Mode will timeout in 4.5 miutes after the last barcode is decoded.

Focus/Locate

By default, the Test mode exits automatically 60 seconds after the last bar code is decoded.

This function causes the camera to automatically learn the fixed focus distance and sensitivity. The Focus LED blinks to indicate this state. To exit the Focus/Locate Mode, press the X-PRESS button once.

The focus procedure is as follows:

1. Place a package with barcode at the desired fixed focus distance in the center of the camera's view.
2. Enter the focus function. The Focus LED will blink.
3. Wait until the Focus LED is steady. This indicates the camera has determined the fixed focus distance and sensitivity.
4. To commit the settings and exit, press the XPress button once.
5. This procedure ends when the values are committed or after a timeout of 60 seconds.

Setup

Once entered, the camera aiming laser is enabled. The SETUP LED blinks to indicate the aiming laser is enabled. Use the aiming laser to aim the camera properly during mounting.

To exit Setup Mode, press the X-PRESS push button once.

Setup Mode will timeout after about 5 minutes.

AutoLearn

Once entered, the reader starts a procedure to automatically detect and recognize barcode types. The LEARN LED blinks to indicate the Learn mode is enabled.

The AutoLearn procedure is as follows:

1. Place one or more barcode types in the camera view.
2. Wait until the LEARN LED stays steady (indicating the reader has detected the barcode.
3. To commit the learned barcode type(s) and exit, press the X-PRESS push button twice.
4. AutoLearn will timeout 60 seconds after the last barcode type is decoded and no learned barcode type(s) will be committed.

AutoLearn will only add new barcode type(s) to the configuration. The function will not drop or modify existing barcode type(s) enabled in the configuration. AutoLearn will only enable a learned barcode type if the barcode type does not already exist in the configuration.

5. GreenSpot and beeper for immediate Good Read feedback.

If you do not want to accept the learned barcode, let it go and AV500 will time out. The learned barcode will not be committed.

Default Parameters

The user shall be able to default the parameters with the express button on power up, **This procedure is as follows:**

1. Press and hold Xpress button and apply power to the unit.
2. The unit will recognize the button press within 15 seconds and blink all five LEDs three times (once per second)
3. Release the Xpress button once the LED's start blinking

If the Xpress button is still pressed after the blink sequence ends, the default request will be ignored.

4. All 5 LEDs will turn off after 3 blinks
5. Press and release the Xpress button again within 5 seconds (all LEDs will turn on)

Failure to press the Xpress button within 5 seconds will result in the default request being ignored.

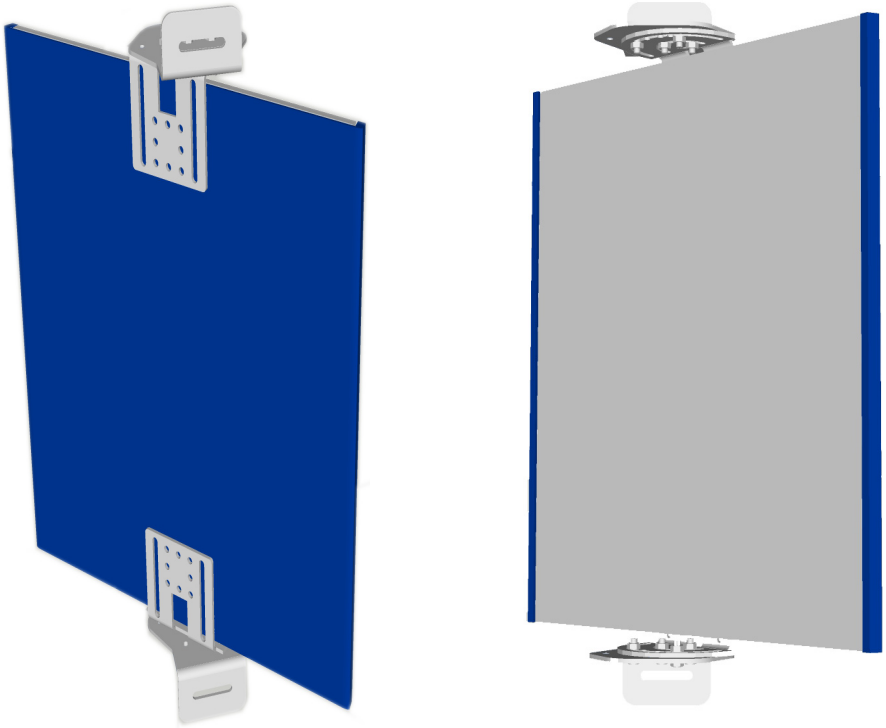
6. All 5 LEDs will blink 3 more times to confirm parameter defaulting will take place
7. Normal LED boot sequence will take place
8. All 5 LEDs will start blinking after the boot sequence finishes. Blinking will continue until the parameters are defaulted
9. The RTP will report the following "critical" message to the web interface until the default sequence is completed: "*Waiting for Xpress Parameter Default to Complete*"
10. The following error will be reported if the RTP requests an Xpress default but the COMe does not know about it "*Xpress parameter default requested but ignored*"

Accessories

The following accessories are available on request for the AV500 Camera Imaging System.

Reflecting Mirror

P/N 93ACC0086 (380mm) or 93ACC0116 (600mm)



NOTE **The reflecting mirror is used to reduce the footprint of your system.**

Ethernet Connection Cable (M12-IP67 to RJ45)

P/N: 93A050034 (1m)

P/N: 93A050035 (3m)

P/N: 93A050036 (5m)

P/N: 93A051389 (10m)

Sync-net Connection Cable (M12 male to M12 female)

P/N 93A050133 (.75m)

P/N: 93A050079 (3m)

P/N: 93A050080 (5m)

P/N: 93A050081 (10m)

I/O Cable (M12-IP67 to CBX)

P/N: 93A050059 (3m)

P/N: 93A050060 (5m)

Power Supply (Single Camera)

P/N: 93ACC0058 (US)

Four Port Power Supply (Multiple Cameras)

P/N 93A000141 (US)

P/N 93A000142 (EU)

P/N 93A000143 (UK)

Power Cable

P/N: 93ACC0149 (3m)

P/N: 93ACC0150 (5m)

Controller Key

P/N: 93A200032

COMMUNICATION PORTS

Host Network

Image Network

Sync Net

Discrete I/O

The AV500 offers one Digital I/O, which stands for Digital Input and Output. This is available for connection to a CBX which provides multiple additional connections. Digital I/Os allow a micro-controller to detect and output logic states. Each digital I/O is configured to one of the following:

Inputs

Tach

Trigger

Dual Zone

Generic

Outputs

Complete Read

Partial Read

Trigger On

Trigger Off

Multiple Read

No Read

FOCUSING DEVICES AND POSITION SENSORS

There are several focusing device options available for the AV500 Camera, see section Five for details.

Photoelectric Sensor

The Datalogic Photoelectric Sensor is used in AV500 camera systems to detect the presence of an item entering the scanning area.

The photoelectric sensor is used in singulated conveyor systems where the packages are separated by an open space between the trailing edge of one package and the leading edge of the next. In irregular package applications, the photoelectric sensor assists in maintaining the package footprint so that the AV500 camera will only scan and provide data for a specific package.

Depending on the application, these devices may need to be configured differently. While the photoelectric sensor and tachometer work well with belt conveyors, a special configuration is needed for tilt-tray and cross-belt sorter applications.

Photoelectric Sensor	
S60 PHOTOCELL KIT W/R3 REFL BRKT HDWR	93ACC1895
MEP-593 PHOTOCELL KIT PNP (PH-1) WITH FREE WIRES	93ACC1791

LCC-75xx Kit with DS2 Light Array

The DS2 Light Array (Light Curtain), part of the LCC-75xx kit, is used to detect the presence of products in top mount applications as they enter the scanning area as well as report the focusing data to the top mounted AV500. The AREAscan™ family of the DS2 series covers controlled heights ranging from 150 to 2500mm, with 5m operating distances for high resolution versions, or 10m for low resolution versions.

Light Curtain Focusing	
LCC-7501 AV7 LIGHT CURTAIN 150MM+CAB 10M	93ACC0170
LCC-7506 AV7 LIGHT CURTAIN 600MM+CAB 10M	93ACC0171
LCC-7509 AV7 LIGHT CURTAIN 900MM+CAB 10M	93ACC0172
LCC-7512 AV7 LIGHT CURTAIN 1200MM+CAB 10M	93ACC0173

Position Sensor

The DK-503 Distance Kit is part of a vision system used to signal the focus range of packages to be imaged by the AV500 camera. It includes an S85 Class 2 visible red LASER sensor to measure direct proximity from 4 m to 7 m and from 20m to 100m retro-reflective models. It includes PNP or NPN, 4-20 mA analog output and RS 485 serial interface.

It comes with:

- Mounting bracket and non-reflective plate
- CVL 2811 Connection cable
- Installation Guide

See Section 5.4 for more information.

Distance Sensor	
DK503 Distance Sensor Kit	93ACC0263

DM3610 Dimensioner

The DM3610 is used to detect the presence of products as they enter the scanning area as well as report the package positions/heights and sequence number to all cameras in the system. The DM3610 can also provide certified (Legal for Trade), side-by-side package detection, or volume measurements for the packages that pass below it.

For complete information about the features and capabilities of the DM3610 Dimensioner, see the dimensioner page on the Datalogic website: www.datalogic.com.

The DM3610 Dimensioner requires the following:

- DM3610
- Power Supply
- Universal Mounting Bracket
- Class 2 EU Adapter (optional)

DM3610	
DM3610-1000 STD NLFT	932702000
DM3610-1100 SING NTEP	932702020
DM3610-1200 SING OIML/MID	932702030
DM3610-1201 SING OIML/MID MOD D	932702031
DM3610-1300 SING MC	932702040

SPEED SENSORS

Encoder (Tachometer)

The encoder/tachometer delivers a continuous pulse to the system, which provides feedback on conveyor speed and transmit point, and can be used to help track the package position along the length of the conveyor.

Encoder (Tachometer)	
OEK-2 OPTICAL ENCODER (CAB 10m+SPRING)	93ACC1770
OEK-3 OPTICAL ENCODER HI RES,6M CBL+SPRI	93ACC0056
OEK-3 ENCODER HI RES M139,6M CBL +SPRI (START/STOP ANTI ROLLBACK)	93ACC0104

INDUSTRIAL CONTROLLERS

Industrial Connection Boxes

CBX510 Series are industrial connection boxes that can be used to connect the barcode readers to an encoder/tachometer, photoelectric sensor, serial devices, relays, or other peripherals.

CBX Connection Box	
CBX100 CONNECTION BOX COMPACT	93A301067
CBX510 CONNECTION BOX MODULAR	93A301087
CBX800 GATEWAY	93A301077

NOTE **Only CBX510 should be used in a system, If additional I/O is needed CBX100 or 500 can be added to other camera systems.**

SC5000

Used when multiple cameras are required, the SC5000 Controller offers all the necessary functions to make the phases of installation, setup, testing, and maintenance easy and quick.

The SC5000 Controller key functions are:

- Bus Controller: cluster management and Host interface of a multi-sided reading tunnel based on EBC (Ethernet Based Communication) bus;
- Automatic replacement procedure: automatic procedure for imager, reader, scanner and bus controller replacement;
- Diagnostic indications on the reading station status, simple to be detected without any PC needed. These indications, based on LEDs and display, provide the maintenance staff with all the necessary information;
- Easy remote access to all of the reading station information, thanks to built-in Ethernet (all models) and fieldbus (Profibus or Profinet models) connectivity;
- Single and Redundant System configurations;
- Integration with Dimensioners and Vision Systems; SC5000's efficiency in hybrid solutions represents a crucial competitive advantage for challenging application requirements.
- Auto PackTrack Calibration procedure from SC5000 Menu using e-Genius web based setup software.
- Energy Saving allows turning on/off the motors and lasers of all network scanners according to the selected digital input, encoder, or communication channel. The time required to restart the system is less than 1 minute independently from the number of scanners connected. It is suggested to use this parameter for example when the conveyor is stopped for a lengthy period.
- Three Inputs (Trigger, Encoder/Tachometer, IN3), three Outputs (OUT1, OUT2, OUT3), one configurable I/O Port (IN4/OUT4). *See* and 2.3.8 Digital Output Configuration.

The SC5000 Controller is divided into two parts:

- The upper part (alloy case) contains the Controller's digital section; here you can find the four Ethernet M12 connectors, the removable SD-Flash memory, the display, the keypad and the LEDs.
- The lower part (plastic case) contains the connection board, the place for the optional Fieldbus modules and the connector panel.

The simple and sturdy mechanical structure makes the SC5000 Controller the ideal solution for industrial environments.

The SC5000 Controller is fully compatible with DS8110 and DX8210 scanners.

The SC5000 Controller allows connection to the Trigger and Encoder/Tach. PNP inputs are available via M12 circular connectors, placed on the lower front panel.

This configuration covers a great part of all the possible user's needs.

You can get access to all the Inputs and Outputs, in both PNP and NPN polarity, using the optional CBX510 connection box accessory; in this case you must connect the box to the controller using the CAB SC5000 TO CBX510 accessory cable.

CHAPTER 2
MECHANICAL INSTALLATION

PREPARING FOR MECHANICAL INSTALLATION

Application-specific drawings and documents provided by Datalogic supersede any contradictory content in this manual.

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Define and confirm the accuracy of your application's requirements and structure position, especially the height of the conveyor from the floor.
- Review all installation-specific drawings provided with your equipment.
- Review and plan the mechanical installation of all devices used in your application. Be sure to allow adequate clearance for maintenance.
- Review and plan the power requirements for your application.
- Check the contents of the shipping cartons against the packing list.
- Record all product serial numbers.

General Mounting Guidelines

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting, or replacing any Datalogic products, parts or related equipment.

As you plan and install your AV500 camera imaging system, keep the following guidelines in mind:

- Follow application drawings for structural details and barcode reader placement.
- Determine the proper orientation and position of the barcode reader(s).
- Leave adequate clearances (approximately 300 mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise. When power and communication wiring must cross, make their intersection perpendicular. Avoiding sharp wire bends or loops, which can affect performance.
- Proper grounding limits the effects of noise due to Electromagnetic Interference (EMI).

Mounting Structure Considerations

Your first task is to mount your AV500 camera. You can provide your own mounting structure or Datalogic can design one for you. We recommend using a Datalogic mounting structure for standard applications.

The AV500 cannot be mounted parallel to the conveyor belt. A 15 degree angle or more is required to avoid specular reflection.

There must be at least 300 mm (12 in) clearance behind the unit for fan air intake!

Your mounting structure must provide the following capabilities:

- It is adjustable enough for you to move your unit to the optimum position for proper scanning.
- It allows a technician access to the camera while it is mounted.
- It must be as vibration free as possible so as not to affect the scanning accuracy.
- It is constructed of steel or aluminum.

Refer to the Chapter "Preparing for Electrical Installation" on page 41 **and Reference Documentation for details on connecting your readers to other devices in the system.**

When installing several AV500s, take care to position them so that no laser beam or LED illumination enters the reading window of other barcode reading devices in the system. This condition could occur more frequently for side mounted applications. If these precautions are not followed, read rate could be negatively affected. To resolve this problem, it is sufficient to slightly change the inclination and/or position of one of the two devices involved.

Maintaining Thermal Performance

All electronic devices and circuitry generate excess heat and thus require thermal management to improve reliability and prevent premature failure. The AV500 is no exception, an internal fan is critical to maintaining AV500 performance. Also, proper clearance must be provided to the unit. There must be at least 300 mm (12 in) clearance behind the unit for fan air intake and you must use the mounting bracket provided with your unit to help maintain proper clearance and air flow.

The fan of the AV500 is a field replaceable part. Request spare part number: 8900006713. Instructions are included.

UNPACKING INSTRUCTIONS

Verify that the AV500 Camera and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- AV500 Camera
- Installation Guide
- Test Chart
- Mounting Bracket

CAUTION

The AV500 Camera and accessory packaging is designed to protect the unit(s) during shipment. Do not throw it away. Save all packing material in case you need to transport your unit(s) to Datalogic for any reason.

1. Open the AV500 packaging.

2. Remove the foam layer to reveal the AV500 and its mounting bracket.

3. Carefully remove the AV500 and its mounting bracket.

4. Save the box and all of the packaging materials in case you need to ship the unit for service or repairs.

COMPLETE INSTALLATION SEQUENCE

Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION.

See the Chapter on **Electrical Installation for electrical installation details.**

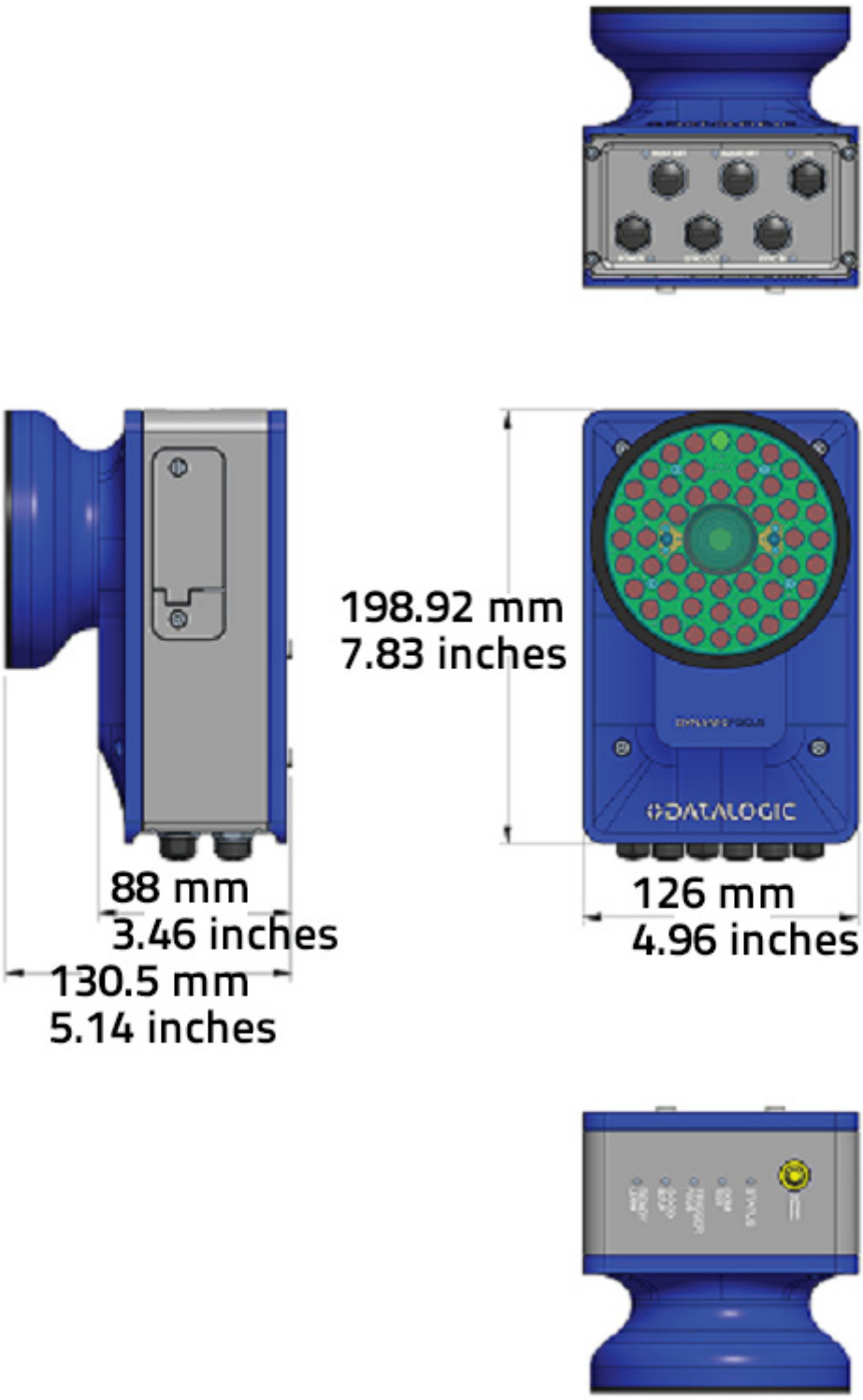
To complete mechanical installation and setup, you must:

1. Review the details of your application's requirements
2. Erect mounting structure or other supporting structures
3. Determine and mark the Mounting Bracket locations
4. Mount the AV500 brackets to the mounting structure
5. Mount the AV500 to the bracket
6. Mount the brackets for the deflection mirror, if required
7. Mount the deflection mirror to its brackets
8. Mount the sensor(s) (Light Curtain, DM3610 Dimensioner, or S85)
9. Mount the photoelectric sensor to the mounting structure (optional)
10. Mount the tachometer to the mounting structure
11. Mount the CBX connection box to the mounting structure
12. Complete electrical installation *(**See "Electrical Installation" on page 41**)*
13. Align the AV500 for proper operation
14. Align the height sensor for proper operation
15. Configure the AV500 *(**See "Accessing e-Genius via AV500" on page 57**)*
16. Calibrate the AV500 ***(See "AV500 Calibration" on page 244)***
17. Check AV500 operations

MOUNTING

Dimensions and Clearances

he AV500 is a sealed, ventilated unit. Mounting the unit with 300 mm [12 in] of clearance front, top, and sides) is recommended for cooling and ease of maintenance.



Physical Support Requirements

For details on the weight of the cameras, *see “Technical Features” on page 276.* Multiple-head systems may include further details on the physical support requirements with any application-specific documentation provided.

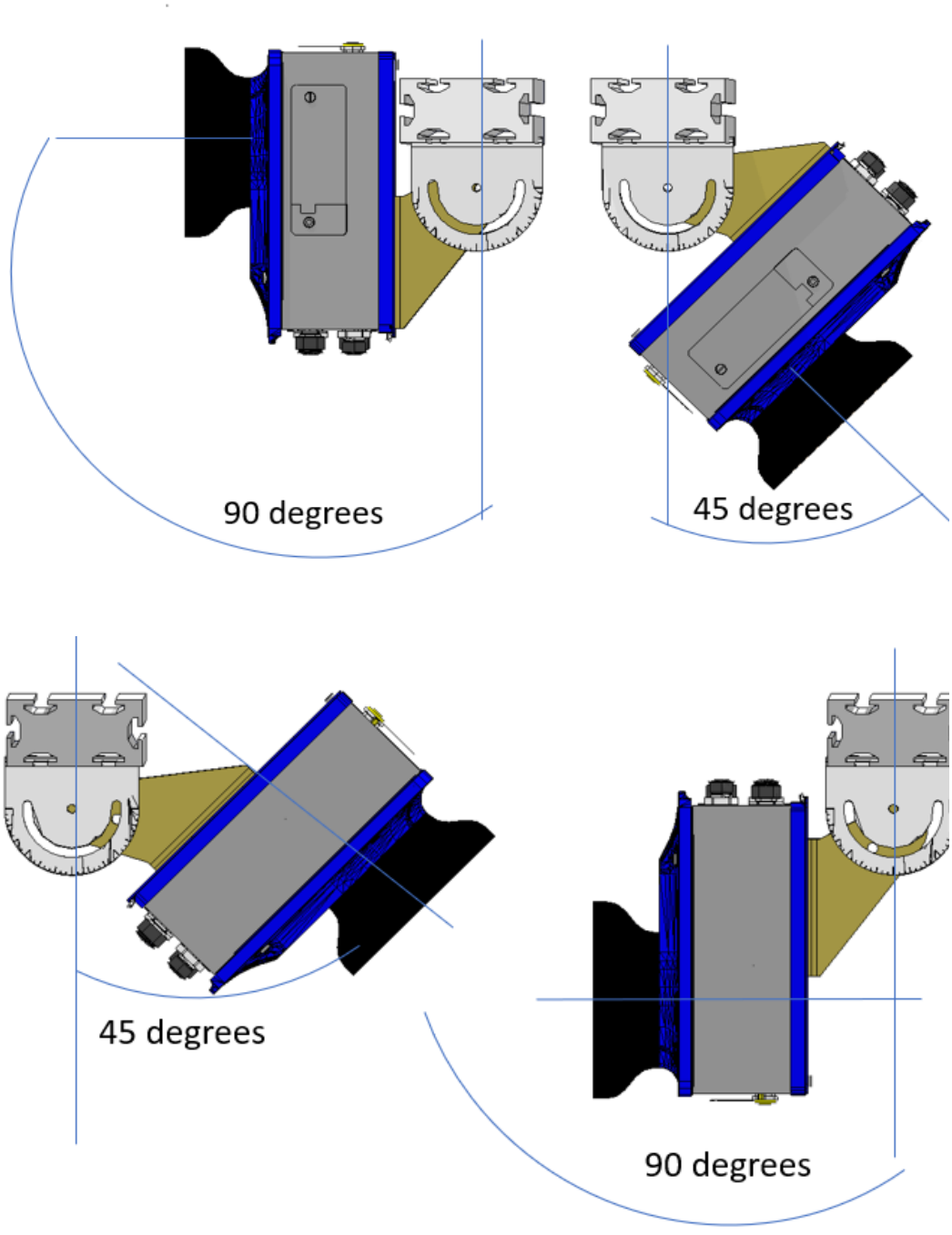
Vibration Limitations

See “Technical Specifications” on page 277.

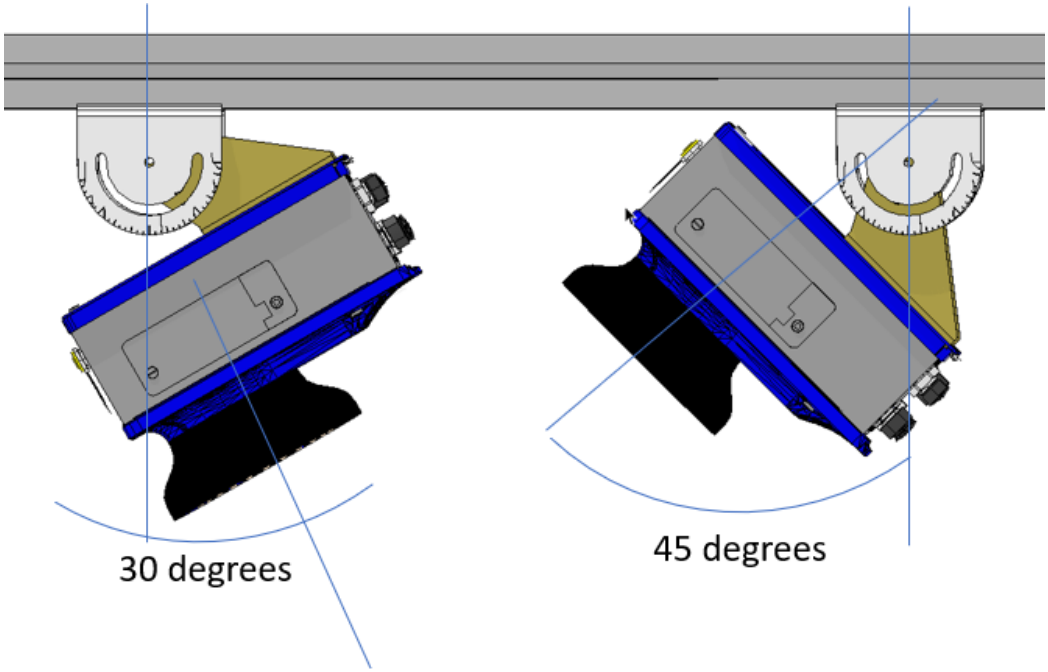
Mounting and Positioning AV500

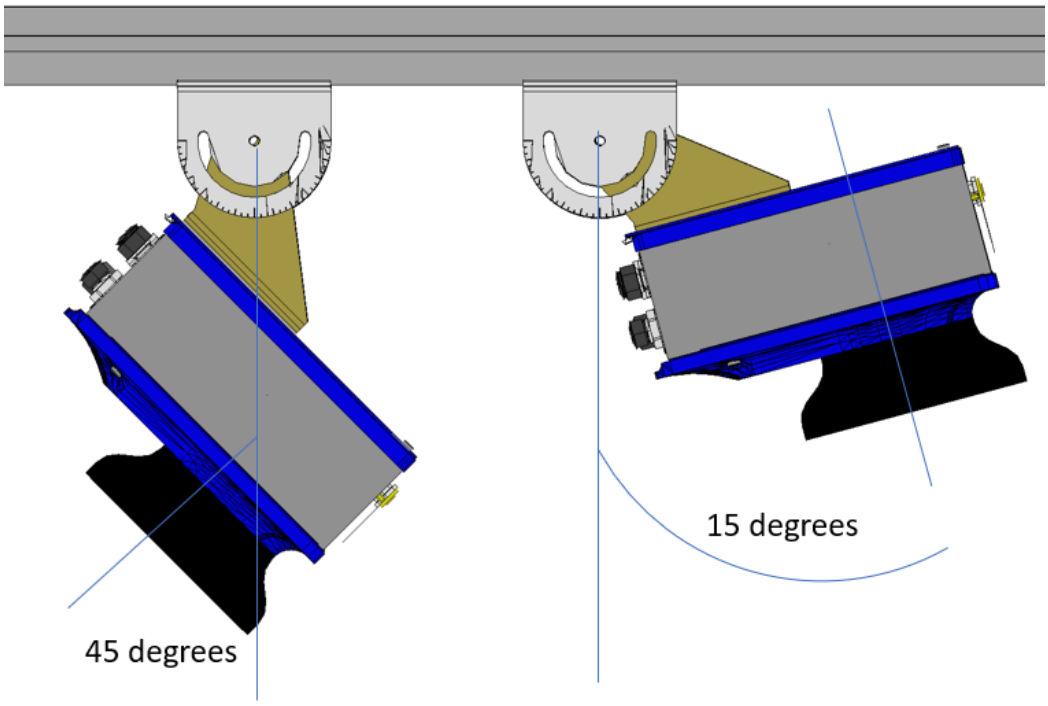
The AV500 system components and in particular the mounting bracket have been designed for installation onto standard Bosch and 80/20 frame profiles (extruded aluminum) and accessories. 60x60 mm profile is recommended for Bosch, although 45x45 mm profiles will work; and standard 1.5” x 3” for 80/20.

The following illustrations show the various typical mounting positions for the AV500.



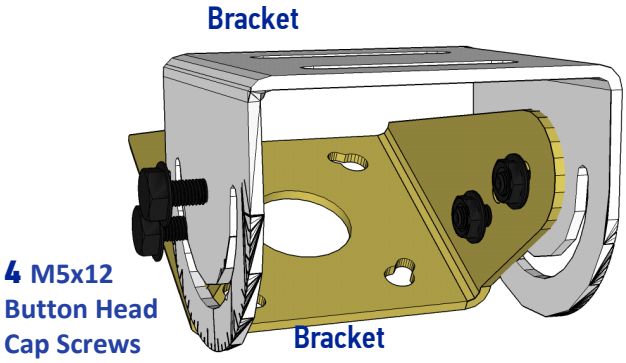
NOTE **AV500 Cameras will only be mounted at 90 degrees when used with a mirror.**


30 degrees
45 degrees


45 degrees
15 degrees

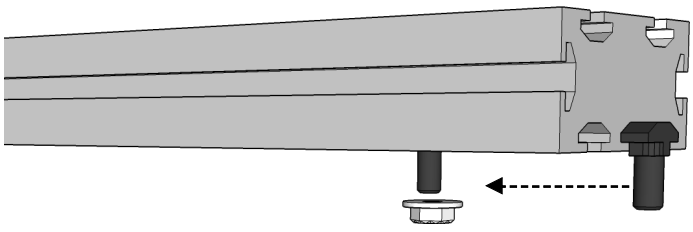
AV500 Mounting Sequence:

1. The AV500 mounting bracket has two parts and comes assembled. It is packaged with your AV500.

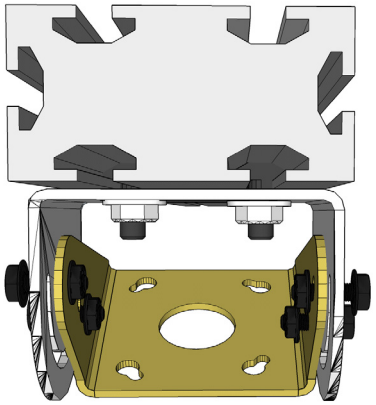


2. In your mounting kit are the required number of T-bolts and nuts used to attached the mounting bracket to the station frame.

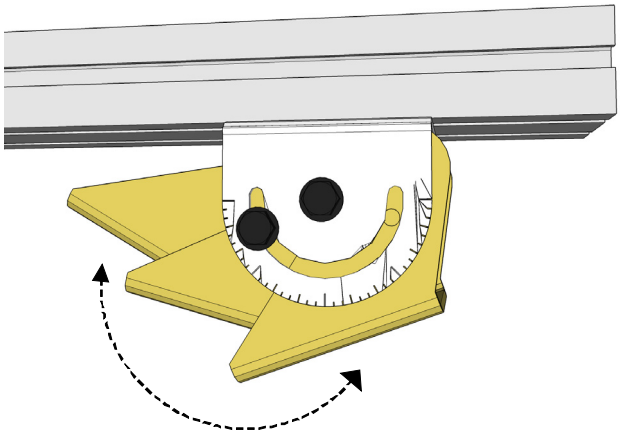
3. Determine where your AV500 will go on the structure (according to the measurements specified in your customer specific mounting diagram.) Slide the T-bolts into place.



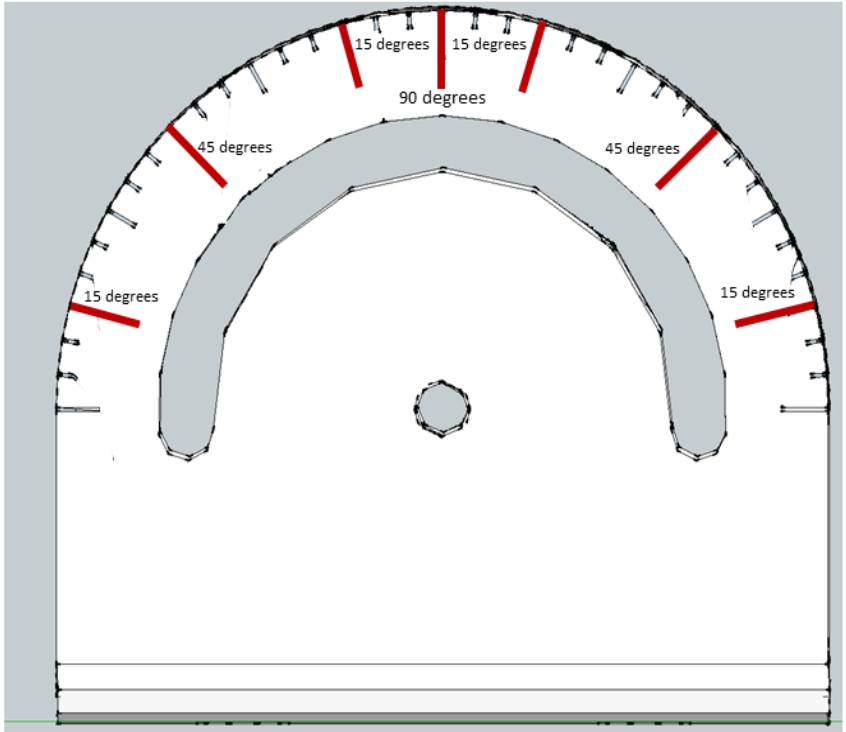
4. Set the AV500 mounting plate in the correct position and tighten the T-bolt nuts.

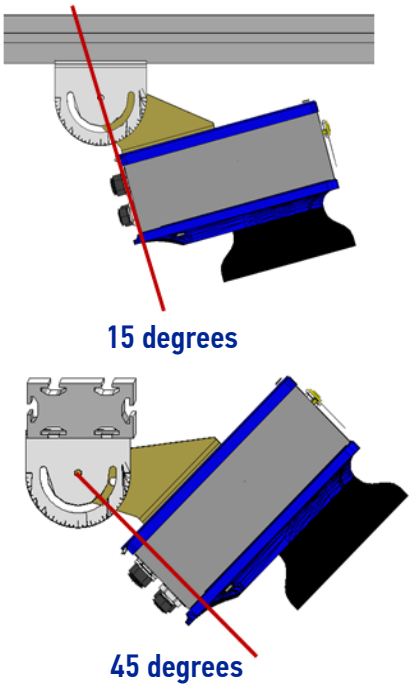


5. Make sure the bolts holding bracket parts together are loose enough to allow you to rotate the bracket.

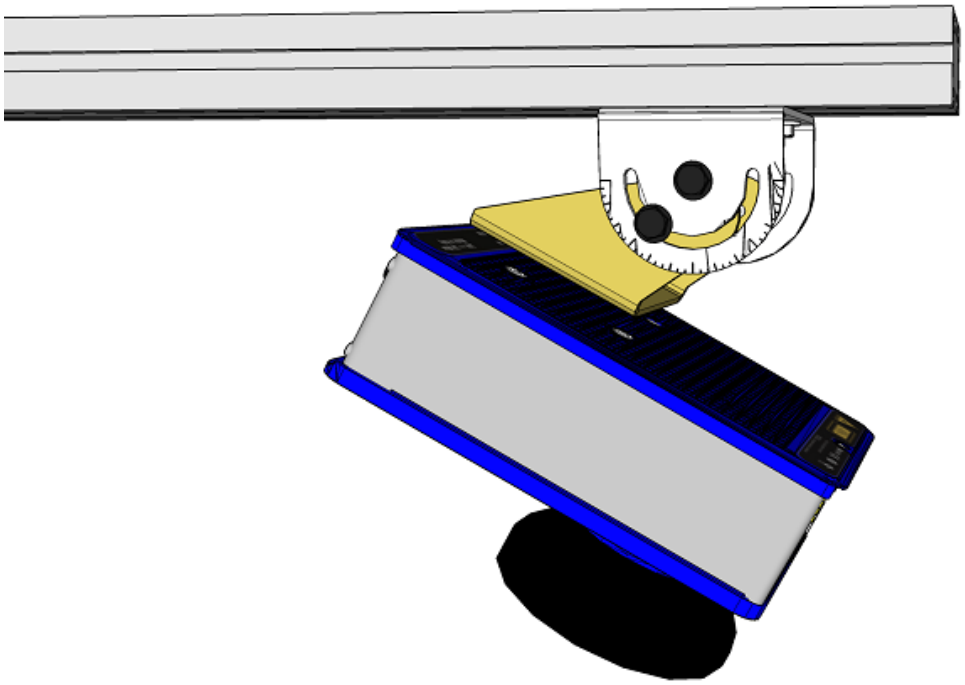


Once the brackets are in the correction position (15, 30, 45 or 90 degrees) tighten the bolts.





7. Attach the camera via the four mounting holes on the back of the unit to the bracket and tight the nuts.

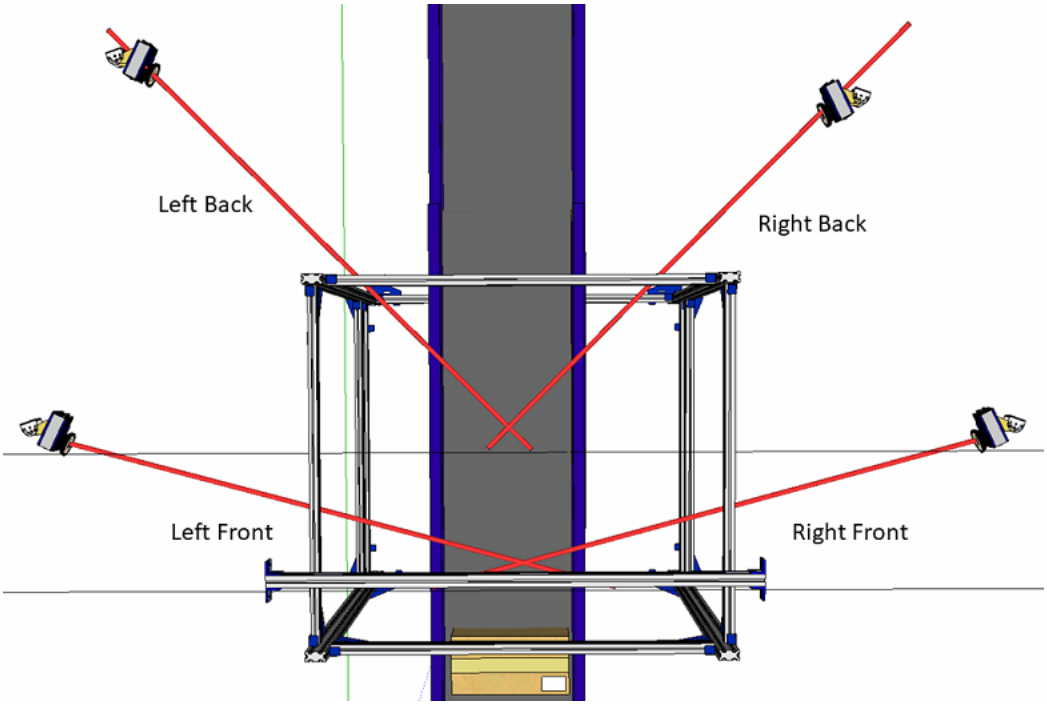


INSTALLING THE DEFLECTION MIRROR

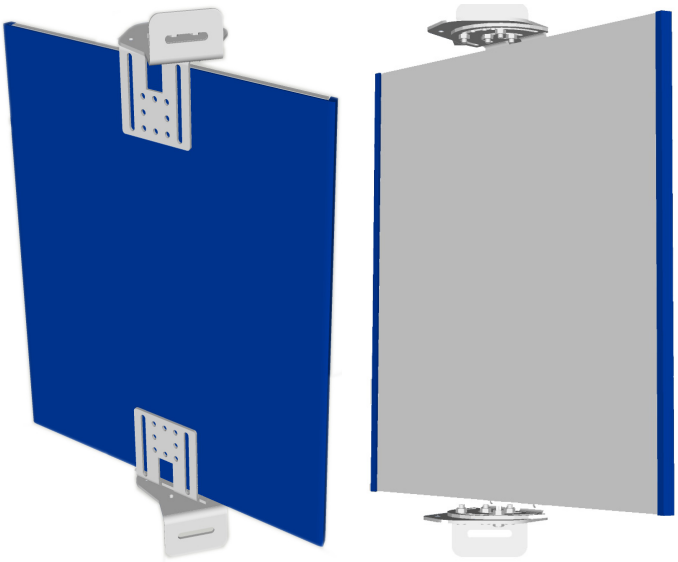
EMK series External Deflection Mirrors are mounted in applications where it is not practical to mount the reader in a position to achieve the full DOF. In these cases a more compact reading station can be constructed using the mirror to fold the camera's view and is particularly useful in side reading applications.

NOTE

The diagram below is for illustration purposes to show how it is not always practical to mount the reader at the necessary distance to achieve the desired DOF and FOV. Refer to your application specific diagrams for more information.



NOTE **For all of the following mounting examples, the positioning distances are not given since they will depend upon the application specific diagrams. Refer to your application specific diagrams for more information.**



Deflection Mirror Bracket Angles

Standard deflection mirror bracket angles are show below. The xxxxx bolt indicates the locking position between the Main Bracket (blue) and the Rising Bracket (red). The angles specified are reflective angles not the physical angle of the bracket or mirror.

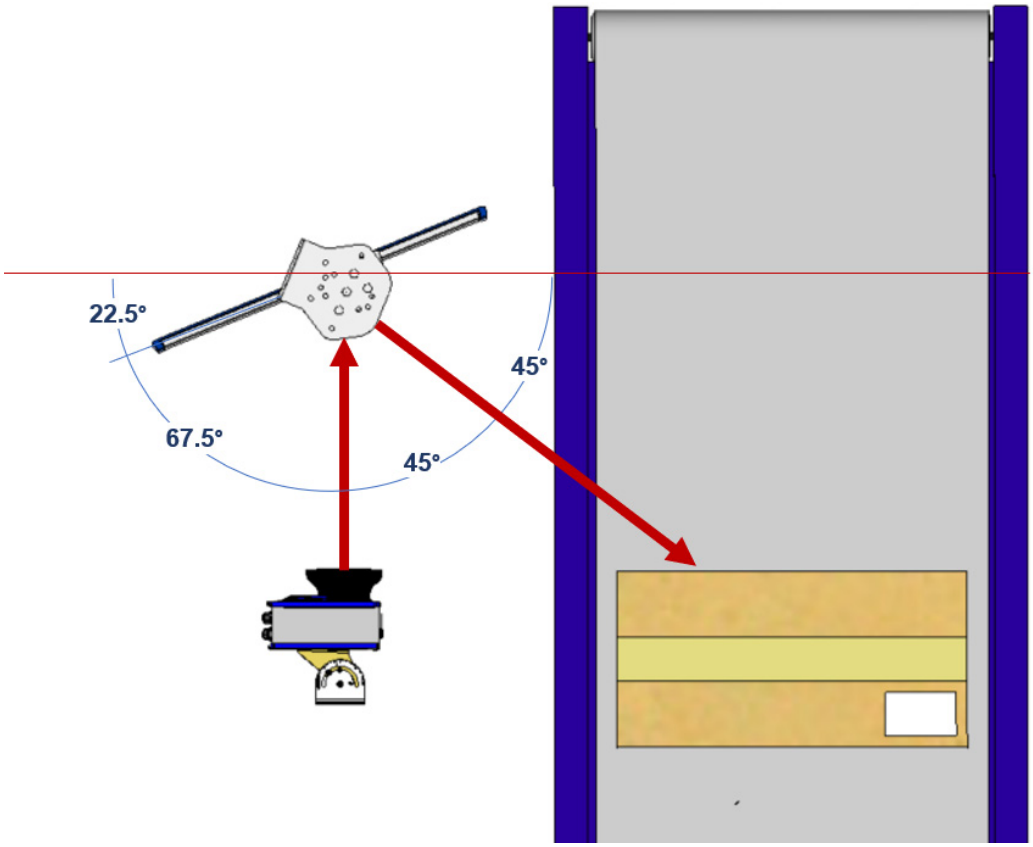
Left Back and Right Back (45 degrees)

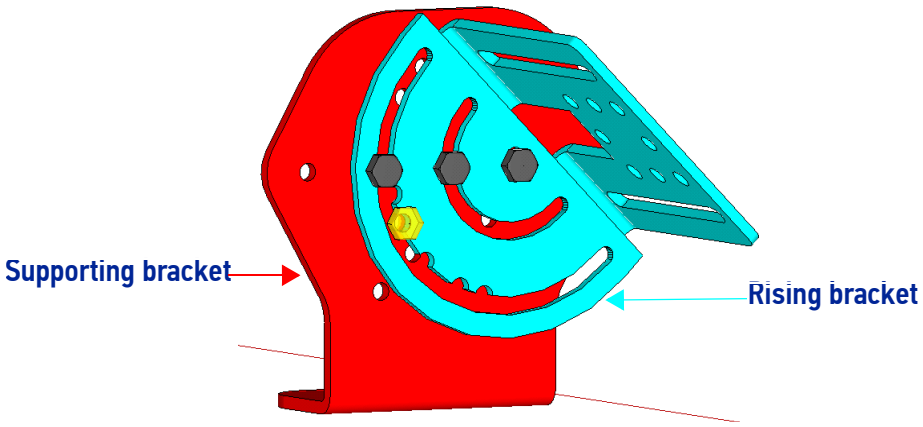
CAUTION

Do not mount the reader so far from the mirror that the reading area extends outside of the mirror surface.

It is critical that the brackets do not stress or flex the mirror, as this will cause focusing and calibration issues.

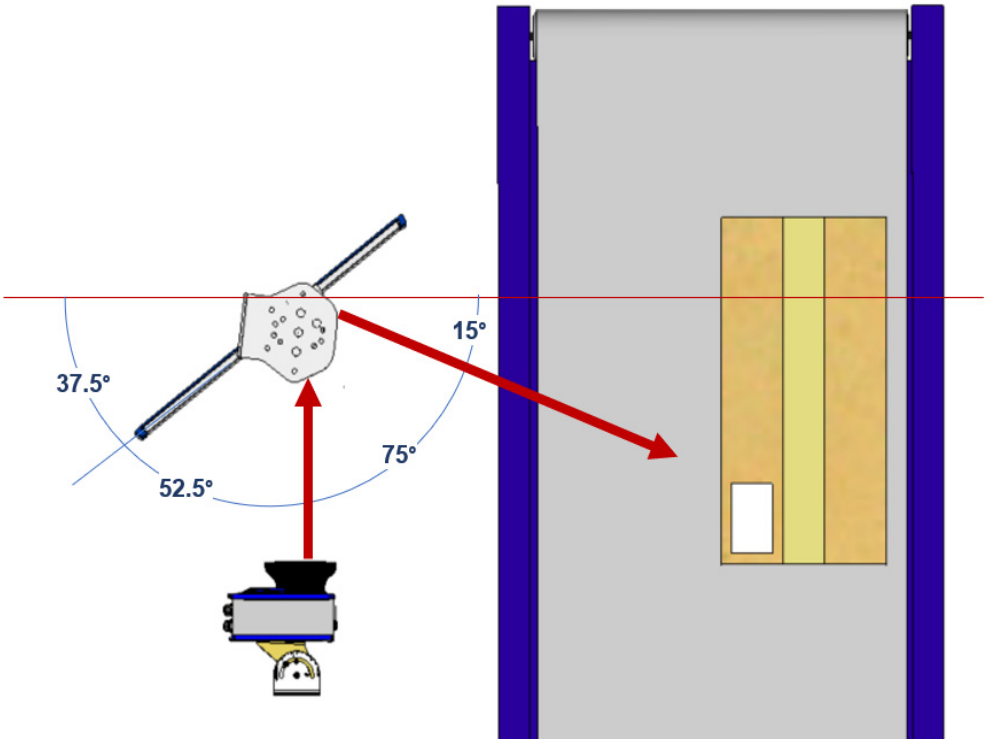
From the parallel position, rotate the mirror 22.5 degrees as shown.

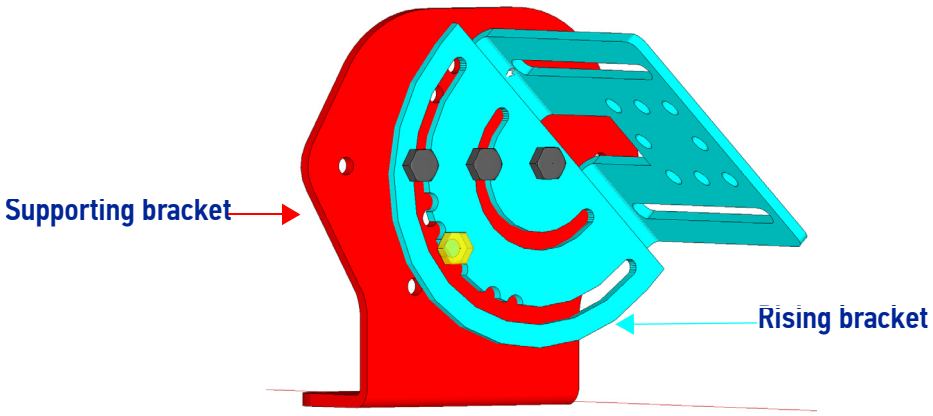




Left Front and Right Front (15 degrees)

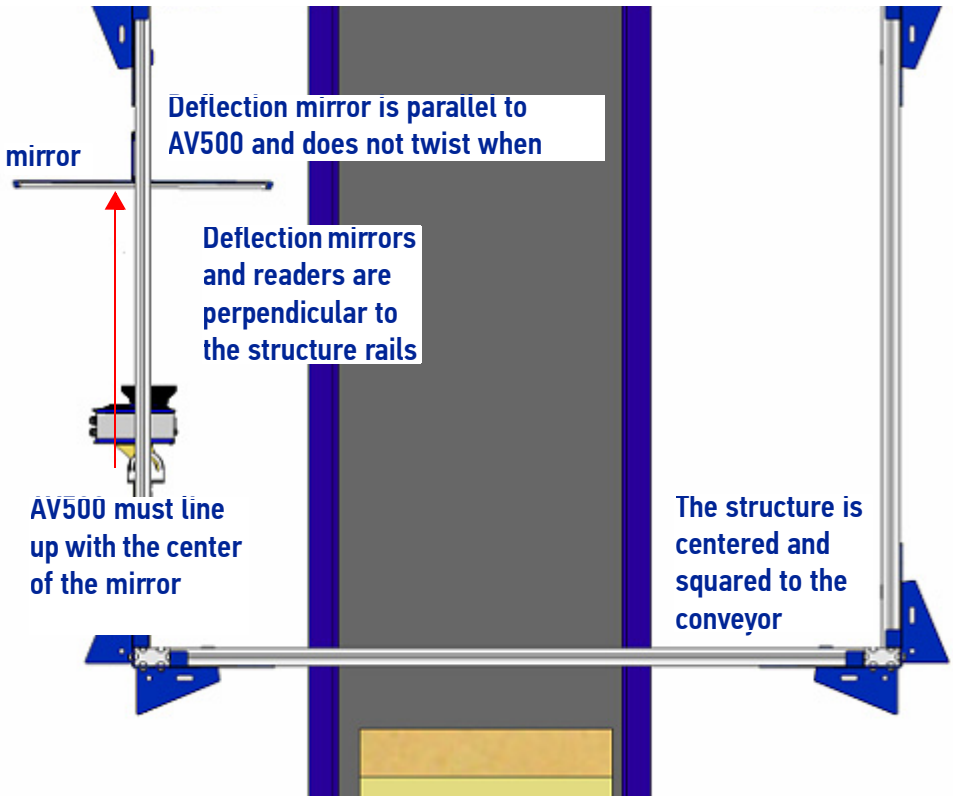
From the parallel position, rotate the mirror 37.5 degrees as shown.





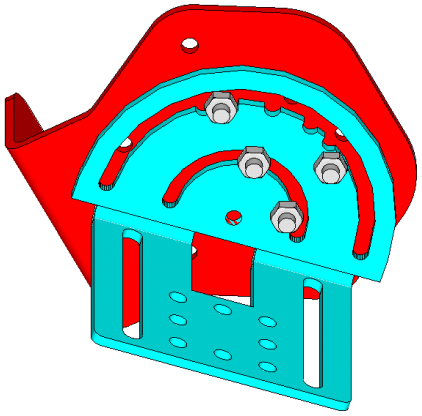
Aligning the AV500 with Deflection Mirrors

When using deflection mirrors with the AV500 reader, which is typical, the mirrors must be mounted parallel to the reader and at the correct distance to allow for proper focus and the highest read rate. Reference the system's application drawing for distances.When mounting the readers and mirrors, make sure:



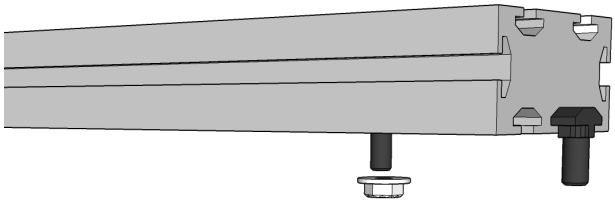
EMK-380 Mounting

The EMK mirror mounting bracket has two parts and comes assembled. It is packaged with your EMK mirror. Whether mounting in a top or side position, mount the mirror as follows:

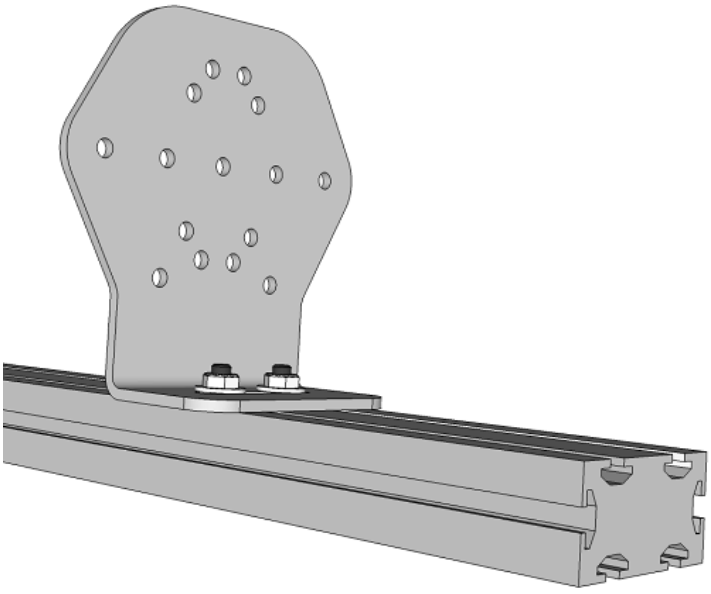


1. Included in your separate mounting kit are T-bolts and nuts. These will be used to attach the bracket to your mounting structure (typically Bosch or 80/20).

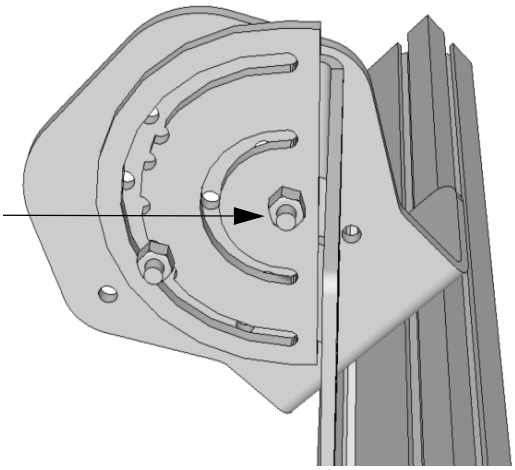
2. Determine where your mirror mounting bracket will go on the structure and slide the T-bolts into place. (2 or 4). Move the mirror assembly to the correct distance from the reader according to your application.



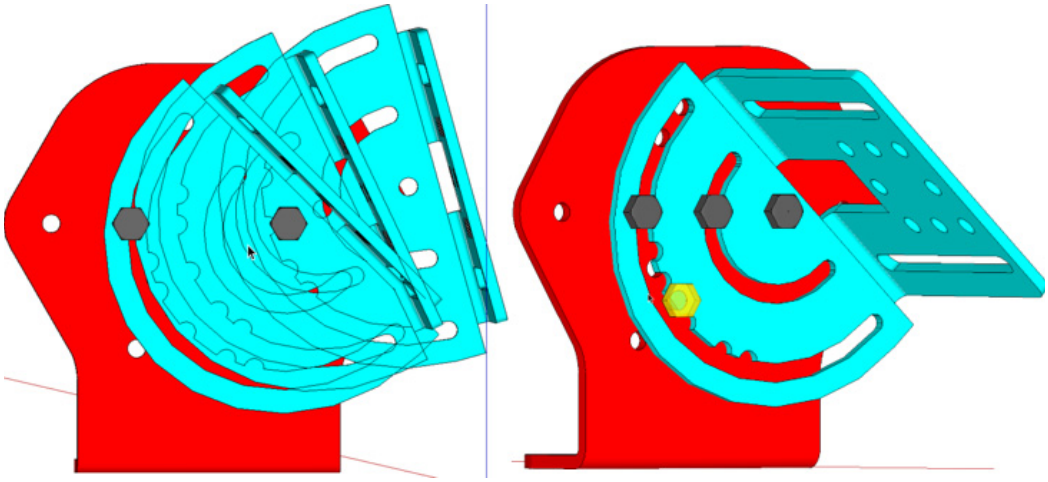
3. Once your bracket is in position, tighten nuts on T-bolts.



4. Mount the mirror rising bracket to the supporting bracket with one bolt in the center position and one bolt in the outer ring.



5. Rotate the mirror brackets so that the correct skew angle slot as shown on the bracket (15 or 45 degrees).

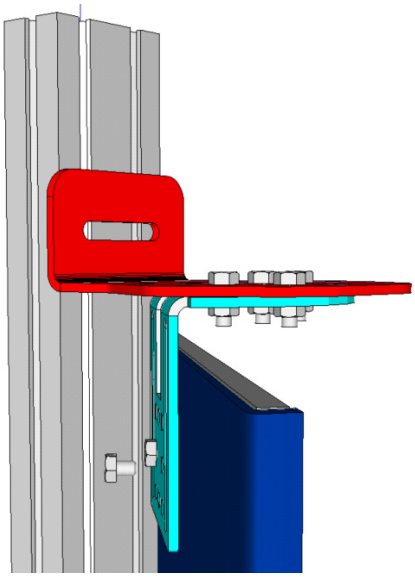


6. When in position, tighten center and outer ring nuts and attach two additional bolts and nuts in place and tighten as shown in previous diagrams.

NOTE

To prevent mirror bowing or flexing, leave enough play with the rising bracket so if top and bottom (or left and right) brackets are not aligned you do not damage the mirror.

7. Now mount the mirror to the bracket.



FOCUSING DEVICE MOUNTING

When required, an external device can be used to measure the position of parcels as they enter the field of view of the AV500 Camera. This information can be used by the camera to determine the correct position for optimal focusing. Proper mounting of these devices is critical to accurately determining the parcel positions. The Datalogic focusing devices may be one of the following:

- AS1AreaScan
- DK502 - S-85 Position Sensor Kit
- DM3610 Dimensioner
- LCC 75XX Light Curtain
- S-60 Photocell

Follow the instructions for correct mounting and positioning of the focusing devices found in each devices reference manual.

AV500 Software setup of these devices is explained in “Focusing device Setup” on page 256.

CHAPTER 3
ELECTRICAL INSTALLATION

Electrical Installation must be performed by Qualified Service Technicians Only! Procedures may involve exposure to high-voltage. A trained and authorized technician must perform these procedures. Do not attempt to perform any electrical installation procedures unless you are a trained technician.

The AV500 contain electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in the References section at the beginning of this manual. Failure to follow these precautions may void your warranty.

PREPARING FOR ELECTRICAL INSTALLATION

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Observe all electrical safety requirements discussed in the Introduction to this manual.
- Define and confirm the accuracy of your application's requirements.
- Review all installation-specific drawings.
- Review and plan the power requirements for your application.
- Review and plan the communications requirements for your application.

The content of this manual may be superseded by any customer-specific documentation provided by Datalogic. Before proceeding with any installation procedures, be sure to review ALL documentation, especially content that contains details specific to your installation.

Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See Chapter **for mechanical installation details.**

Most AV500 applications are shipped with the CBX connection box and all the necessary cabling required to electrically install the system. If your system requires custom-length cables or other special wiring, documentation specific to these requirements has been provided in your shipment. This special documentation supersedes any contradictory content in this manual.

To reduce the possibility of damage to the unit, check all cabling between the AV500 camera and other devices for accuracy.

CONNECTING AN AV500 CAMERA

To install an AV500, follow this sequence:

1. Complete mechanical installation *(See "Mechanical Installation" on page 25.)*
2. Complete electrical installation.
3. Observe all electrical safety requirements outlined in this chapter.
4. Ground the mounting structure to protective earth (PE) ground.
5. If used, wire the photoelectric sensor (or other trigger).
6. Wire the tachometer to the CBX connection box, (*see "Encoder/Tachometer Wiring to CBX510" on page 55).*
7. Connect the M12 end of the Ethernet cable to the camera's HOST NET port.
8. Connect to Ethernet device.
9. Connect the AV500 to its power supply.

To turn off you AV500, use a power switch or box. Do not disconnect the 5 pin power connection from the unit.

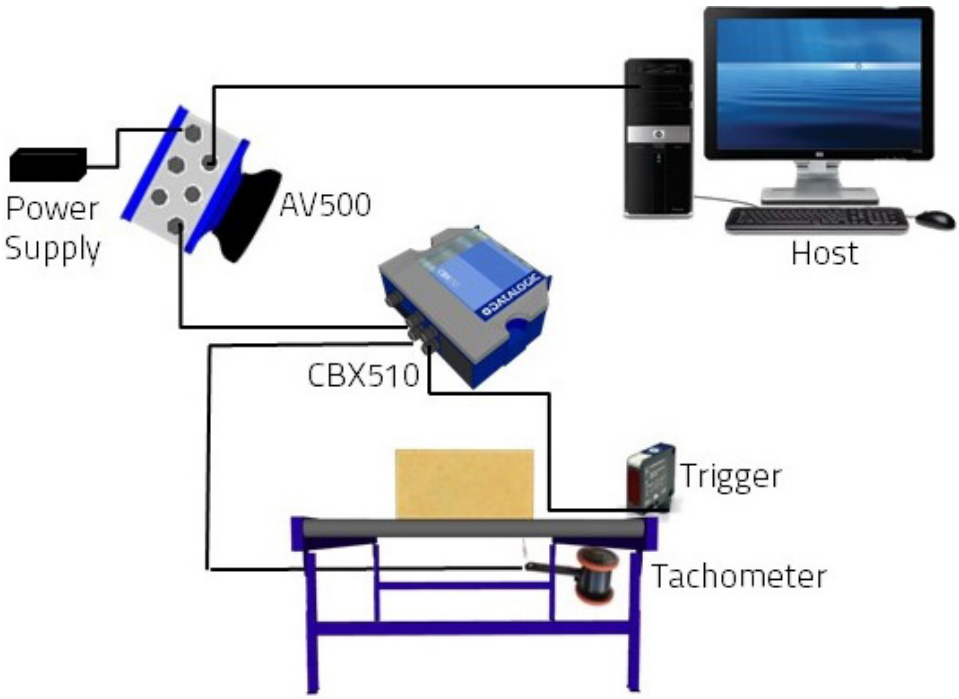
If you attach the power supply to the AV500 and it is already attached to power, it may cause the AV500 to not boot correctly. Recycle power by unplugging the AC cord from the power supply and plugging it back in.

10. Connect the power supply to the power source.
11. Setup / check camera operations *(See "Focusing device Setup" on page 222.)*

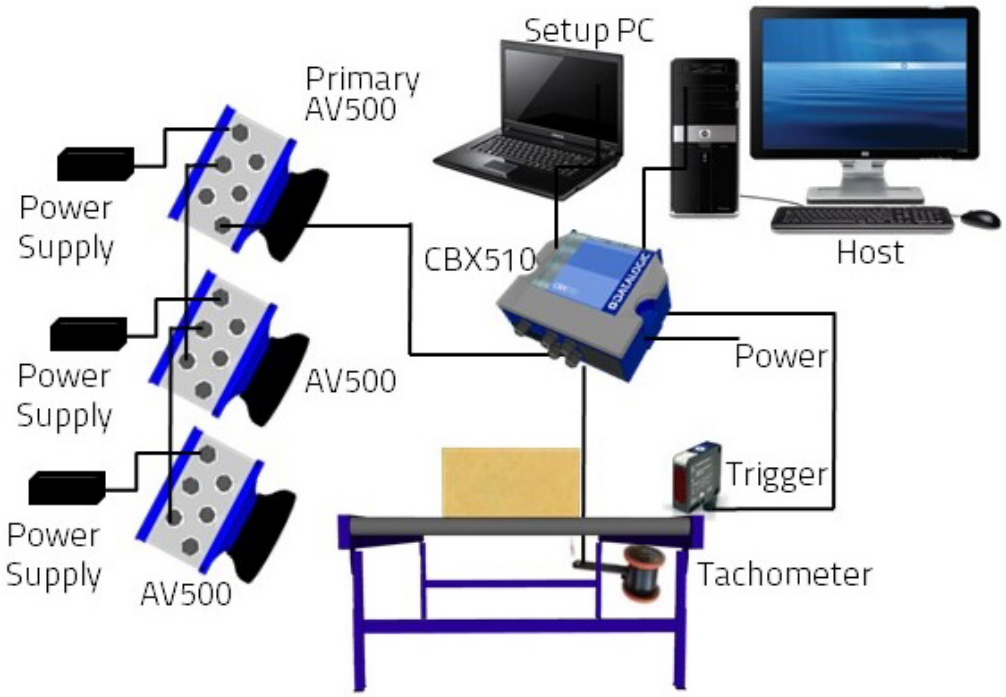
TYPICAL CONNECTION BLOCK DIAGRAMS

Single Head Stand Alone AV500

Single Head AV500 with Tachometer and Photoeye



Multiple AV500s Connected via SyncNet in Primary/Secondary Controller Configuration



GENERAL ELECTRICAL INSTALLATION GUIDELINES

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting or replacing any Datalogic products, parts or related equipment.

As you plan and install your barcode reader(s), be sure to keep the following guidelines in mind:

- Determine the camera is in the proper location as outlined in Chapter 2.
- Leave adequate clearances (approximately 300mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise.
- When extraneous power and communication wiring must cross, make their intersection perpendicular. Avoid running power and data wiring parallel to each other. If possible, maintain one of the following separations between the power and data wiring:
- 300 mm [12 in] gap
- use steel conduit and 25 mm [1 in] gap
- 6.5 mm [0.25 in] of aluminum.

WARNING

When planning your installation wiring, remember all power connections must be quick-disconnect. For PERMANENTLY CONNECTED EQUIPMENT a readily accessible disconnect device must be incorporated in the building installation wiring. For PLUGGABLE EQUIPMENT the socket-outlet must be installed near the equipment and must be easily accessible.

To assure no ESD damage will occur, be sure to observe the precautions outlined in the Introduction to this manual.

Ground the mounting structure to safety ground (protective earth ground (PE)). See section Grounding **for wiring recommendations for safety ground.**

AV500 CONNECTOR PANEL

After completing mechanical installation, use this section to properly wire your cameras for optimal performance in your application. AV500 wiring connections are made to the connector panel and through the CBX connection box (via the I/O port). In most applications, the cable connections to the barcode reader will include:

AV500 Camera

1. **HOST NET** – Barcode data to Host
2. **IMAGE NET** – Configuration, Remote Monitor application or image export
3. **POWER** – Power connected to AV500 power connector
4. **I/O** – Provides connection to CBX Connection Box
5. **SYNC OUT** – AV500 internal data, device network
6. **SYNC IN** – AV500 internal data, device network

WARNING

If a connector is not in use, it should always be covered with its protective cap.

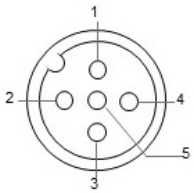
Route wiring from the barcode reader's connector panel through the wiring channels (if available) on the Datalogic mounting structure when interconnecting cables to other devices.

CONNECTING A PC TO THE AV500

During initial setup, a PC (laptop) may be connected to the AV500 with an RJ45 cable. Connect an Ethernet cable from the **HOST NET** or **IMAGE NET** port of the AV500 to the Ethernet port of your PC. For information on connecting to e-Genius, *see "E-Genius" on page 56.*

POWER CONNECTOR PIN-OUT TABLE (CUSTOM POWER SUPPLY)

A recommended power supply and cabling is available for the AV500 Camera. However, if your installation requires custom power supply wiring, the pin-outs of the AV500 camera power connector are provided below.

<table>
<tr><td rowspan="2">24 -2.5A MAX</td><td colspan="3">POWER INPUT</td></tr>
<tr><td colspan="2">Unit Connector (shown)</td><td>Mating Cable Connector</td></tr>
<tr><td rowspan="6">5 PIN M12 Type Male
 
</td><td colspan="2">5 PIN M12 Type Male</td><td>5 PIN M12 Type Female</td></tr>
<tr><td>Pin</td><td>Function</td><td></td></tr>
<tr><td>1</td><td>+24 VDC</td><td></td></tr>
<tr><td>2</td><td>-24 VDC</td><td></td></tr>
<tr><td>3</td><td>dc return</td><td></td></tr>
<tr><td>4</td><td>dc return</td><td></td></tr>
<tr><td>5</td><td>protective earth (chassis)</td><td></td></tr>
</table>

NOTE

When using an AV500 camera, no power supply is required for the CBX510 connection box. All power and some communication options are fed to the CBX510 through the scanner's 17-pin I/O connector to the CBX510 25-pin connector using the cable provided.

In cases where the AS-I cabling is not used, the alternative CAB-LP-05 cable can be used to connect the power supply to the scanner. Connect the Brown/White pair to +24 Vdc and the Blue/Black pair to dc return. Chassis ground needs to be connected. Use cable CS-A1-02 that has 5th ray wire.

SELECTING THE CORRECT CBX CONNECTION BOX FOR YOUR APPLICATION

As shown in *section Typical Connection Block Diagrams*, typical applications require a single CBX connection box to connect the trigger and encoder inputs to the master camera. The camera sources power to these devices. Other possible CBX connections are for digital outputs or a serial host.

- **CBX100/CBX500** - used for slave cameras (and as an alternative for master cameras). It provides general access to digital input/output signals.

- **CBX510** - used for typical standalone or master cameras (cannot be used for slave cameras). It provides general access to digital input/output signals. It doesn't require special jumpers to set operation or power sourcing.
- **CBX800** - used for Fieldbus communication between standalone or master cameras and a Host. Various Fieldbus modules can be installed in the CBX800. The master camera communicates through its main serial interface to the CBX800 which must be programmed for the specific Fieldbus communication to the Host. It also provides general access to digital input/output signals.The table below indicates the available options for each recommended CBX Connection Box.

	OPTIONS						
DEVICE	Tach Input	Trigger Input	General Purpose Input	General Purpose Output 1	General Purpose Output 2	Works as Slave	Works as Master
CBX100	X	X		X	X	X	w/ jumper (Ref to D+)
CBX510	X	X	X	X	X		X
CBX800	X	X	X	X	X	X	w/ jumper (Ref to D+)

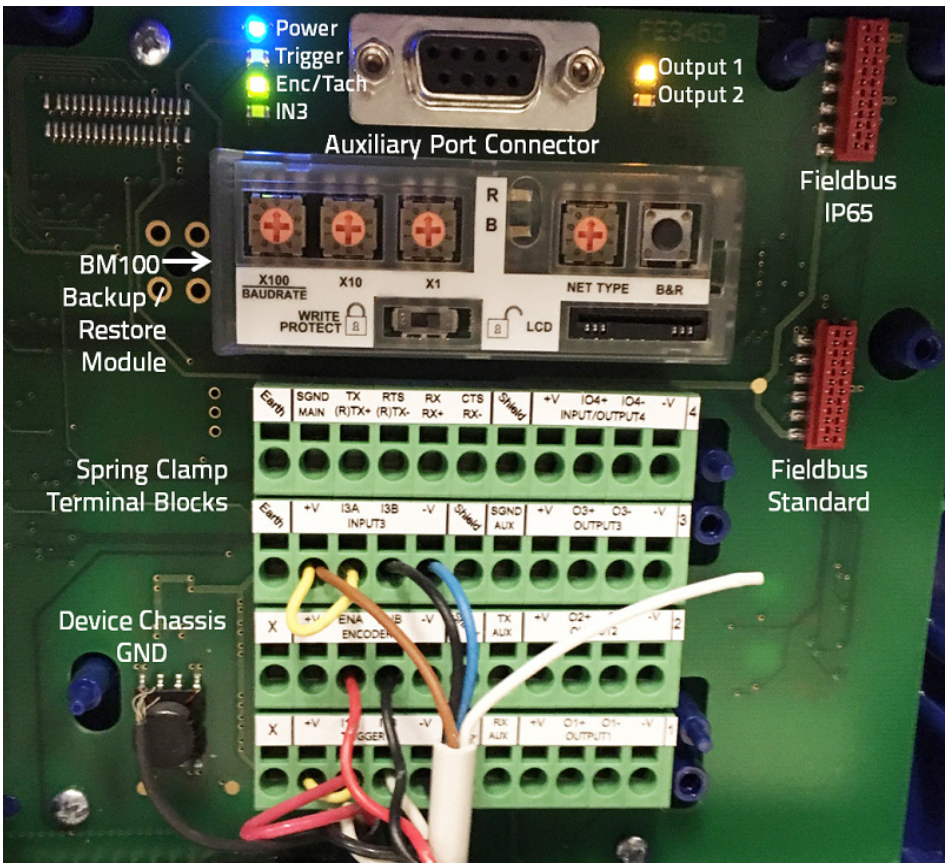
Although multiple AV500 cameras can have a CBX box, only one of the CBX boxes in the system can have the Jumper to make it the Master.

CBX CONNECTION BOX INITIAL CONFIGURATION

Complete installation information on these connection boxes is available in the *CBX Box Installation Manuals* available at www.datalogic.com.

CBX510 CONNECTION BOX

Complete installation information for the connection box is available in the ***CBX510 Installation Manual*** available at www.datalogic.com. The interior of the box is shown below.



WARNING

If you are terminating more than one wire in a single terminal, cut off any tinned ends and twist the wires together before inserting them into the terminal.

Sync In/Sync Out

If connecting several AV500s together, they may be connected via the Sync In and Sync Out ports.

Host Net/Image Net

During initial setup, a PC (laptop) may be connected to the AV500 with an RJ45 cable. Connect an Ethernet cable from the **HOST NET** or **IMAGE NET** port of the AV500 to the Ethernet port of your PC. For information on connecting to e-Genius, *see Chapter 4.*

NOTE

Parameters for tunnel are set up in the Controller AV500 only. IP Address for Host Net and Image Net are as follows:

Host Net: 192.168.3.10

Image Net: 10.0.40.20

Photoelectric Sensor Connections to CBX510

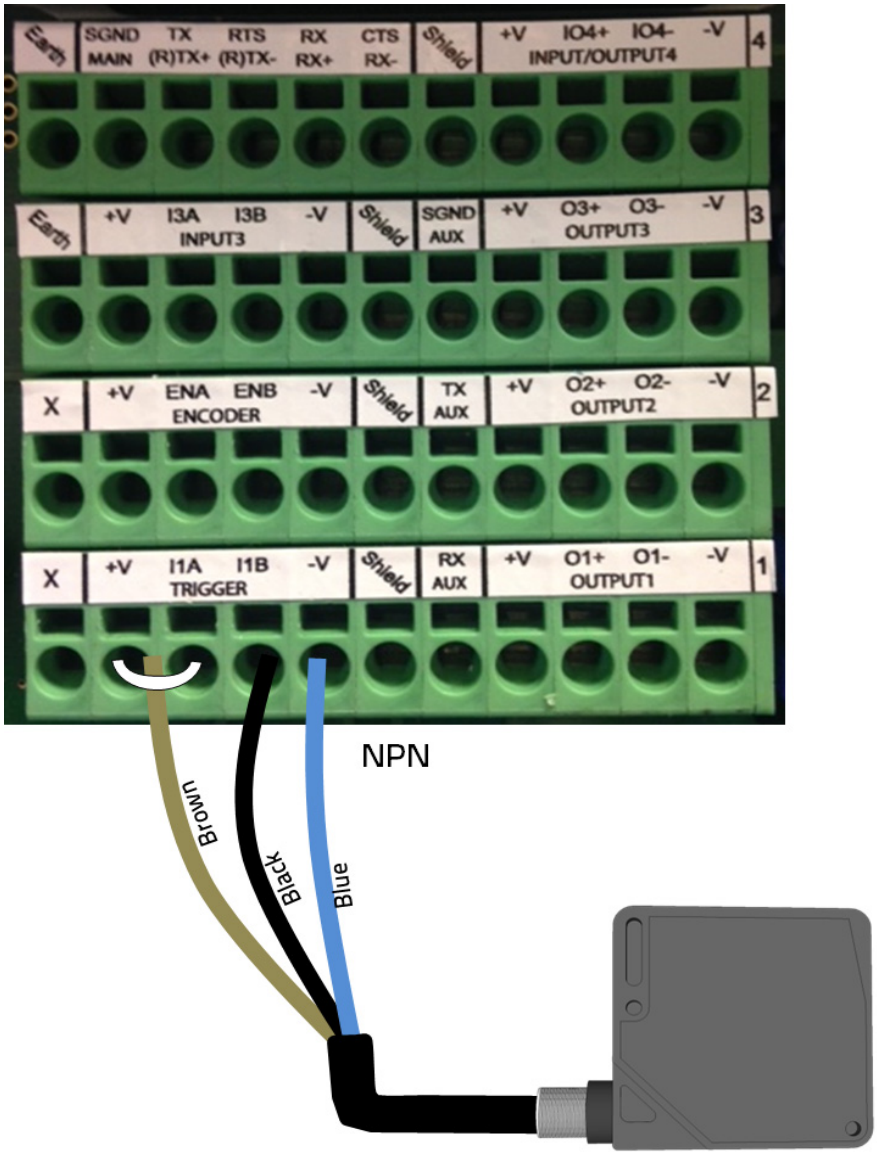
Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX510 terminal block.

If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

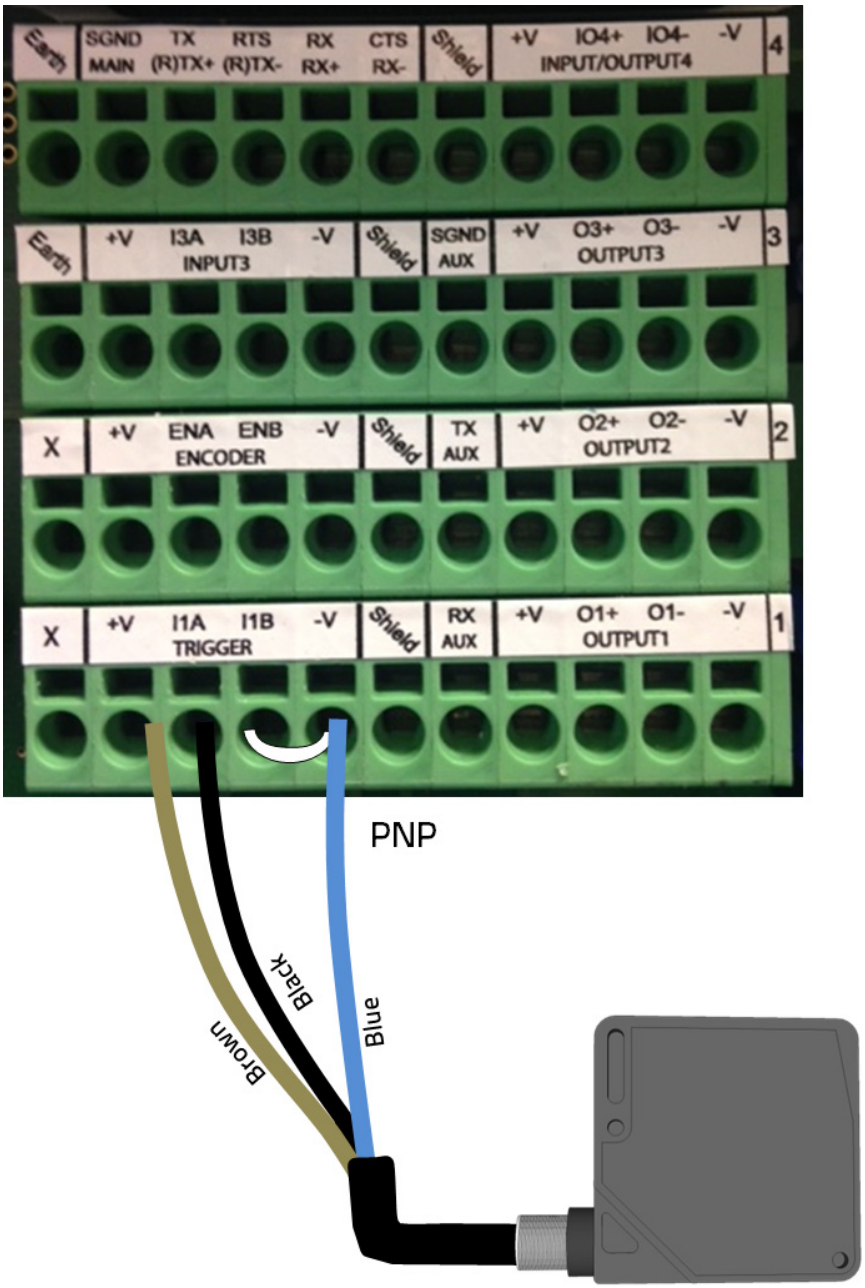
To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and then on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX510 terminal block.

Photoelectric Sensor to CBX510 (NPN)

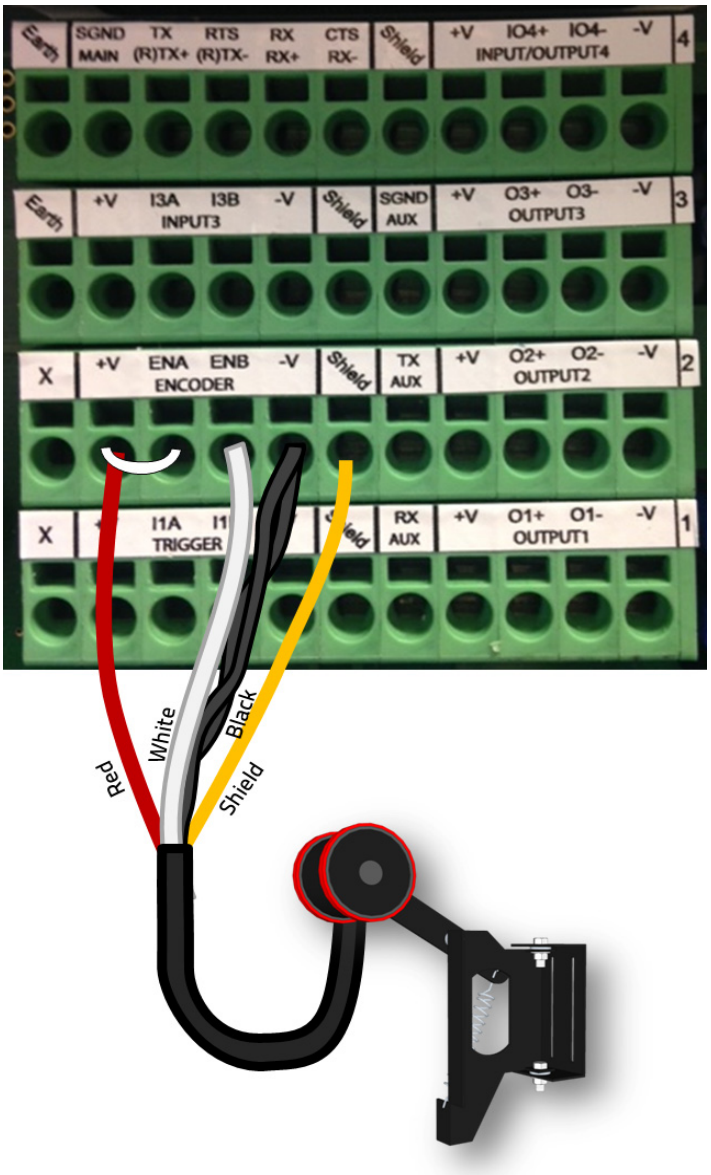


Photoelectric Sensor to CBX510 (PNP)

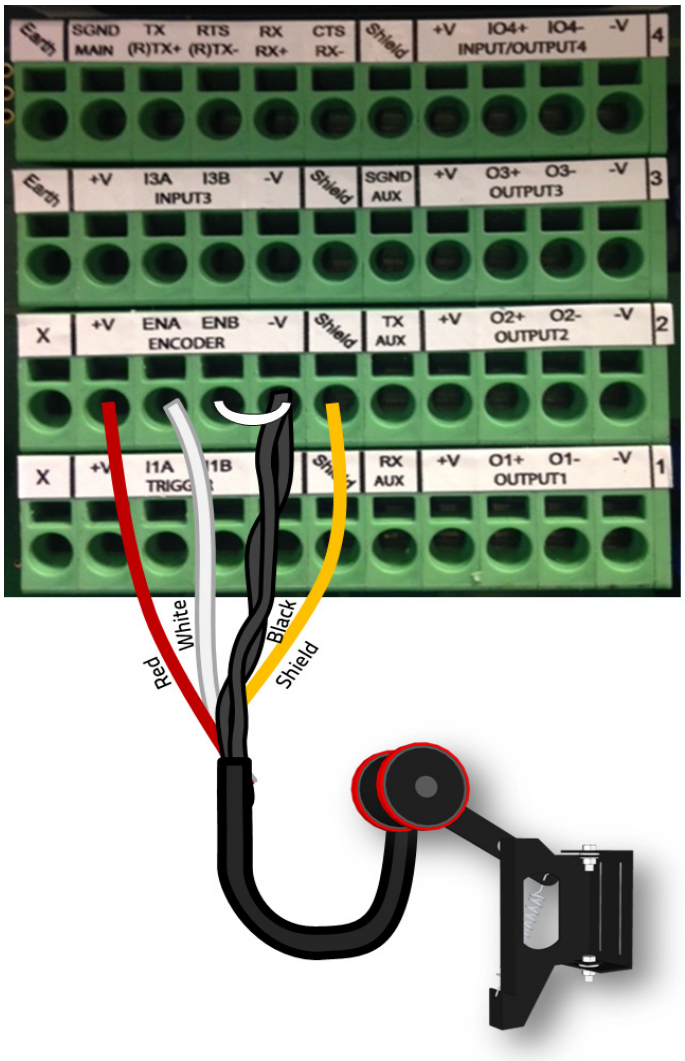


Encoder/Tachometer Wiring to CBX510

Encoder/Tachometer Wiring for NPN Output to CBX510



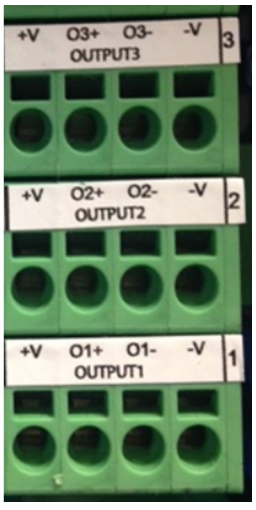
Encoder/Tachometer Wiring for PNP Output to CBX510



Digital Output Configuration from CBX510

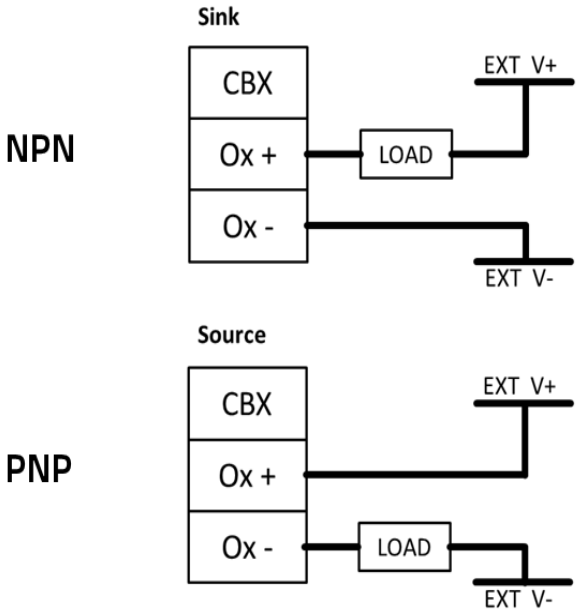
The CBX510 includes an OUTPUTS block for wiring relays as needed for external accessories.

Outputs 1 – 3
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1 V at 10 mA Max.
Max. Power Dissipation 90 mW at 50 degrees C Ambient Temperature.

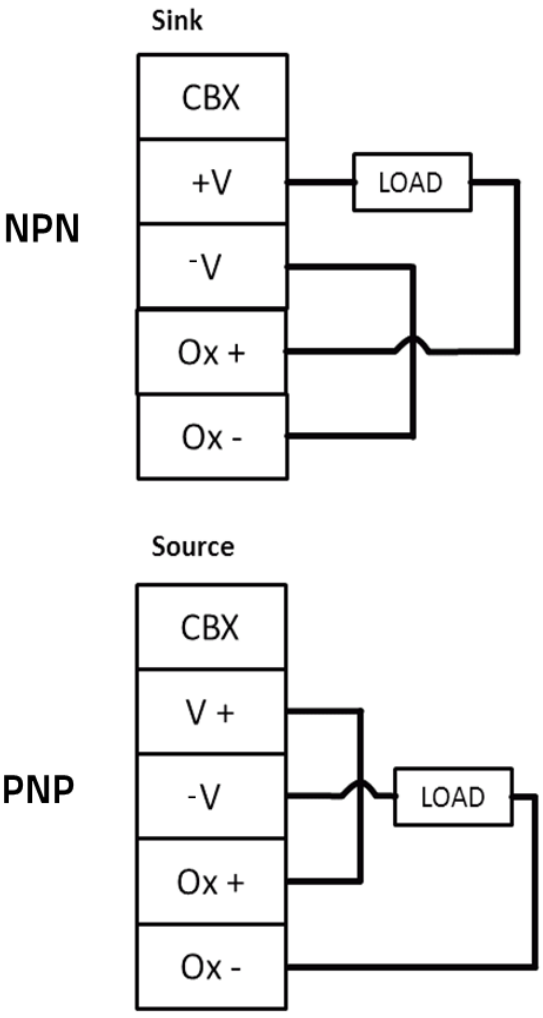


Schematics for Isolated and Non-Isolated digital outputs are provided below.

Unpowered Outputs



Powered Outputs



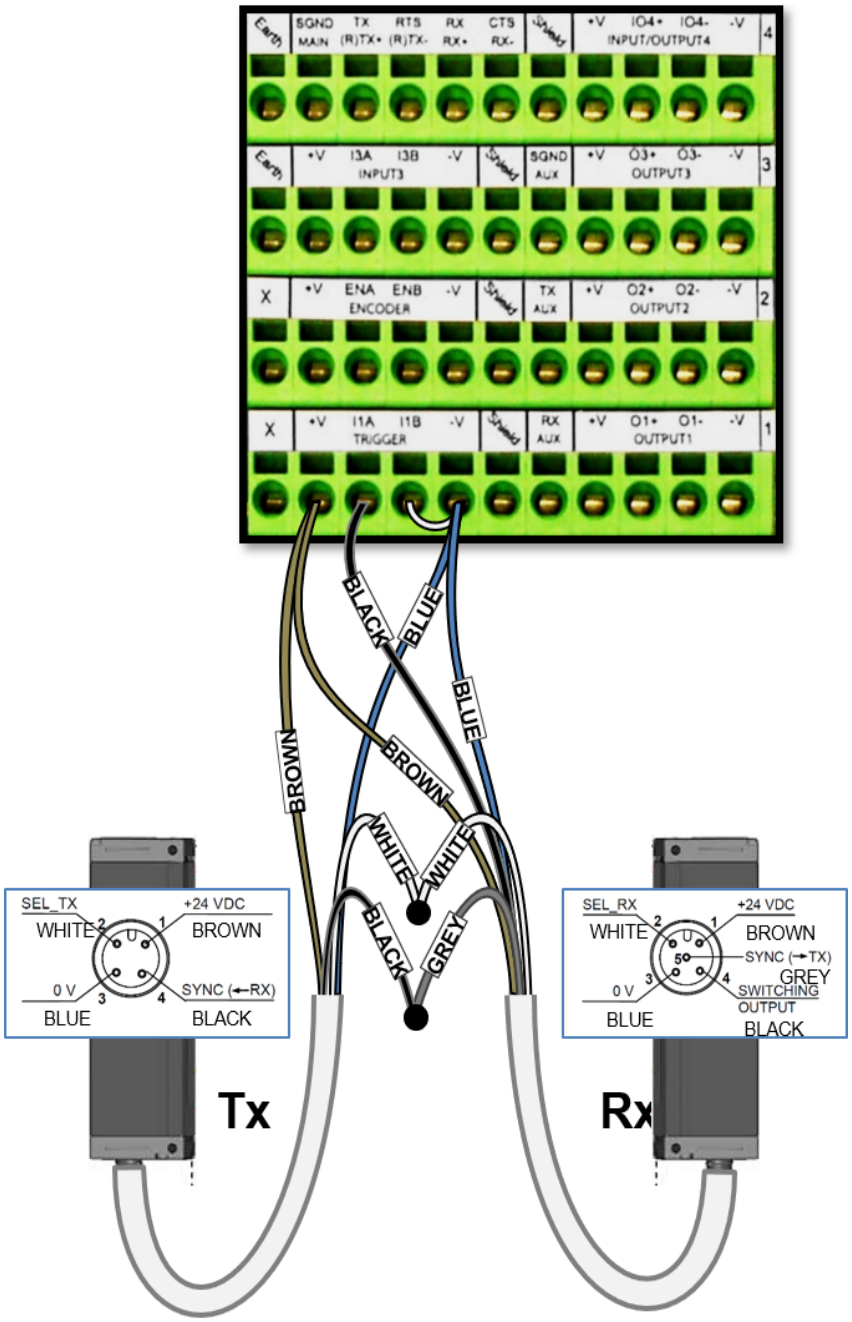
FOCUSING DEVICE WIRING

An external device can be used to measure the position of parcels as they enter the Field of view of the AV500 Camera. This information is used by the camera to determine the correct position for optimal focusing. The Datalogic focusing devices may be one of the following:

- AS1
- DK502 - S-85 Position Sensor Kit
- LCC 75XX Light Curtain
- DM3610 Dimensioner

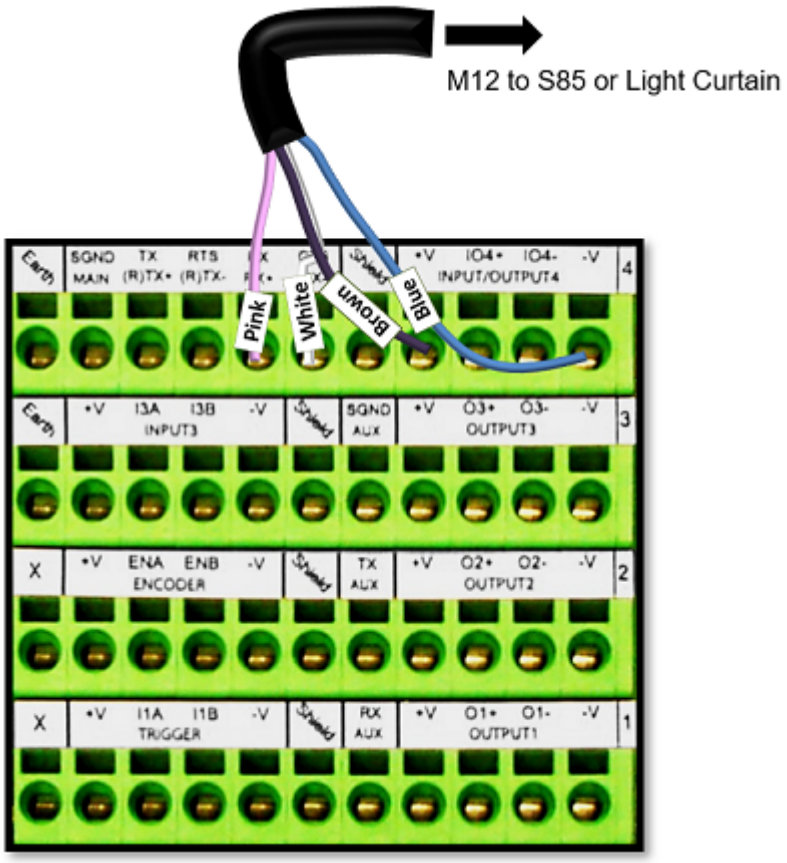
ASI

When using an AS1 for focusing, the AS1 must be wired to the CBX510 connected to the AV500 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)



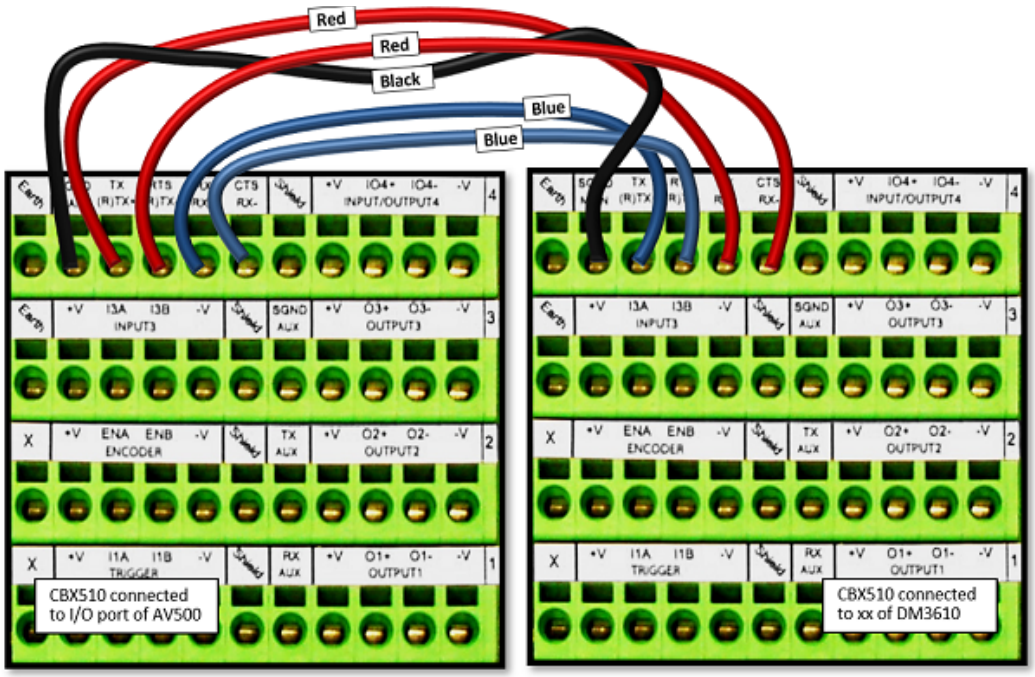
DK503 - S-85 Position Sensor and LCC 75XX Light Curtain

When using the S-85 or Datalogic Light Curtain for focusing, they must be wired to the CBX510 connected to the AV500 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)



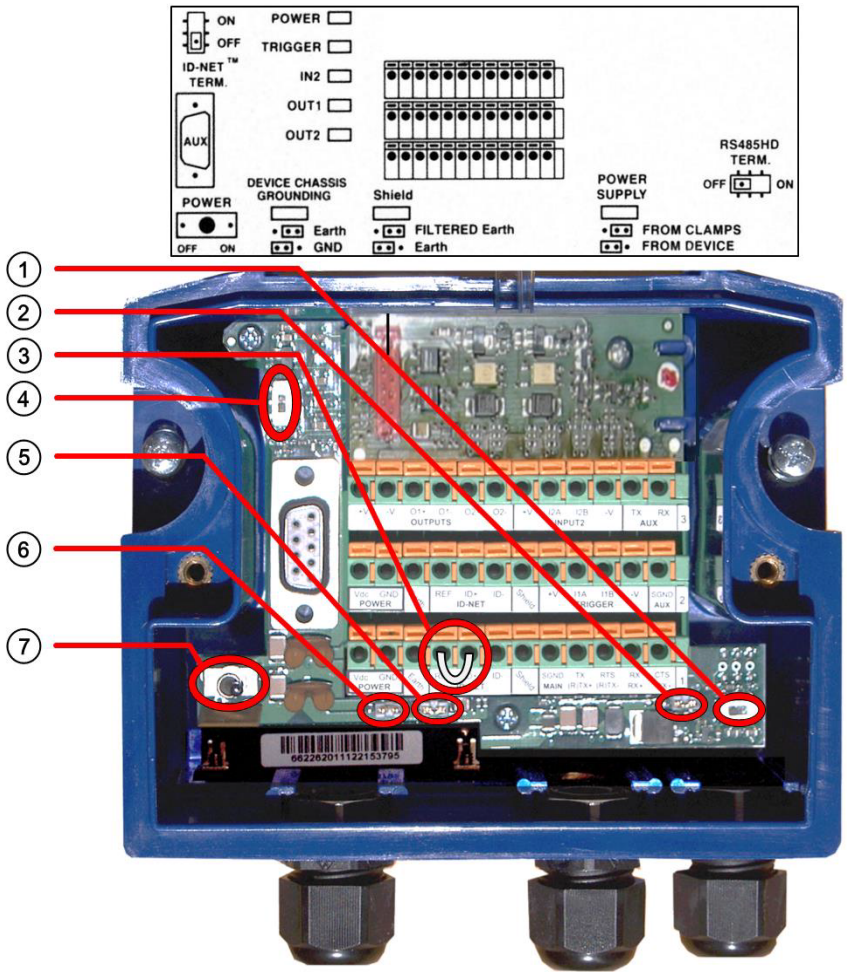
Wiring from DM3610 CBX100/CBX800 to AV500

When using a DM3610 dimensioner for focusing, the DM3610's CBX box must be wired to the CBX box connected to the AV500.



CBX100

Please verify that the CBX100 connection box is configured for the AV500 application as follows:



Reference the image and diagram above:

1. Set RS422HD TERM switch to OFF.
2. Set POWER SUPPLY jumper to FROM DEVICE.
3. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).

NOTE

In order for a standalone or Master AV500 to initialize properly, it must be connected to a CBX100. On power-up the AV500 looks for the jumper (item number 3 in the image above) and will assume the responsibility of provided the SYNC Network IP addresses. Slave units in an array/tunnel will receive their SYNC Network IP addresses from the Master.

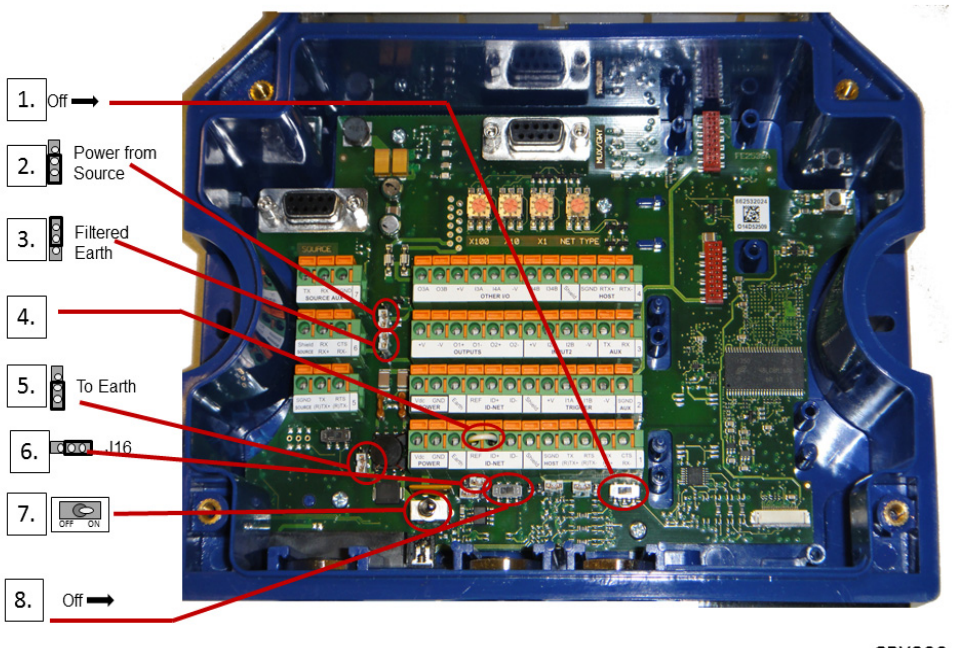
WARNING

Although multiple AV500 cameras can have a CBX box, only one of the CBX boxes in a multi-camera system can have the jumper to make it the Master.

4. Set ID-NET TERM switch to OFF.
5. Set Shield jumper to FILTERED Earth.
6. Set DEVICE CHASSIS GROUNDING to Earth.
7. Set POWER Switch to ON.

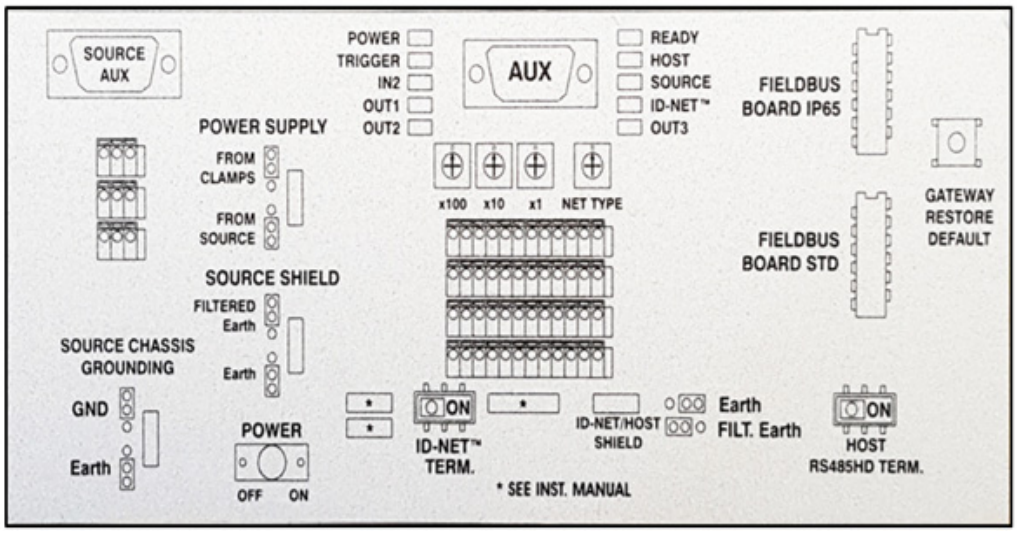
CBX800

Please verify that the CBX800 connection box is configured for the AV500 application as follows.



1. Set HOST RS485HD TERM switch to OFF.
2. Set Power Source Selector jumper to FROM SOURCE.
3. Set Shield jumper to FILTERED Earth.
4. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).
5. Set DEVICE CHASSIS GROUNDING to Earth.
6. Set J16 Jumper 16 to right position.
7. Set POWER switch to ON.
8. Set ID-NET TERM switch to OFF.

Box Interior Diagram



Photoelectric Sensor Connections to CBX100/800

Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX510 terminal block.

If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

WARNING

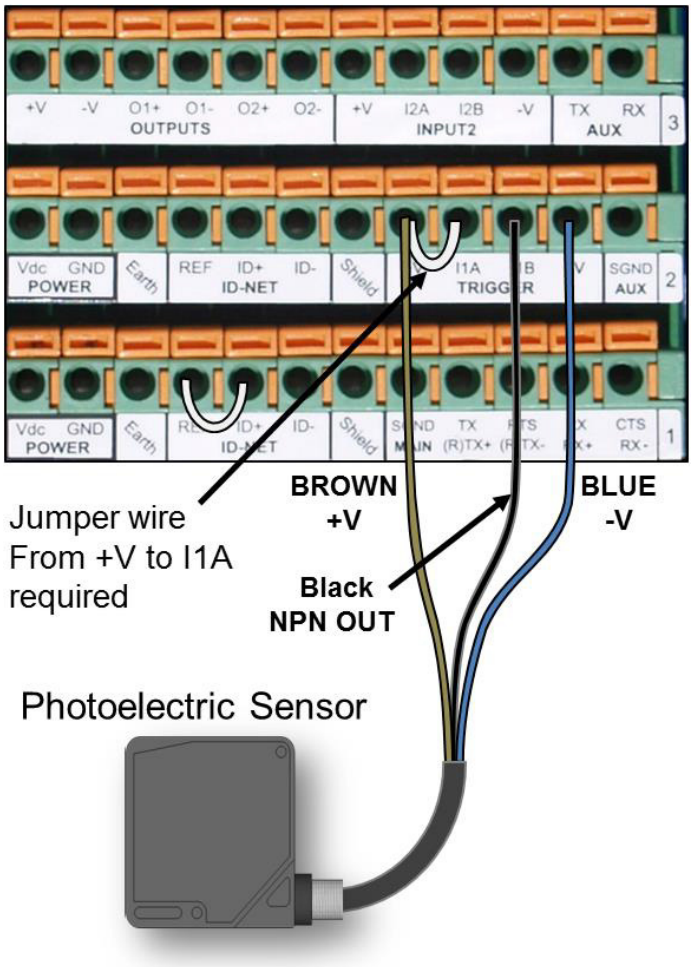
You must use shielded interface cables with this product. To maintain FCC compliance, the cable shield must make a 360-degree connection to the shielded mating connector.

NOTE

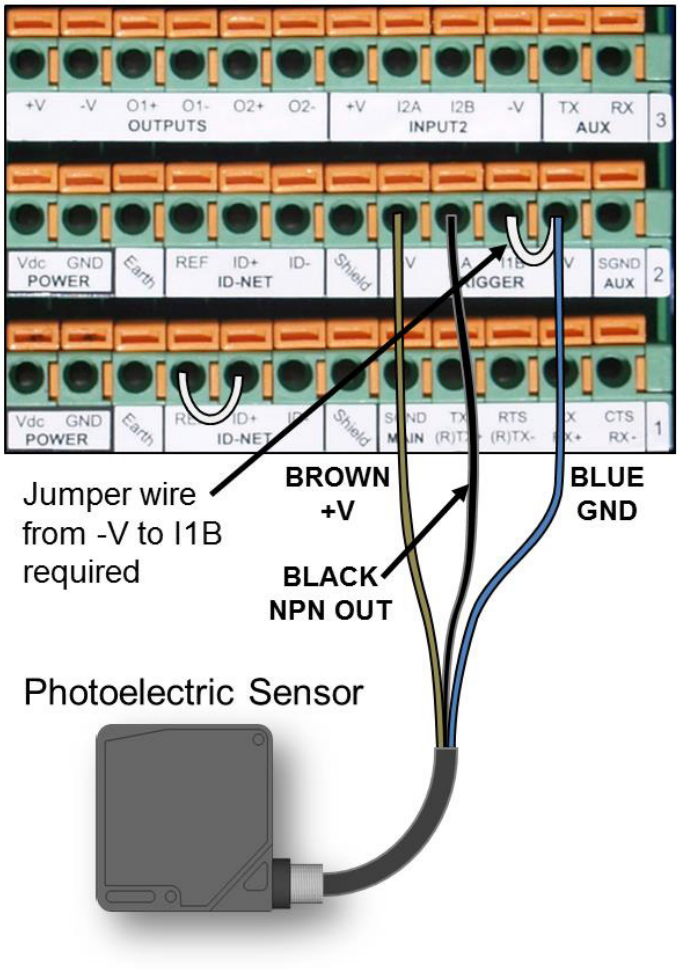
To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and also on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX510 terminal block.

Photoelectric Sensor to CBX100 and CBX800 (NPN)

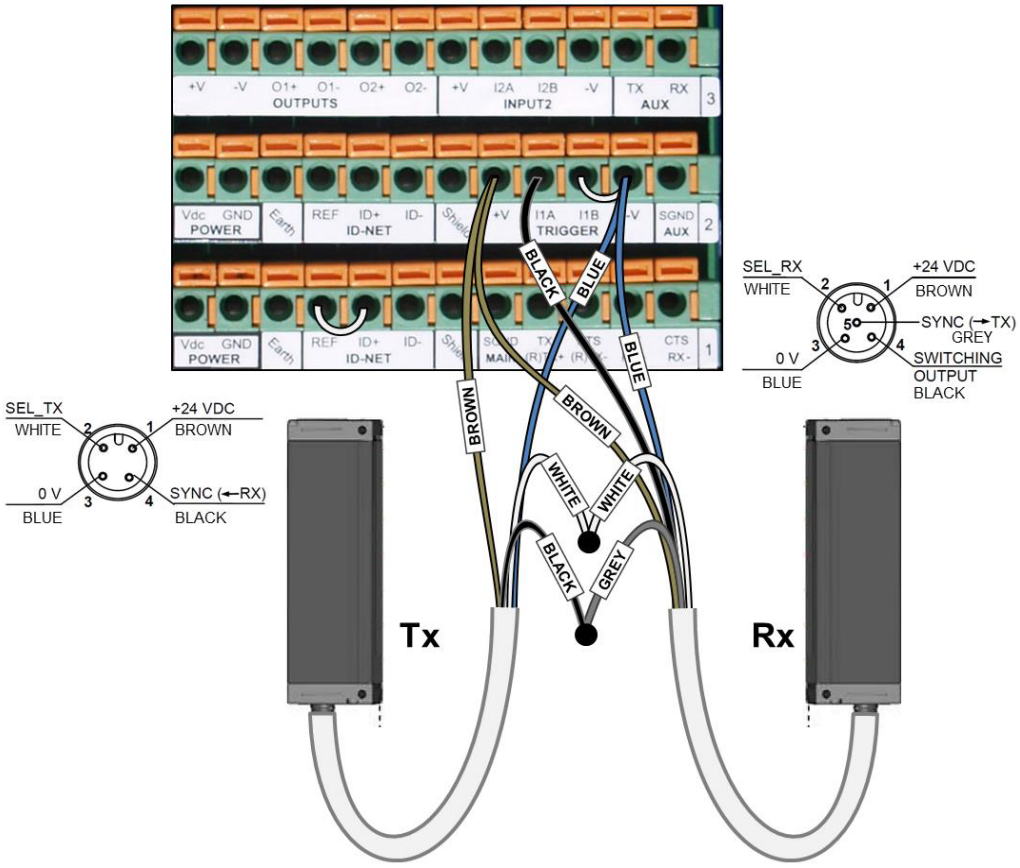


Photoelectric Sensor to CBX100/CBX800 (PNP)



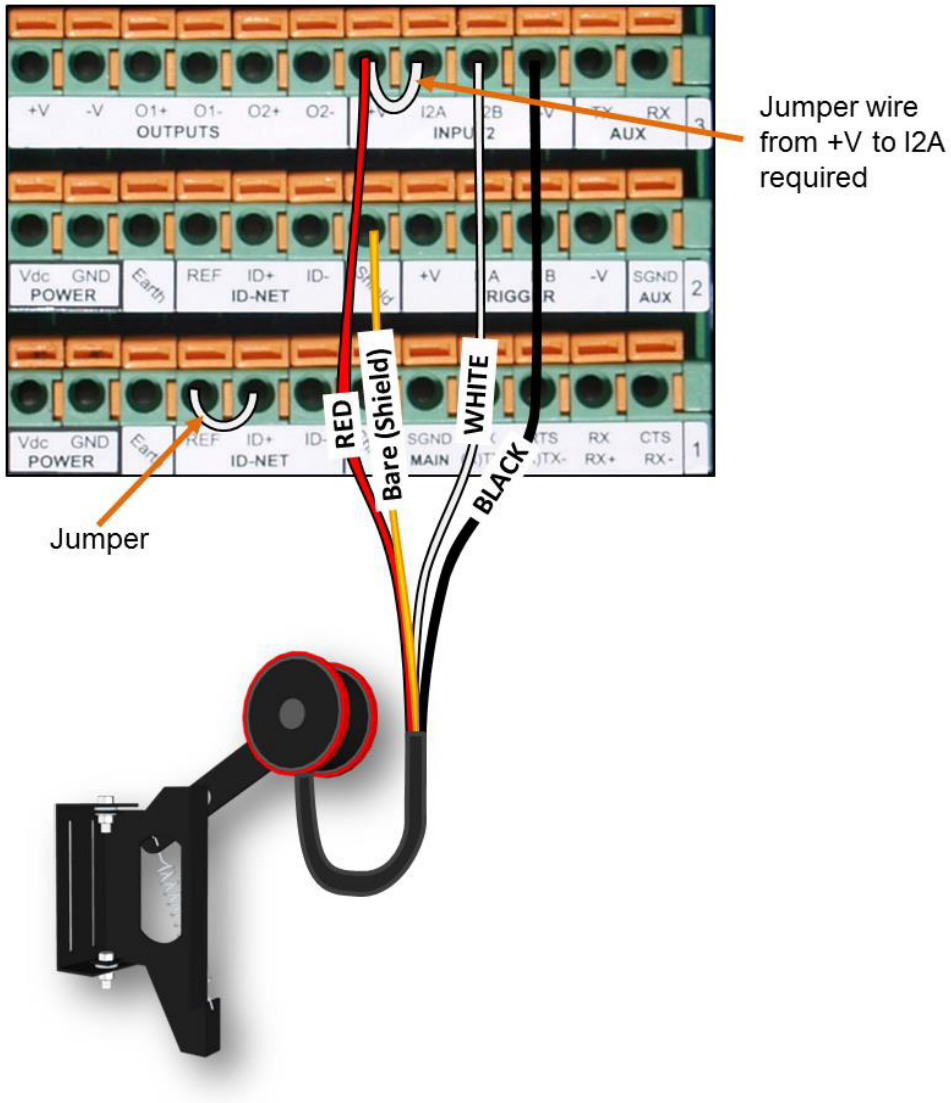
AS1 Area Sensor to CBX100/CBX800 Connections

The **AS1** area sensors can detect and provide trigger for very small or irregularly shaped objects. PNP Output


+V -V O1+ O1- O2+ O2-
OUTPUTS
+V I2A I2B -V
INPUT2
TX RX
AUX
3
Vdc GND
POWER
Earth
REF ID+ ID-
ID-NET
Shield
+V I1A I1B -V
TRIGGER
SGND
AUX
2
Vdc GND
POWER
Earth
REF ID+ ID-
ID-NET
Shield
CTS
RX-
1
BLACK
BLUE
BLUE
BROWN
BROWN
WHITE
WHITE
BLACK
GREY
Tx
Rx
SEL_TX
WHITE
+24 VDC
BROWN
0 V
BLUE
SYNC (←RX)
BLACK
SEL_RX
WHITE
+24 VDC
BROWN
SYNC (→TX)
GREY
0 V
BLUE
SWITCHING
OUTPUT
BLACK

Encoder/Tachometer Wiring to CBX100/CBX800

Encoder/Tachometer Wiring for NPN Output to CBX100/CBX800



NOTE

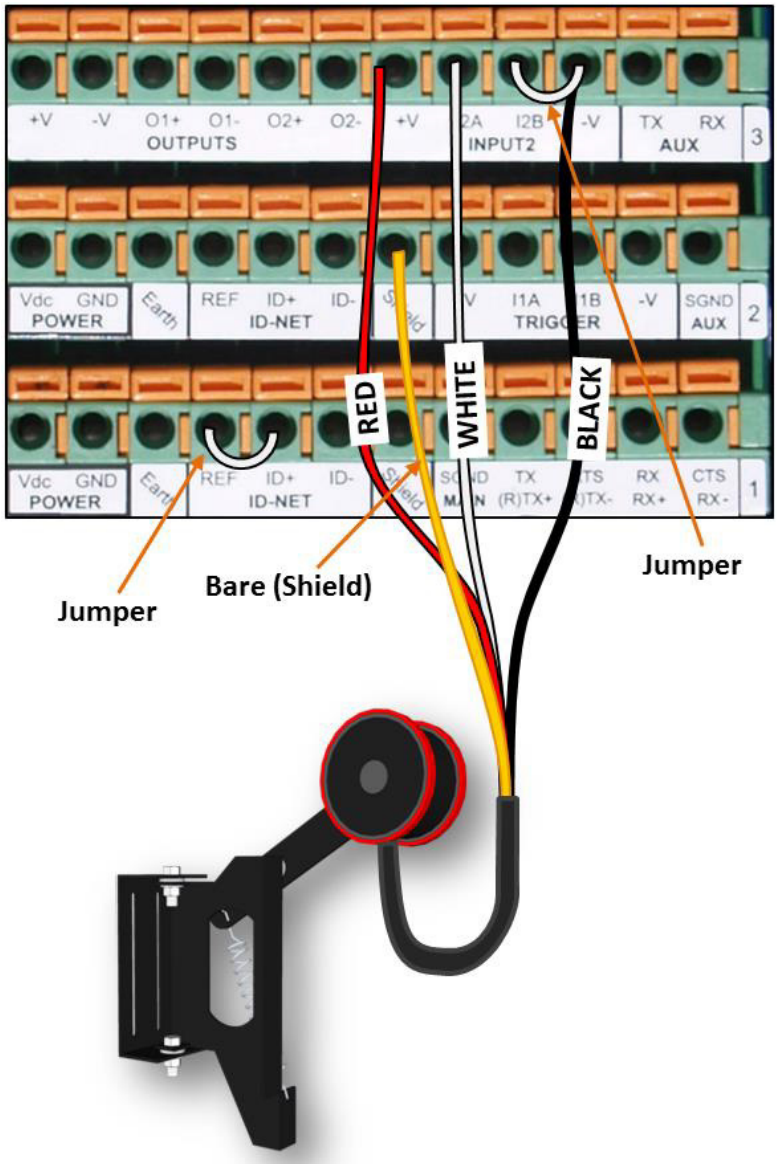
Some Photocraft tachometers may have a different color coding:

(+V) Red or White/Orange

(Signal) White or White/Blue

(Ground) Black or **Orange/White**

Encoder/Tachometer Wiring for PNP Output to CBX100/CBX800



NOTE

Some Photocraft tachometers may have a different color coding:

(+V) Red or White/Orange

(Signal) White or White/Blue

(Ground) Black or **Orange/White**

Serial Communication Wiring to CBX100/CBX800

The AV500 provides serial RS232/RS422 communications to other devices through the CBX100/CBX800.

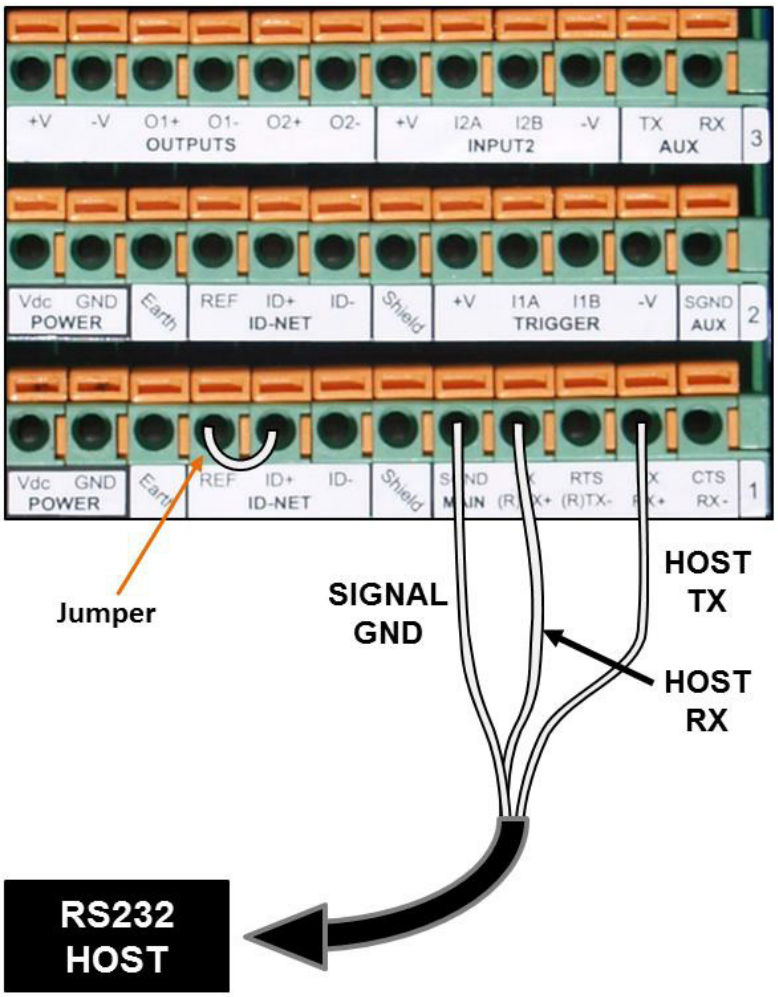
- RS232 provides point-to-point communications at distances up to 15 M [50 ft].
- RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]

The following wiring diagrams illustrate the different types of serial communications available via the CBX100 pin block. It is very important that you make the proper pin connections.

RS232 with No Handshaking

Use RS232 for a direct connection to a controller, personal computer, or other device. RS232 provides point-to-point communications at distances up to 15 M [50 ft]. If longer cable lengths are needed, use RS422.

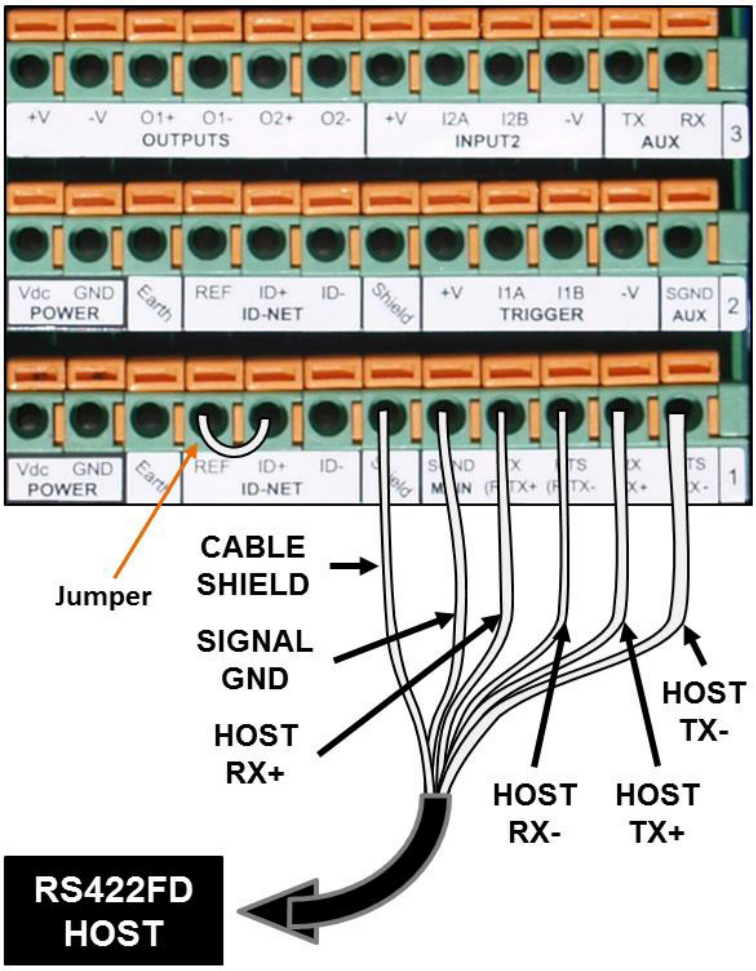
Use the following illustration as a guide when you want to connect your system to a device using RS232 communication with no handshaking.



RS422FD HOST (Full Duplex)

Use RS422 for a direct connection to a controller, personal computer, or other device. RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]. Full

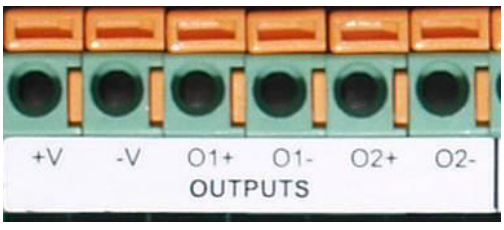
duplex wiring supports a four wire, double twisted pair RxD/TxD. The Signal GND and shield cables are also required as shown.



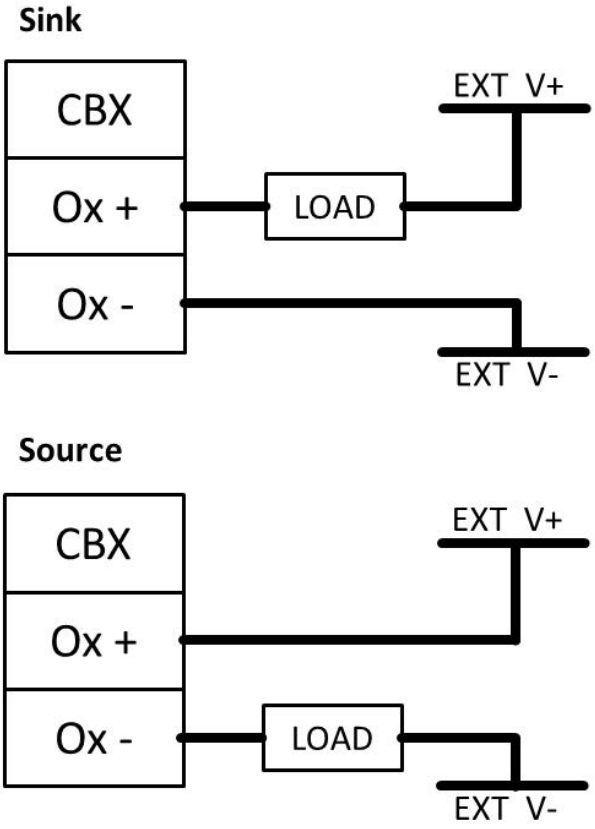
Relay Configuration for CBX100/800

The CBX100/CBX500 includes an OUTPUTS block for wiring relays as needed for external accessories. e-Genius Modify | Relays window includes options for outputs 1 and 2 including Life Light, Trigger Output, Error Light, Ready Light, Good Dim, and No Dim.

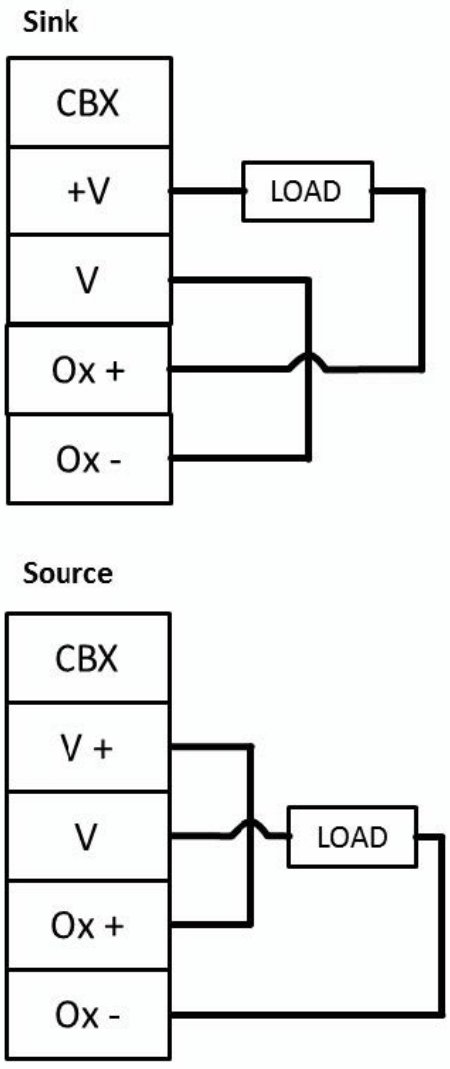
Schematics for Isolated and Non-Isolated relays are provided below.

Outputs 1 and 2	
Maximum Voltage 30V	
Collector Current (pulse) 130 mA Max.	
Collector Current (continuous) 40 mA Max.	
Saturation Voltage (VCE) 1 V at 10 mA Max.	
Max Power Dissipation 90 mW at 50 degrees C (Ambient temperature)	

Unpowered Outputs



Powered Outputs



Grounding

To avoid any problems with electrical noise that could negatively affect system function, make sure that:

1. The AC power cable coming into the PWR box is always provided with a Ground and connected to the proper connector (Protective Earth - PE).
2. The structure where the readers, controllers, encoders/tachometers, and photo-electric sensors are mounted is grounded to the conveyor or to the PE terminal inside the PWR.
3. The Shield wires from the Encoder/Tachometer and photoelectric sensor cables are connected to the proper *Shield* terminal in the CBX box.
4. Normally, steps 1 through 3 will guarantee proper function. In case of problems such as transmission of strange or wrong characters, devices stop working without any reason, or other unexpected behavior, try connecting the CBX or Controller Earth terminal to the PE terminal inside the PWR box.

Check AV500 Installation

After completing the installation, confirm that the AV500 reader(s) and CBX connection box have been properly installed mechanically and electrically. Use the Installation Sequence at the beginning of this chapter and your application specifications to check your installation.

CHAPTER 4
E-GENIUS

Datalogic camera imaging systems provide fully automated, industrial quality barcode identification and imaging. The e-Genius web based application provides an easy-to-use series of configuration and diagnostics features that enable you to set up your imaging system.

GETTING STARTED

e-Genius resides on each camera. You will use e-Genius to define operating parameters, construct output messages, view diagnostics and access utilities for the system. e-Genius enables you to configure, fine-tune, and monitor your scanning system operations.

Please clear the PC's browser cache regularly or set up the browser to disable caching altogether. This is especially important after software upgrades to make sure updates in e-Genius are visible.

Prerequisites

Before setting up your camera(s), you will need the following:

Computer	Laptop
Browser	Internet Explorer 11 (or later)
	Firefox 30 (or later)
	Chrome 36 (or later)

Do not use auto-select/auto-fill in the web browser to fill in a parameter value.

For proper e-Genius operation, make sure the web browser used is configured to allow pop-ups.

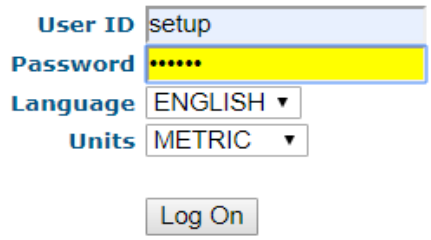
Accessing e-Genius via AV500

To access e-Genius:

NOTE

Before starting up or testing the AV500, it must be connected to a CBX Connection Box depending on the system configuration. Since Host and Image IP ports have static IP addresses, they may have changed from their default addresses. Contact your IT department to acquire the correct IP address.

1. Connect your computer to the AV500 **HOST NET, IMAGE NET** or **SYNC NET** port using an M12 to RJ45 Ethernet cable.
2. Turn on your laptop computer.
3. Configure your PC's IP Address to be in the same network as the port you are connected to. See "To change your PC's IP Address:" on page 76.
4. Open a web browser and enter the IP address for the unit. If the correct IP address is entered, the Log On window appears.



The default setup IP address for all **AV500** cameras is: 192.168.0.145 (setup/sync controller), 192.168.3.10 (Host), and 10.0.40.20 (Image).

5. Enter the **User ID** (default is *setup*) and **Password** (default is *DLAset*) for your system in the fields provided. Your site administrator may have modified these defaults.
6. Select a language from the Language drop-down list.
7. Select **METRIC** or **IMPERIAL** from the Units drop-down list. All parameters which require units of measure will be in the option you select, unless otherwise specified.
8. Click **Log On.**

If the user name and password are valid, the application enables all functions available to the user and displays the System Info window.

If the password is not valid, the application displays a results box with the message, "Incorrect Password." Click OK to return to the Log On window and enter the correct user name and password. If you don't know the password, contact your system manager.

WARNING

The user ID and password shown above provide full setup rights to the user.

If a user only needs to view system information **without saving changes**, the **User ID:** monitor and **Password:** DLAmon should be used.

To change your PC's IP Address:

1. From the desktop click the Start button, and then search for or select **Control Panel**.
2. Type Network and Sharing in the search box, and then from the results, under Network and Sharing Center, click Change adapter settings or select the Local Area Connection you wish to change.
3. Right-click on the Local Area Connection (or Ethernet), and select Properties.

Your PC may name the LAN port different than the Local Area Connection. For example, "Ethernet".

4. Select the Networking tab. Under **This connection uses the following items**, click Internet Protocol Version 4 (TCP/IPv4), and then click Properties.
5. Select **Use the following IP address**. In the IP address field, type the first 3 octets of the IP address of the unit.
6. For the last octet, type a number that differs from the last octet in the AV500's IP address. The actual number used is not important as long as it does not match that of the AV500.

Example: If the camera's IP Address is 192.168.3.10, set your PC's IP Address to 192.168.3.11.

7. In the Subnet mask field, type 255.255.255.0
8. Click **Okay**.

To log out of the e-Genius:

Click  at the upper right corner of the e-Genius window to Log Out. When logged out, the Log On window will appear.

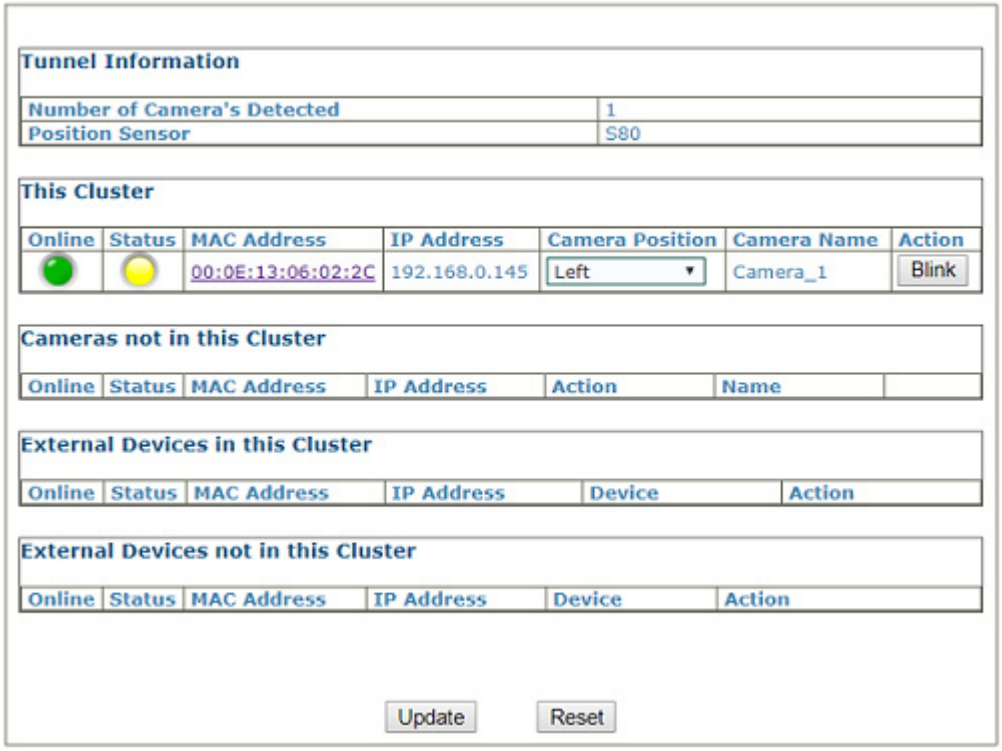
SYSTEM INFO

System Info provides basic AV500 system data (whether your system includes one AV500 or an array). View cameras and bring new devices into a cluster (array of cameras and devices that work together). Critical information such as software version, MAC address, and camera position is also included.

To view System Information:

1. In the menu tree under **Modify Settings**, click **System Info**. The **System Info** window opens.

2. The information in this form is auto-filled. The fields are described below.



System Info

Tunnel Information

Number of Cameras Detected

Displays the number of cameras found in the system.

Position Sensor

Displays the type of Position sensor and indicates whether it is a Dimensioner, Light Curtain or S85.

This Cluster

Online

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status

Green = No errors and ready to read

Gray = Unit not connected

Yellow = Warning present, if you click on the MAC address, it will take you to the status viewer page for more info on the error

Red = Error, if you click on the MAC address, it will take you to the status viewer page for more info on the error

MAC Address

Displays the internal MAC Address (Media Access Control Address) Since all MAC addresses are unique, it is the information that the camera uses in the cluster to share data from camera to camera. Click the MAC Address link to view details about that specific device (See Device Details below).

IP Address

Displays the internal Sync Net IP address of the unit used for camera-to-camera communication.

Camera Position

Select Not Assigned, Top, Left, Right, or Bottom from the drop-down list.

Camera Name

Displays the camera's name assigned in Modify Settings | Device Settings | <device> | Device Info.

Action

Click Blink. This identifies the camera in the array. When clicked, the camera illumination turns on for around 10 seconds.

Cameras not in this Cluster

Displays a list of discovered cameras not currently included in the cluster. This includes the same information listed above for each camera. See section for information on moving AV500 cameras into the Cluster.

External devices in this Cluster

Displays a list of external devices currently included in the cluster. This includes the same information listed above for each device.

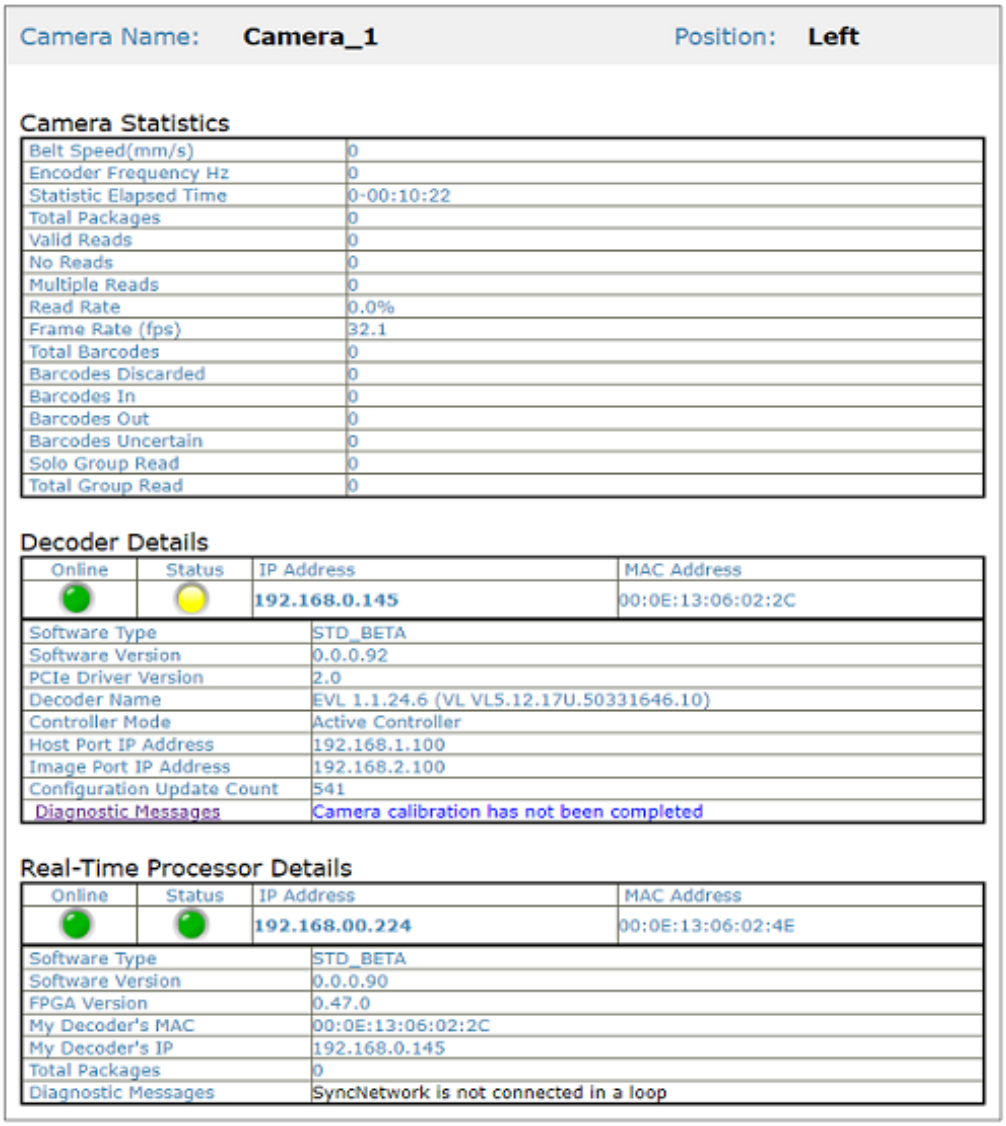
External Devices not in this cluster

Displays a list of external devices not currently included in the cluster. This includes the same information listed above for each device.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Details

From the **System Info** window, click on a device's **MAC Address** to open a window displaying details about that device. The details include statistics, decoder, software, and processor information.



Camera Name: **Camera_1** Position: **Left**

Camera Statistics

Belt Speed(mm/s)	0
Encoder Frequency Hz	0
Statistic Elapsed Time	0-00:10:22
Total Packages	0
Valid Reads	0
No Reads	0
Multiple Reads	0
Read Rate	0.0%
Frame Rate (fps)	32.1
Total Barcodes	0
Barcodes Discarded	0
Barcodes In	0
Barcodes Out	0
Barcodes Uncertain	0
Solo Group Read	0
Total Group Read	0

Decoder Details

Online	Status	IP Address	MAC Address
		192.168.0.145	00:0E:13:06:02:2C

Software Type	STD_BETA
Software Version	0.0.0.92
PCIe Driver Version	2.0
Decoder Name	EVL 1.1.24.6 (VL VL5.12.17U.50331646.10)
Controller Mode	Active Controller
Host Port IP Address	192.168.1.100
Image Port IP Address	192.168.2.100
Configuration Update Count	541
Diagnostic Messages	Camera calibration has not been completed

Real-Time Processor Details

Online	Status	IP Address	MAC Address
		192.168.00.224	00:0E:13:06:02:4E

Software Type	STD_BETA
Software Version	0.0.0.90
FPGA Version	0.47.0
My Decoder's MAC	00:0E:13:06:02:2C
My Decoder's IP	192.168.0.145
Total Packages	0
Diagnostic Messages	SyncNetwork is not connected in a loop

Camera Statistics

Belt Speed

Displays the speed of the conveyor belt in millimeters per second.

Encoder Frequency

Displays the encoder frequency.

Statistics Elapsed Time

Displays the amount of time elapsed from the last reset or the last modification to the configuration of the system for which the unit has been collecting statistics. This is reset at startup and when the “Reset Counts” button is clicked.

Total Packages

The total number of packages detected by the presence sensor, including errors.

Valid Reads

Number of labels completely read by the system (the same label may include more than one barcode).

No Reads

The total number of unsuccessful code reads for the camera.

Multiple Reads

The total number of times the same bar code has been read by the camera.

Partial Reads

Number of labels partially read by the system (only some of the barcodes set in the “Group Label” settings are read).

Read Rate

The number of good reads divided by the total number of reads.

Frame Rate (fps) frames per second

The total number of frames per second captured by the camera.

Total Barcodes

Indicates the number of barcodes read from all the scanners, including Multiple Reads.

Barcodes Discarded

Barcodes not programmed in “Code Definition” parameters group + "Barcodes Out" + “Encoder Errors”.

Barcode In

Total number of barcodes found on the packs detected by the single scanner.

Barcode Out

Total number of barcodes found outside the packs detected by the single scanner.

Barcodes Uncertain

Total number of barcodes found that intersect more than one pack, and are therefore ambiguous, detected by the single scanner. This is visible only when Operating Mode is PackTrack.

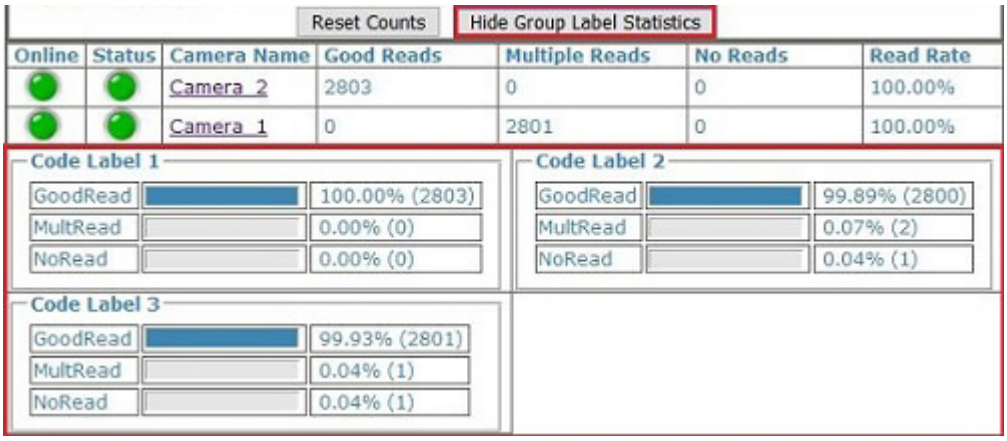
Solo Group Read

The total number of times a single defined group was read

Total Group Read

The total number of times all defined groups were read

GROUP LABEL STATISTICS



NOTE

These statistics are exposed by clicking the “Show Group Label Statistics” button, which will then change to “Hide Group Label Statistics.” This button is disabled until there is something to show, e.g. it will be disabled if you have Reset Counts and not inducted any packages yet. The legend changes from “Code Label X” to “Group Label X” when using “Logical Combination” as the “Code Combination” setting.

Good Read

Increases when all barcodes programmed in the related “Group Label are read.

Multiple Read

Increases when more than one barcode programmed in the related “Group Label” setting is read.

No Read

Increases when none of the barcodes programmed in the related “Group Label” setting is read.

Decoder Details

Online Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

IP Address

The Internet Protocol address (IP address) is a numerical label assigned to the device connected to a computer network that uses the Internet Protocol for communication.[1][2] An IP address serves two principal functions: host or network interface identification and location addressing.

MAC Address

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

Software Type

Describes the type of software on the device. Typically this will indicate STANDARD or a customer name if your software is custom.

Software Version

Identifies the version number of the software

PCIe Drive Version

Peripheral Component Interconnect Express, better known as PCI Express (and abbreviated PCIe) is a computer expansion card standard used in motherboard-level connections and as an expansion card interface.

Decoder Name

Identifies the type of decoder. For example, BLR_VL5.10.56R_LNX or EVL 1.1.24.2 (VL VL5.11.00U.50331646.10)

Controller Mode

Displays the mode of the camera; Active Controller, Backup Controller or Client.

Host Port IP Address

The Internet Protocol address (IP address) of the host port.

Image Port IP Address

The Internet Protocol address (IP address) of the image port.

Configuration Update Count

The number of times the configuration file has been updated.

Diagnostic Messages

Displays any diagnostic messages that apply. Click on Diagnostics Messages to access the complete list of possible messages.

Datalogic Technical Support will use these Diagnostic messages to properly diagnose and troubleshoot your AV500.

Real Time Processor Details

Online Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

IP Address

The Internet Protocol address (IP address) is a numerical label assigned to the device connected to a computer network that uses the Internet Protocol for communication.[1][2] An IP address serves two principal functions: host or network interface identification and location addressing.

MAC Address

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

Software Type

Describes the type of software on the device. Typically this will indicate STANDARD or a customer name if your software is custom.

Software Version

Identifies the version number of the software

FPGA Version

The version of the Datalogic field-programmable gate array (FPGA).

My Decoder's MAC

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

My Decoder's IP

The Internet Protocol address (IP address) is a numerical label assigned to the device connected to a computer network that uses the Internet Protocol for communication.[1][2] An IP address serves two principal functions: host or network interface identification and location addressing.

Total Packages

The total number of packages that have been seen by the camera.

Diagnostic Messages

Displays any diagnostic messages that apply. "No active Errors or Warnings." may display.

GLOBAL SETTINGS

Use the Global Settings menu options to configure your camera system. Global settings can be made to any camera and then distributed to the other cameras in the cluster. You can later make modifications to the global system settings using these same menu selections:

“Operating Mode” on page 87
“Object Detection” on page 106
“Barcode Settings” on page 107
“Communications” on page 143
“Output Format” on page 154
“Image Saving” on page 163
“Time Synchronization” on page 172

E-GENIUS BASICS

e-Genius Menu Tree

The functions that you can select are displayed in a menu tree on the left–hand side of **e-Genius**. The function list is organized much like the hierarchy of a file system, where you can expand items that are preceded by a box ( ) to further sub–levels until you find a function of interest.

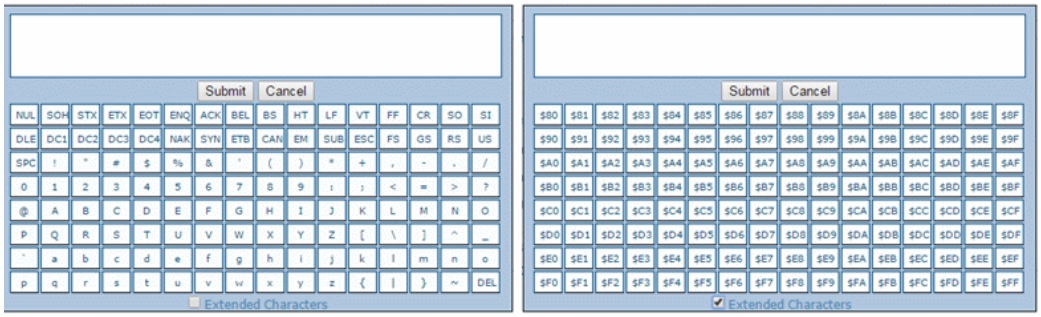
Sub–levels appear indented below the items from which they are expanded. Clicking the box again collapses that branch of the menu. You can expand no further when an item is not preceded by a box.

The **e-Genius** menu tree appears with no items expanded. Click the folders to display the active window for the setup function and/or expand the folders to view any additional setup features.

The Text Entry Tool

In cases where text needs to be entered to create message headers, trailer, custom messages, or for other reasons, the **Text Entry Tool** pencil icon will be displayed.

1. Click to open the Text Entry Tool.



The Text Entry Tool is needed to enter unprintable characters or characters that cannot be typed. For example, <CR> is a single character presented as a string for easier reading. The character must be entered with the Text Entry Tool, if typed normally it will be recognized as a string and not as a single character.

You can enter text in the text field by typing, or click on the character buttons to create your message. Select the **Extended Characters** check box to reveal a new set of control characters.

Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Getting Help

e-Genius provides complete online help (this document).

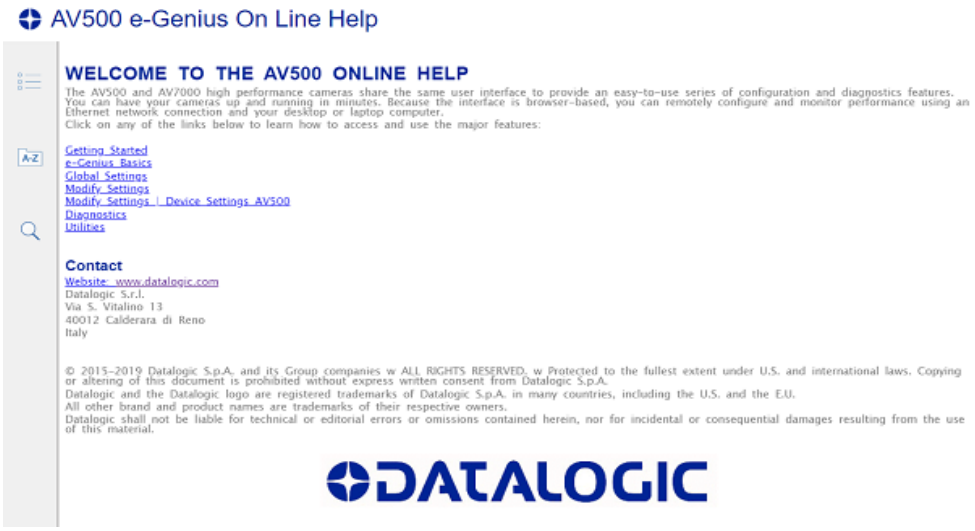
To access the complete help system:

1. Select **Utilities | Help** in the **e-Genius** menu tree. The help **Welcome** window appears. The **Welcome** page provides important product information as well as three ways to find specific help information: **Contents** and **Search.**

To display contextual help for a current window:

1. Click the Help icon displayed at the top right of the screen. A help window appears, providing you with information for that specific page.

2. Click the  link in the upper left corner of the help window to access Contents options.



MODIFY SETTINGS

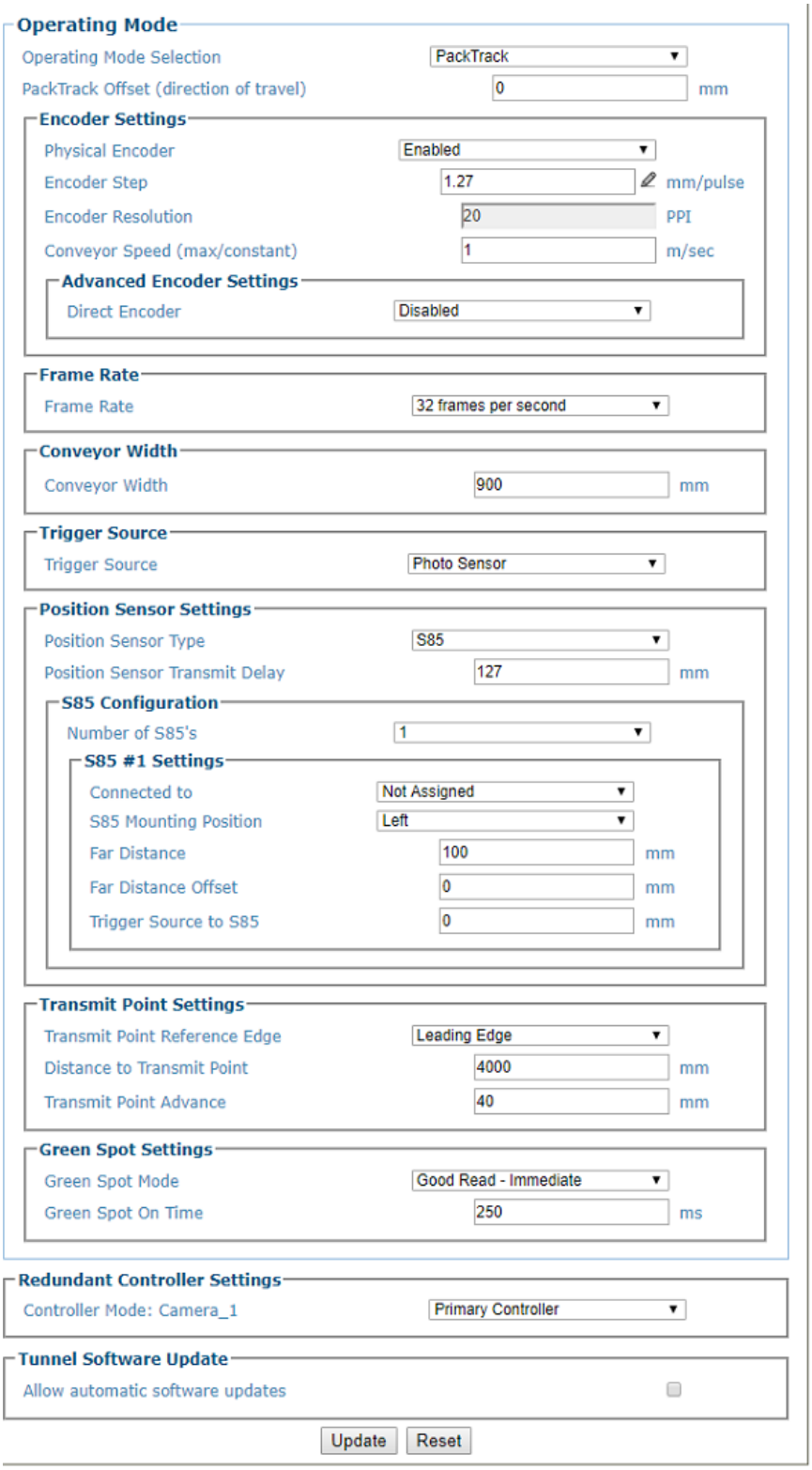
Use the **Modify Settings Menu Tree** selections during initial setup to configure your scanning system. If necessary, you can later make modifications to the configuration using the same menu selections, including:

OPERATING MODE

Use **Operating Mode** to set up the physical parameters for your system including encoder, trigger, conveyor, and position sensor attributes. There are three major Operating Modes options that are selectable in the AV500; PackTrack, Online, and Continuous.

To edit the system Operating Mode:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Operating Mode.** The **Operating Mode** window opens.

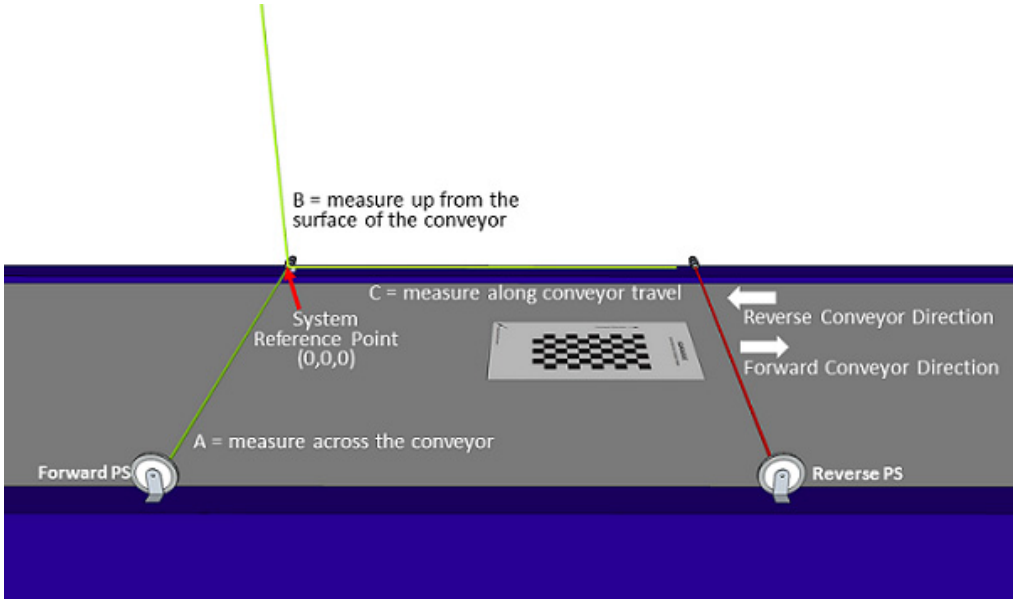


2. Enter the appropriate information in the form as described below:

Operating Mode Selections

Select one of the following modes:

“Packtrack Mode” on page 89 is a patented operating mode for Datalogic devices used to read and correctly assign codes read on different parcels when placed in the scanner reading area at the same time. The technology allows for smaller gaps between packages. It can also be used in bidirectional systems, in which you may want to read codes going forward or reverse. See “Understanding PackTrack” on page 85.



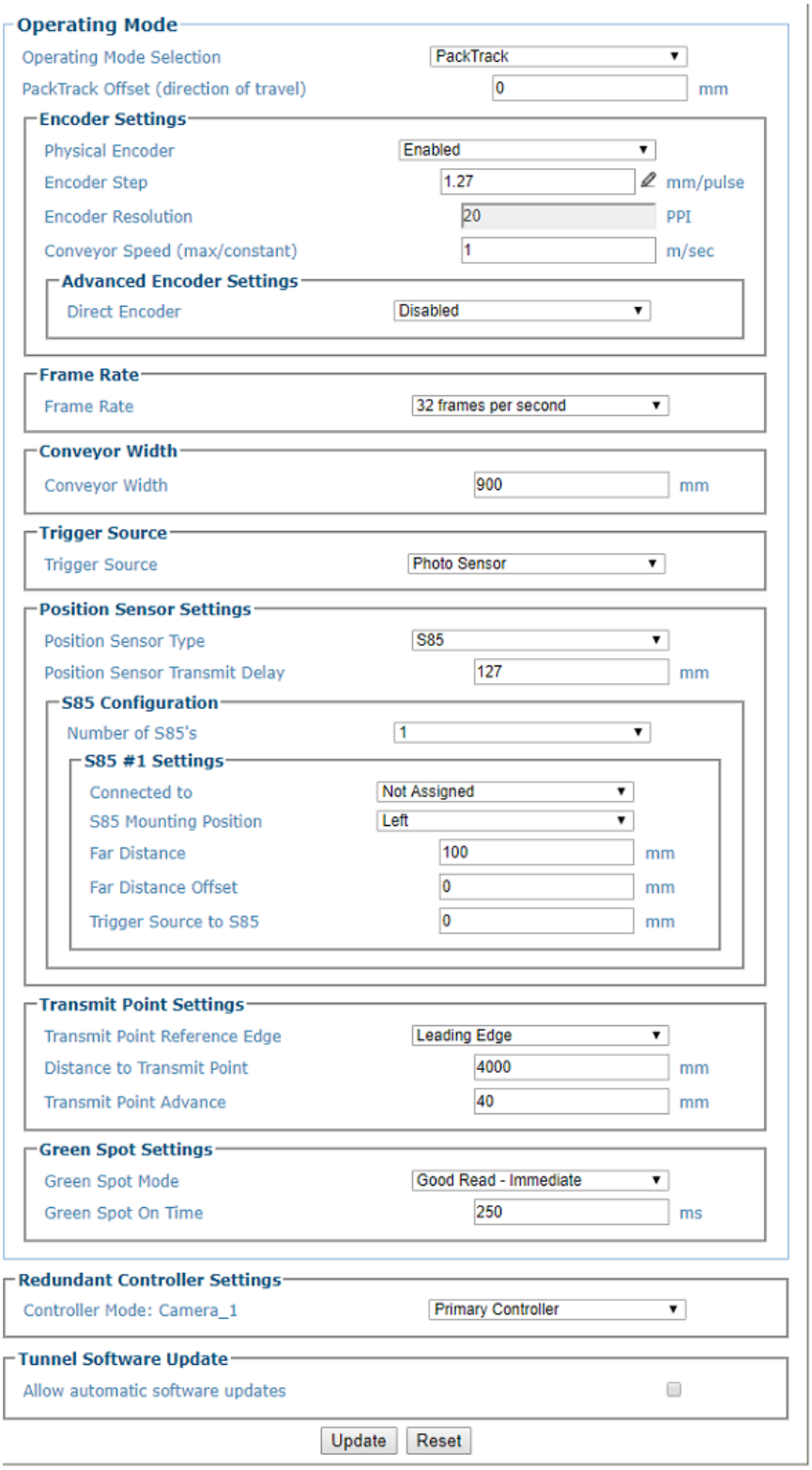
“Online Mode” on page 96 in Online operating mode, the reading phase is defined as the time between a Phase ON and Phase OFF event. The Phase events can be signals coming from one or two external presence sensors connected to the scanner inputs or serial start/stop strings sent from the host over the serial interface or Ethernet input.

“Continuous Mode” on page 99 is continuous image / frame acquisition mode with immediate decode result processing and transmission. Frames are acquired at a constant rate of 32 frames per second with no trigger. Suppression filters are available for eliminating duplicate decode results within a single frame and across multiple frames and can be configured either based on time or distance. When using a distance based suppression filter, distance can be based on a physical encoder where the clock time to timeout will be dependent on how fast the belt is running or where time will be based on an internal tach set to 1 meter per second. An option for code replication is also available where a decode result is replicated or not suppressed when the same code value is decoded but the code types are different.

NOTE

Image Saving does not work in Continuous Mode.

PACKTRACK MODE



Encoder Settings

Physical Encoder

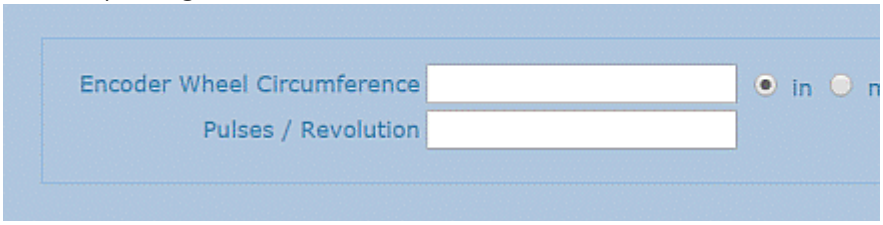
Select Disable or Enable from the drop-down list:

- **Disable:** External encoder is disabled, and internal encoder is active

- **Enable:** A physical encoder is connected to the Encoder input and is enabled

Encoder Step (mm/pulse)

Click  to activate the Encoder Step input form. Enter the Encoder Wheel Circumference in the field provided and select the in or mm option. Enter the Pulses / Revolution in the field provided (See the table below for values). Click **Submit** to save the values, or click **Cancel** to return to the Operating Mode window.



Encoder Step Settings Table

Encoder Wheel Circumference	PPR (Pulses Per Revolution)	Encoder Step (mm)	Encoder Step (inch)	Encoder Model
304.8 mm [12 in]	192	1.5875	16	1000019875
304.8 mm [12 in]	240	1.27	20	1000019875
300 mm [11.81 in]	192	1.5625	16	OEK-2 93ACC1770
300 mm [11.81 in]	240	1.25	20	OEK-2 93ACC1770
304.8 mm [12 in]	2400	0.127	200	OEK-3 93ACC0104

Encoder Resolution

Displays the encoder/tachometer resolution in pulses per inch (PPI) based on the Encoder Step calculation. This field cannot be edited.

Conveyor Speed (max/constant) (m/sec)

When the Physical Encoder is enabled the formula for the Max Conveyor Speed is calculated. The formula is not used when the Physical Encoder is disabled.

When disabled there is no physical tach connected to the camera. The Max Conveyor Speed option uses an internal clock that sets the tach to match the conveyor speed.

Formula: Max conveyor speed x 1.05

See “AV500 System Elements Positioning” on page 102

Advanced Encoder Settings

These settings are available when Physical Encoder is set to Enabled above.

Direct Encoder

Select Disable or Enable from the drop-down list. Direct encoder is a high-resolution encoder/ tachometer used in start/stop applications.

Frame Rate

Frame Rate

Select an appropriate Frame Rate from the drop-down list.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

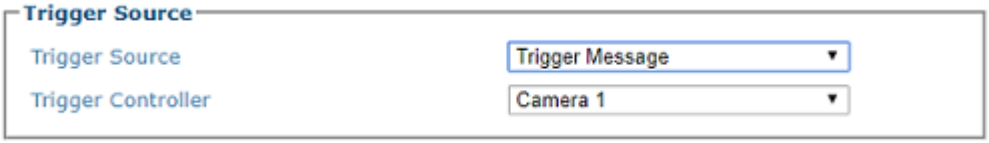
Conveyor Width

Conveyor Width

Enter the width of the conveyor.

Trigger Source

Trigger Source



Select from the drop-down list.

- **Position Sensor:** triggers when selected position sensor senses a package.
- **Photo Sensor:** triggers when a photoelectric sensor is blocked.
- **Trigger Message:** triggers when a trigger message is received from an external device.
- Ethernet/IP: triggers when a trigger message is received from a PLC. The limit is 20 milliseconds.

The following Trigger Source options are available.

Trigger Controller

Select which camera in your system is controlling the trigger message.

Position Sensor Settings (Primary Controller)

Position Sensor Type

Select **No Position Sensor, Light Curtain, Dimensioner, S85, or S85 with DL Light Curtain** from the drop-down list, depending on the specific position sensor used by the system.

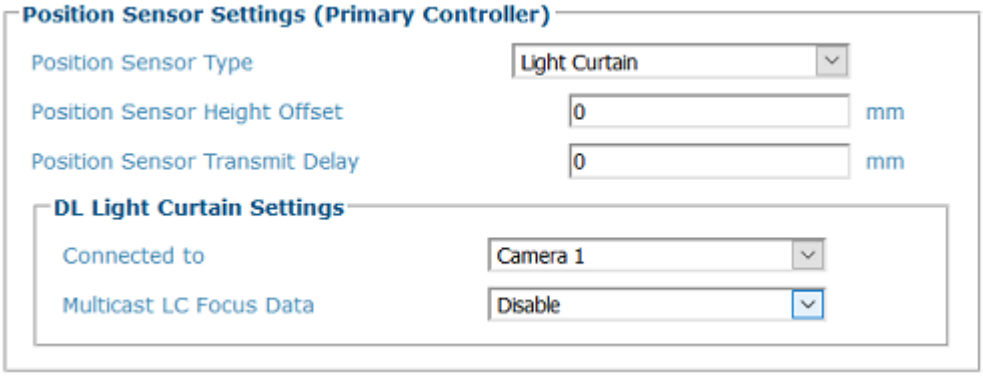
Position Sensor Height Offset

Enter the distance between the position sensor's zero height reference point and the conveyor's surface. This should be set to zero (0) for other, non-light curtain position sensors.

Position Sensor Transmit Delay

Enter the distance from the position sensor to the transmit point. *(See "AV500 System Elements Positioning" on page 87.)*

DL Light Curtain Settings



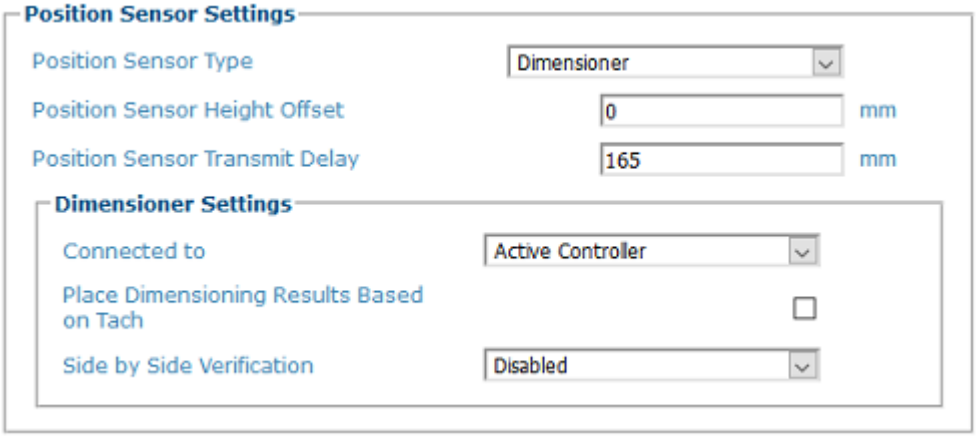
Connected to

Select a camera in the system to which the light curtain is connected.

Multicast LC Focus Data

Select Disable or Enable. Selecting Enable allows the sending of Light Curtain focus data to ALL the cameras in the array.

Dimensioner Settings



Place Dimensioning Results Based on Tach

Select the check-box to enable placement of the Dimensioning results based on the tachometer. This option works in conjunction with the DM3610 when the Datalogic Message is selected as it's transmit message format. the AV500 will receive the message at the defined Transmit Point Distance parameter.

Transmit Point Distance

Enter the distance in the field provided. This is the distance at which the transmit point occurs and the AV500 is looking for the information from the DM3610/DC3000.

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package edge of the DM3610 message.

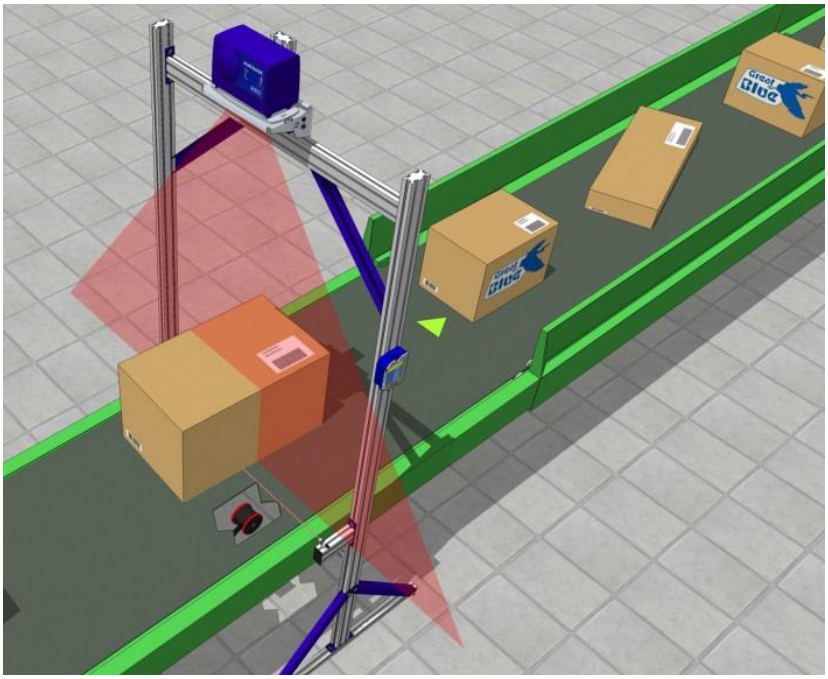
Connected to

Will default to Active Controller. Active Controller indicates the Dimensioner must be connected to the Active Controller in the cluster. Click the drop-down to select the camera the Dimensioner is connected to. This will force the selected camera to accept Dimensioner data, all others will ignore incoming Dimensioner data.

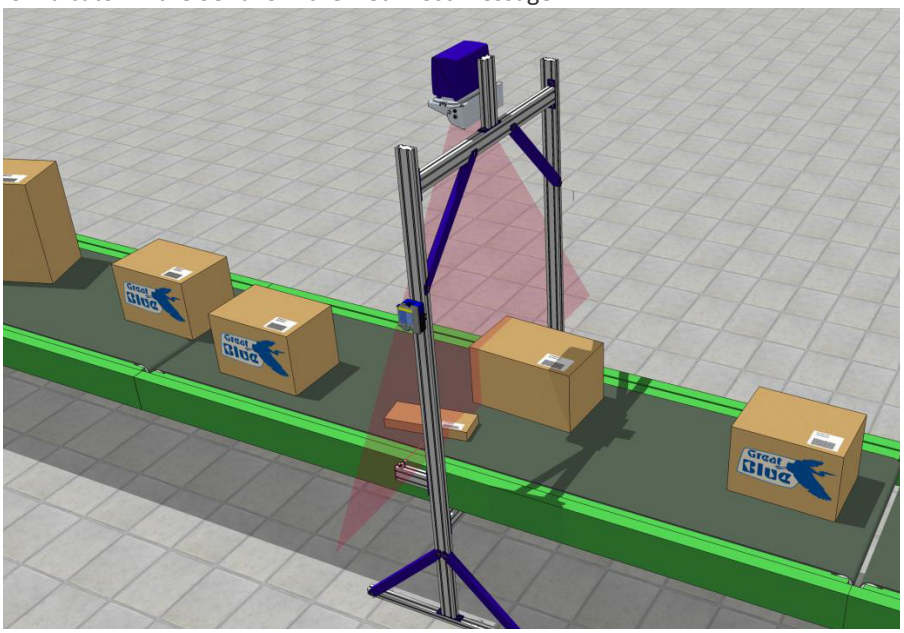
Side by Side Verification

Select Enabled or Disabled from the drop-down list. Select Enabled if your system requires Side by Side Verification. This is only available for Dimensioners.

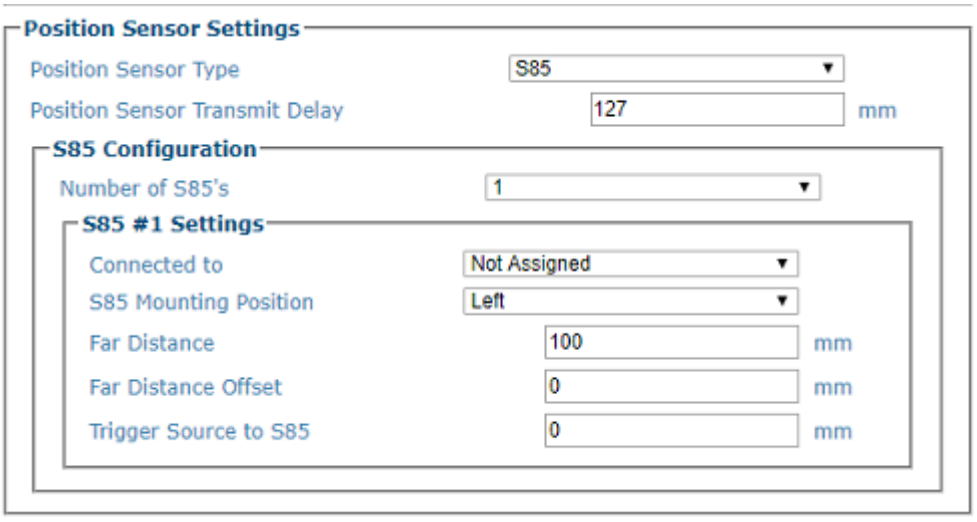
In a “singulated” material handling system, parcels are separated by at least the minimum spacing distance along the direction of travel; there is at most one parcel across the conveyor at a time; therefore there is only one parcel present during a trigger cycle. A trigger is typically generated by a photoeye or a hardware signal from the sorter.



In a singulated system, a **Side-by-Side** (SBS) is an error condition in which these conditions are violated. The end-user wants to know when this happens (when their parcel flow has inadvertently become “non-singulated”), and Datalogic systems can tell them this by means of an SBS indicator in the Serial or Ethernet “host message.”



S85 Configuration



Number of S85’s

Select None or 1 from the drop-down to specify the number of S85’s in your AV500 system.

S85 #n Settings

Connected to

Select Not Assigned or a camera in the system to which the S85 is connected.

S85 Mounting Position

Select Top, Left or Right to specify the S85 position. This is in reference to the flow of product through the system not to which camera it will be providing the focus.

Far Distance

Enter the S85 Far Distance. The Far Distance is the farther distance away from the AV500 that a label will be found. In most cases this is the far side of the conveyor, but there are some application where the far side of the conveyor and the far working distance of the AV500 may be different.

Far Distance Offset

Enter the S85 Far Distance Offset. This value is used when the S85 is unable to be set to the

correct distance due to some physical restriction. This value is added to the far of the S85 and counterbalances the focusing information.

Trigger Source to S85

Enter the distance in inches from the trigger source to the light curtain.

Transmit Point Settings

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.

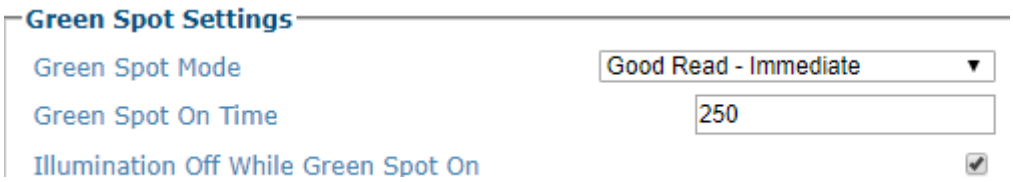
Distance to Transmit Point

Enter the distance from the location of the trigger source to the host transmit point in the field provided.

Transmit Point Advance

Enter the distance upstream of the transmit point when the camera will stop decoding the image data. This will help eliminate processing errors.

Green Spot Settings



Green Spot Mode

Select one of the following from the drop-down list:

- **Disabled**
- **Good Read** - Immediate: this option will light the green LED at the time of the bar code being decoded. In an array only the AV500 that read the bar code will light.
- **Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time in milliseconds that the Green Spot should remain on.

Redundant Controller Settings

Controller Mode: Camera_1

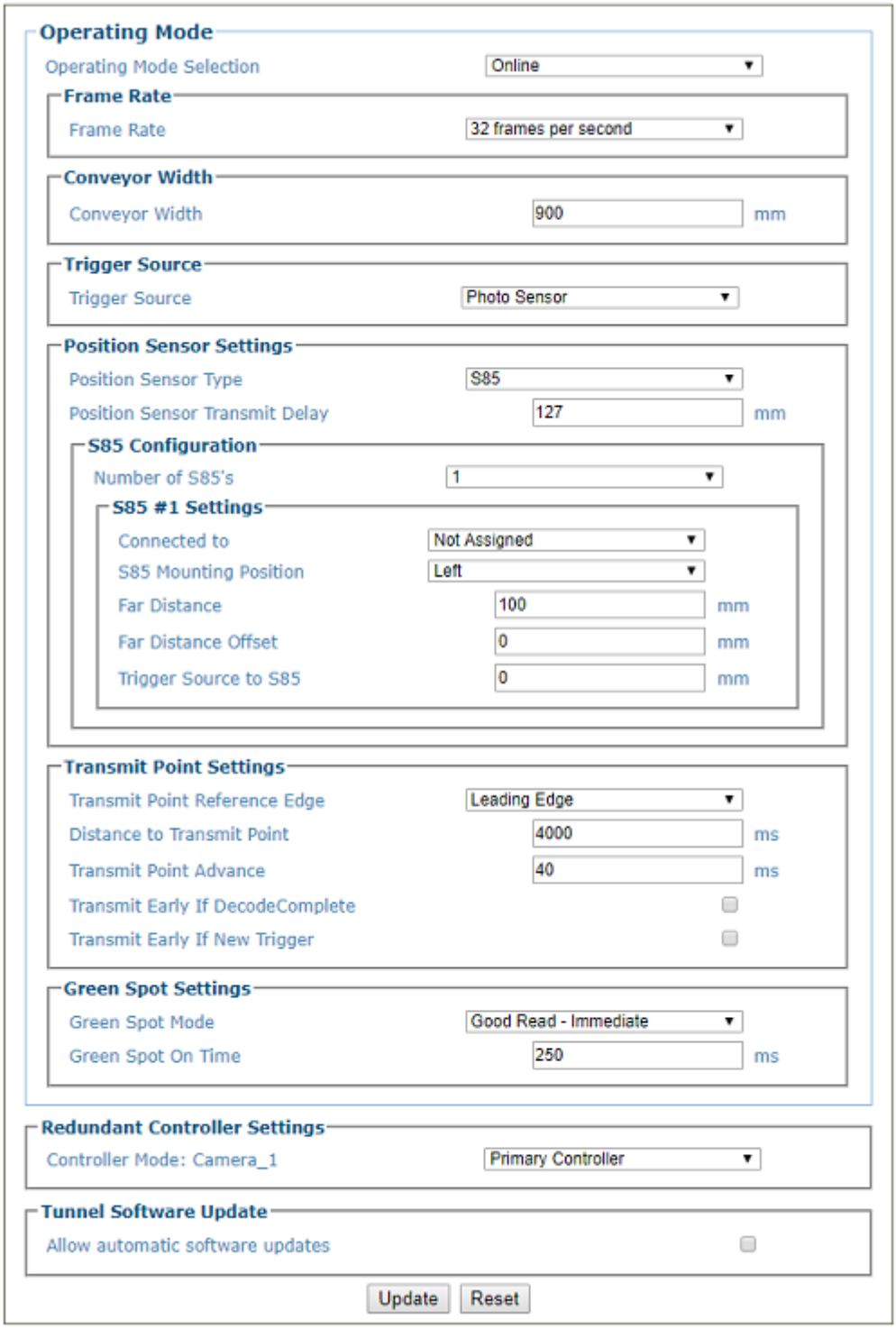
- **Auto-Detect:** this option is used when a CBX is used in the array. All AV500 units in the array will check the status of the bit created by the IDNet jumper. The one that identifies the connection will become the controller.
- **Primary Controller**
- **Secondary Controller**

Tunnel Software Update

Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras. This will not update software of different types on individual cameras, it is only intended to update the version of software currently on the camera.

ONLINE MODE



Frame Rate

Frame Rate

Select an appropriate Frame Rate from the drop-down list.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Conveyor Width

Conveyor Width

Enter the conveyor width.

Trigger Source

Trigger Source

Select Position Sensor, Photo Sensor, or Trigger Message from the drop-down list.

- **Position Sensor:** triggers when selected position sensor senses a package.
- **Photo Sensor:** triggers when a photoelectric sensor is blocked.
- **Trigger Message:** triggers when a trigger message is received from an external device.
- **Ethernet / IP:** If trigger message comes from PLC on Ethernet IP Connection

If you select Photo Sensor or Trigger Message as your Trigger Source, the following Trigger Source options are available.

Trigger Controller

If Trigger Message is the Trigger Source, select which camera in your system is controlling the trigger message.

Position Sensor Settings (Primary Controller)

Position Sensor Type

Select No Position Sensor, Light Curtain, Dimensioner, S85, or S85 with Light Curtain from the drop-down list, depending on the specific position sensor used by the system.

Position Sensor Height Offset

Enter the distance between the light curtain's (light array's) zero height reference point and the conveyor's surface. This should be set to zero (0) for other, non-light curtain position sensors.

Position Sensor Transmit Delay

Enter the distance from the position sensor to the transmit point in the field provided.

DL Light Curtain Settings

Connected to

Select a camera in the system to which the light curtain is connected.

Multicast LC Focus Data

Select Disable or Enable from drop-down. Enable if you have a Light Curtain and there are multiple camera's running fixed focus in varying positions that should all receive Light Curtain trigger information.

Dimensioner Settings

Place Dimensioning Results Based on Tach

Select the check-box to enable placement of the Dimensioning results based on the tachometer. This option works in conjunction with the DM3610 when the Datalogic Message is selected as it's transmit message format. The AV500 will receive the message at the defined Transmit Point Distance parameter.

Transmit Point Distance

Enter the distance in the field provided.This is the distance at which the AV500 is looking for the information from the DM3610/DC3000Transmit Point Reference Edge

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.

Side by Side Verification

Select Enabled or Disabled from the drop-down list if your system requires Side by Side Verification. This is only available for Dimensioners.

S85 Configuration

Number of S85's

Select None or 1 from the drop-down to specify the number of S85's in your AV500 system.

S85 Settings

Connected to

Select Not Assigned or a camera in the system to which the S85 is connected.

S85 Mounting Position

Select Top, Left or Right to specify the S85 position. This is in reference to the flow of product

through the system not which camera it will be providing the focus to.

Far Distance

Enter the S85 Far Distance. The Far Distance is the greatest distance away from the AV500 that a label will be found. In most cases this is the far side of the conveyor but there are some application where the far side of the conveyor and the far working distance of the AV500 can be different.

Far Distance Offset

Enter the S85 Far Distance Offset. This value is used when the S85 is unable to be set to the correct distance due to some restriction. This value is added to the far Distance of the S85 and compensates the focusing information.

Trigger Source to S85

Enter the distance from the trigger source to the light curtain.

Transmit Point Settings

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.

Distance to Transmit Point

Enter the distance from the location of the trigger source to the host transmit point.

Transmit Point Advance

Enter the distance. This is the distance upstream of the transmit point when the camera will stop decoding the image data. This will help eliminate processing errors.

Transmit Early If Decode Complete

Click the check box to transmit when decode is completed.

Transmit Early if New Trigger

Click the check box to transmit when new trigger is received.

Green Spot Settings

Green Spot Mode

Select one of the following from the drop-down list:

- **Disabled**
- **Good Read** - Immediate: this option will light the green LED at the time of the bar code being decode. In an array only the AV500 that read the bar code will light
- **Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time is milliseconds that the Green Spot should remain on.

Redundant Controller Settings

Controller Mode: Camera_1

Select one of the following from the drop-down list:

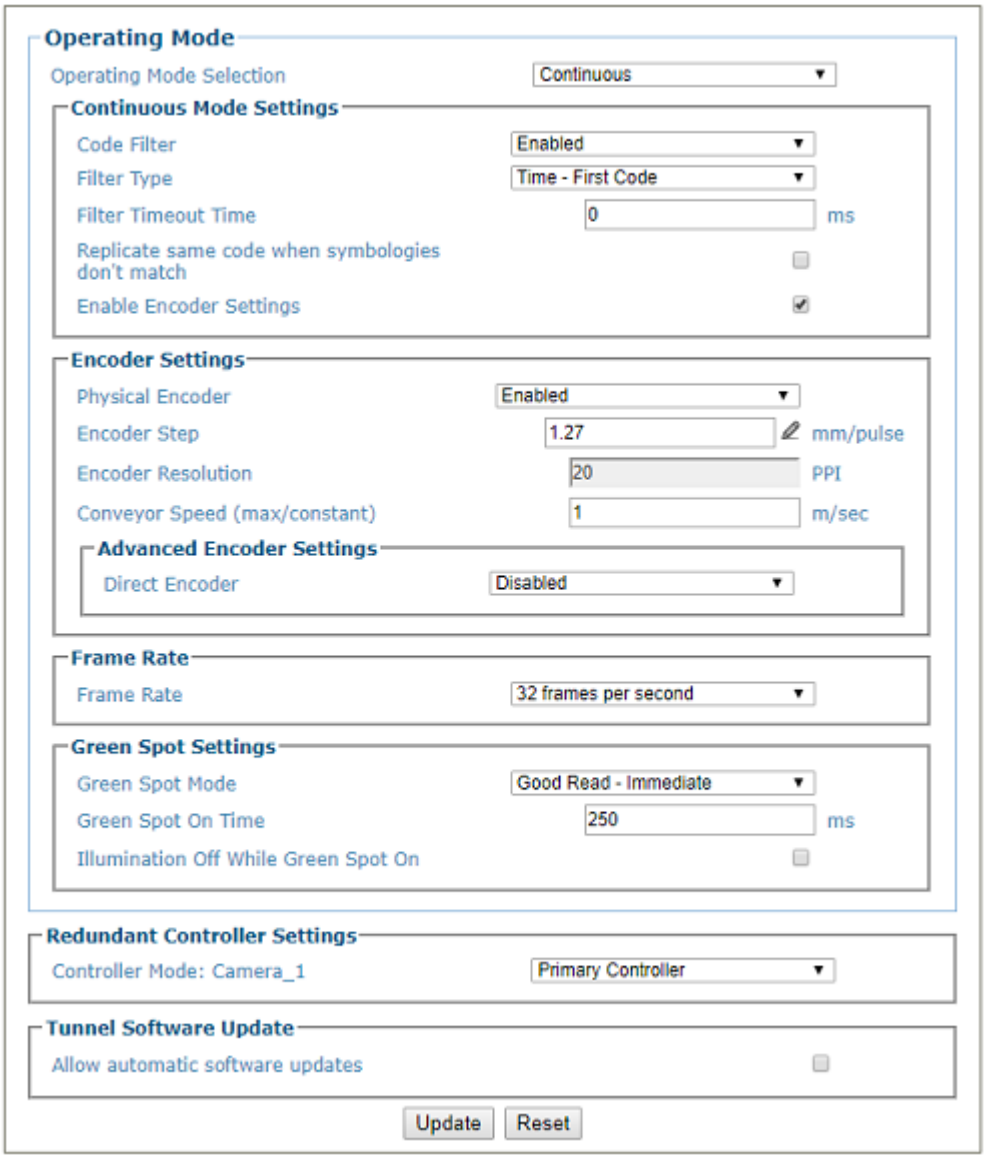
- **Auto-Detect:** this option is used when a CBX is used in the array. All AV500 units in the array will check the status of the bit created by the IDNet jumper. The one that identifies the connection will become the controller.
- **Primary Controller:** Select if the camera you are setting up is the Primary Controller.
- **Secondary Controller:** Select if the camera you are setting up is the Secondary Controller.

Tunnel Software Update

Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras.

CONTINUOUS MODE



Continuous Mode Settings

Code Filter

Select Enabled or Disabled from the drop-down. If enabled code filter options become available. The AV500 offers several different conditions associated to the Continuous Mode Settings. These different options allows the user to configure the AV500 to accommodate Such conditions as reading unique bar code data, restrict reading the same bar code by time (ms), or by distance (mm).

Filter Type

Select one of the following from the drop-down:

- **New Unique Code:** when selected will read a bar code. The AV500 stores the data in a memory location and transmits this data to the host. It will then continue to look for bar code data. If the bar code data read by the AV500 matches the data that is stored in memory, the AV500 will not transmit it a second time to the host. If the bar code data is different, the AV500 will replace the memory location with the new bar code data and transmit the new data to the host.
- **Time - First Code/Last Code:** Since the AV500 is an area camera it will acquire images at 32 frames per second. The first and last option is in respect to the bar code images found. When the First option is selected the AV500 will use the first image with a decoded bar code to start the timer. For the selection without a tachometer or the starting point for the mm to transmit in a system with a tachometer. The AV500 will read a bar code and place the data into a memory location. It will then start an internal timer. When the AV500 reads another bar code it will check the new bar code data with the previous data stored in memory. If the new bar code data matches the previous data the AV500 will check the timer. If the time appointed has not been exceeded, and the data is the same, the AV500 will not transmit the

data to the host. if the data matches and the timer times out, the AV500 will transmit the data to the host.If the new bar code data is different then the bar code in memory the AV500 will replace the bar code in memory with the new bar code data and transmit the new bar code data to the host.

•**Distance - First Code/Last Code:** operate the same as time, but the tachometer is used to measure distance. the AV500 will not transmit that bar code data again until it has not been decoded for the time specified or the conveyor has traveled the specified distance as defined here.

Filter Timeout Time

When the Filter Type is selected the Filter Timeout Time option is made available. this option allows the user to set the time before the AV500 will transmit the same bar code data as the previous decode. Enter time in milliseconds.

Replicate same code when symbologies don't match

Click the check-box to transmit the same bar codes when contain the same data but they are not the same symbology.

Enable Encoder Settings

Click the Check-box to enable encoder settings. The Enable Encoder Settings is used when the bar code data is compared by distance rather then time.When this option is enabled the Distance - First Code and Distance - Last Code filter types are made available.

Encoder Settings

Physical Encoder

Select Disable or Enable from the drop-down list:

•**Disable:** External encoder is disabled, and internal encoder is active

•**Enable:** A physical encoder is connected to the Encoder input and is enabled

Encoder Step (mm/pulse)

Click  to activate the Encoder Step input form. Enter the Encoder Wheel Circumference in the field provided and select the in or mm option. Enter the Pulses / Revolution in the field provided (See the table below for values). Click Submit to save the values, or click Cancel to return to the Operating Mode window.

Encoder Resolution

Displays the encoder/tachometer resolution in pulses per inch (PPI) based on the Encoder Step calculation. This field cannot be edited.

Conveyor Speed (Max/constant)(m/sec)

When Physical Encoder is Disabled, enter the conveyor speed in meters per second in the field provided (see formula below).

When Physical Encoder is Enabled, enter the maximum belt speed using the formula below. Setting the belt speed too high will affect image quality; setting it too low will give you an exceeded maximum line rate error when the belt exceeds this setting.

Formula: Max conveyor speed x 1.05

Advanced Encoder Settings

The settings are available when Physical Encoder is set to Enabled above.

Direct Encoder

Select Disable or Enable from the drop-down list. Direct encoder is a high-resolution encoder/ tachometer used in start/stop applications.

Frame Rate

Frame Rate

Select an appropriate Frame Rate from the drop-down list.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Green Spot Settings

Green Spot Mode

Select one of the following from the drop-down lists:

- **Disabled**
- **Good Read - Immediate:** this option will light the green LED at the time of the bar code being decode. In an array only the AV500 that read the bar code will light
- **Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time is milliseconds that the Green Spot should remain on.

Illumination Off While Green Spot On

Click the check-box to turn of Illumination while Green Spot is on. This may help you use Green Spot to line up the AV500.

Redundant Controller Settings

Controller Mode: Camera_1

Select one of the following from the drop-down list:

- **Auto-Detect:** this option is used when a CBX is used in the array. All AV500 units in the array will check the status of the bit created by the IDNet jumper. The one that identifies the connection will become the controller.
- **Primary Controller:**
- **Secondary Controller:**

Tunnel Software Update

Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

AV500 SYSTEM ELEMENTS POSITIONING

Critical to any data collection system are the timing and distance positions of the devices connected to the data collection device. They are critical because they signal it about many things:

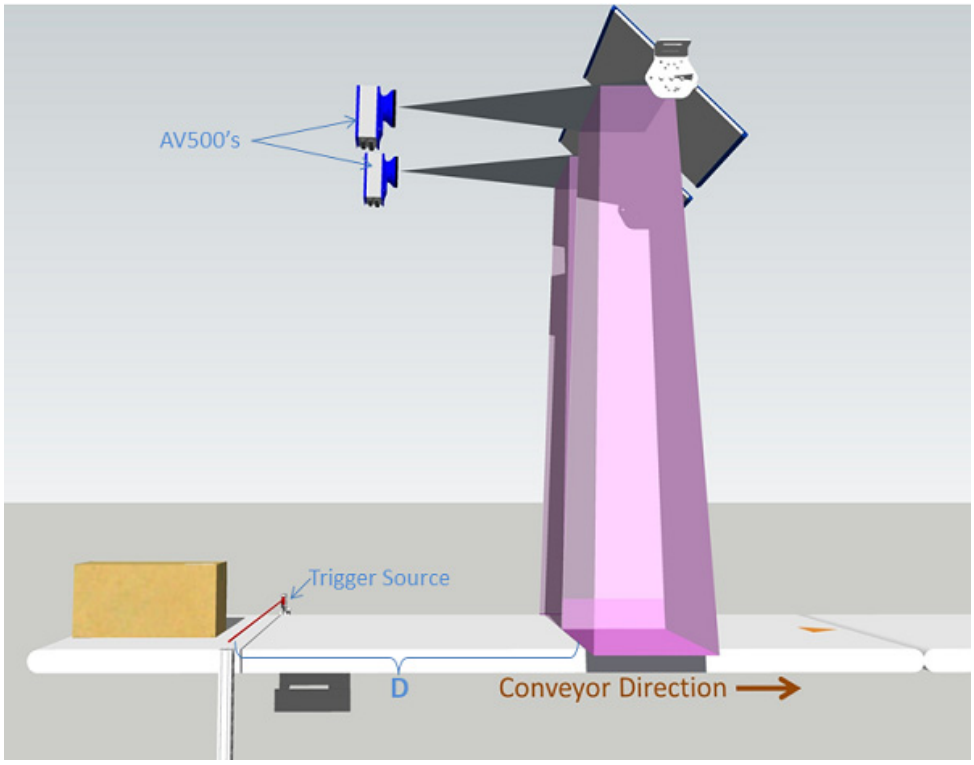
- When a parcel is entering the system
- Where and how is the parcel positioned as it enters the system
- What size is the parcel
- Where is the barcode on the parcel.

For the purpose of proper focusing of the device.

In this section we will explain where these devices (and their signals) must be positioned in relation to the AV500(s).

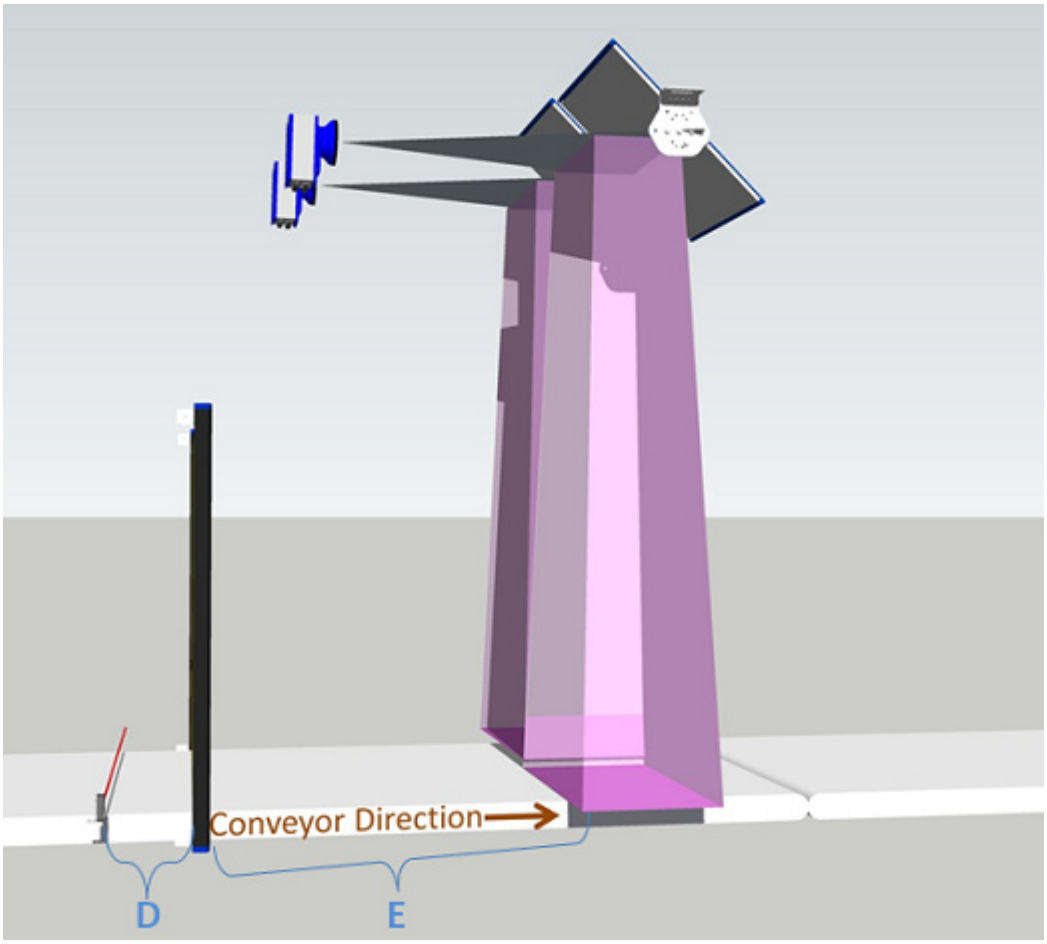
- What is the distance from trigger source to position sensor
- What is the distance from position sensor to AV500
- What is the distance from DM3610 to trigger source and position sensor
- What is the distance from the Light Curtain to trigger source and position sensor

Fixed Focus, One Photoeye or Trigger Device



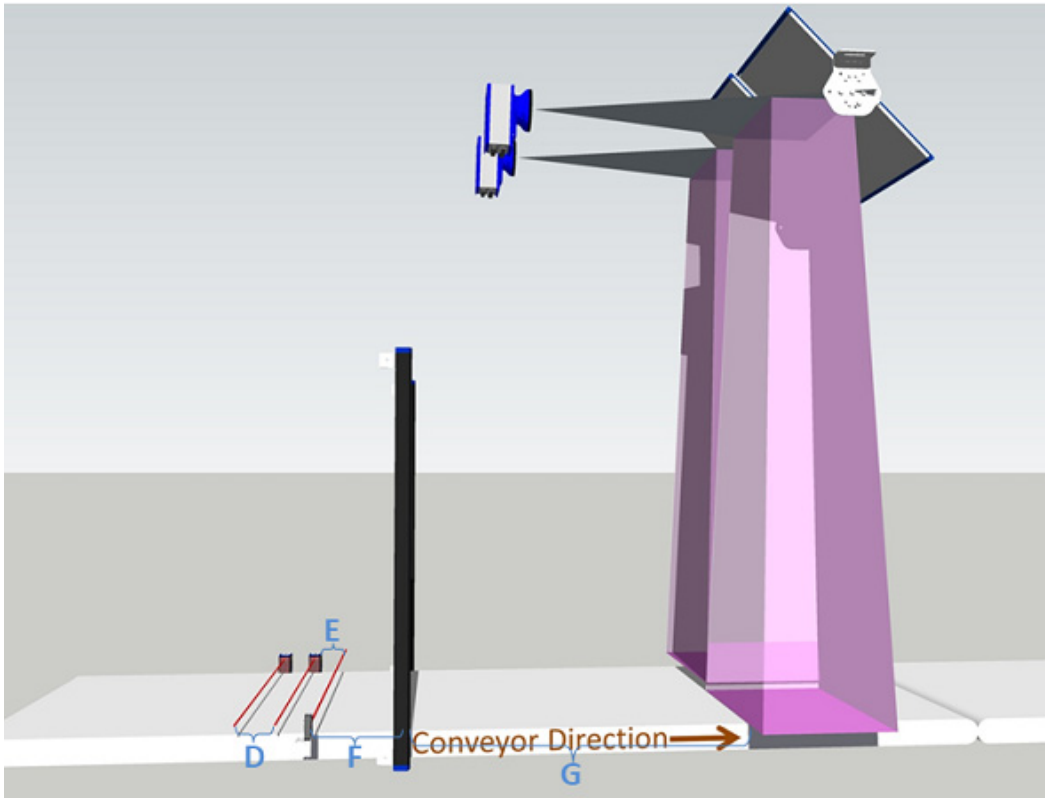
Identifier	Item 1	Item 2	Distance		Timing	
			Standard (in.C)	Metric	M/S	F/M
D	Trigger Source	AV500	5 or 10	127		

Light Curtain and Photoeye



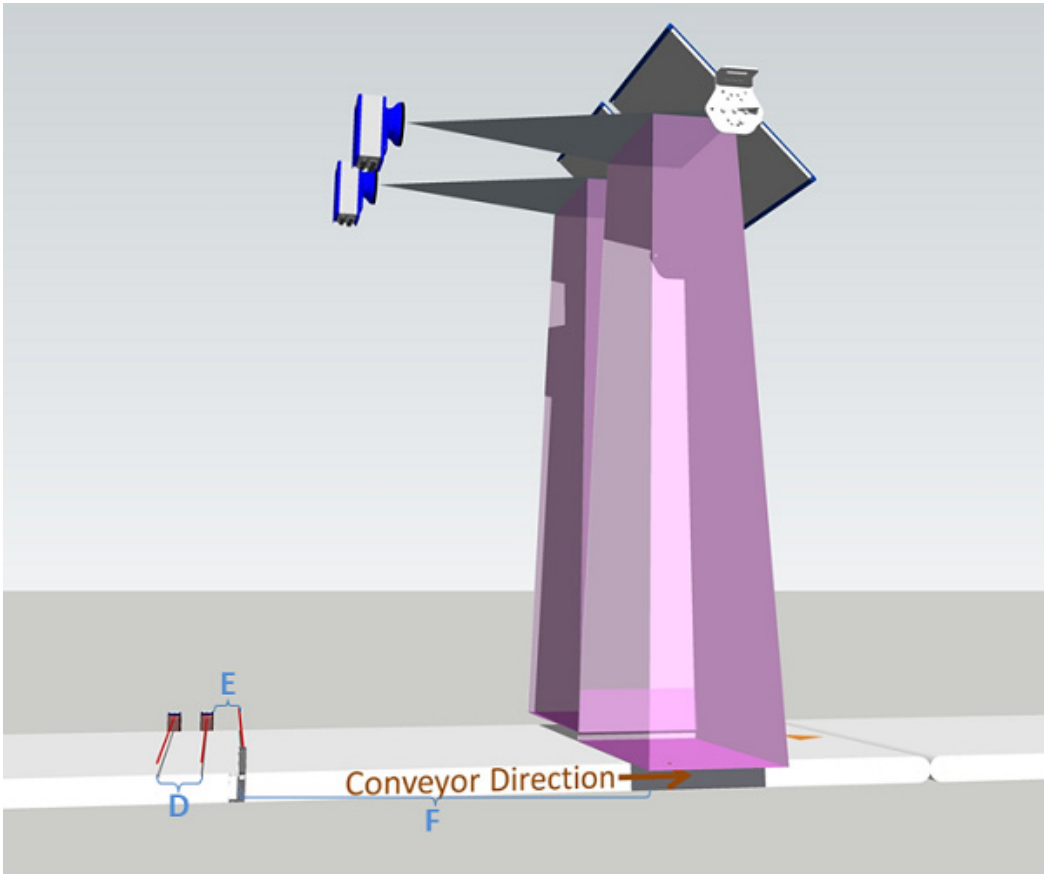
Identifier	Item 1	Item 2	Distance		Timing	
			Standard (in.)	Metric	M/s	F/M
D	Trigger Source	Light Curtain	5	127		
E	Light Curtain	AV500	12	305		

Light Curtain and S85's



Identifier	Item 1	Item 2	Distance		Timing	
			Standard (in.)	Metric	M/s	F/M
D	Trigger Source	Light Curtain	5	127		
E	S85 #1	S85#2	5	127		
F	S85#2	Light Curtain	No distance required			
G	Light Curtain	AV500	12	305		
Position Sensor Delay			5	127		

PE and Two S85's



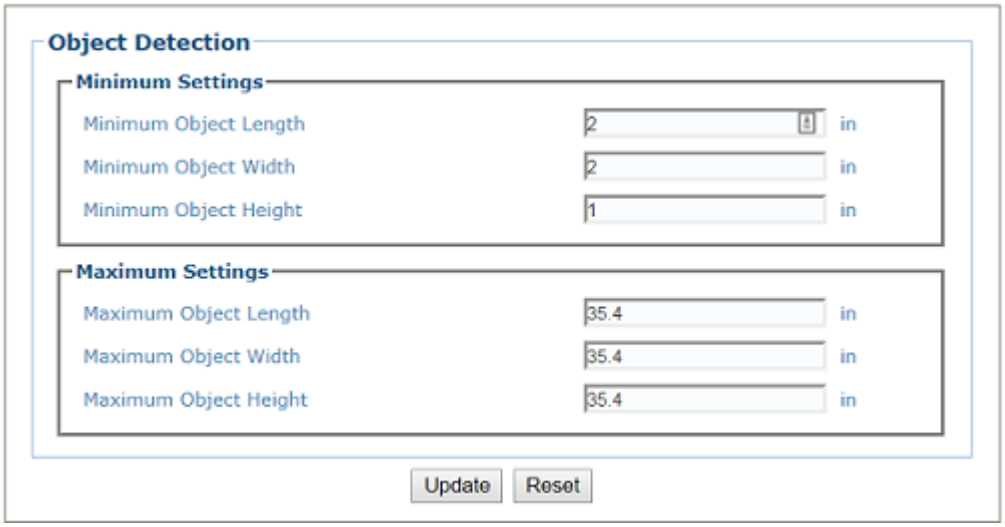
Identifier	Item 1	Item 2	Distance		Timing	
			Standard (in.)	Metric	M/s	F/M
D	Trigger Source	S85 #1	5	127		
E	S85 #1	S85#2	1	25.4		
F	S85#2	AV500	12	305		

OBJECT DETECTION

Use **Object Detection** to set the minimum and maximum size parameters for objects (packages) in your system.

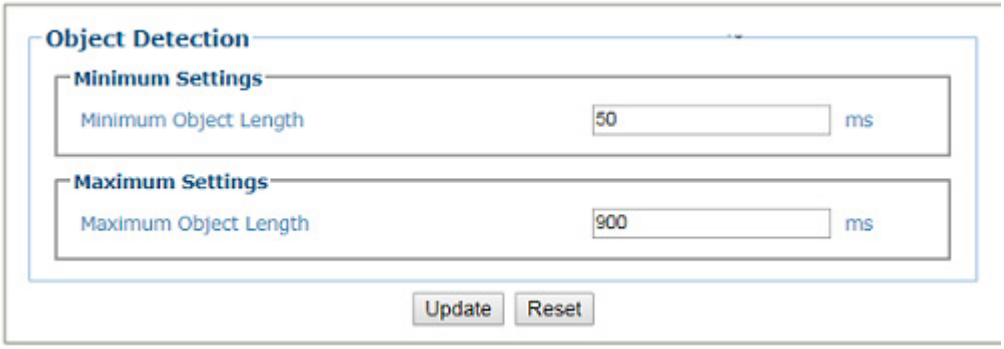
To edit the system Object Detection:

1. In the menu tree under **Modify Settings**, navigate to **Global Settings | Object Detection**. The **Object Detection** window opens.



2. For PackTrack Mode Enter the minimum and maximum detection size settings for object length, width and height in the fields provided.

3. Enter just the minimum and maximum object length for Online and Continuous mode.



4. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

BARCODE SETTINGS

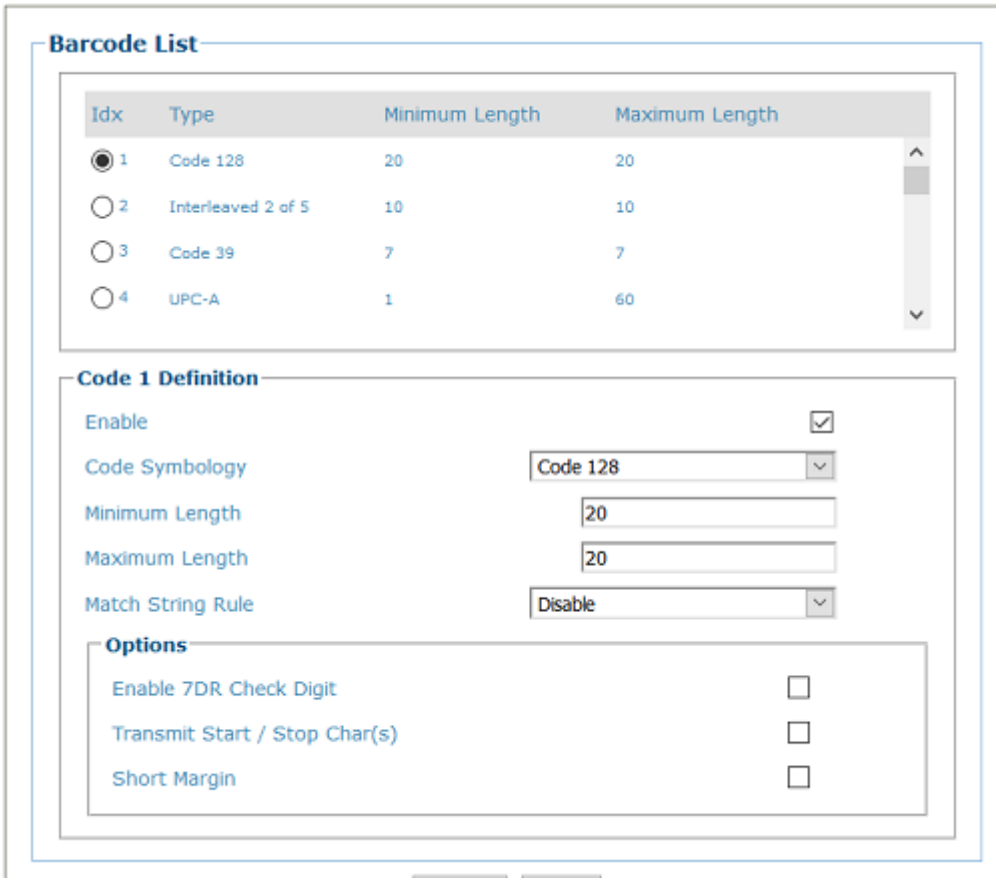
Use Barcode Settings options to define the barcodes to be read, as well as no read, multiple read and other message characteristics. Make modifications to the system barcode settings using the menu selections:

Barcode Settings Table

Use the **Barcode Settings Table** to select and configure barcodes to be read by your application. Different configuration options are available based on the barcode type selected.

To edit the Barcode Settings Table:

1. In the menu tree under **Modify Settings**, navigate to **Global Settings | Barcode Settings | Barcode Settings Table**. The **Barcode Settings Table** window opens.



2. Enter the appropriate information in the form as described below:

Top Panel

Displays a list of barcodes that have been added to the system with the following columns:

Idx (Index)

Select an option button for the row/barcode you wish to edit.

- If a barcode type is displayed in the selected row, its configuration can be edited.
- If a row displays disabled, enable it and select a barcode type to configure for that row.

Type

Displays the name of the barcode symbology for that index. If no symbology has been added for a row, disabled is displayed.

Minimum Length

Displays the minimum barcode character length for that row's symbology.

Maximum Length

Displays the maximum barcode character length for that row's symbology.

Code n Definition

NOTE

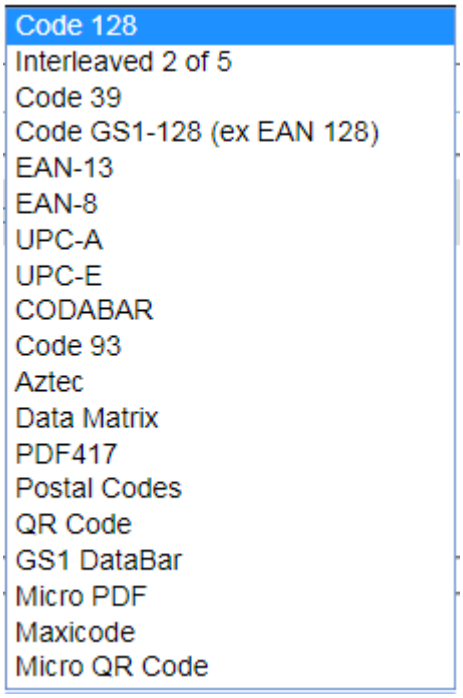
Input fields will vary depending on the selected symbology

Enable

Select the Enable check box to activate the selected barcode. De-select the Enable check box to disable the selected barcode. When the check box has been selected, configuration and code type options are displayed.

Code Symbology

Select a barcode symbology from those available in the Code Symbology drop-down list.



Add On (EAN and UPC Codes only)

Select No Add On, 2 digits Add On, or 5 digits Add On from the Add On drop-down list.

No Add On

2 digits Add On: Adds this many digits as a supplement to the barcode

5 digits Add On: Adds this many digits as a supplement to the barcode

NOTE

EAN is the acronym for International Article Number, previously known as European Article Number.

Minimum Length (Not shown on EAN and UPC)

Enter the minimum character length for the selected barcode.

Maximum Length (Not shown on EAN and UPC)

Enter the maximum character length for the selected barcode.

Match String Rule

Select Disable, Match, or Do Not Match from the drop-down list. This parameter defines the matching rule, according to which a code can be transmitted.

- **Match:** All codes matching the Pattern Match String will be transmitted
- **Do Not Match:** All codes not matching the Pattern Match String will be transmitted

Pattern Match String (max. 200 chars)

Click to activate the “The Text Entry Tool” on page 59 and create a pattern match string.

A Pattern Match String allows the user to check for a sequence of characters in a group of barcodes. The string can be made up of a sequence of alpha numeric characters combined with Regular Expression Syntax.

The regular expression algorithms allow checking for conditional barcode information based on specific expression functions (see below). A pattern matching string is programmable for each barcode used in the system, and if the barcodes read do not match the defined string, a No Read Event will be returned. A no read is sent depending on the Match/Do Not Match selection.

It is possible to define the matching string by inserting Regular Expressions, including but not limited to the following:

. – (dot) Matches any character

* - (asterisk) Matches 0 or more of the preceding character.

+ - (plus) Matches 1 or more of the preceding character.

\d - Matches any single digit

\w - Matches any word character (alphanumeric & underscore).

[XYZ] - Matches any single character from the character class.

[XYZ]+ - Matches one or more of any of the characters in the set.

$ - Matches the end of the string.

[^a-z] - When inside of a character class, the ^ means NOT; in this case, match anything that is NOT a lowercase letter.

Examples:

Match a code starting with 123 string and followed by any string of characters:

Match String = 123.*

Example Code = 123aC53

Match a code ending with 123 string preceded by any string of characters:

Match String = .*123

Example Code = 41pO123

Match a code having 123 string in any position: 0)

Match String = .*123.*

Example Code = 41pO123253

For Codabar codes the start/stop characters must be considered in the match conditions. For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions. Input fields will vary depending on the selected symbology.

OPTIONS

Code 128

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

Transmit Start / Stop Char(s)

Select the check box to enable transmission of start and stop characters.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

Interleaved 2 of 5

Use Check Digit

Select the check box to include the Check Digit in the code transmitted. Check digits can improve decoding safety: it is generally the last digit aligned to the right of the code and verifies the validity of the preceding digits. The calculation technique and number of check digits depend on the code selected.

It is advised to enable the check digit whenever correct code identification is difficult.

Transmit Check Digit

Select the check box to enable transmission of the Check Digit.

NOTE **For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions.**

A check digit is a character that is transmitted at the end of the data. It is the remainder of an equation that uses all data in the bar code. The same algorithm is used at the host and to ensure that the data from the camera is completed.

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

Code 39

Use Check Digit

Select the check box to include the Check Digit in the code transmitted

Transmit Check Digit

Select the check box to enable transmission of the Check Digit.

NOTE **For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions.**

A check digit is a character that is transmitted at the end of the data. It is the remainder of an equation that uses all data in the bar code. The same algorithm is used at the host and to ensure that the data from the AV500 is completed.

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

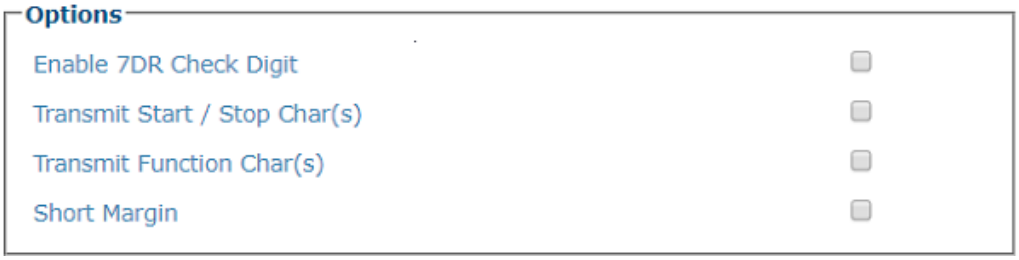
Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

Full ASCII

Select the check box to enable full ASCII. This pertains to Code 39 only.

Code GS1-128 (ex EAN 128)



Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

Transmit Start/Stop Char

Select Disabled, Lower Case, or Upper Case from the drop-down list. This parameter is available only for Codabar code symbologies. It allows transmitting the code start character:

- **Disabled:** The character is not selected;
- **Lower Case:** The character is transmitted in lower case;
- **Upper Case:** The character is transmitted in upper case.

Transmit Function Char(s)

Select the check box to enable transmission of functional characters.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

EAN-13, EAN-8, UPC-A

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

Quiet Zone

Specify the quiet zone in the field provided.

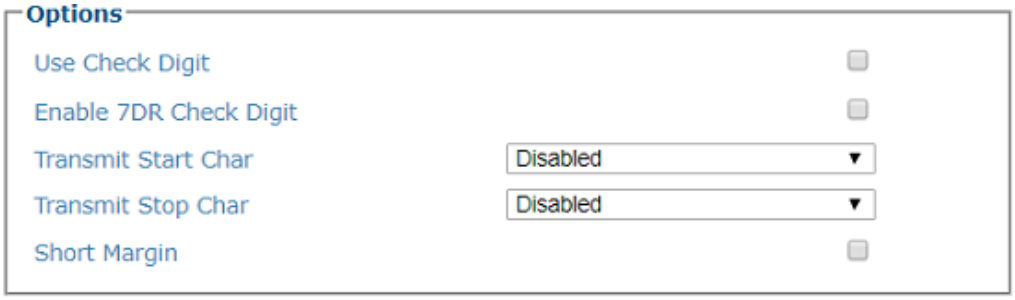
This defines the minimum quiet zone (white margins) measured in narrowest module width. This option may be symbology dependent.

UPC-E

UPCE Expand

Select the check box to enable conversion of a full-length UPC (UPC-A) UPC-E. Excess zeros will be suppressed.

CODABAR



Use Check Digit

Select the check box to include the Check Digit in the code transmitted

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

Transmit Start/Stop Char

Select Disabled, Lower Case, or Upper Case from the drop-down list. This parameter is available only for Codabar code symbologies. It allows transmitting the code start character:

- **Disabled:** The character is not selected;
- **Lower Case:** The character is transmitted in lower case;
- **Upper Case:** The character is transmitted in upper case.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

NOTE **For Codabar codes the start/stop characters must be considered in the match conditions.**

Code 93

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

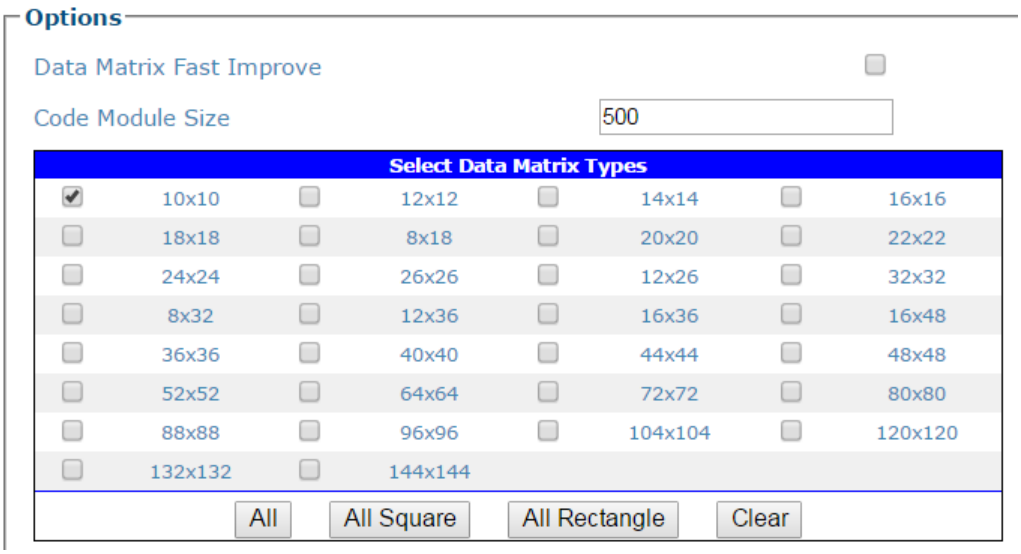
Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This option deals with an illegal quiet zone.

Data Matrix Options

Data Matrix Fast Improve

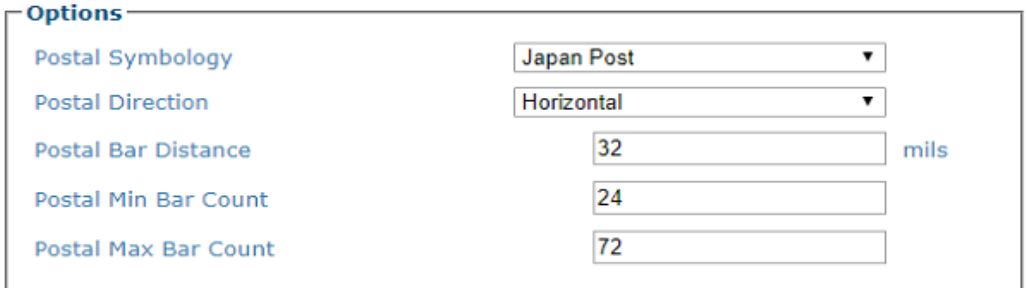
Select the check box to enable the Data Matrix options available via the table shown below. Select the Data Matrix Fast Improve check box and the check box next to the Data Matrix type codes required from the provided table.



These options are identified by counting the number of elements on the horizontal and vertical rows of the code to be read.

- Select All to select all of the Data Matrix codes listed.
- Select All Square to select all of the Data Matrix square codes.
- Select All Rectangle to select all of the Data Matrix rectangular codes.
- Select Clear to clear the table of any selections.

Postal Codes



Select a symbology from the drop-down list, and then define its parameters including:

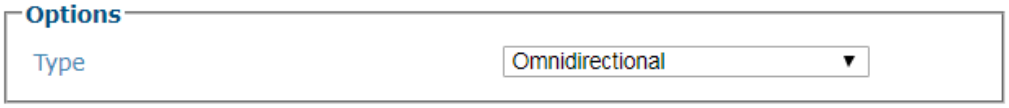
- **Postal Direction:** Select Omnidirectional, Horizontal, Vertical, or Horizontal/ Vertical from the drop-down list.
- **Postal Bar Distance:** Enter the bar distance in the field provided.
- **Postal Min Bar Count:** Enter the minimum number of bars in the field provided.
- **Postal Max Bar Count:** Enter the maximum number of bars in the field provide

QR Code

Code Module Size

Enter number of code modules in the field provided.

GS1 DataBar



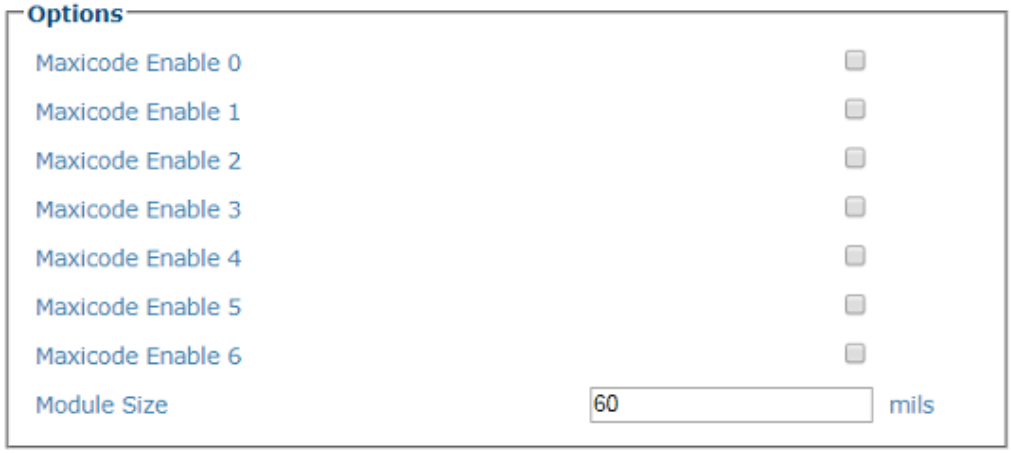
Type

Select Omnidirectional, Expanded, Limited, Expanded Stacked, or Stacked from the drop-down list.

These options are available when reading GS1 DataBar stacked type barcodes, this parameter can be enabled to apply a fixed safety margin to the decoding process in terms of decoding time (number of scans). This parameter is particularly useful in applications that read tall

stacked type codes or on slow moving conveyors.

Maxicode



Maxicode Enable n

Select the check box corresponding to the Maxicode(s) to enable.

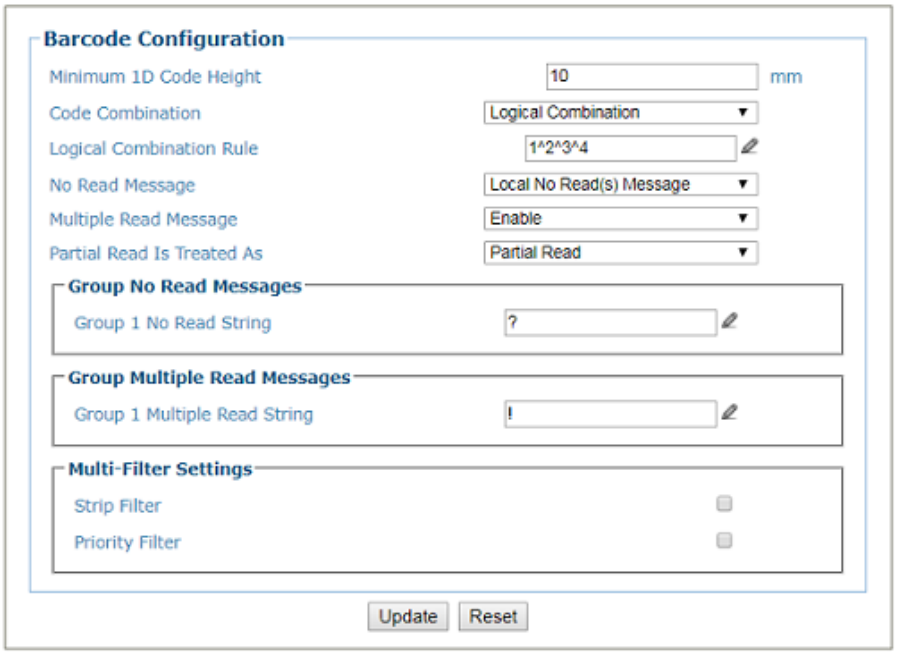
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Barcode Configuration

Barcode Configuration is used to define the relationship between the barcodes read and processed by your cameras and how they are grouped together for transmitting to the host. For example, which ones must be read, which ones are optional and what is the priority. It also defines the formatting of no read, multiple read, partial read and duplicate messages.

To edit the Barcode Configuration:

1. In the menu tree under **Modify Settings,** navigate to Global Settings | **Barcode Settings** | **Barcode Configuration**. The **Barcode Configuration** window opens.



2. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum height of codes the system is expected to read. This parameter defines the minimum height of the barcode the AV500 will read. The minimum height is 6 mm [.25 in].

NOTE

The smaller the Minimum 1D code height the more processing time is needed to complete the decode. If the application is having difficulty providing a decoded bar code, and the minimum bar height is greater then 6mm (.25 in) the parameter may be increased to assist in the decoding.

Code Combination

Select **Single Label, Standard Multi Label, Logical Combination**, or **Code Collection** from the drop-down list. The Code Combination parameter selects the decoding mode for the barcode reader. Follow these links for each type of Code Combination to view its specific inputs:

- **Single Label:** In Single Label mode only one barcode can be read in each reading phase; however it can be determined automatically from up to 10 enabled codes. The barcode reader stops decoding as soon as a single code is read.

NOTE

If there are multiple barcodes within the barcode readers read area during a trigger cycle, the first barcode decoded will be the data transmitted to the host.

- **Standard Multi Label:** In Multi Label mode the barcodes selected (up to 10), will all be read in the same reading phase. If the reading phase terminates before all the codes are read, and a No Read message is enabled, Local or Global, a no read message is produced.

In case of Standard Multi Label, the codes will be distinguished EITHER by their symbology, OR by their contents. If two (or more) codes share the same symbology and content, the barcode reader will perceive them as a unique code.

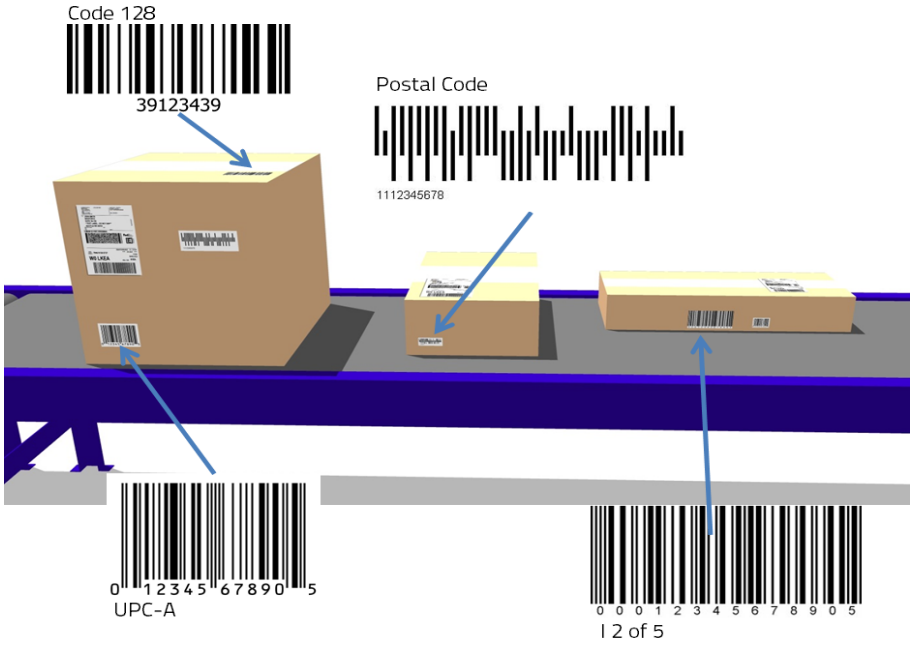
- **Logical Combination:** In Logical Combination mode the codes of the groups defined by the Logical Combination Rule are read in the same reading phase.
- **Code Collection:** In Code Collection mode expected codes are collected within a single reading phase in the order in which they are read. The No Read message is produced only if none of the codes are read. Up to 50 codes can be collected.

Based on your code combination selection, different fields will become available. See the following sections for the details of your code combination.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

No Read Message Examples

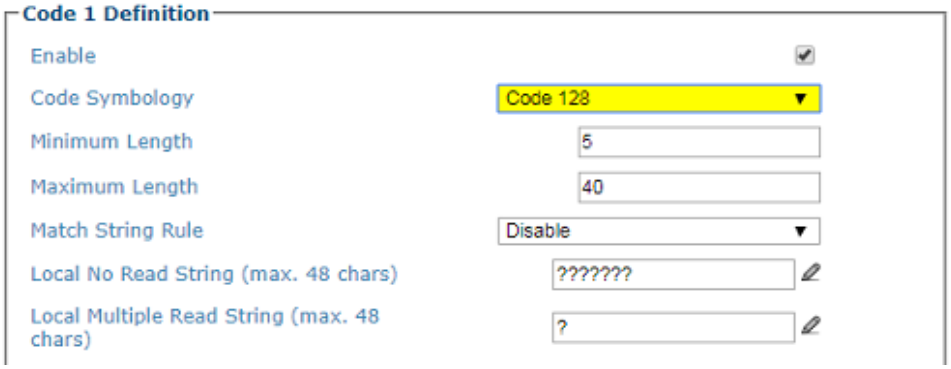
System parcels may contain multiple bar codes on multiple labels. You define exactly what bar codes will be read and what needs to transmit to your host. You can also define, no read messages, match strings, and multiple read options.



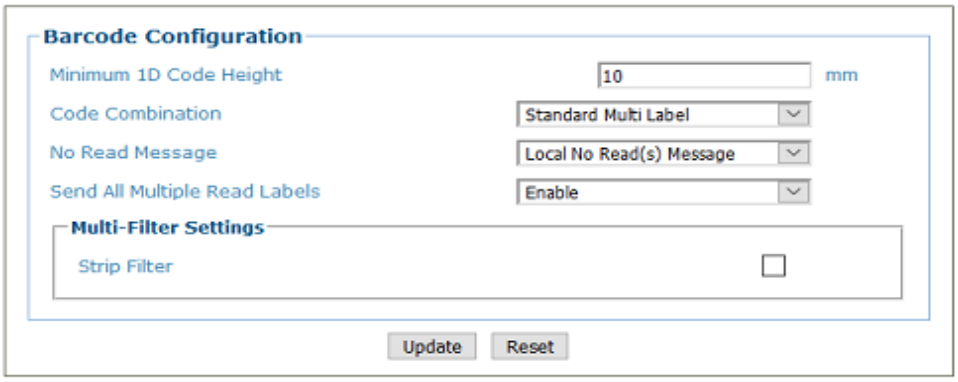
NOTE

Be aware No Read messages are handled differently, based on the Barcode Configuration you choose. The No Read field will appear on different menu pages depending on the Barcode Configuration/Code Combination setting. When the Standard Multi Label/Local No Read(s) Message is selected, the No Read Field appears with the individual bar codes selected on the Barcode Settings Table

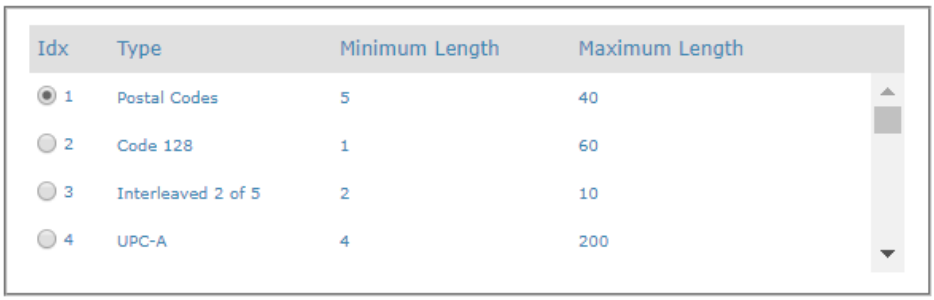
In the Barcode Settings Table you set up what types of bar codes will be decoded. You can set up to 50 bar codes.



Barcode Configuration allows you to set up what will be transmitted once barcodes are read (or not read).

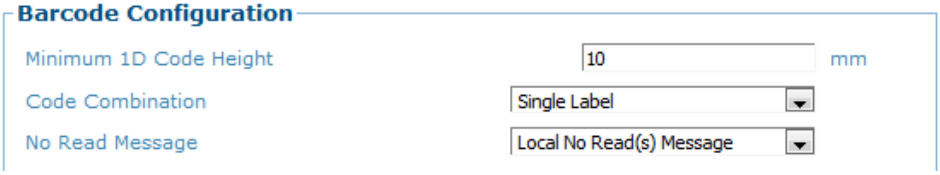


For our examples, four bar codes have been enabled; Postal codes, Code 128, Interleaved 2of 5, and UPC-A

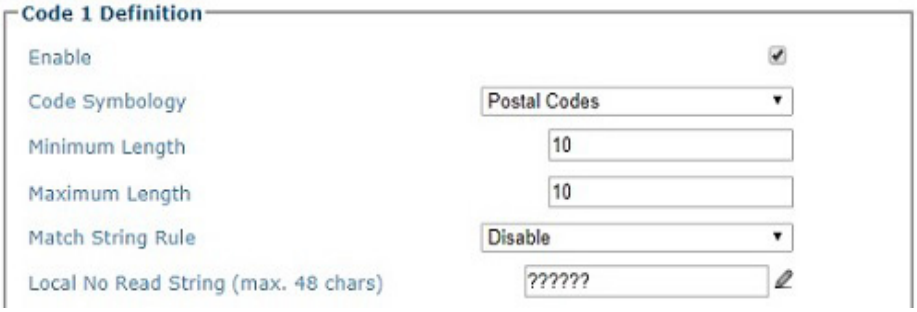


Single Label - Local No Read

In Single Label mode only one barcode can be read in each reading phase; however it is determined automatically from up to 10 enabled codes. The barcode reader stops decoding as soon as a code is read. If a code is not read during the reading phase, the No Read message is produced.



Local No Read Message specifies that a No Read String is defined in the Barcode Settings Table for each of the four bar codes.



As parcels pass under the reader, the first code decoded is transmitted:

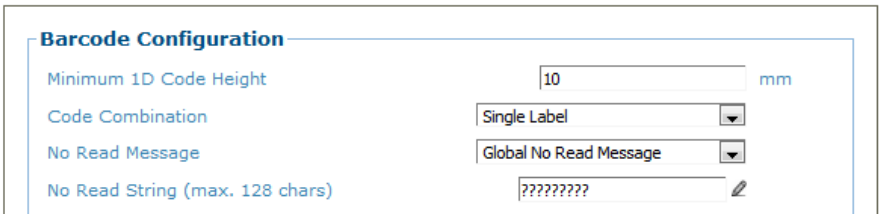
#STX675898767566#CR#LF

If none of the barcodes are read then a single no read message is transmitted:

#STX???????#CR#LF

Single Label - Global No Read

Global No Read Message specifies a single No Read String for all of the bar codes.



Again the first code decoded is transmitted:

#STX675898767566#CR#LF

If no codes are read the Global No Read String is transmitted:

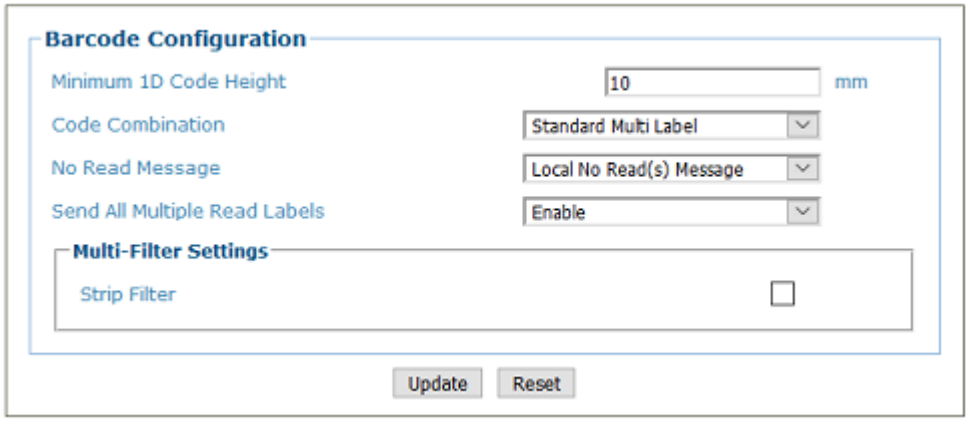
#STX???????#CR#LF

Standard MultiLabel - Local No Read Message

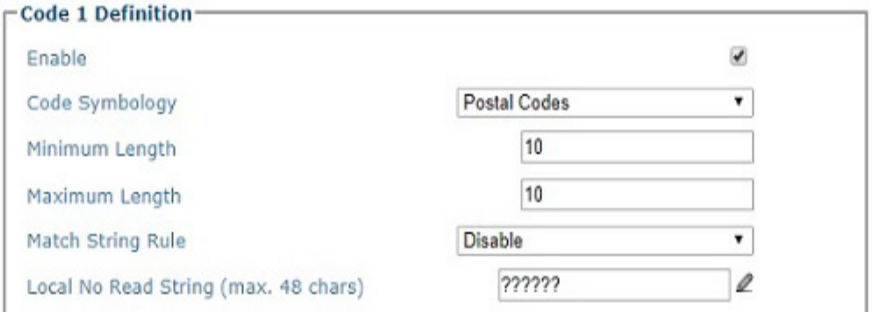
In Multi Label mode the barcodes selected (up to 10), are all read in the same reading phase. If the reading phase terminates before all the codes are read, there are three options with a no read:

- Disable No Read Message
- Global No Read Message
- Local No Read Message.

only when the Local No Read is selected will be a no read be sent for each code in the Barcode Settings Table that is not read. The No read field is found with each individual code selected in the Barcode Settings Table



When Local No Read Message has been selected a no read message is defined for each of the barcodes in the Barcode Settings Table.



When reading multiple labels it is important to consider how to treat partial reads. For example, what if 3 out of four codes are read. If Partial Read is Treated As is considered

a Good Read, any of the codes read may be transmitted. In the parcel image below, two of the codes on the parcel have been read.

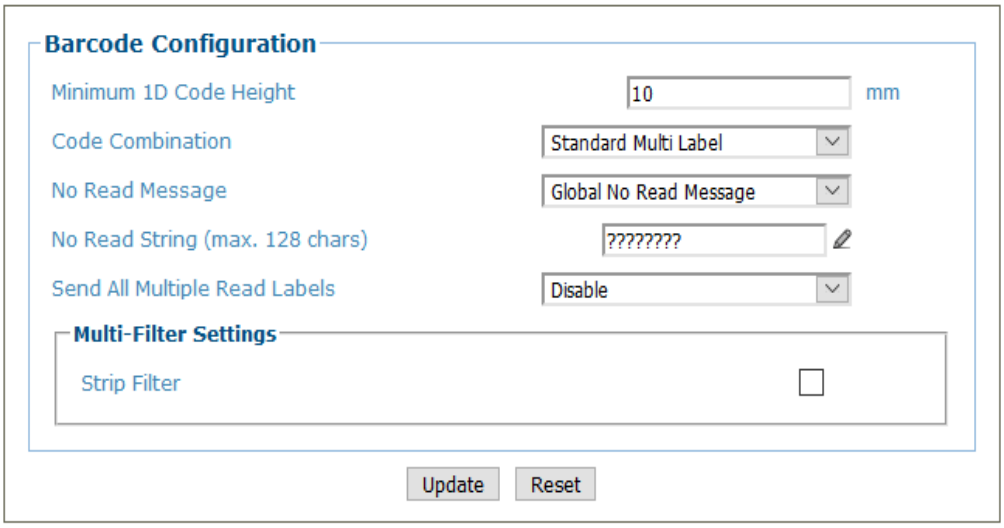
Since two of the enabled codes were read and two were not, the message is transmitted as:

#STX?????,1234567890123,?????,675898767566#CR#LF

This indicates that the first and third codes enabled did not read while the second and fourth did and were transmitted.

Standard MultiLabel - Global No Read Message

Standard Multi Label has been selected. However this time we select a Global No Read Message and Partial Read is Treated As a No Read.



In this example all 4 codes must be read during the reading phase for it to be considered a good read.

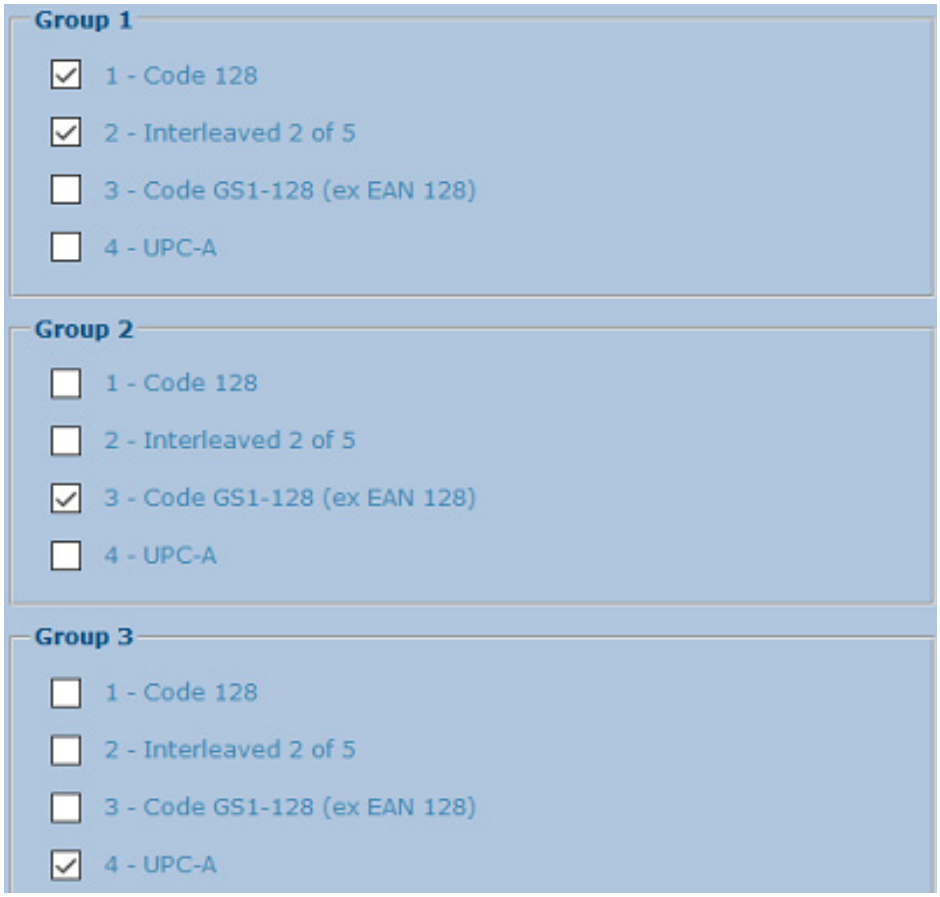
All 4 codes must be read during the reading phase.

STX00271100020548725509180349769661,234567890123,0467,675898767566#CR#LF

If all four codes are not read during the reading phase, a single No Read message is transmitted:

#STX???????#CR#LF

Standard Multi Label Local No read.

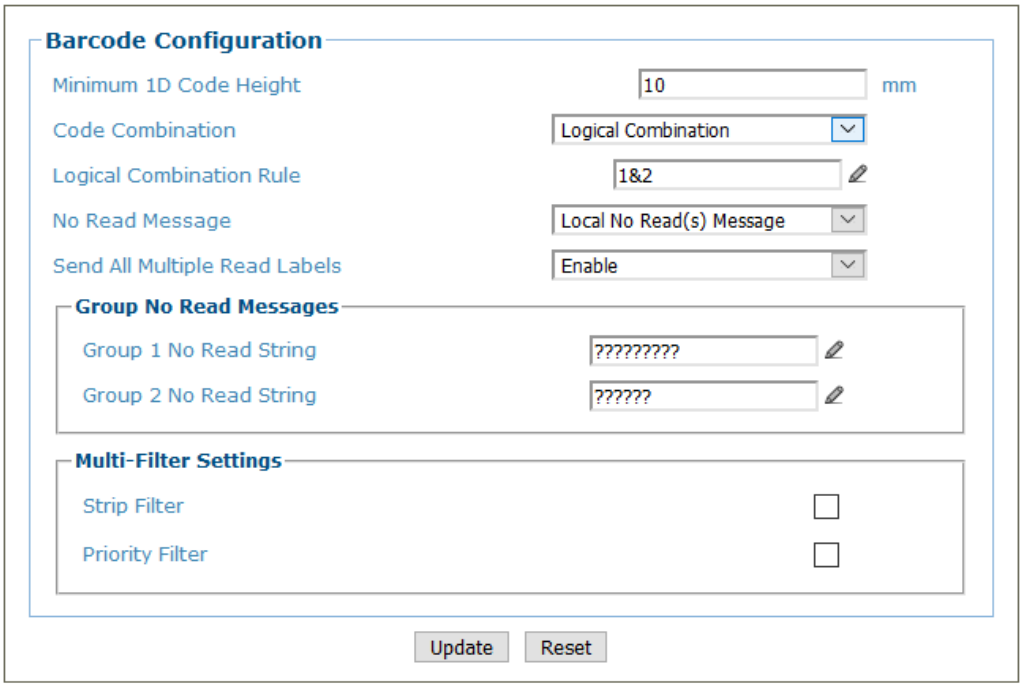


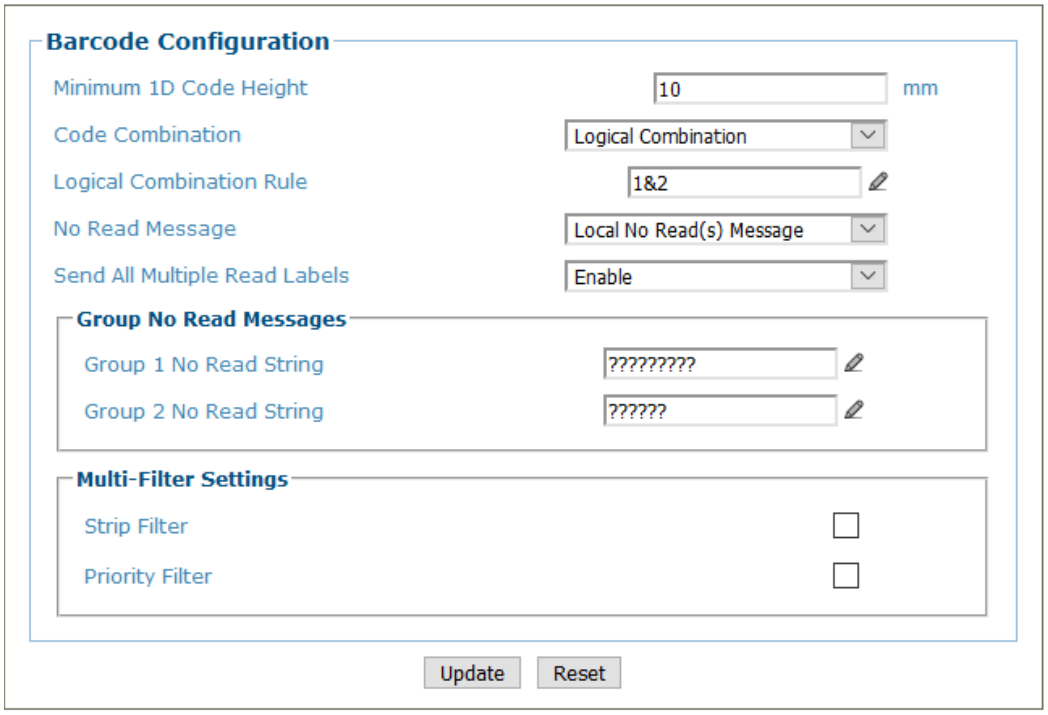
In this condition if a bar code is not read it's no read message will be transmitted. The order of the message fields are set in the Barcode Settings Table.

Logical Combination - Local No Read

In Logical Combination mode the codes of the groups defined by the Logical Combination Rule are read in the same reading phase.

As before four codes have been enabled. In this case, four code groups have been defined and a logical combination rule states that code groups 1 and 2 and 3 and 4 must be read during the reading phase.





Local No Read Message is selected and a no read string is defined for each code. In this example Multiple Read Message has also been enabled and defined as !!!!!. Partial Read Is Treated As is set as No Read. Each of the four groups contains 1 possible code.

The transmitted message might look like this:

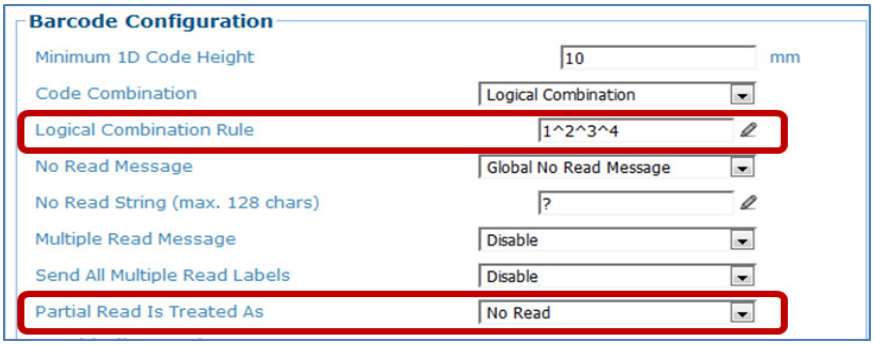
STX00271100020548725509180349769 66,!!!!!,0467,675898767566#CR#LF

In this message each group code has been read, however there were multiple reads in Group 2.

Logical Combination - Global No Read

In this example, each group contains all four possible codes. Group 4 is shown below:

The Logical Combination Rule is defined as Code 1 or Code 2 or Code 3 or Code 4. Partial Read Is Treated As is again defined as No Read.

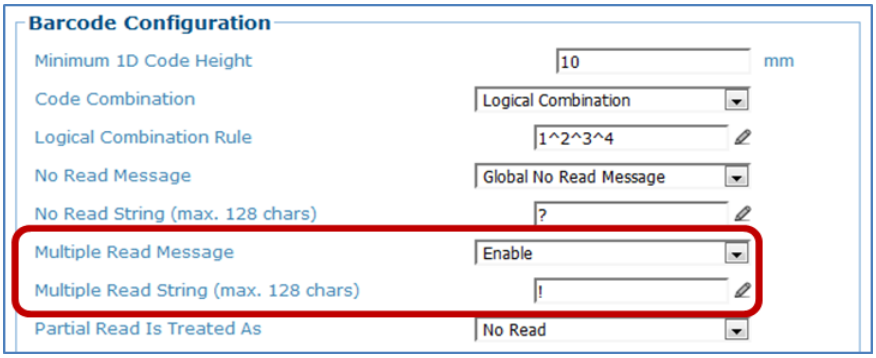


The transmitted message might be:

#STX675898767566#CR#LF

This indicates one of the codes in one of the groups was read.

In this example Multiple Read Message is enabled and defined as!.



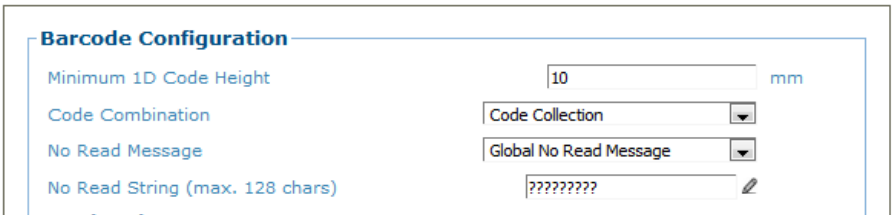
The transmitted message might be:

#STX!#CR#LF

This indicates a multiple read (more than one of any one of the four codes defined) occurred during the trigger cycle.

Code Collection - Global No Read

In Code Collection mode expected codes are collected within a single reading phase in the order in which they are read. The No Read message is produced only if none of the codes are read. Up to 50 codes can be collected.



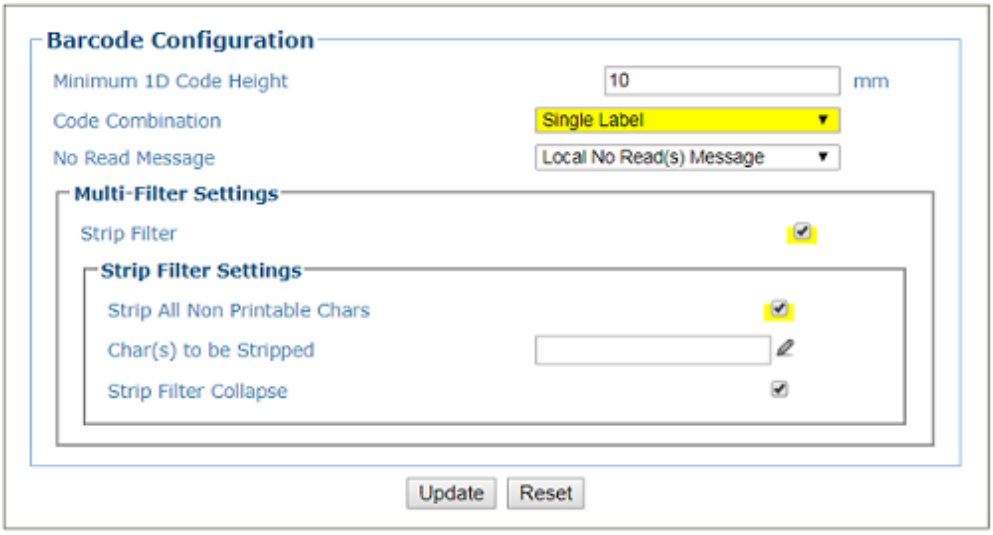
Three of the four enabled codes are read, therefore those that are read are transmitted:

#STX00271100020548725509180349769 66,1234567890123,675898767566#CR#LF

As this time you cannot use Local No Read.

Single Label

When **Single Label** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the **Minimum Code Height** in the field provided (mm [in]).

Code Combination

Single Label has been selected.

No Read Message *(See "No Read Message Examples" on page 103)*

Select **Disable No Read Message, Global No Read Message,** or **Local No Read(s) Message** from the drop-down list. The **No Read** condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase. When multiple codes are enabled in the **Barcode Settings Table**, and not all of the codes are read within a trigger cycle, a single **Global No Read** message is transmitted to the host.

Local No Read(s) Message: This option is used when **Standard Multi Label** or **Code Collection** is selected. A **Local No Read** message is a configurable **No Read** message associated with each individual code enabled in the Barcode Settings Table.

No Read String (max. 128 chars)

Click to activate the "The Text Entry Tool" on page 59 and create a string to be displayed when **Global No Read Message** is selected from the **No Read Message** drop-down list.

Multi-Filter Settings "Understanding Filters" on page LVI

Strip Filter

Select the check box to display the **Strip Filter** options. This filter, when enabled, allows the elimination of characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to activate the **Text Entry Tool** and enter specific characters to be stripped from the code. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed).

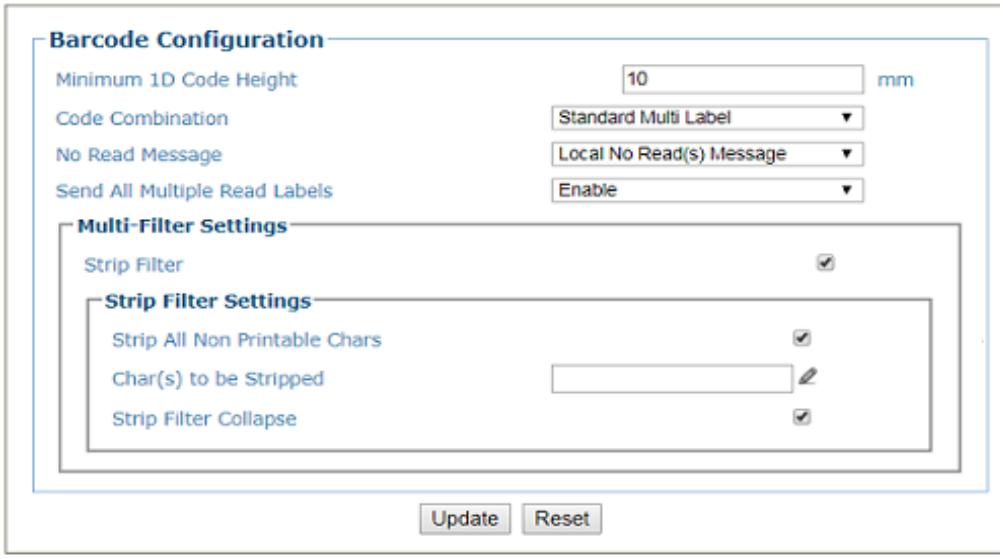
Replacement Char

Click to activate the "The Text Entry Tool" on page 59 and enter the substitution character to replace all the stripped ones. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text. It can even be null.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Standard Multi-Label

When **Standard Multi Label** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum code height in the field provided (mm [in])

Code Combination

Standard Multi Label has been selected.

No Read Message *(See "No Read Message Examples" on page 103)*

Select **Disable No Read Message, Global No Read Message,** or **Local No Read(s) Message** from the drop-down list. The No Read condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Local No Read(s) Message: This option is useful when one or more codes are not read in the reading phase or when more codes than the expected number set by the configuration parameters are read.

If working in **Standard Multi Label** mode, this option activates the **Code Label Local No Read String** and the **Code Label Local Multiple Read String** parameters which allow setting a **Local No Read String** and a **Local Multiple string** for each defined code symbology.

No Read String (max. 128 chars)

Click to activate the "The Text Entry Tool" on page 59 and create a string to be displayed when **Global No Read Message** is selected from the **No Read Message** drop-down list. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Multiple Read Message

Select **Enable, Disable** from the drop-down list.

Send All Multiple Read Labels

Select **Enable, Disable** from the drop-down list. Available with Standard Multi Read and Logical Combination. When set to Disable, if there are two or more codes during the read cycle, the AV500 will transmit the first decoded bar code and ignore all other bar codes with matching parameters. The "first decoded bar code" can be different between trigger cycles.

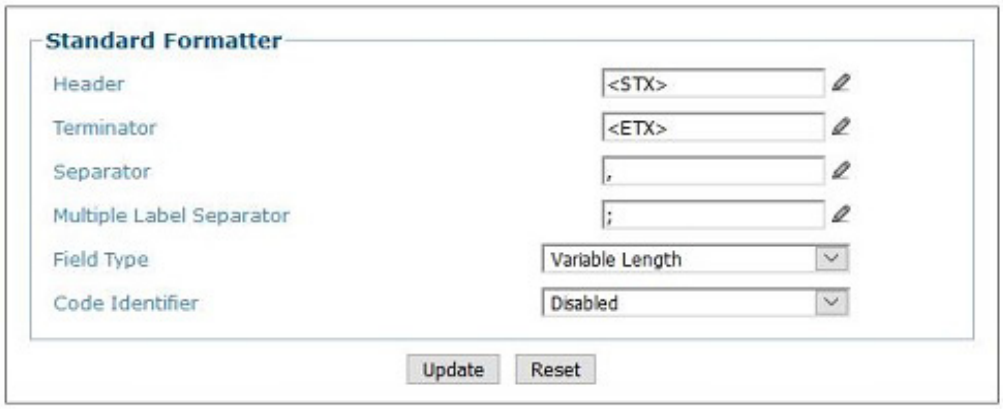
When enabled the AV500 will read all bar codes having the same symbology and number of characters.

In order for the multi messages to be transmitted there are several menus that will need to be

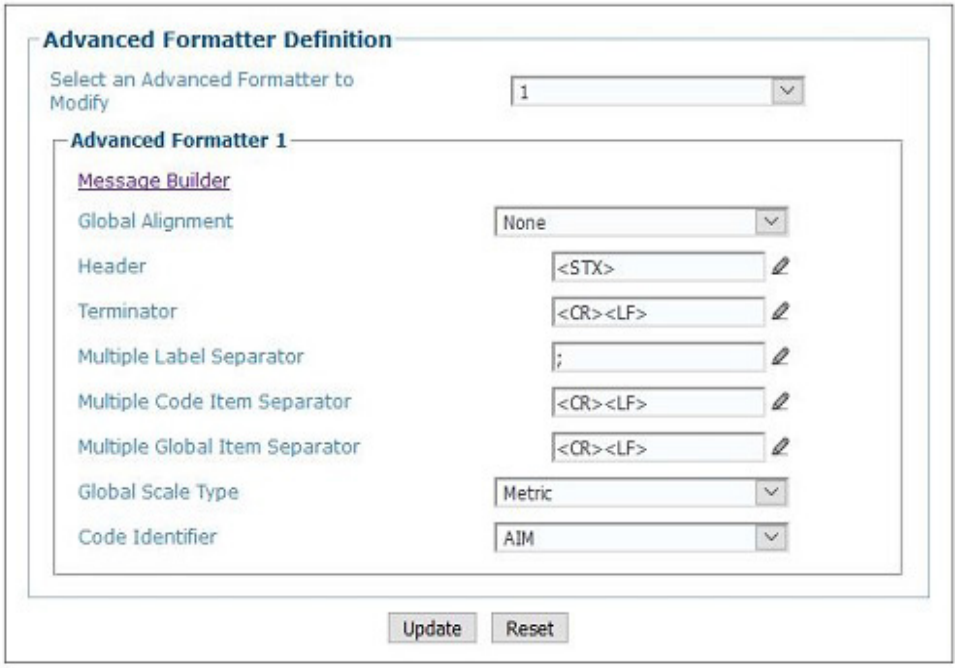
configured.

First, **Enable Send All Multiple Read Labels:**

Next, define a **Multiple Label Separator** (Standard Formatter):



Next, define a **Multiple Label Separator** (Advanced Formatter):



Partial Read Is Treated As

When an application is set to read two or more bar codes in a trigger cycle, there are certain decisions that the application software needs to make. In an example where two bar codes are enabled and only one of the two codes are read the customer can choose to:

Send only the single bar code that was read to the host

Only send bar code data if both bar codes are read.

This defines a Partial read condition. If only one of the two bar codes are read the following option can be selected:

- **No Read** – if only one of the two codes are read transmit a No Read
- **Good Read** – if only one of the two codes are read transmit that read data
- **Partial Read** - A Partial Read is a condition when multiple barcodes are enabled, but not all barcodes are read during a trigger cycle.

Multi-Filter Settings

Strip Filter

Select the check box to display the **Strip Filter Settings** options. This is a second level filter that when enabled allows eliminating characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to activate the "The Text Entry Tool" on page 59 and enter specific characters to be stripped from the code. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

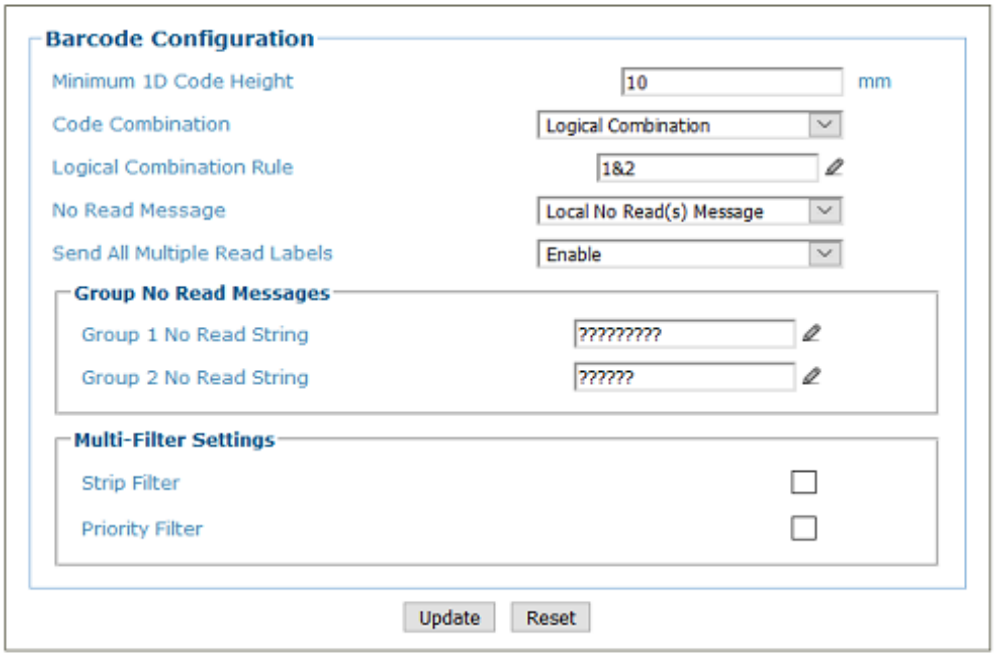
Click to activate the "The Text Entry Tool" on page 59 and enter the substitution character to replace all the stripped ones. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Logical Combination

When Logical Combination has been selected from the Code Combination drop-down list, the Barcode Configuration window reveals related input fields. In Logical Combination, you can define groups of codes from the codes set in the Barcode Setting Table which can be read within a trigger cycle. You can define up to 50 groups.

NOTE The **Logical Combination** option is only available when more than one code is enabled in the **Barcode Settings Table**.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

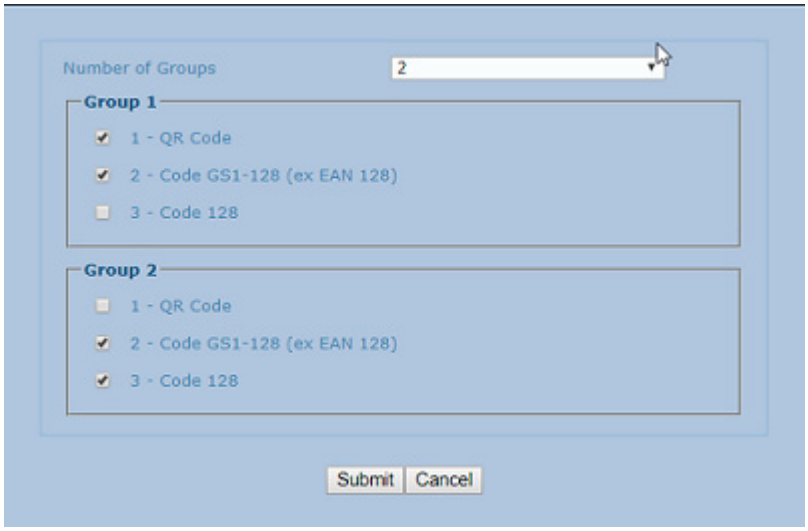
Enter the minimum code height in the field provided (mm [in])

Code Combination

Logical Combination has been selected.

Logical Combination Rule

Click to activate the Code Group selection dialog box.



Select the number of groups you wish to use from the Number of Groups drop-down list. Then select the check box next to the Group/Code you wish to define. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Groups and their order define the output message format, while each group identifies an expected code or group of codes. When placing 1 bar code within a group the AV500 will fill that group location in the host message with only the code selected.

If you define the Logical Combination Rule to include Group 1 and Group 2 and Group 3 and Group 4. The Logical Combination Rule parameter will appear as follows:

For the1&2&3&4 rule, when two or more codes are selected within the same group the AV500 will fill this groups field with the first decoded bar codes listed in that group.

If you define the Logical Combination Rule to include two groups, one with Code 1 or 2 and the second with Code 3 or 4 the Logical Combination Rule will appear as follows.

When editing the logical combination rule, proceed as follows:

- Define the Barcode Settings indicating the type of expected code labels. It is possible to define up to 10 different code types;
- Define how many code types (groups) are expected by editing the combination rule through the following logical operators. Each group may include one or more selected code types.

The maximum number of groups to be defined for each rule string is 15.

If Local No Read Message is selected from the No Read Message drop-down list, the Group No Read Messages parameter group is displayed requiring the definition of a Local No Read String for each group.

Example

If three barcodes are enabled and barcode 1 and 2 are read successfully but barcode 3 is a no read, the message could look like this:

<STX>12345678xxx,12345678xxx,noread <CR><LF>

No Read Message ***(See "No Read Message Examples" on page 103)***

Select Disable No Read Message, Global No Read Message, or Local No Read(s) Message from the drop-down list. The No Read condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Local No Read(s) Message: This option is useful when one or more codes are not read in the reading phase or when more codes than the expected number set by the configuration parameters are read.

No Read String (max. 128 chars)

Click to activate the "The Text Entry Tool" on page 59 and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Multiple Read Message

Select Disable or Enable from the drop-down list. This string will be sent if, during the reading phase, the barcode reader reads more than the number of the expected barcodes set by the configuration parameters. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Multiple Read String (max. 128 chars)

Click to activate the “The Text Entry Tool” on page 59 and create a string to be displayed in case of Multiple Read Message. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

This parameter is only available when Multiple Read Message is enabled and the No Read Message selection is different from Local No Read(s) String. It is possible to select either the ASCII or HEX value. If disabled, the barcode reader transmits the first code read.

Send All Multiple Read Labels

Select **Enable**, **Disable** from the drop-down list. Available with Standard Multi Read and Logical Combination. When set to Disable, if there are two or more codes during the read cycle, the AV500 will transmit the first decoded bar code and ignore all other bar codes with matching parameters. The "first decoded barcode" can be different between trigger cycles.

When enabled the AV500 will read all bar codes having the same symbology and number of characters.

In order for the multi messages to be transmitted there are several menus that will need to be configured.

Partial Read Is Treated As

Select No Read, Good Read, or Partial Read from the drop-down list.

A Partial Read is a condition when multiple barcodes are enabled, but not all barcodes are read during a trigger cycle.

Multi-Filter Settings

Strip Filter

Select the check box to display the Strip Filter Settings options. This filter, when enable, allows eliminating characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to activate the “The Text Entry Tool” on page 59 and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

Click to activate the “The Text Entry Tool” on page 59 and enter the substitution character to replace all the stripped ones. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Priority Filter Settings

Select the check box to display the Priority Filter options. This function allows

the user to prioritize barcodes.

Example:

If there is a message with a field that should contain one of multiple code types (for example, Code128, Code39 and I2of5). In this field, the user wants:

If Code 128 is read, it goes in the field (any code39 and I2of5 are ignored)

If Code 128 is not read – if Code39 is read, it goes in the field (and I2of5 is ignored)

If Code 128 and Code30 are not read – if i2of5 is read, it goes in the field.

Group List

Enter the Group List in the field provided. This field defines the specific Logical Combination groups to which the Priority Filter will apply. The groups are numbered according to the order in which they are listed (from left to right) in the Logical Combination Rule parameter.

Format: Group Number(s) separated by the comma character

Example:

1,3 means the Priority Filter is applied to Logical Groups 1 and 3. Logical Group 2 will not have the Priority Filter applied, however it will follow the normal rules of code analysis, and if

selected, the Strip Filter parameters will apply.

Filter Type

Select Normal or Advanced from the drop-down list.

Description:

Normal: Uses the Logical Combination Rule string to define the priority

Advanced: Uses the Priority Filter Advanced String to define the priority. Advanced type allows the priority filter to essentially take "priority" over the Logical Combination Rule string.

NORMAL

When the Priority Filter Type is set to Normal, the operators used in the Logical Combination Rule string have the following meaning:

& = AND operator which separates a group from the previous/following one;

^ = The priority is given to the code label indicated to the left of the operator. If this code is read, the group is in Good Read independent from any other code in the same group.

Example:

Logical Combination Rule = 1^2&5^3^4&6^7 (3 groups)

Results Without Priority Filter:

Group 1 - read either code 1 or 2 = Good Read; read both code 1 and 2 = Multiple Read

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read either code 6 or 7 = Good Read; read both code 6 and 7 = Multiple Read

Results With Priority Filter:

Filter Enabled on Groups = 1,2

Group 1 - read code 1 = Good Read independent from reading code 2

Group 2 - read code 5 = Good Read independent from reading code 3 or 4; read code 3 = Good Read independent from reading code 4

Group 3 - read either code 6 or 7 = Good Read; read both code 6 and 7 = Multiple Read

ADVANCED

When the Priority Filter Type is set to Advanced, the Priority Filter Advanced String applies to the Logical Combination Groups. This string must correspond to the order of the groups defined in the Logical Combination Rule string.

The following operators can be used:

& = Code group separator. This operator separates a group from the previous/following one;

^ = The priority is given to the code label indicated to the left of this operator. If this code is read, the group is in Good Read independent from any other code in the same group.

| = Equal priority operator (vertical line). Codes separated by this operator have the same priority and if both codes are read a Multiple Read will result.

The only difference from the implicit pattern string of the Normal (default) case when the Logical Combination Rule string is used, is the Equal Priority operator.

Example:

Logical Combination Rule = 1^2&5^3^4&8^6^7 (3 groups)

Results Without Priority Filter:

Group 1 - read either code 1 or 2 = Good Read; read both code 1 and 2 = Multiple Read

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read either code 8 or 6 or 7 = Good Read; read any combination = Multiple Read

Results With Priority Filter:

Filter Enabled on Groups = 1,3

Filter Type =Custom

Custom Filter Pattern String = 1^2&8^6|7 (2 groups)

Group 1 - read code 1 = Good Read independent from reading code 2

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read code 8 = Good Read independent from reading code 6 or 7; no read on code 8 and read either code 6 or 7 = Good Read; no read on code 8 and read both code 6 and 7 = Multiple Read

Advanced Filter String

Enter the character string (see above).

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values. 0)

Logical Combination Rules

The following are examples of rules used with **Logical Combination** selection in **Barcode Configuration.** For all the following examples the **No Read Message** parameter is set to Global No Read Message.

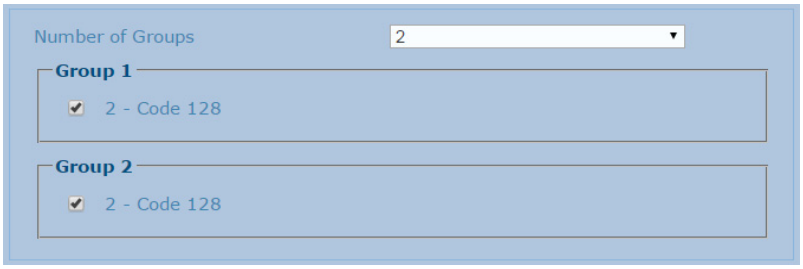
Example 1

Code label setting#1 = Code 128

Logical Combination Rule = 1&1

Defines 2 groups, each of them expecting a **Code 128** label.

Decoded Code Symbology		Output Message
First Label #1	Second Label #1	
---	---	<Header><Global No Read Message><Terminator>
X	---	<Header><Global No Read Message><Terminator>
---	X	<Header><Global No Read Message><Terminator>
X	X	<Header><Code 128 data><Data Packet Separator><Code 128 data><Terminator>



NOTE

If **Multiple Read Message** is enabled and a third label belonging to the **Code 128** symbology is decoded, the **Multiple Read** string will be transmitted instead. If the **Multiple Read Message** is disabled, the third code label is ignored and only the first two bar codes in the order that they are decoded will be transmitted.

For advanced formatting, if the **Send All Multiple Read Labels** parameter is enabled, then all three labels are sent in the output message; the multiple read label is separated by its own **Multiple Read Label Separator String** which should be different from the **Data Packet Separator (DPS).**

Example 2

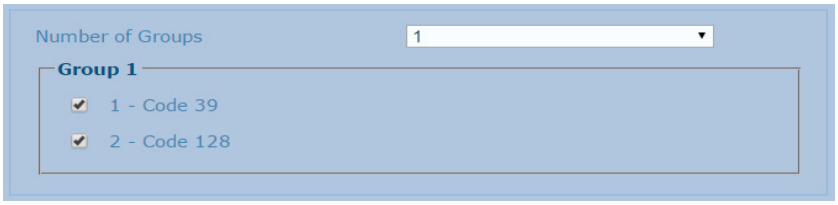
Code label setting#1 = Code 39

Code label setting#2 = Code 128

Logical Combination Rule = 1^2

Defines a single group expecting a **Code 39** label OR a **Code 128** label.

Decoded Code Symbology		Output Message
Label #1	Label #2	
---	---	<Header><Global No Read Message><Terminator>
X	---	<Header><Code 39 data><Terminator>
---	X	<Header><Code 128 data><Terminator>
X	X	<Header><First decoded code/Multiple Read Message string ><Terminator>



Example 3

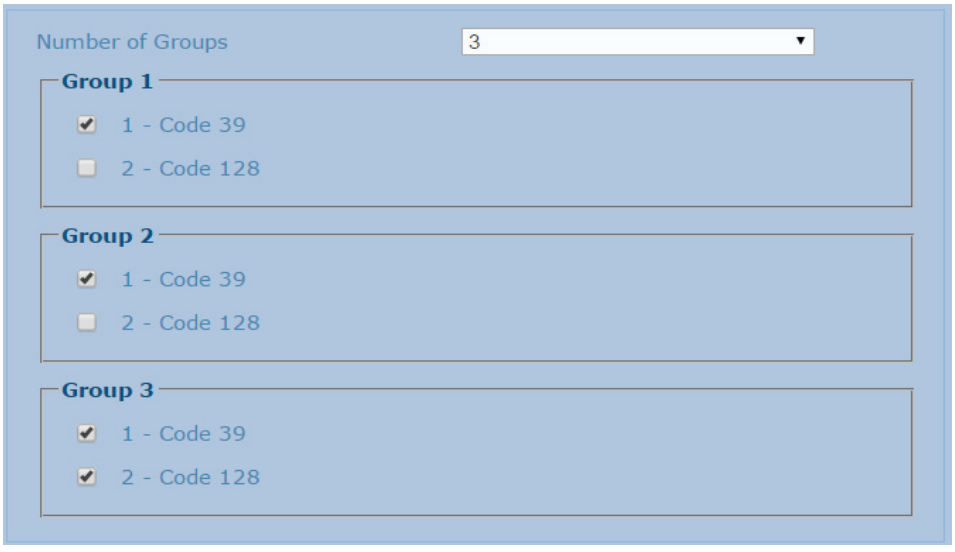
Code label setting#1 = Code 39

Code label setting#2 = Code 128

Logical Combination Rule = 1&1&1^2

Defines three different groups. The first two groups expect a **Code 39** label while the third one expects a **Code 39** label OR a **Code 128** label.

Decoded Code Symbology				Output Message
First Label #1	Second Label #1	Third Label #1	Label #2	
---	---	---	---	<Header><Global No Read Message><Terminator>
X	---	---	---	<Header><Global No Read Message><Terminator>
---	X	---	---	<Header><Global No Read Message><Terminator>
---	---	X	---	<Header><Global No Read Message><Terminator>
---	---	---	X	<Header><Global No Read Message><Terminator>
X	X	X	---	<Header><Code 39 data><DPS>< Code 39 data><DPS>< Code 39 data><Terminator>
X	X	---	X	<Header><Code 39 data><DPS><Code 39 data><DPS><Code 128><Terminator>
X	X	X	X	<Header><Code 39 data><DPS><Code 39 data><DPS><First decoded code/Multiple Read Message string><Terminator>



Example 4

Code label setting#1 = Interleaved 2/5

Code label setting#2 = Code 128

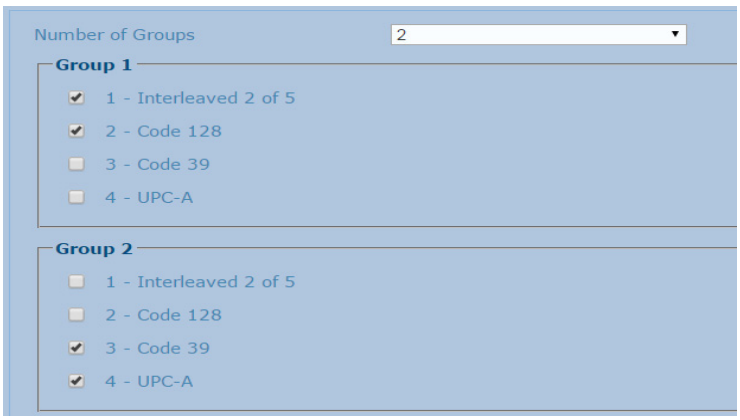
Code label setting#3 = Code 39

Code label setting#4 = UPC-A

Logical Combination Rule = 1^2&3^4

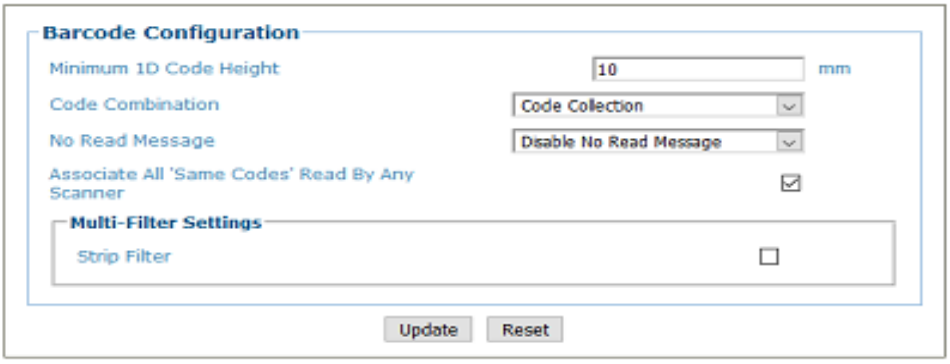
Defines 2 groups, each of them expecting one of the defined code types. The first group may expect an **Interleaved 2 of 5** label or a **Code 128** label. The second group may expect a **Code 39** label or a **UPC-A** label.

Decoded Code Symbology				Output Message
Label #1	Label #2	Label #3	Label #4	
---	---	---	---	<Header><Global No Read Message><Terminator>
X	---	---	---	<Header><Global No Read Message><Terminator>
---	X	---	---	<Header><Global No Read Message><Terminator>
---	---	X	---	<Header><Global No Read Message><Terminator>
---	---	---	X	<Header><Global No Read Message><Terminator>
X	X	---	---	<Header><Global No Read Message><Terminator>
X	---	X	X	<Header><Code93><DPS>< First decoded code/Multiple Read Message string><Terminator>
X	X	X	---	<Header><First decoded code/Multiple Read Message string><DPS><EAN 8 data><Terminator>
---	X	X	X	<Header>< Interleaved 2/5 data><DPS>< First decoded code/Multiple Read Message string ><Terminator>
X	---	X	---	<Header><Code 93 data><DPS><EAN 8 data><Terminator>
X	---	---	X	<Header><Code 93 data><DPS><UPC-A data><Terminator>
---	X	X	---	<Header><Interleaved 2/5 data><DPS><EAN 8 data><Terminator>
---	X	---	X	<Header><Interleaved 2/5 data><DPS><UPC-A data><Terminator>
X	X	X	X	<Header><First decoded code/Multiple Read Message string><DPS>< First decoded code/Multiple Read Message string ><Terminator>



Code Collection

1. When **Code Collection** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



2. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum code height in the field provided (mm [in]).

Code Combination

Code Collection has been selected.

No Read Message *(See "No Read Message Examples" on page 103)*

Select Disable No Read Message, Global No Read Message, or Local No Read(s) Message from the drop-down list. The No Read condition occurs when no barcodes are read during the trigger cycle.

- **Disable No Read Message:** A No Read Message is not transmitted.
- **Global No Read Message:** A No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Associate All'Same Codes"Read By Any Scanner

Checked by default, indicates that barcodes of the same content and symbology are transmitted only once regardless of how many devices read them. If unchecked, codes are sent for each device that reads them.

No Read String (max. 128 chars)

Click to activate the "The Text Entry Tool" on page 59 and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list.

Multi-Filter Settings

Strip Filter

Select the check box to display the Strip Filter options. This filter, when enabled, allows eliminating characters not managed by the host.

Strip Filter Settings

Strip All Non Printable Chars

Select the check box to remove non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to activate the "The Text Entry Tool" on page 59 and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

If strip filter is not enabled, click to activate the "The Text Entry Tool" on page 59 and enter the substitution character to replace all the stripped ones. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

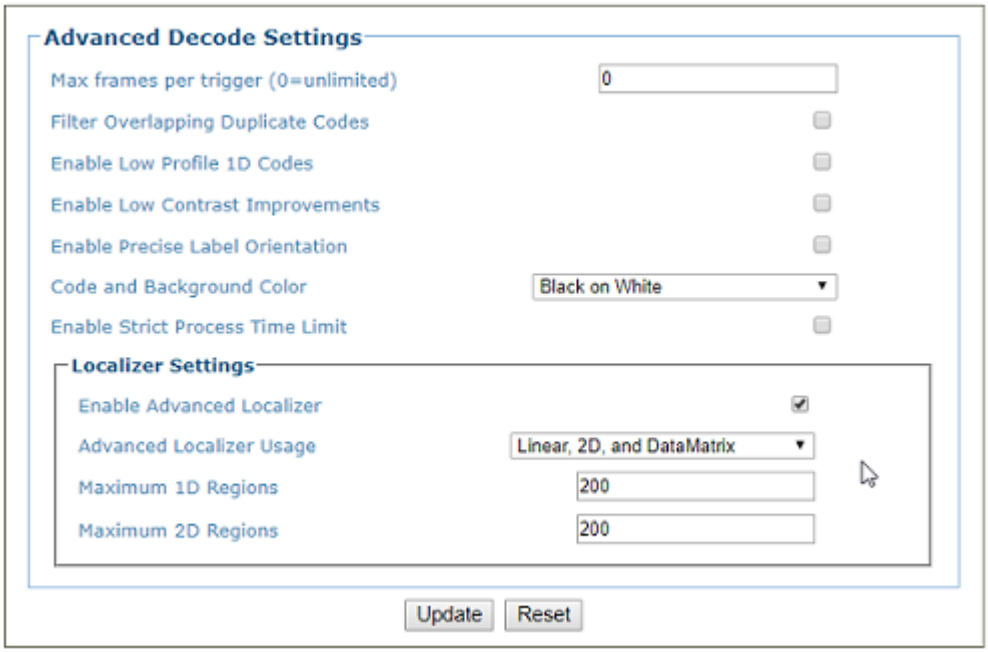
Advanced Decode

Advanced Decode provides ways to improve read rate, by setting filters or more precise parameters, however these settings often affect processing time. When you set Advanced Decode parameters there is a fine balance between reading performance and processing time. Use **Advanced Decode** options with caution.

To edit the Advanced Decode Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Advanced Decode.** The **Advanced Decode** window opens.

NOTE **It is best to use Advanced Decode only when necessary and under the guidance of Datalogic Tech Support.**



2. Enter the appropriate information in the form as described below:

Min distance between frames in a trigger (For PackTrack only)

Enter the minimum distance between frames required per trigger cycle.

Max frames per trigger (0=unlimited) (For Online only)

Enter the maximum number of frames the AV500 can process per trigger. (a value of 0 will allow the AV500 to collect up to the maximum number). To limit the number of frames to less than 64, enter a value between 1 and 63.

Filter Overlapping Duplicate Codes

Select the Check box to enable the camera to filter out duplicates where the bounding boxes overlap.

Enable Low Profile 1D Codes

Select the check box to enable reading of low profile 1D barcodes.

NOTE **This option may increase processing time which may create no reads**

Enable Low Contrast Improvements

Select the check box to enable automatic contrast improvements.

Enable Precise Label Orientation

Select the check box to enable precise label orientation. This option tells the decode engine to spend more processing time locating the center point and bounding box around the barcode symbol.

NOTE

This option may increase processing time which may create no reads

Code and Background Color

Select Black on White, White on Black, or Both from the drop-down list to match the kind of barcodes read by the system.

Enable Strict Process Time Limit

Select the check box to enable a processing time to be set. Specify the maximum amount of time the decoder can spend processing a single image. This may be used to prevent the decoder from spending too much time on a noisy image

Strict Process Time Limit

Enter an amount of time in ms to limit your camera's processing time to.

Advanced Localizer Settings

Enable Advanced Localizer

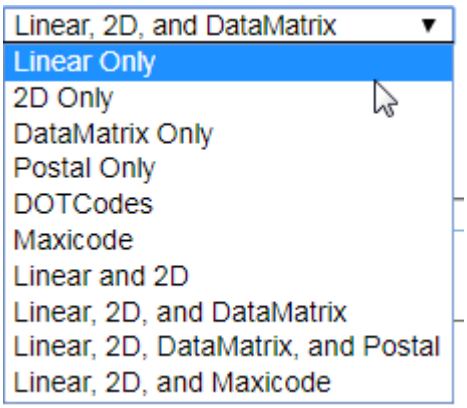
Select the check box to enable the advanced localizer options.

WARNING

DO NOT change this parameter unless directed by Datalogic Support.

Advanced Localizer Usage

The AV500 employs hardware acceleration to locate possible bar codes. This option specifies for which symbologies the hardware acceleration should be used



The following parameters allow you to define an ROI or Region of Interest for the decoder. This is a region where you will find the bar code. You may want to define a different Max 1D region than the Max 2D region because you may want one to be larger than the other. The parameters below allow you define these individually.

Maximum 1D Regions

Enter the necessary 1D Region.

Maximum 2D Regions

Enter the necessary 2D Region.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

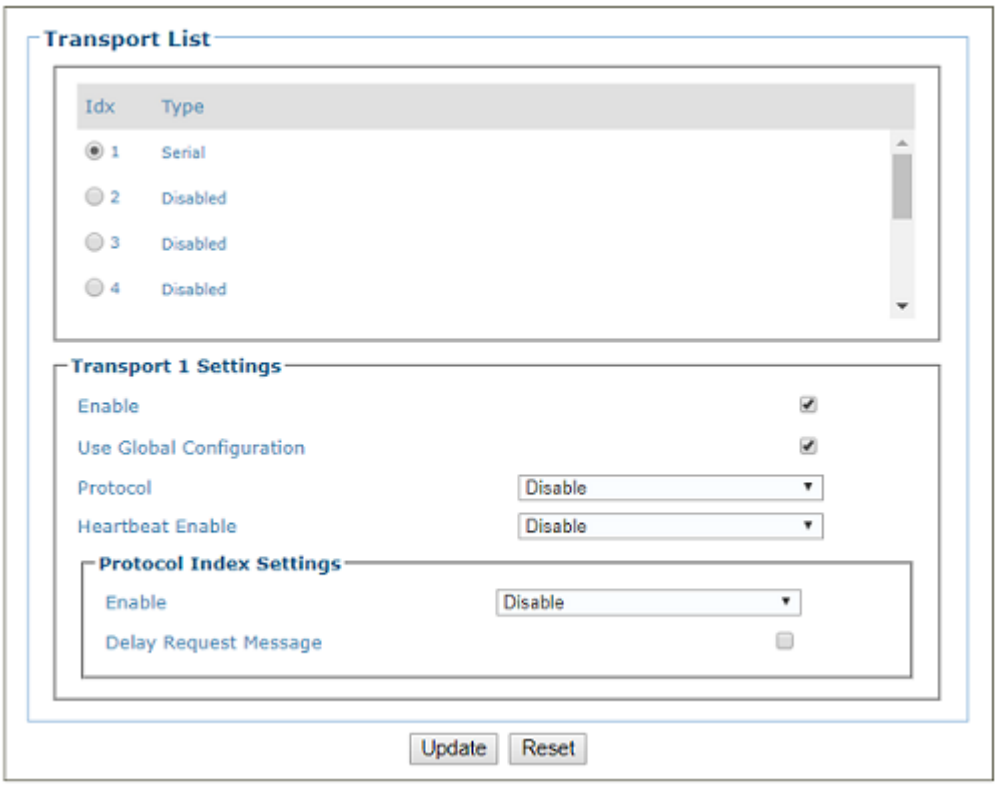
COMMUNICATIONS

Use the Communications Transports window to setup, edit, and configure numbered user sockets or serial ports for your scanning system. User sockets are another interface available for Ethernet communication. There are nine available.

Transport parameters are used to setup the serial or Ethernet configuration to match the transmit/receive parameters of an external interface.

To edit the Transports settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Communications | Transports.** The **Transports** window opens.



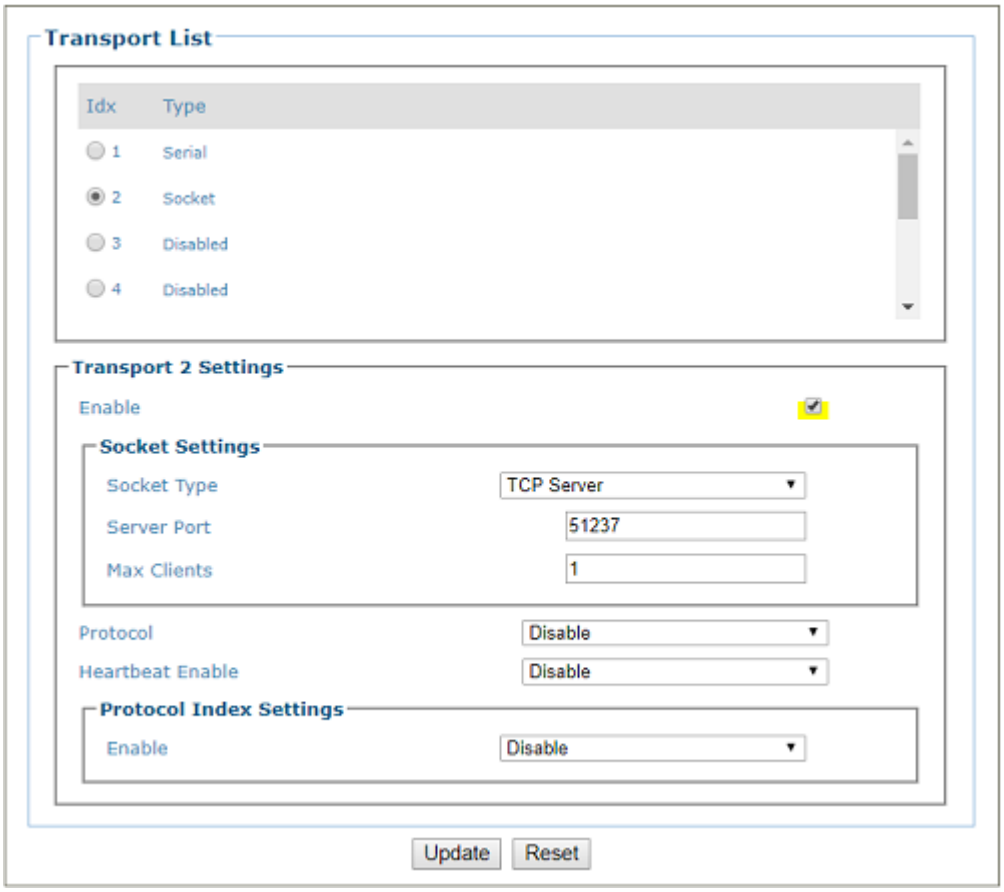
2. Enter the appropriate information in the form as described below:

Transport List

Select an Idx option button in the list at the top of this window to create a new transport setting item, or to edit an existing one.

NOTE

Transport # 1 is the only setting that allows for a Serial communication connection.



Enable

Select the check box to reveal the related configuration options.

Use Global Configuration

Select the check box to reveal the global configuration options. When Global Configuration is selected, any of the camera's in the tunnel will use this transport.When Global Configuration is not selected all the cameras in the array can be selected to transmit the data.

NOTE **Since the serial message is transmitted from the CBX box, the AV500 that is connected to the CBX box is the only unit that can accommodate serial communication.**

Serial Settings

Protocol

Select one of the following from the drop-down:

Disable

Standard

Advanced

Crisplant

Beumer

Custom 1 - 5

Not Available

Heartbeat Settings

Hearbeat Enable

Select one of the following from the Heartbeat Enable drop-down.

Disable: The Heartbeat message is not transmitted

Unconditional: The Heartbeat message is always transmitted, even if communication is still active.

Conditional: The Heartbeat message is transmitted only when there is no communication.

Timeout

Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.

Header and terminator must match the external product or the AV500 will not recognize the message.

Header

Click to activate the “The Text Entry Tool” on page 84 and create heartbeat header text to signal the beginning of the heartbeat message. Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to activate the “The Text Entry Tool” on page 84 and create Terminator text to signal the end of the heartbeat message. Characters from NUL (00H) to ~ (7EH) can be used.

Counter Modulus

Select Disable, 10, 100, 1000, 10000 or Custom from the drop-down list.

This parameter enables a counter to track the number of Heartbeat messages.

- Disable No counter field in the Heartbeat message
- 10 Counts cyclically from 0 to 9
- 100 Counts cyclically from 0 to 99
- 1000 Counts cyclically from 0 to 999
- 10000 Counts cyclically from 0 to 9999
- Custom Allows defining a custom counter start/stop range from 0 to 10000.

Counter Starting Value

Enter a counter start value in the field provided.

For the Custom Counter Module this parameter selects the starting counter value.

Selections: a number from 0 to 9999

Counter Direction

Select Up or Down from the drop-down list to set the counter direction.

Diagnostic Message

Select the check box to include a diagnostic field in the heartbeat message.

Separator

Click to activate the “The Text Entry Tool” on page 84 and create a separator character(s) to set the Diagnostic Message apart from the heartbeat message.

Device Select

Select the device from the drop-down for which you are setting a transport. The Device Select option is only available when the "**Use Global Configuration**" option is NOT selected.

Disable

Proceed to Protocol Index Settings.

Standard

Proceed to Protocol Index Settings.

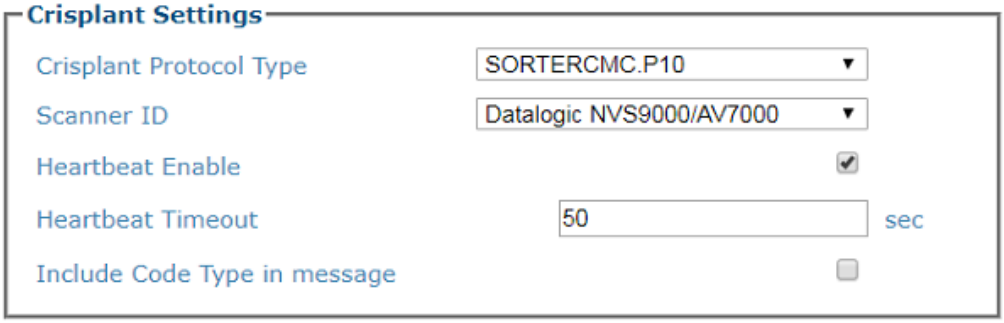
Advanced

Advanced Formatter Index

Select 1 - 5 from the drop-down. When the Advance Option is selected the cameras will use

the configuration defined in the Output Format>Advanced Formatter page (See “Output Format | Advanced Formatter” on page 158). There are up to 5 configurations that can be constructed.

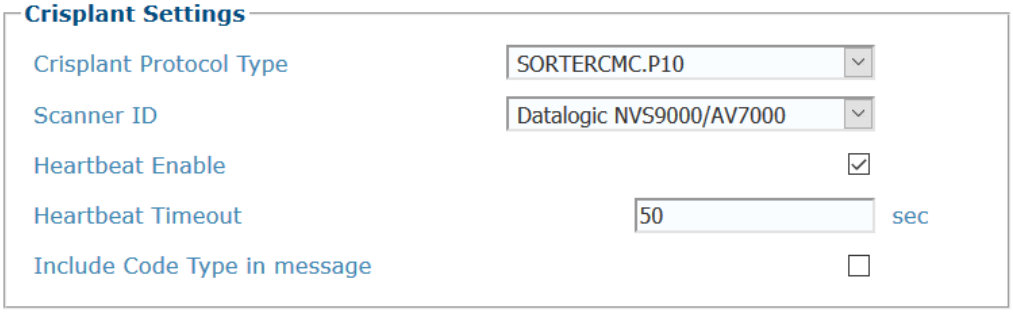
CRISPLANT SETTINGS



Crisplant Protocol Type

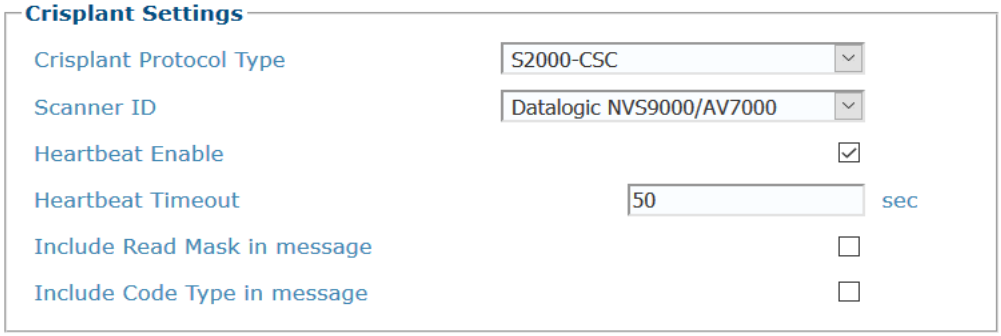
Select one of the three Crisplant protocols: P10, CSC, or CMC from the drop-down list.

•SORTERCMC P10



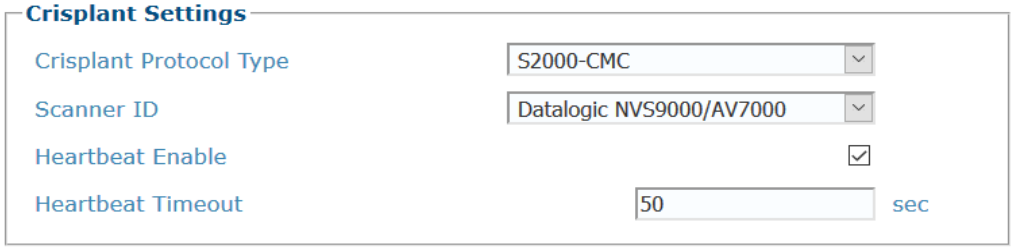
•The Protocol Index message syntax is fixed according to the Crisplant P10 message specifications.

•S2000-CSC



• The Protocol Index message syntax is fixed according to the Crisplant CSC message specifications.

•S2000-CMC



•The Protocol Index message syntax is fixed according to the Crisplant CMC message specifications.

Scanner ID

Select Datalogic AV500, NVS9000/AV500, Accu-Sort 4800, Accu-Sort 55/70, Accu-Sort Quad-X. Available if Crisplant has been selected.

Heartbeat Enable

Select the check box to enable Crisplant heartbeat messages.

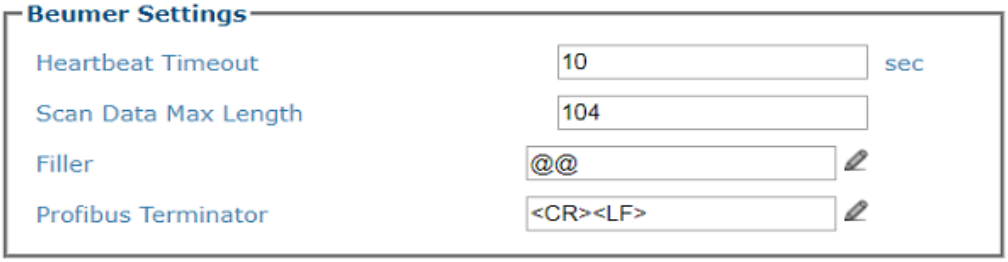
Heartbeat Timeout

Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.

Include Code Type in message

Select the check box to add the AIM code identifier to the host message.

BEUMER SETTINGS



Heartbeat Timeout

Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.

Scan Data Max Length

Enter a maximum length value in the field provided. This field defines the number of characters that will be expected by the Beumer host PLC.

Filler

Click  to activate the “The Text Entry Tool” on page 84 and create a filler character(s).

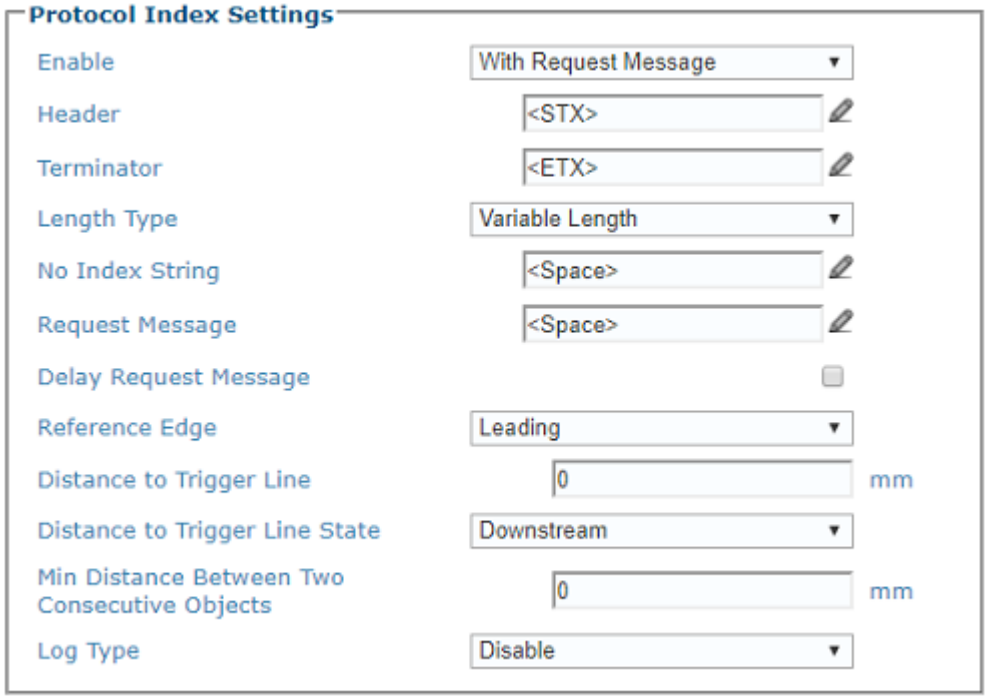
Profibus Terminator

Click  to activate the “The Text Entry Tool” on page 84 and create a filler character(s) to terminate a Profibus message.

CUSTOM

There are some applications that the standard AV500 software will be unable to accommodate. In these conditions a custom version of software is provided.

Protocol Index Settings



Enable

Select one of the following from the drop-down.

- **Disable:** The selected communication channel is not used for Protocol Index string communication.
- **Without Request Message:** The Host sends the Protocol Index string autonomously on the selected communication channel.
- **With Request Message:** The Host waits for the Protocol Index Request Message sent by the scanner, when the trigger detects the presence of a pack, before transmitting the Protocol Index string associated to the pack itself on the selected communication channel.

NOTE **The Header and Terminator need to match the external component.**

Header

Click to activate the "The Text Entry Tool" on page 84 and create a Header (up to 128 bytes) to be defined and transmitted as a block preceding the Protocol Index string sent by the Host. Use characters from NUL (00H) to ~ (7EH).

Click Submit to save your changes, or click Cancel to return to the previous window.

Terminator

Click to activate the "The Text Entry Tool" on page 84 and create a Terminator to be defined and transmitted as a block following the Protocol Index string sent by the Host. Use characters from NUL (00H) to ~ (7EH).

Click Submit to save your changes, or click Cancel to return to the previous window.

Length Type

Select Variable Length, Length in Message, or Fixed Length from the drop-down list.

- **Variable Length:** The length of the Protocol Index string sent by the Host is variable.
- **Length in Message:** The first byte of the barcode reader output message indicates the length of the Protocol Index string sent by the Host.
- **Fixed Length:** The Protocol Index string has a fixed length from 3 to 12 characters.

No Index String

Click  to activate the “The Text Entry Tool” on page 84 and create a No Index String. Click Submit to save your changes, or click Cancel to return to the previous window.

This parameter defines the string to be transmitted instead of the Protocol Index within the output message when no Protocol Index string has been associated to the package.

Request Message

The Request Message is the message that the AV500 sends to the external component, requesting the component to send the protocol message.

Delay Request Message

When unchecked, the request message gets sent at start of trigger. Select this check box and the request message will be delayed by the Reference Edge and Distance to Trigger Line specified here.

Reference Edge

Select Leading or Trailing from the drop-down list. This is the edge of the package when the external component will send the message to the AV500.

Distance to Trigger Line

Enter the distance from the receiving point of the Protocol Index to the trigger line in the field provided.This option allows the AV500 to recognize a protocol index message even it occurs upstream such as a message from a scale.

This parameter specifies the distance from the physical Trigger Line (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.

Distance to Trigger Line State

Select Upstream or Downstream. This parameter specifies if the distance from the physical Trigger Line is required Upstream or Downstream (i.e. Trigger Source) To the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package. This option allows the AV500 to recognize a protocol index message even it occurs upstream such as a message from a scale.

Min Distance Between Two Consecutive Objects

Enter the smallest possible distance between system packages in the field provided. This specifies the minimum distance (in mm or inches) between two consecutive packages. It is used to compensate for imprecision in the Distance from Protocol Index to Trigger Line parameter by virtually lengthening the package. This parameter implies that if two consecutive packs are placed on the conveyor at a distance less than the minimum, a Protocol Index assignment error will occur.

Log Type

Select Disable, Standard, or Advanced from the drop-down list. Advanced Logging is used during calibration or troubleshooting to confirm that the protocol index message is solidly found on the correct box.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

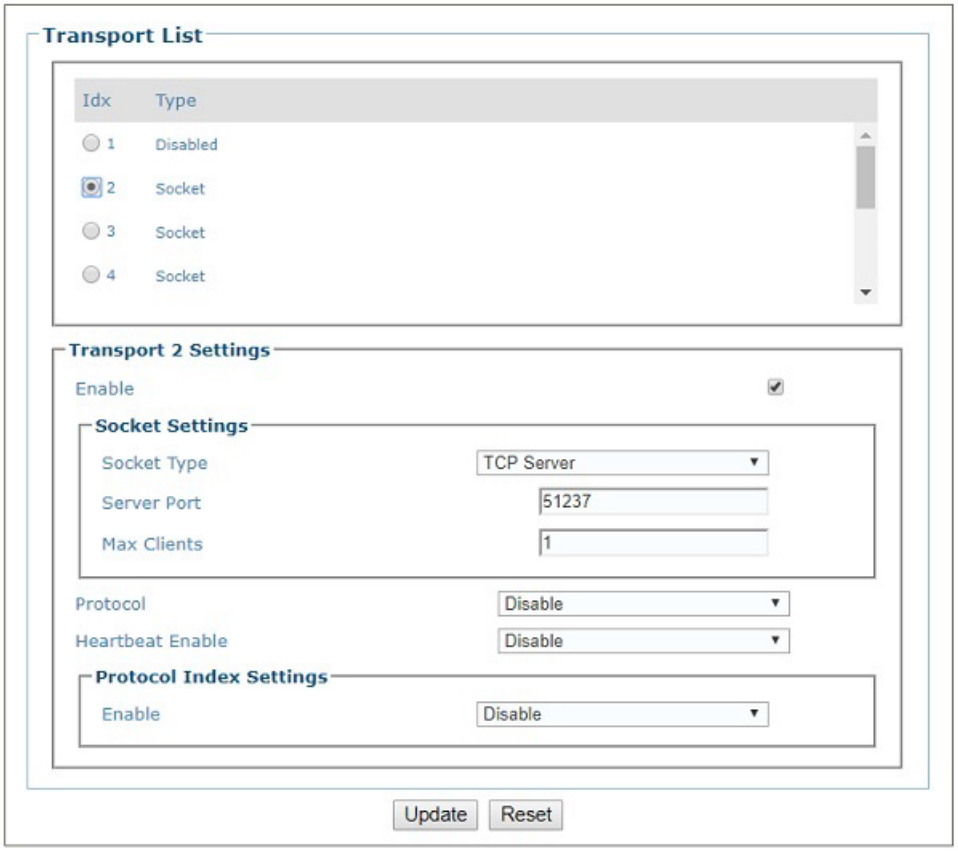
Protocol Index Examples

The Protocol Index is used to get a message from third party equipment such as a scale or sorter.The message can then be attached to the barcode message output from the system. In the following example, a message from a third party scale needs to be attached to a barcode relating to a package.

Protocol Index Setup Example:

First, configure the transport connections in **Global Settings | Communications | Transports**.

1. Navigate to **Global Settings | Communications | Transports.**
2. Select a transport for the incoming data message from the scale. In this example, **transport number 2** is selected.
3. Click the **Enable** checkbox. Socket settings parameters appear.



4. Make sure **TCP Server or Client** is selected from the Socket Type drop-down list.
5. Enter the shared Server port # of the unit generating the protocol index information and specify Max Clients.
6. Under the **Protocol Index Settings - Enable** section of the screen, select **Without Request Message** from the drop-down list. Associated parameters appear.
7. Enter a **Header** and **Terminator** for the incoming message from the scale in the fields provided. Use the **“The Text Entry Tool” on page 59** to create the Header and Terminator, in this example <STX> and <ETX>.

NOTE **The header and terminator must match the Protocol Index source, in this case, the scale structures.**

8. Select a length for the message from the **Length Type** drop-down list. In this example **Variable Length** is selected.

9. Enter **NoScale** for the **No Index String**. This means “NoScale” will be attached to the outgoing host message if nothing is received from the scale.

10. Select **Trailing** from the **Reference Edge** drop-down list. This indicates the back/trailing edge of the box is the reference point. Trailing is the normal setting for a message from scale.

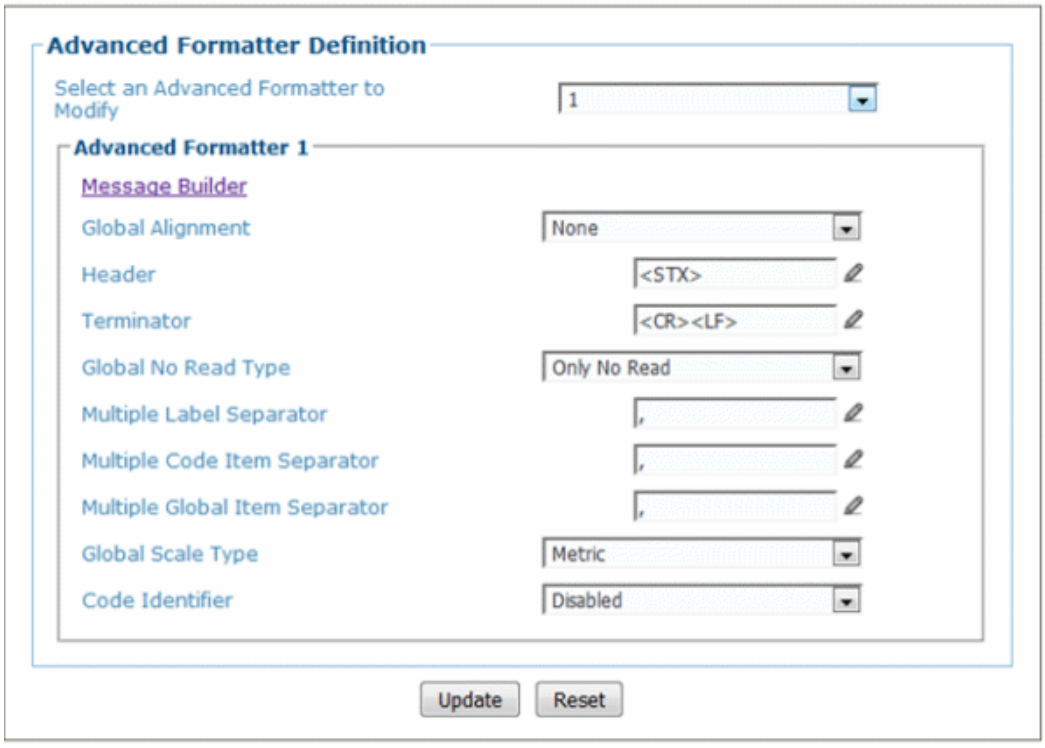
11. In the **Distance to Trigger Line,** enter the measured distance from the trigger to the expected scale transmission location on the conveyor belt. Measure distance for AV500 trigger to the transmission point from the scale will have been set up in the scale configuration. This parameter specifies the distance from the Trigger Line (Trigger Source) to the expected receiving point of the Protocol Index. It is used together with the Minimum Distance between Two Consecutive Parcels parameter to assign the Protocol Index information to the correct pack.

12. Select **Upstream** or **Downstream** from the **Distance to Trigger Line State**.

13. Enter a distance in the **Min Distance between Two Consecutive Objects** text field. This specifies the minimum distance (in mm) between two consecutive packages. It is used to compensate for imprecision in the Distance from Protocol Index to Trigger Line parameter by virtually lengthening the package.

Configuration Host Message with Protocol Index

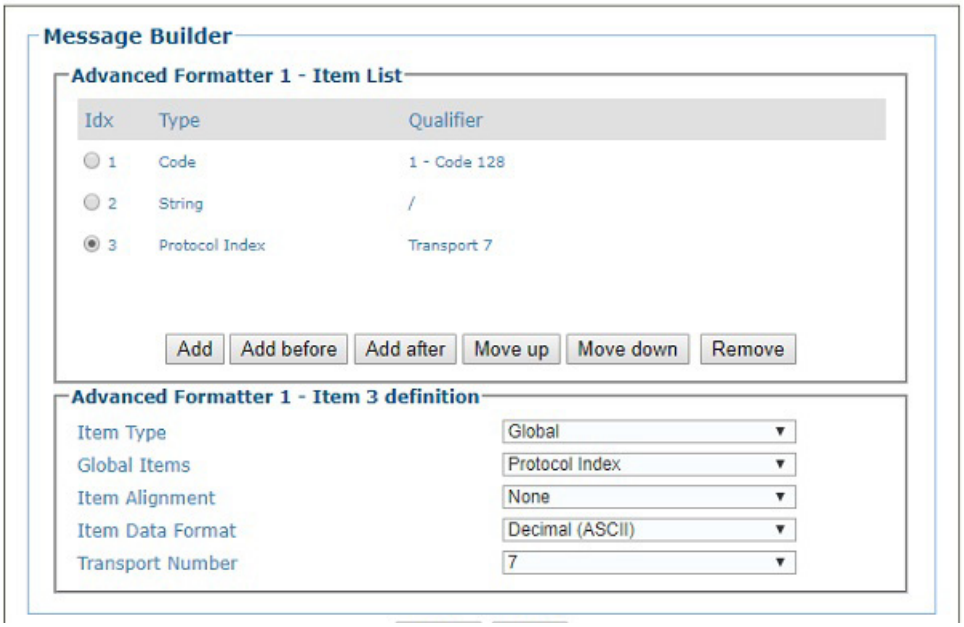
Navigate to **Modify Settings | Global Settings | Output Format | Advanced Formatter**. the Advanced formatter window opens



1. From the **Advanced Formatter** window, select 1 from the Select an Advanced Formatter to Modify drop-down list. This is the outgoing host message that will combine the barcode data and scale (protocol index) message.

2. Click on the **Message Builder** link. The Message Builder window opens.

3. Set up a Code (system barcode), and a delimitter to fall between the barcode data and protocol index data from the scale. See **Advanced Formatter Message Building** Examples in section .



4. Click **Add** and select **Code Related** for the item type, to define the barcode as the first part of the message.
5. Select **Code** from the **Code Related Items** drop-down.
6. Click **Add** and select **String** for the item type, to add a string to separate the code and the scale data.
7. Select **Disabled, Previous Code or Next Code** for the Link to Code drop-down.
8. Use the **"The Text Entry Tool" on page 59** to create the string.
9. Click **Add,** to add in the scale message (Protocol Index).
10. Select **Global** from the Item Type drop-down list.
11. Select **Protocol Index** from the Global Items drop-down list.
12. Select **None** from the Item Alignment drop-down.
13. Select **Decimal (ASCII)** from the Item Data Format drop-down.
14. Select 2 (in this example) from the Transports drop-down list. This was selected as the **Idx # in Global Settings | Communications | Transports**.

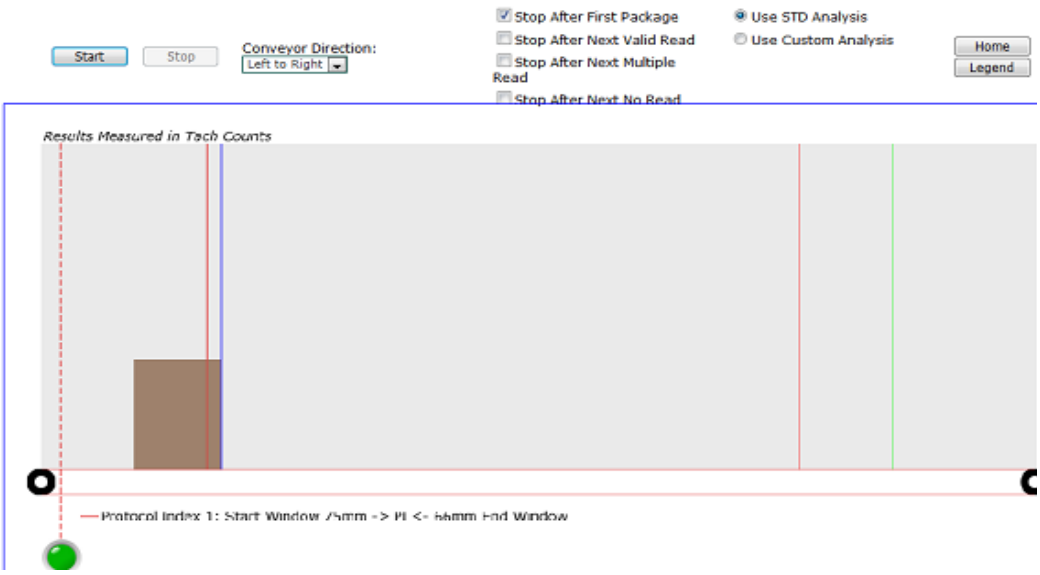
Finally, test the **Protocol Index Output**

1. Navigate to **Diagnostics | Conveyor View**. The **Conveyor View window** opens.

NOTE

Refer to "Diagnostics | Conveyor View" on page 203.

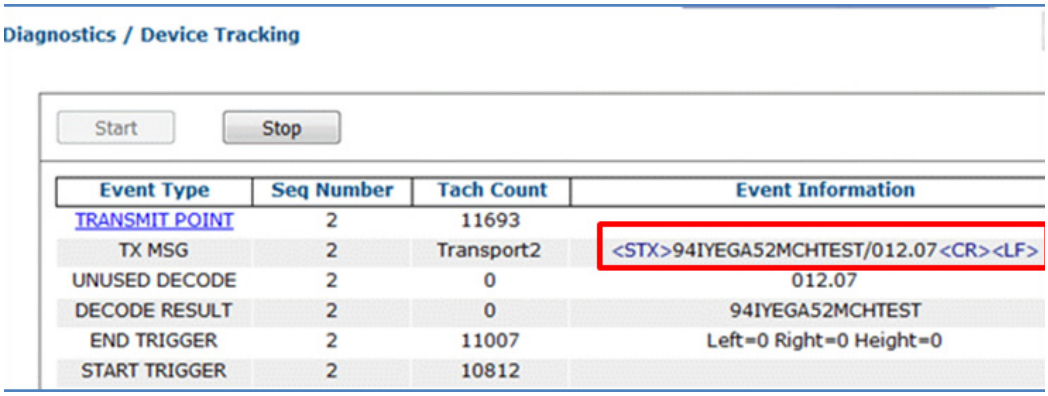
2. Run a small package through the system and view the results on the Conveyor View.



3. Click **Legend** to determine the line color for the Protocol Index. The color depends on the transport selected to bring in the Protocol Index Message. The line representing the Protocol Index (Scale Message) should fall on the small test package. If it doesn't, adjust the Distance to Trigger Line value in the Transports window for transport 7.

4. In e-Genius, navigate to **Diagnostics | Device Tracking.** The Device Tracking window opens.

5. Again, run the small package through the system. Look at the Event Information for transports 2 (in this example) and verify that the information returned is what you expect: <STX>(barcode data)/(Protocol Index Data)<CR><LF> or <STX>94IYEGA52MCHTEST/012.07<CR><LF> in the example below.



OUTPUT FORMAT

Use Output Format to format messages. The following options are available:

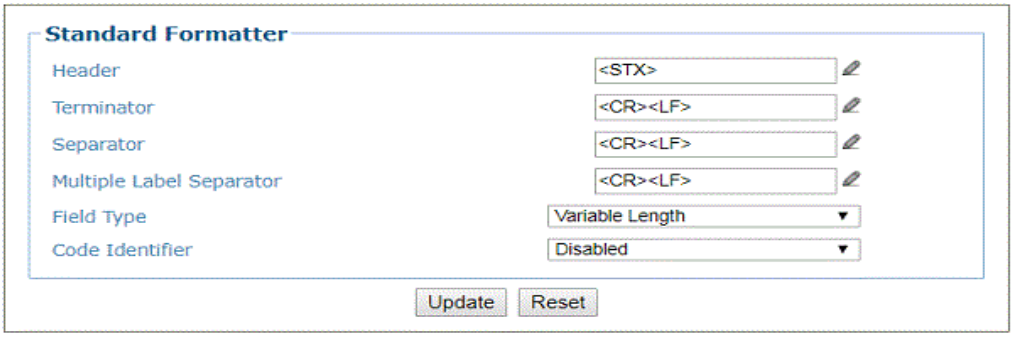
Output Format | Standard Formatter

Use the **Standard Formatter** to set up standard code parameters for output messages.

To edit the Standard Formatter settings:

1. In the menu tree under **Modify Settings,** navigate to G**lobal Settings | Output Format | Standard Formatter**. The **Standard Formatter** window opens.

2. Enter the appropriate information in the form as described below:



Header

Click to activate the “The Text Entry Tool” on page 59 and create a header string. Headers (up to 128 bytes) can be defined and transmitted as a block preceding the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to activate the “The Text Entry Tool” on page 59 and create a terminator string. Terminators (up to 128 bytes) can be defined and transmitted as a block following the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Separator

Click to activate the “The Text Entry Tool” on page 59 and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

The Data Packet Separators (up to 128 bytes) are used to separate barcodes in the reading phase. For this reason, it is very useful when the Multi Label parameter has been enabled. If selected, they occur within the Code Field and are transmitted after each decoded code.

Multiple Label Separator

When Standard Multi Label or Logical Combination is selected in the Barcode Configuration page, the Multiple Label Separator option appears. This allows for the configuration of a character that will be transmitted between multiple bar codes.

Field Type

Select **Variable Length or Fixed Length** from the drop-down list. The code field length can be (in number of characters/digits) specified in order to be accepted for decoding:

- **Variable Length:** All possible code field lengths (in number of characters/digits) allowed for the code selected are accepted. When the Variable Length option is selected the following options appear: Field Length, Fill Direction, and Fill Character
- **Fixed Length:** Only the length defined by the Code Field Length parameter is transmitted.

Field Length

Enter a length value in the filed provided. Only for fixed length format.

Fill Direction

Select Left or Right from the drop-down list. Only for fixed length format.

Fill Character

For fixed length, click to activate the See “The Text Entry Tool” on page 59 and create a fill character.

Code Identifier

Select **Disabled, AIM**, or **Custom** from the drop-down list. This parameter allows enabling/disabling the transmission of the code ID in the output data format.

- **Disabled:** No code identifier is included in the output message
- **AIM:** The AIM standard identifier is included in the output message
- **Custom:** This selection activates a list of Custom Code ID strings, allowing the user to define an identifier string for each code symbology. The string will be included in the output message.

In each code string option, click  to activate the See “The Text Entry Tool” on page 59 and create a character string.

List of Code Types

This list appears when Custom is selected from the Code Identifier drop-down list. For each code type, click  to activate the See “The Text Entry Tool” on page 59 and create Code Identifier characters.

Custom Code Identifiers

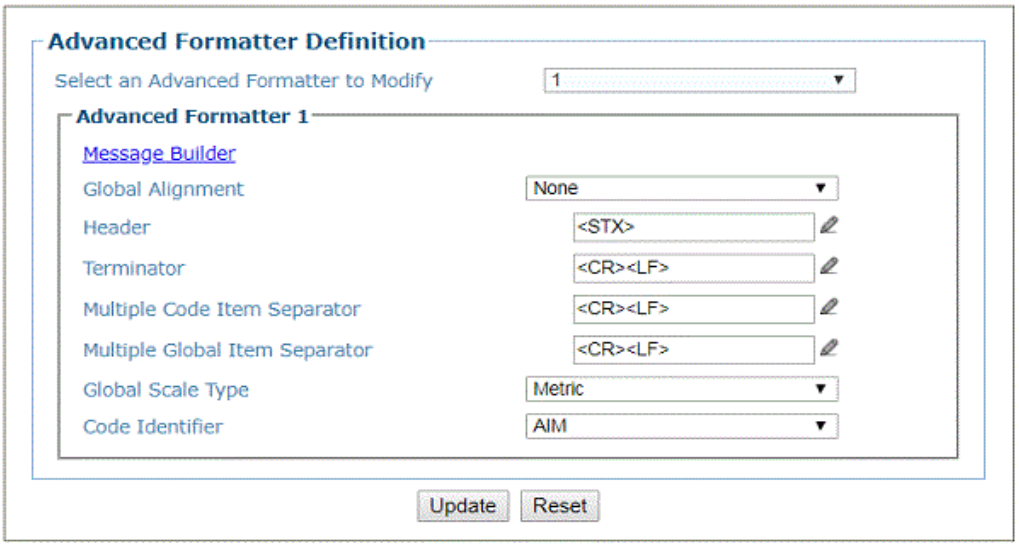
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Output Format | Advanced Formatter

Use the **Advanced Formatter** to set up a selection of advanced code parameters for output messages. This is useful when you need to create more complex messages to the Host. There are five unique message formats that can be constructed. Once the format is defined the format is assigned to a port in the **Communication>Transports** menu option by selecting the Advanced option in the Data Output Protocol drop down. Then select the Advanced Formatter item in the Advanced Formatter Index number.

To edit the Advanced Formatter settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Output Format | Advanced Formatter.** The Advanced Formatter window opens.



Select an Advanced Formatter to Modify

Select a numeric Advanced Formatter item to modify from the drop-down list. There are five host messages that can be constructed.

Message Builder

Click on this link to open the Message Builder“Advanced Formatter | Message Builder” on page 146 window.

Global Alignment

Select None, Left, or Right from the drop-down list.

When you activate Global Alignment you are choosing to add characters (padding) to the leading and/or trailing edge of the transmitted message. Left refers to the leading part of the message, and Right refers to the trailing part of the message.

Align Length

Enter the number of characters to align by.

Align Filler Char

Enter the character to fill the align length with.

Header

Click to activate the “The Text Entry Tool” on page 59 and create a header string. Headers (up to 128 bytes) can be defined and transmitted as a block preceding the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to activate the “The Text Entry Tool” on page 59 and create a terminator string. Terminators (up to 128 bytes) can be defined and transmitted as a block following the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Multiple Label Separator

Click to activate the “The Text Entry Tool” on page 59 and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used. This is only available if your configuration is Multi-Label or Logical Combination.

Multiple Code Item Separator

Click to activate the “The Text Entry Tool” on page 59 and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

Multiple Global Item Separator

Click to activate the “The Text Entry Tool” on page 59 and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

Global Scale Type

Select Metric, Imperial, Encoder Units, or Normalized (0-255) from the drop-down list.

- **Metric:** Metric length units are used
- **Imperial:** Imperial length units are used

Code Identifier

Select Disabled, AIM, or Custom from the drop-down list. This parameter allows enabling/disabling the transmission of the code ID in the output data format.

- Disable: No code identifier is included in the output message
- AIM: The AIM standard identifier is included in the output message
- Custom: This selection activates a list of Custom Code ID strings, allowing the user to define an identifier string for each code symbology. The string will be included in the output message.

In each code string option, click to activate the “The Text Entry Tool” on page 59 and create a character string.

List of Code Types

A list of codes appears when Custom is selected from the Code Identifier drop-down list. For each code type, click to activate the “The Text Entry Tool” on page 59 and create Code Identifier characters.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

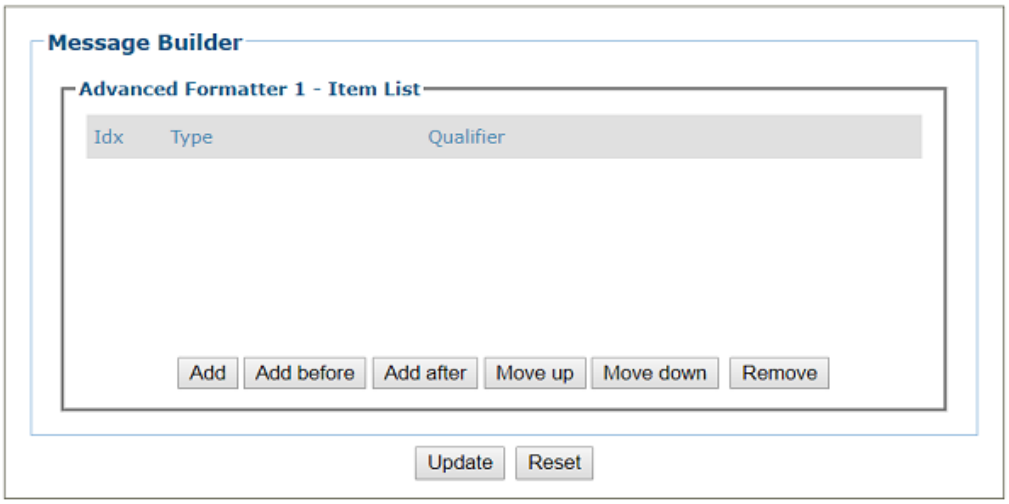
Advanced Formatter | Message Builder

Use the **Message Builder** window to configure Standard or Advanced system messages.

This option allows for the defining of each field in the host message. When Message Builder is activated, Its settings apply to the Advanced Formatter *n* Item that was being modified in the Advanced Formatter Definition window.

To Use the Message Builder:

1. Click on the **Message Builder** link in the **Advanced Formatter** window. The **Message Builder** window opens.



2. Enter the appropriate information in the form as described below:

Advanced Formatter n - Item List

The number displayed represents the Advanced Formatter n Item being modified in the Advanced Formatter Definition window.

The Items in this list are the fields in the message being transmitted.

Idx

Displays the index number of the messages. The idx field identifies the order that the information will be sent to the host.

Type

Displays the message type including various Code Related Item, String, or Global Item messages.

Qualifier

Displays relevant qualifiers for the message item if needed.

Advanced Formatter n - Item List Buttons

Add

Click to add a new message item to the bottom of the list. The type of message added is based on the Item Type selected in the Item n Definition section of the window (see below).

Add before

Click to add a new message item above the currently selected idx number.

Add after

Click to add a new message item below the currently selected idx number.

Move up

Click to move the selected message item up one level in the list.

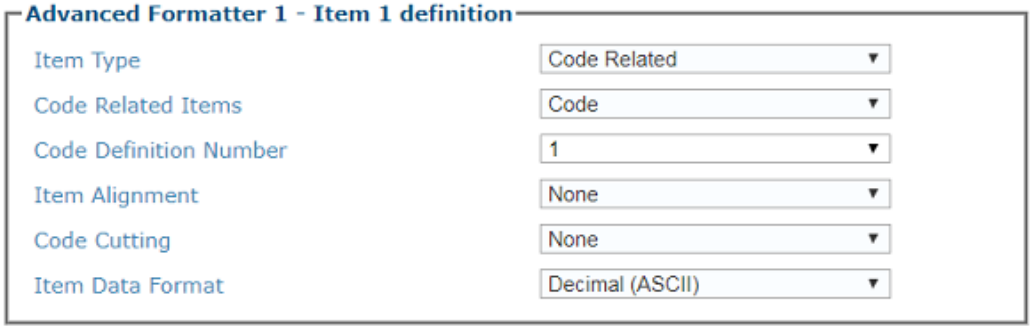
Move down

Click to move the selected message item down one level in the list.

Remove

Click to remove the selected message item.

If you click Add, Add before, or Add After the following window opens:



Item n Definition

Item Type

Select String, Code Related, or Global from the drop-down list. Each selection reveals a unique set of options. Code Related and Global item types will reveal a unique set of options. The String option is a free flowing text box.

CODE RELATED ITEMS:

Select a code related item from those available in the drop-down list. This option is available when Item Type > Code Related has been selected. The Code Related items can be associated to a specific programmed code or group label depending on the Code Combination selection. Selections Include:

- **Code:** Barcode data
- **Length:** Number of characters in code
- **Read Mask: I**n tracking mode - 32-bit mask indicating which barcode reader in the network has read the code (when character <1> is present in the related position). In On Line mode - 32-bit mask indicating the lowest unit number barcode reader in the network that read the code (when character <1> is present in the related position).
- Total Read Count: Indicates how many times the code has been read by all barcode readers present in the network during the same reading phase.

NOTE

These depend on the "Center Coordinates" option selected, Image Related or Space Related. If Image Related: the values will be in pixels, If Space Related: the values will be in millimeters.

- **X Position:** X coordinate for the code that was read
- **Y Position:** Y coordinate for the code that was read
- **Z Position:** Z coordinate for the code that was read
- **Code Identifier:** Indicates type of code that was read
- **Encoder Value:** Encoder Value identifies the tachometer count that the bar code was found at.
- **Code Orientation Angle:**

GLOBAL ITEMS:

Select a global item from those available in the drop-down list. This option is available when Item Type > Global has been selected. Selections Include:

- **Total Read Mask:** Indicates the complete reading mask related to all codes read during the reading phase
- **Total Read Count:** Indicates the sum of all Code-related Total Reading Counts of each code read during the reading phase
- **Sequence Number:** Indicates the sequential number assigned to the package
- **Hours:** Indicates hour the code was scanned
- **Minute:** Indicates minute the code was scanned
- **Seconds:** Indicates second the code was scanned
- **Day:** Indicates day of the month the code was scanned

- **Month:** Indicates month the code was scanned
- **Year:** Indicates year the code was scanned
- **Protocol Index:** Indicates the programmed protocol index string data
- **Parcel Length:** Indicates the approximate length of the package
- **Parcel Width:** Indicates the approximate width of the package
- **Parcel Height:** Indicates the approximate height of the package
- **Parcel Volume:** Indicates the approximate volume of the package
- **Parcel Orientation Angle:** Indicates the angle of the package
- **Parcel Isolated:** indicates it is not a side-by-side condition as detected by the Dimensioning system.
- **Image Filename: I**ncludes the filename of the image

STRING ITEMS:

Link to Code

Select Disabled, Previous Code, or Next Code from the drop-down list.

- **Disabled:** A code will not be linked to this text string
- **Previous Code:** The text string will be linked to the previous generated code
- **Next Code:** The text string will be linked to the next generated code

Miscellaneous String

Click  to activate the “The Text Entry Tool” on page 59 and enter a code related string.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values

IMAGE SAVING

Use Image Saving options to configure how and to where images are saved:

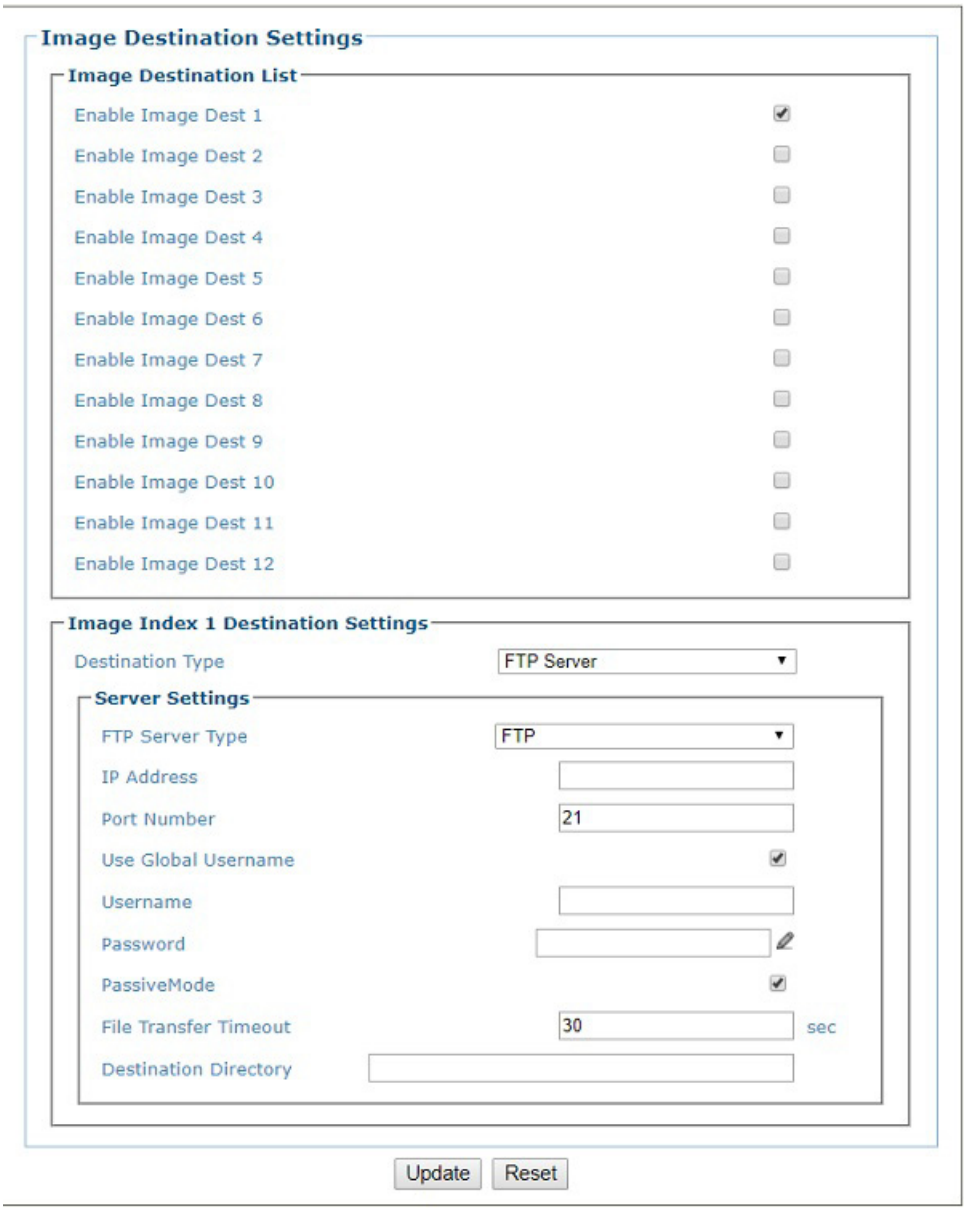
- “Destination Settings” on page 163
- “Image Settings” on page 167

Destination Settings

Use **Destination Settings** to configure how and where system images are saved. There are twelve configurable image destinations available.

To edit the Destination Settings:

1. In the menu tree under **Modify Settings**, navigate to G**lobal Settings | Image Saving | Destination Settings.** The **Destination Settings** window opens.



2. Enter the appropriate information in the form as described below:

Image Destination List

Select the check box(es) corresponding to the numbered image destination to enable setup. Image Index n Destination Settings inputs will appear for the image destinations selected.

Image Index n Destination Settings

Destination Type

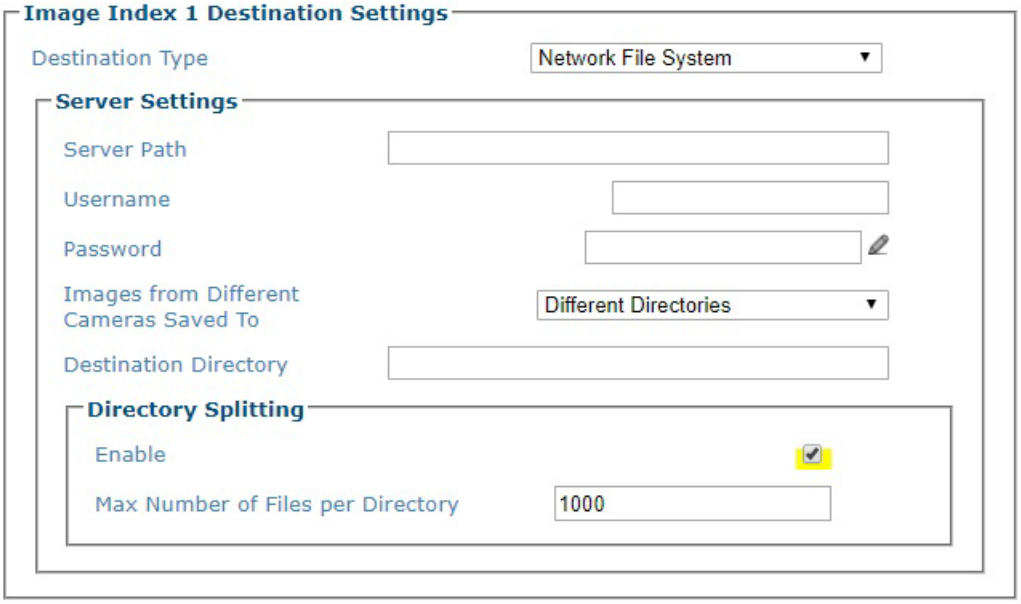
Select File System, FTP Server, External Viewer, or On Camera from the drop-down list to save to a remote file system server.

- **Network Files System:** Reveals options for saving to an external file system folder. Network Files System. The customer will determine where on their system the images files will be saved. Their IT department will provide the Server Path, Username, and password. They will also determine how the images will be saved on their server and determine whether each cameras images will be saved in Different Directories or all cameras images will be saved to the same location. Their IT department will also provide the Destination Directory on their server where the images will be saved. The Directory Splitting options Use the explanation below
- **FTP Server:** Reveals options for save to an FTP server IP Address/Port Number - the IP address and Port Number where the FTP Server is located will be provided by the customer IT department
- **External Viewer:** Provides a field for the Destination IP Address of the viewer. The External Viewer is only used as a diagnostic and calibration tool
- **On Camera:** Provides options to store images on the camera to be retrieve by your system. These files can be accessed either through e-Genius under Diagnostics - “Viewing Camera Images” on page 224 or by connecting to the camera’s on board FTP server. The Host or Image Ethernet connection can be used to connect to the FTP server.

  Username: dluser

  Password: plop.

Server Settings Network File System



Server Path

Enter the complete path of the server.

Username

Enter a valid username.

Password

Click to activate the “The Text Entry Tool” on page 59 and enter the password required to access the server.

Images from Different Cameras Saved To

Select Different Directories or Same Directory from the drop-down.

Different Directories: images are saved in different directories

Same Directory: images are saved in the same directory

Destination Directory

Enter the complete path of the destination directory.

Directory Splitting

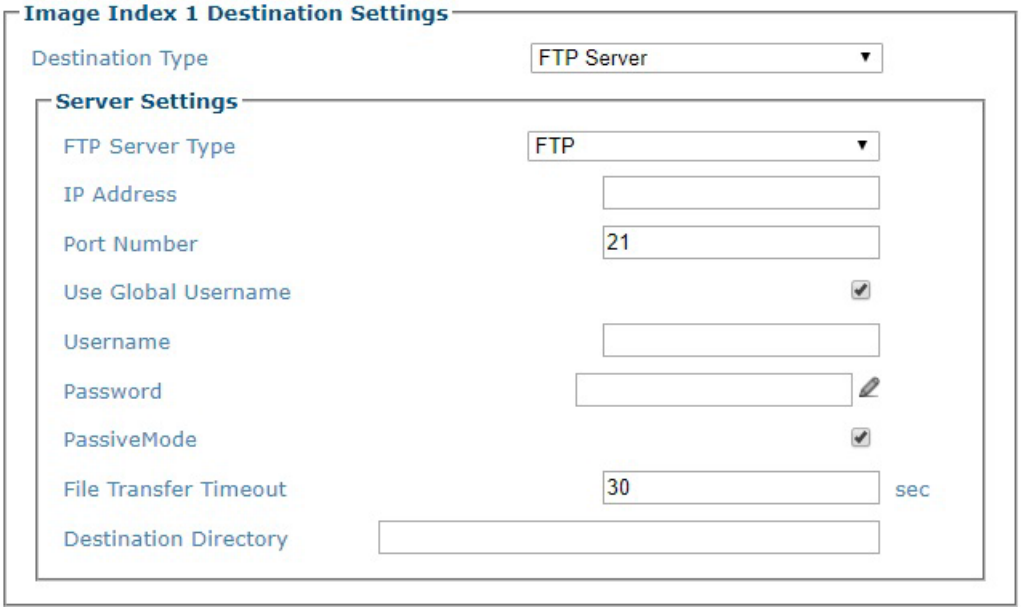
Enable

Select the check box to enable directory splitting. Enabling this parameter causes the destination directory to be split into subdirectories containing a number of images not greater than the defined Split Destination Max File Number (see below). The subdirectories of the Saving Path are numbered consecutively: 1, 2, 3, etc.

Max Number of Files per Directory

Enter the number of files allowed in each subdirectory.

Server Settings FTP Server



Server Path

Enter the complete path of the server.

Username

Enter a valid username.

Password

Click to activate the “The Text Entry Tool” on page 59 and enter the password required to access the server.

Images from Different Cameras Saved To

Select Different Directories or Same Directory from the drop-down.

Different Directories

Same Directory

Destination Directory

Enter the complete path of the destination directory.

Server Settings External Viewer

Destination IP Address

Enter the IP Address of the External Viewer destination

Server Settings On Camera

Port Number

Enter the number of the port On Camera to receive images.

Directory Splitting

Enable

Select the check box to enable directory splitting. Enabling this parameter causes the destination directory to be split into subdirectories containing a number of images not greater than the defined Split Destination Max File Number (see below). The subdirectories of the Saving Path are numbered consecutively: 1, 2, 3, etc.

Max Number of Files per Directory

Enter the number of files allowed in each subdirectory.

Destination Directory Maintenance

Click the check box to enable directory maintenance.

Max Number of Files

Enter the maximum number of image files to maintain on the camera.

Max Total Size

Enter the size in mega bytes to allow for on camera image storage.

Max File Age

Enter the age in seconds of images to save.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Image Settings

Use the **Image Settings** window to configure where and how images are saved.

To edit the Image Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Image Saving | Image Settings.** The **Image Settings** window opens.

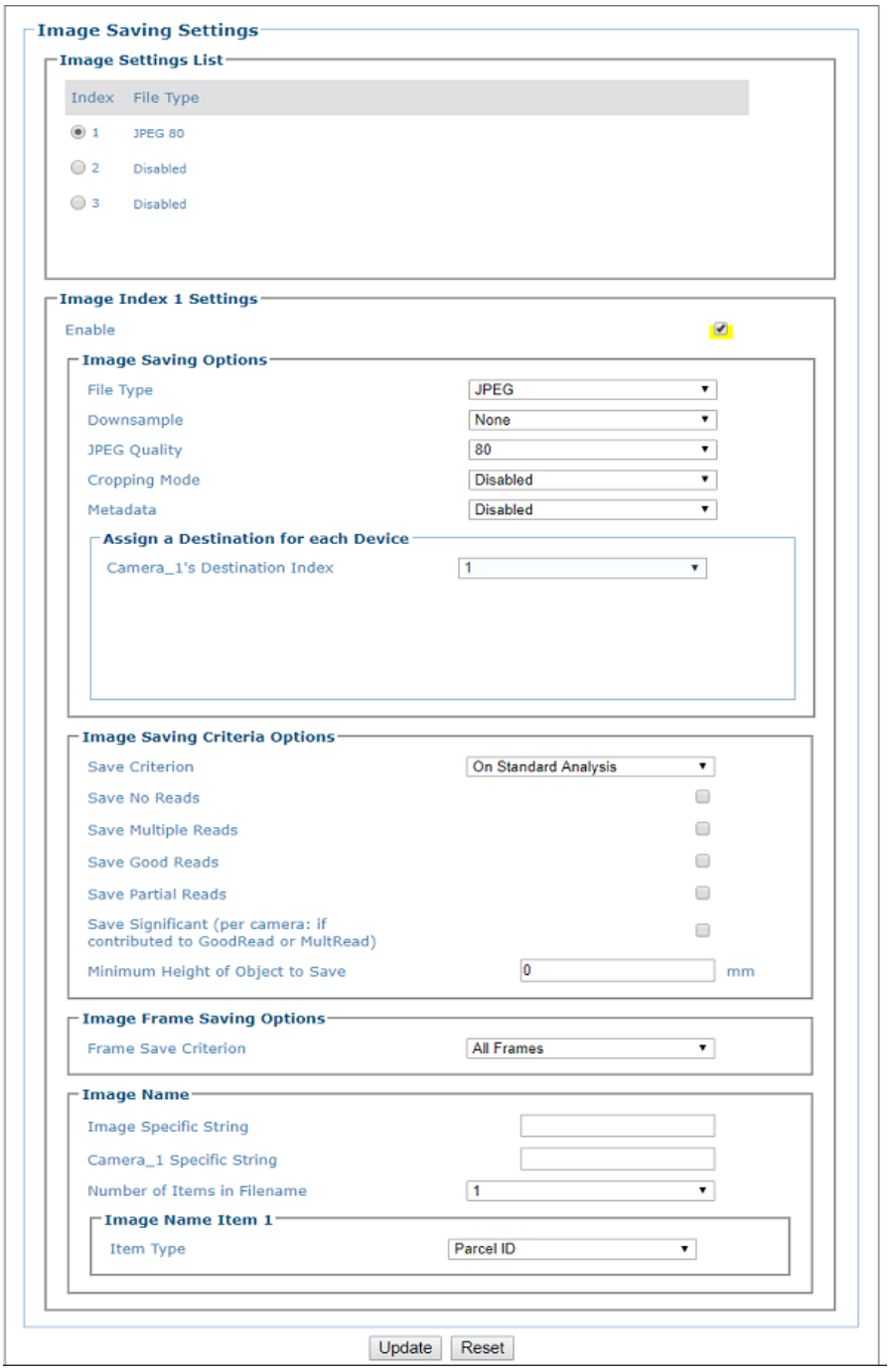


Image Settings List

Select the option button adjacent to the item you wish to create or modify.

Image Index n Settings

Enable

Select the check box to reveal the image settings options.

Image Saving Options

File Type

Select JPEG, Bitmap, or TIFF from the drop-down list. Specifies the type of image to save as.

Downsample

Select None, 2, 4, 8, or 16 from the drop-down list.

JPEG Quality

Only available when JPEG is selected. Select a quality percentage from the drop-down list.

Quality defines the compression, by the Hoffman algorithm, in JPG images: 100 means maximum quality and minimum compression, lower values mean lower quality but higher compression. Valid values are in the range from 15 to 100.

Cropping Mode

Select Disabled or Crop to Object or User Defined, or Imaging Subregion from the drop-down list.

Crop to Object: This option provides cropping on the start and stop edges of the parcel image. The Crop to Object option is used for full cropping: not only on the start and stop edge of the parcel but also on both parcel sides. This is possible only when the distance sensors are available.

User Defined: This option provides the user with the ability to crop each side of the image independently. You can assign different cropping regions for each camera. The available parameters are:

- Camera_1's Left: Enter the numbers of pixel by which the image should be cropped
- Camera_1's Right: Enter the numbers of pixel by which the image should be cropped
- Camera_1's Top: Enter the numbers of pixel by which the image should be cropped
- Camera_1's Bottom: Enter the numbers of pixel by which the image should be cropped
- **Imaging Subregion:** Image cropped to the subregion specified in the Subregion Wizard.

Margin

Enter the numbers of pixel to use for a margin around the object.

Metadata

Select Disabled, Embedded, or External File from the drop-down list.

- **Disabled:** Metadata not used
- **Embedded:** Metadata is embedded with the image
- **External File:** Metadata is saved to an external file.

Assign a Destination for Each Device

Camera n's Destination Index

Select Disabled or a destination index number from the drop-down list. The destination index number refers to the Image Destination List in Modify Settings | Global Settings | Image Saving | Destination Settings.

Image Saving Criteria Options

Save Criterion

Select All or On Standard Analysis from the drop-down list.

- **All:** Sends out all images.
- **On Standard Analysis:** Allows you select the image criterion from the options below.

No Reads, Multiple Reads, Good Reads and Partial Reads are all based on the results of what is read by the entire cluster of cameras.

Save No Reads

Select the check box to save no read images.

Save Multiple Reads

Select the check box to save multiple read images.

Save Good Reads

Select the check box to save good read images.

Save Partial Reads

Select the check box to save partially read images.

If this camera contributed to a Good Read or Mult Read, the condition will be evaluated as true for this camera. Each camera evaluates a parcel based on what it read only (not what the entire cluster read).

Save Significant (per camera: if contributed to GoodRead or MultRead)

Select the check box to save an image only if it has contributed to GOOD-READ or MULTI-READ result. This helps cut down on the amount of storage used.

Example: If the parcel is GOOD-READ or MULTI-READ, at least one barcode must have been decoded in an image for it to be considered “significant.”

Minimum Height of Object to Save

Enter a minimum package height from which images will be saved. This is used to avoid saving images of various objects or debris caused by false triggers.

Image Frame Saving Options

Frame Save Criterion

Since the AV500 is a area camera there may be a large number of images during each trigger cycle. It may be necessary to limit the number of images saved. The Frame Save Criterion allow for the limiting of the number of frames saved. Select one of the following from the drop-down:

- **All Frames**
- **Frames with Decode Results**
- **Frames with Minimum Overlap:** Specify an amount in mm that frames must overlap to be saved.

- **Every Nth Frame:** Specify which frame of the 32 frames per second to save.

Image Name

These options relate to the image file naming conventions.

Any characters in the image file name that are not allowed in Linux or Windows will be replaced with an underscore (_). Characters that can be considered safe for both operating systems include alphanumeric values, dash (-), period (.), and underscore (_).

Image Specific String

Enter a string to be assigned to all camera image file names.

Camera n Specific String

Enter a string to be included identifying the specific camera name (example: top).

Number of Items in Filename

This identifies how many fields are used for the file name

Select a number from 1 to 16 from the drop-down list. Since the AV500 is a area camera there may be a large number of images during each trigger cycle. It may be necessary to limit the number of images saved. The Frame Save Criterion allow for the limiting of number of frames saved.

Image Name Item n

Item Type

Select an Image Name item type from the drop-down list, including:

- **Parcel ID:** Uses the parcel ID as the Image Name
- **Image Specific String:** Uses the image string entered above
- **Date:** Uses the current date (yyyymmdd)
- **Time:** Uses the image scan time (hhmmss)
- **Analysis Result:** Adds read analysis code to the image naming convention
- **Protocol Index:** Uses the protocol index data, as defined in the following options. the Protocol Index allows for the selection of the transport (communication port) that the

Protocol Index is received on.

•**String** this is a free form box allowing for text characters to be entered.

•**Camera Specific String T**he Camera Specific String is the name applied to the AV500 in the above Image Name>Specific String field

•**Code**

•**Counter**

•**Frame ID**

•**Frame Index**

Transport Number

Select a transport number from the drop-down list.

Cutting Mode

Select Disabled or Simple from the drop-down list. When Simple is selected from the options below are revealed.

Number of Leading Characters to Cut

Enter a number indicating the number of characters to cut from the leading part of the message.

Number of Trailing Characters to Cut

Enter a number indicating the number of characters to cut from the trailing part of the message.

String uses the character string entered below
Item String (Max 16 Chars.)

Select a transport number from the drop-down list

Camera Specific String appends the specified string to the image file name.

Code
Code Group Index

Logical combination group number as specified in Barcode Settings | Barcode configuration

Cutting Mode

Select Disabled or Simple from the drop-down list. When Simple is selected from the options below are revealed.

Number of Leading Characters to Cut

Enter a number indicating the number of characters to cut from the leading part of the message.

Number of Trailing Characters to Cut

Enter a number indicating the number of characters to cut from the trailing part of the message.

Counter: Uses a counter as described below
Counter Module

Enter the number maximum for the counter before it turns over to start at 1 again.

Alignment

Select None, Left, or Right from the drop-down list. When Left or Right is selected the options below are revealed.

Align Length

Enter the number of characters to fill with the Align Filler Character.

Align Length is the number of characters to fill if the counter value if less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.

Example:

Counter Max Number (Counter Module) = 10000

Counter Current Value = 500

Align Filler Char = X

Counter shown in Image Name = XX500 (Left Alignment) or 500XX (Right Alignment)

Align Filler Char

Enter a filler character to use with Align Length.

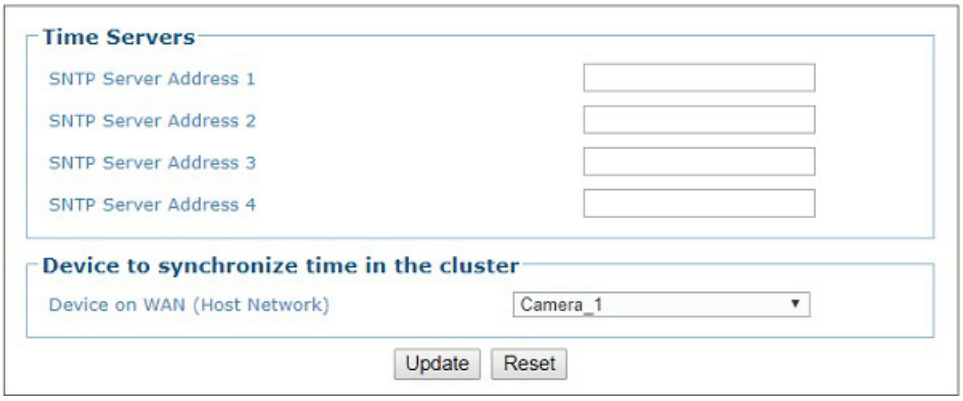
2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

TIME SYNCHRONIZATION

Use **Time Synchronization** to synchronize system time between the system devices. Time must be synchronized for accurate tracking and logging. This feature allows all units within an organization to have the same time stamp. For example, product located on the west coast can have the message stamped with east coast time. It synchronizes equipment with a company's central PC.

To view and edit Time Synchronization settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Time Synchronization.** The **Time Synchronization** window opens.



2. Enter the appropriate information in the form as described below:

Time Servers

Simple Network Time Protocol (SNTP) Server Address N

Enter the IP address for the servers you wish to synchronize.

Device on WAN (Host Network)

Select None or the camera name from the drop-down list of the camera whose host network is connected to the network with the time server. All the devices in the system will synchronize to the selected device.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

MODIFY SETTINGS | DEVICE SETTINGS AV500

Use the Device Settings during initial setup to configure device specific settings. If necessary, you can later make modifications to the device settings using the same menu selections, including:

Device Information | Camera #n

Use the **Device Settings** window to view device information, including a description, serial number, and address.

To view the Device Settings window:

1. In the menu tree under **Modify Settings**, navigate to D**evice Settings | <Camera Name> (if applicable) | Device Info**. The **Device Info** window opens.

2. Enter the appropriate information in the form as described below:

Camera Name

Enter a unique name for the camera.

Once changed, this name will appear in the System Info page and the Device Settings menu tree.

NOTE

The following characters may NOT be used in the camera name: # % & { } \ > * ? / (space) $! ' " : @ + ` | =.

The rest of the parameters are automatically filled.

Serial Number

Displays the serial number sent by the device.

Device ID

Displays the device ID as programmed in the factory and defines what kind of device this camera is. Some examples are: AV500, AV900, AV7000, AV7000CR.

Lens Size

Displays the size of the lens; Is it a 16, 25 or 35 mm lens.

Lens Aperture Size

Displays the Lens Aperture Size; 6, 7, 8 or 9

Sensor Size

Displays the Sensor Size;

Ethernet Ports

(These fields are not editable)

SyncNet MAC Address

Displays the MAC (media access control) address of the cameras SYNC Ethernet port

SyncNet IP Address

Displays the cameras SYNC IP address.

Image Port MAC Address

Displays the MAC Address of the cameras Image Ethernet Port.

Host Port MAC Address

Displays the MAC Address of the camera's Image Ethernet port.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

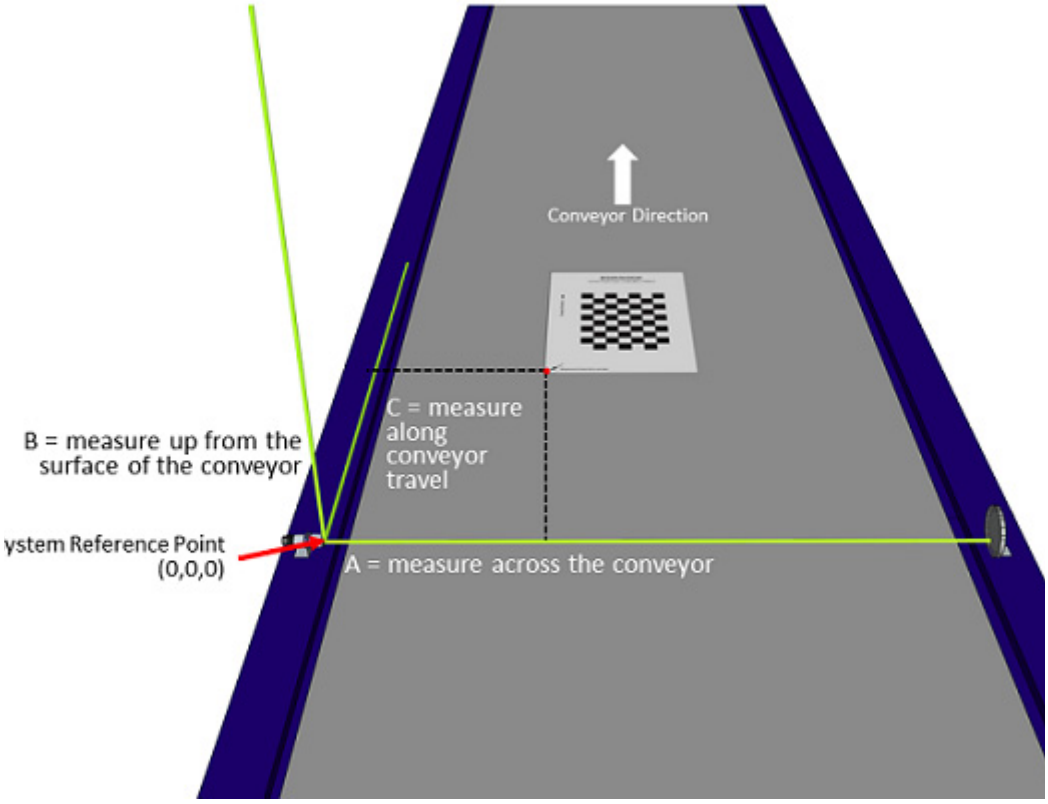
UNDERSTANDING PACKTRACK

PackTrack is a patented operating mode for Datalogic products used to read and correctly assign codes on different parcels when read at the same time. If the codes of two or more consecutive parcels are found at the same time in the camera reading area, the condition occurs where, the code of the second pack is read first, just before the code of the previous pack. A system without PackTrack would assign the code of the second pack to the first pack and vice versa, thus causing a gross error in sortation.

NOTE

Tracking starts 10 cm before and stops 10 cm after the Reading Area in order to ensure the bar code is assigned to the correct package.

PackTrack uses a right-handed reference system where the **A** axis coincides with the Photoelectric Sensor line, the **B** axis is oriented upwards from the conveyor (see figure below) and the **C** axis coincides with the conveyor direction. The arrows point in the positive direction. The coordinate point of origin (0,0,0) is on the left edge of the conveyor as illustrated.



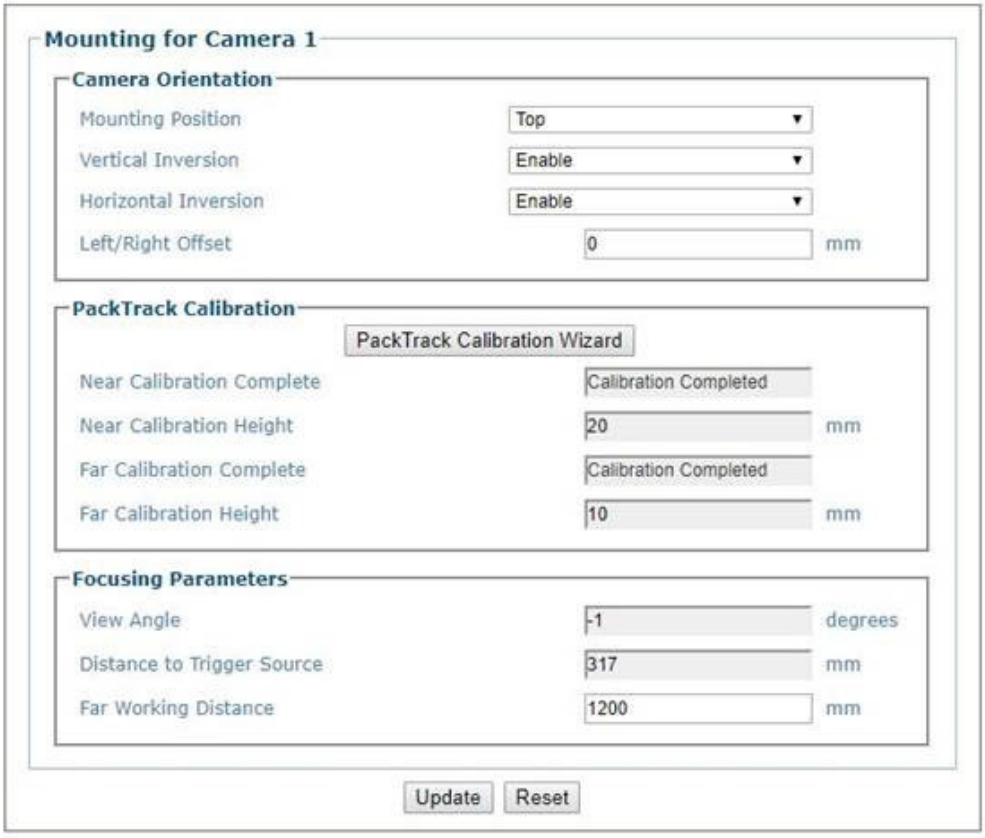
A, B and C are absolute for the reading station, i.e. valid for all the cameras independently from their position or orientation with respect to the conveyor. For this reason, after the PackTrack configuration (and calibration) has been correctly performed, when a barcode is under the beam to be read by the cameras, its position is defined by the coordinates of its central point, independently from which camera is reading it.

Device Settings | Camera #n | Mounting

Use the **Mounting window** when installing and calibrating the camera.

To view the Mounting window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Mounting.** The **Mounting window** opens.



2. Enter the appropriate information in the form as described below:

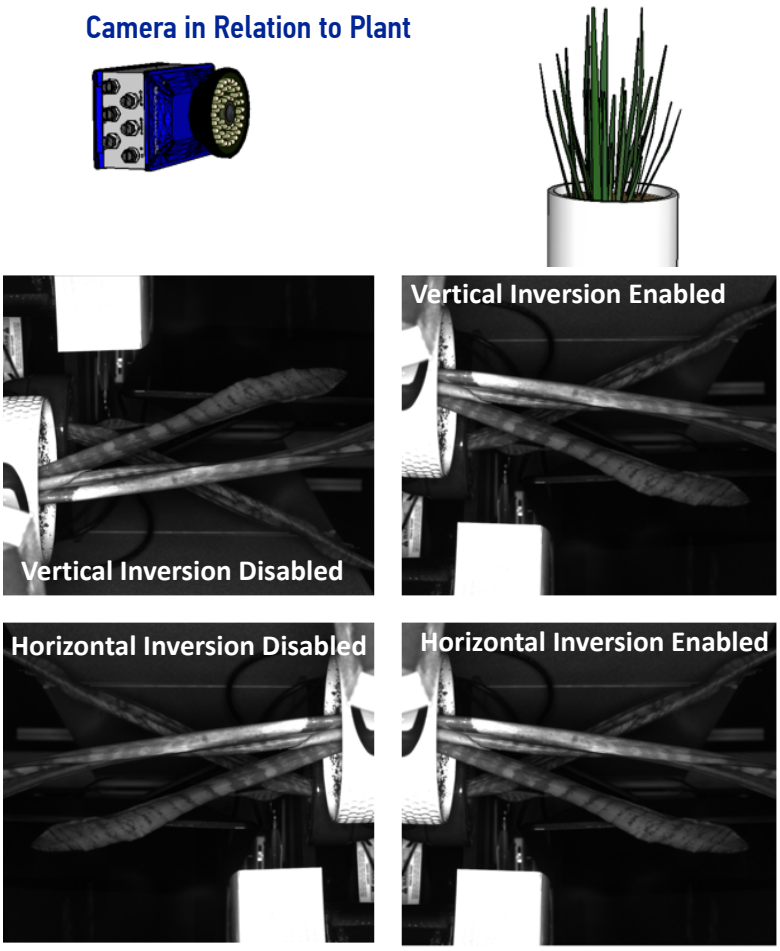
Camera Orientation

Mounting Position

Select **Top, Left, Right,** or **Bottom** from the drop-down list depending on where the camera is mounted.

This parameter allows defining the installation position of the camera in multi-camera tunnel installations according to the code reading on the conveyor: Top, Right, Left, etc. This parameter acts on the software reading algorithms and on the position and height sensors configuration.

Vertical Inversion



Select **Disable** or **Enable** from the drop-down list.

This parameter (when enabled) allows inverting or mirroring the image sent by the camera. This function is used to set the object movement with respect to the camera mounting position (i.e. camera position = Top Back). It is used to change a reversed (mirrored) image to proper orientation for OCR applications or video coding.

Horizontal Inversion

Select **Disable** or **Enable** from the drop-down list.

This parameter (when enabled) allows inverting or mirroring the image sent by the camera. This function is used to set the object movement with respect to the camera mounting position (i.e. camera position = Top Back). It is used to change a reversed (mirrored) image to proper orientation for OCR applications or video coding.

Left/Right Offset (Y)

Enter the camera offset from the Y-axis (across the conveyor). 0 = centered on Y. This defines the center of the cropped image.

PackTrack Calibration

PackTrack Calibration Wizard

Click to open the PackTrack Calibration Wizard (see “PackTrack Calibration Wizard” on page 180). This is used during initial calibration only.

Calibration Parameters (these are automatically completed when the PackTrack Calibration Wizard has been run). These parameters are not editable.

Near/Far Calibration Complete

Indicates whether the Mounting Wizard was successfully executed to learn the PackTrack Calibration.

Near/Far Calibration Height

Indicates the height (or offset from the far working distance) where the Mounting Wizard learned the PackTrack Calibration.

Focusing Parameters

View Angle

View angle is determined by PackTrack calibration. This value represents the view angle of the camera. This value should not be changed after it is set by PackTrack calibration.

This parameter allows defining the reading angle of the camera. For standard installations this angle should be set to match the mechanical mounting: +15 or -15 degrees (single side object reading), +45 degrees for a side/back read or -45 degrees for a side/front read (double side object reading) depending on the type of installation. This parameter may be up to two degrees different then the 15/45 degree after the completed calibration.

For top read single side, +15 degrees is facing downstream, and -15 degrees is facing upstream. For top read multi-side, +45 degrees for top/back and -45 degrees for top/front.

Positive angles correspond to the package front or leading side with respect to the package movement and negative angles correspond to the package back or trailing side.

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

The possible values are from -50° to +50°. The default setting is 15°. See “Mounting and Positioning AV500” on page 32.

Distance to Trigger Source (X)

Defines the distance from the camera scan line to the trigger source (typically a Photo Sensor, Position Sensor, Light Curtain or DM3610 Dimensioner).

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

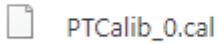
Far Working Distance (Z)

Defines the distance from the camera to the furthest scanning point.

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

Backup/Restore Mounting Calibration for this device

Download the current Mounting Calibration here ....Download



Click **Download** and a calibration file for the device is automatically downloaded. You can save the file to your desired location.

Choose File

Click the **Choose File** button to select a calibration file do load.

Load Calibration File

Click **Load Calibration File** to upload the file you have selected.

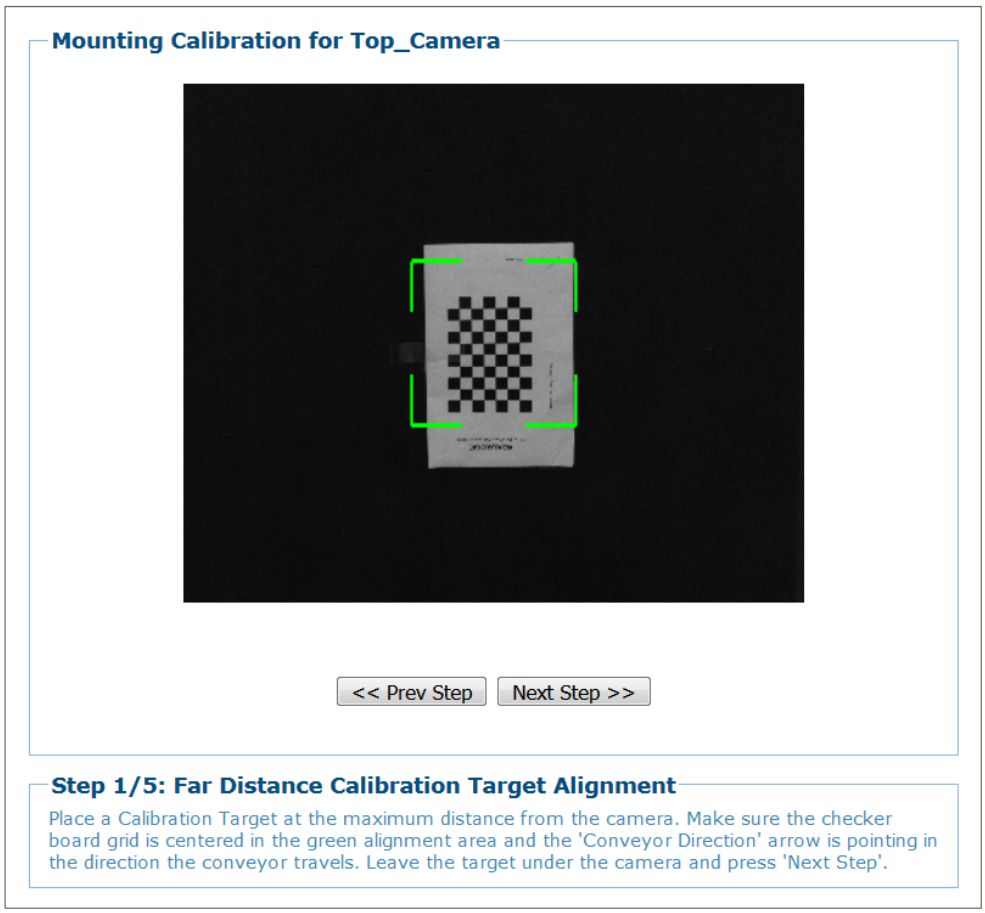
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

PackTrack Calibration Wizard

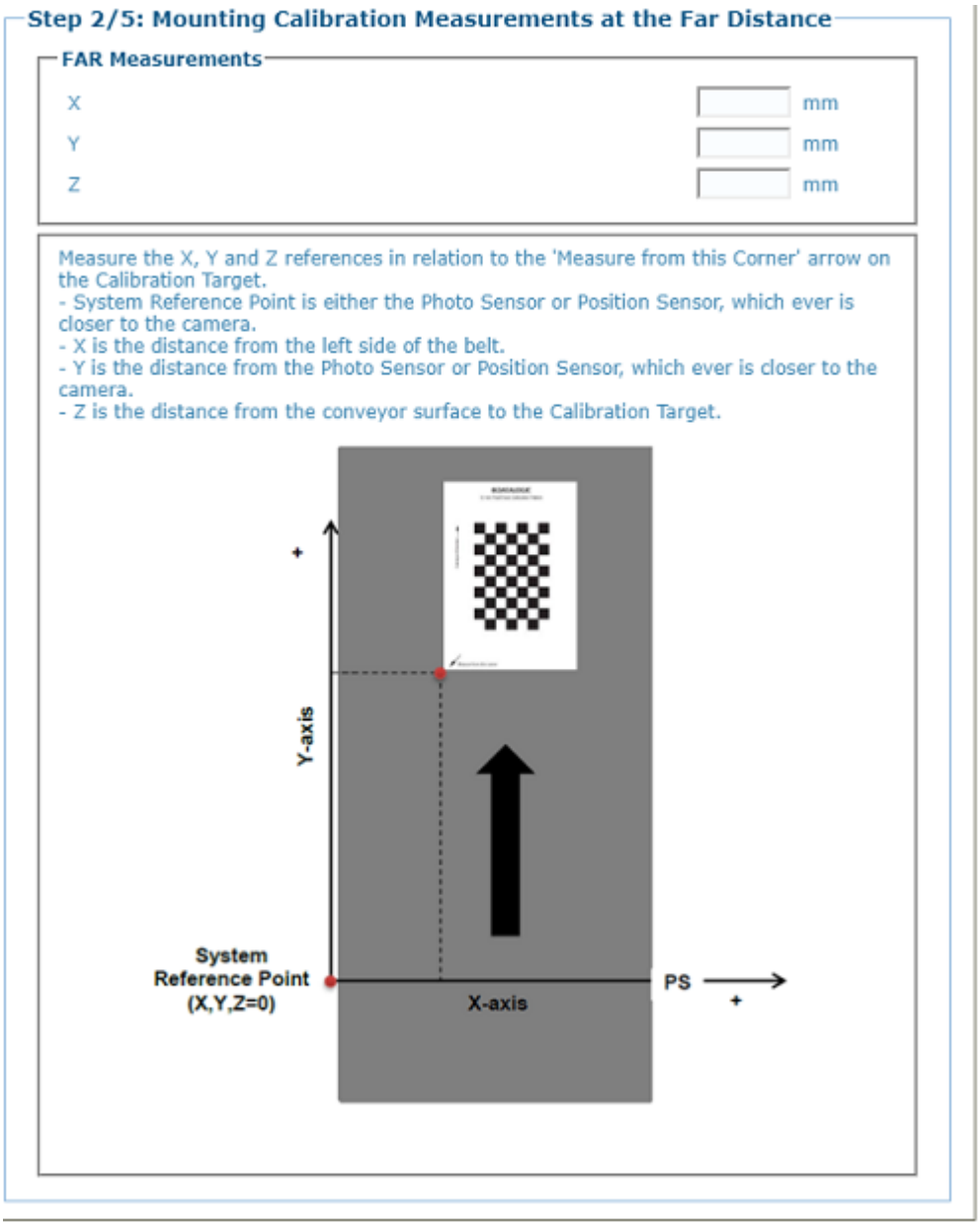
Use the **Mounting Calibration Wizard** to automatically calibrate mounting dimensions and settings.

To access the Mounting Calibration Wizard:

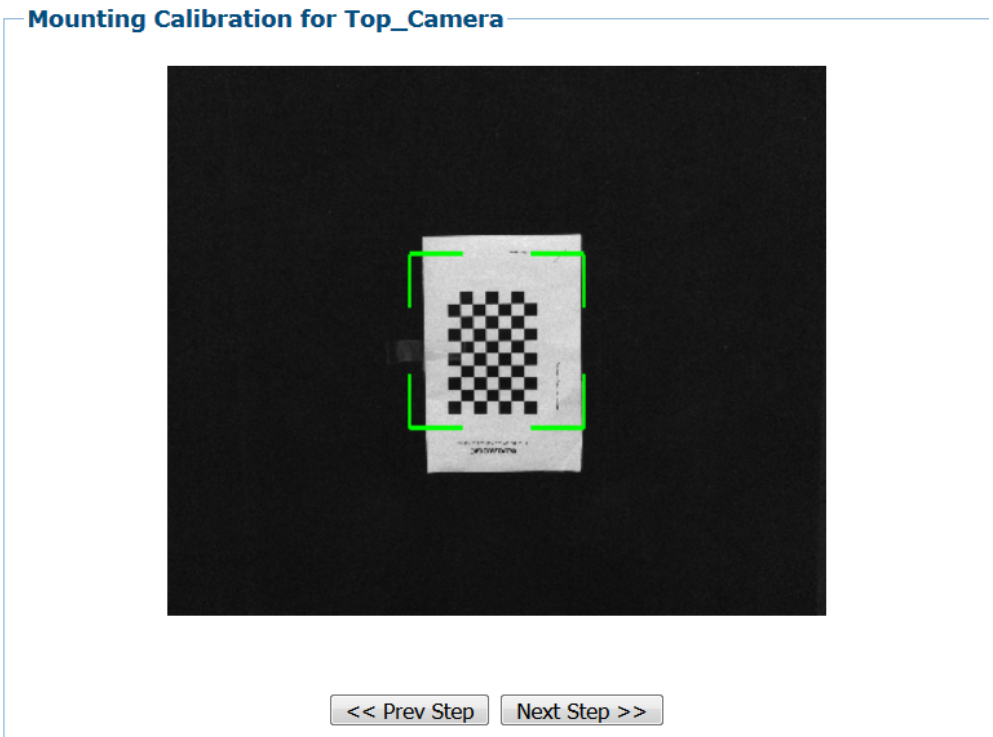
1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Mounting**. The **Mounting** window opens. Click the **Mounting Calibration Wizard** button.



2. Place a **Calibration Target** at the maximum distance from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press '**Next Step**'.



3. At the Far Distance, measure along conveyor travel, the distance from the trigger source to the target.
4. At the Far Distance, measure across the conveyor the distance from the target to the edge of the scanning area or the side of the conveyor belt.
5. At the Far Distance, measure up from the conveyor surface to the target, if the target is on the surface of the conveyor, this measurement will be 0.
6. Enter the measurements.



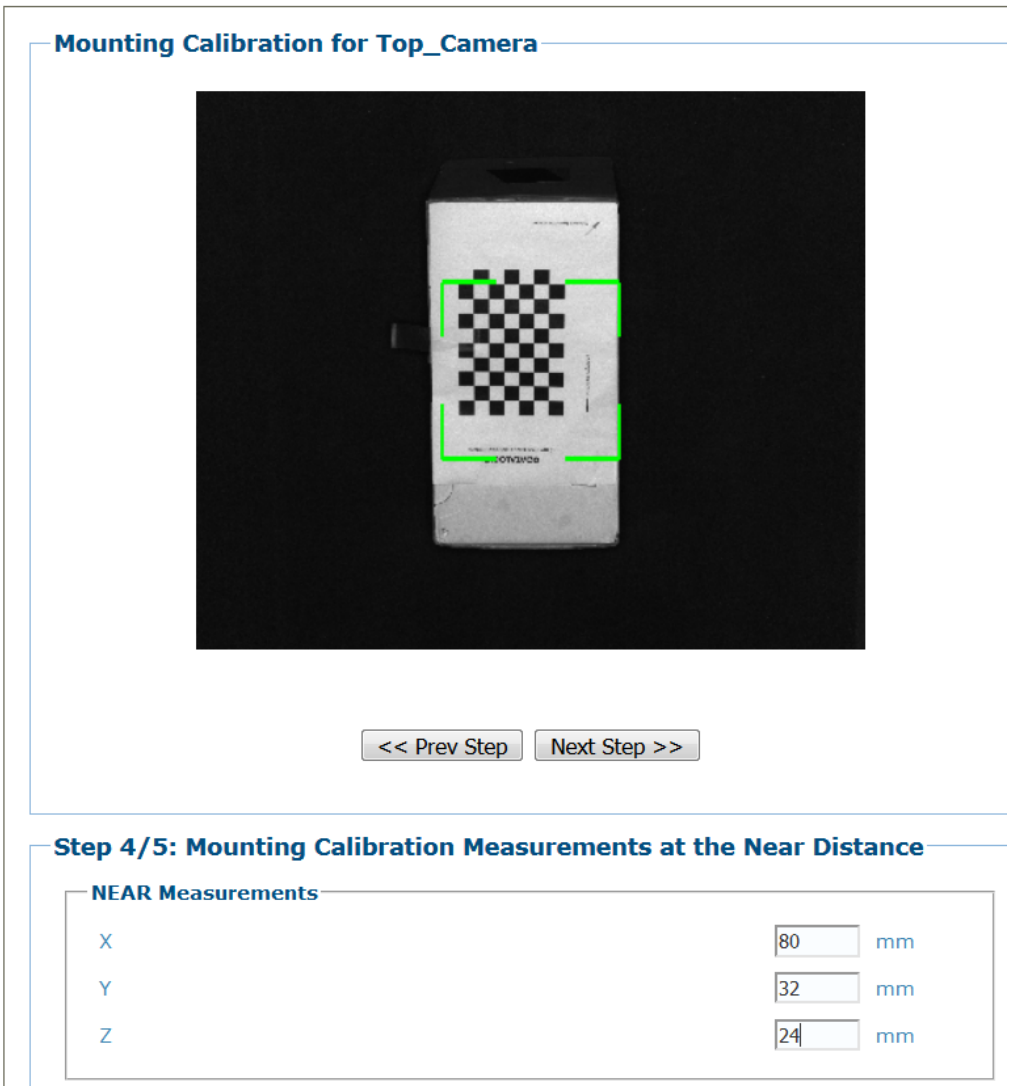
7. Place a Calibration Target at the **minimum distance** from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press '**Next Step**'.

8. At the Near Distance, measure along conveyor travel, the distance from the trigger source to the target.

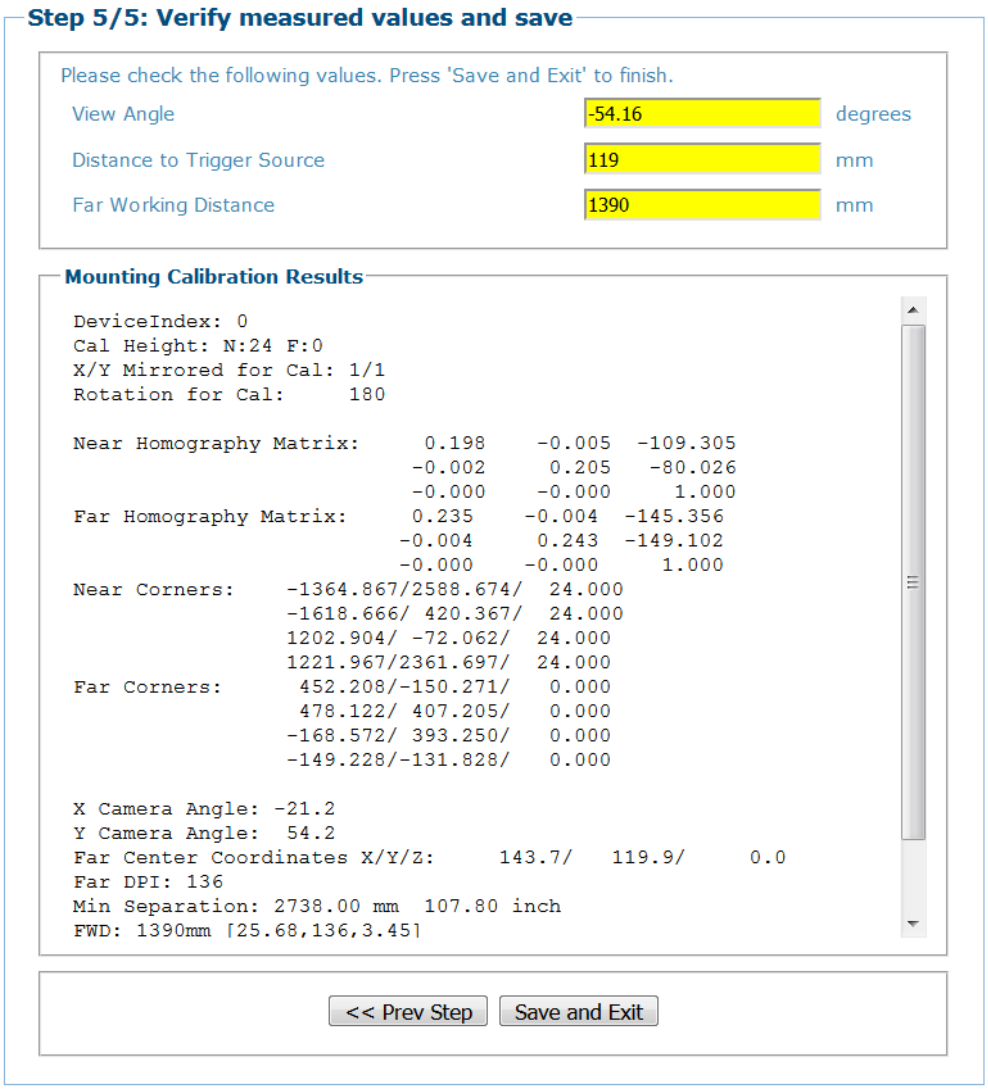
9. At the Near Distance, measure across the conveyor the distance from the target to the edge of the scanning area or the side of the conveyor belt.

10. At the Near Distance, measure up from the conveyor surface to the target, if the target is on the surface of the conveyor, this measurement will be 0.

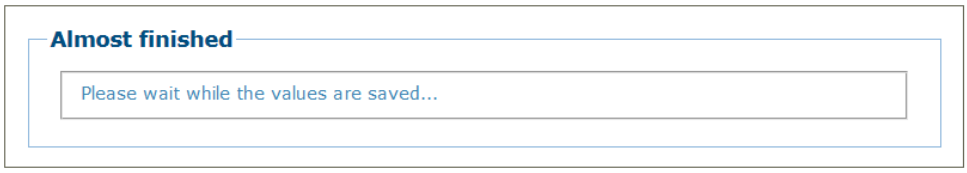
11. Enter the measurements.



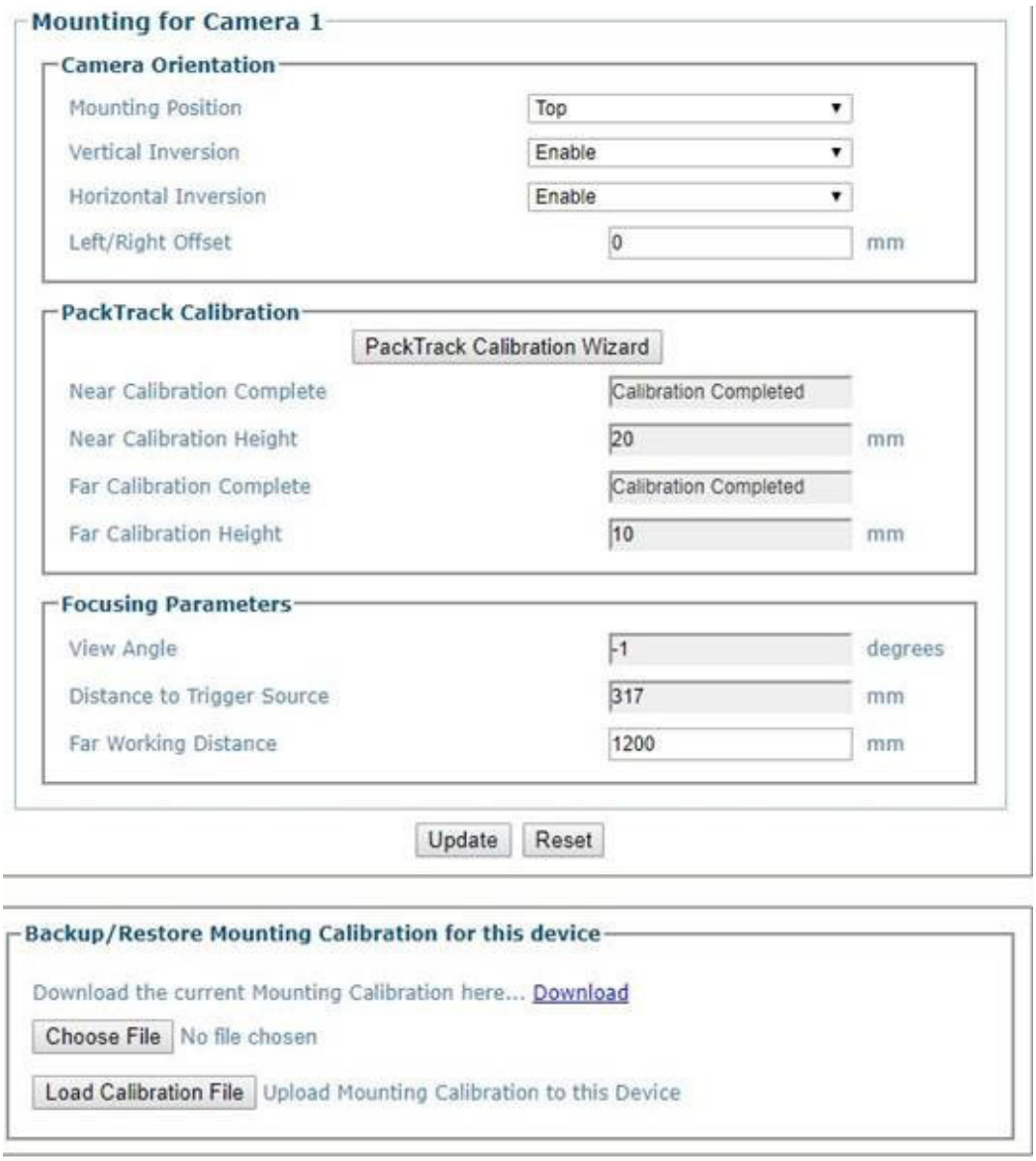
12. Click **Next Step** and the following screen appears.



13. Click **Save and Exit** and the following message appears while the values are being saved.



14. When the values have been saved e-Genius will return to the Mounting screen for that camera with the information learned from the Calibration Wizard in the appropriate fields.


Mounting for Camera 1
Camera Orientation
Mounting Position
Top
Vertical Inversion
Enable
Horizontal Inversion
Enable
Left/Right Offset
0
mm
PackTrack Calibration
PackTrack Calibration Wizard
Near Calibration Complete
Calibration Completed
Near Calibration Height
20
mm
Far Calibration Complete
Calibration Completed
Far Calibration Height
10
mm
Focusing Parameters
View Angle
-1
degrees
Distance to Trigger Source
317
mm
Far Working Distance
1200
mm
Update
Reset

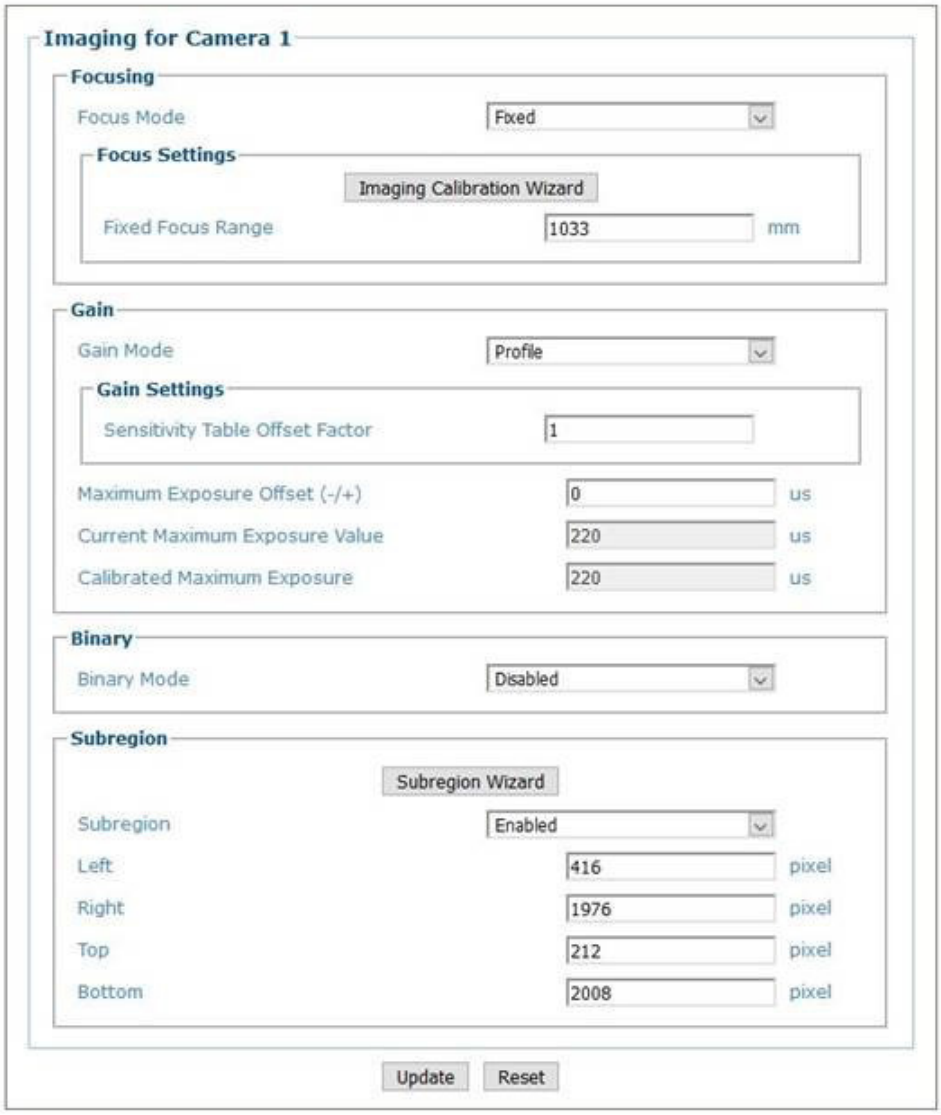
Backup/Restore Mounting Calibration for this device
Download the current Mounting Calibration here... Download
Choose File
No file chosen
Load Calibration File
Upload Mounting Calibration to this Device

Device Settings | Camera #n | Imaging

Use the **Imaging** window to configure how the selected camera focuses on images.

To view the Imaging window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera name> | Imaging.** The **Imaging** window opens.



2. View and modify the following imaging information:

Imaging for Camera_1
FOCUSING
Focus Mode

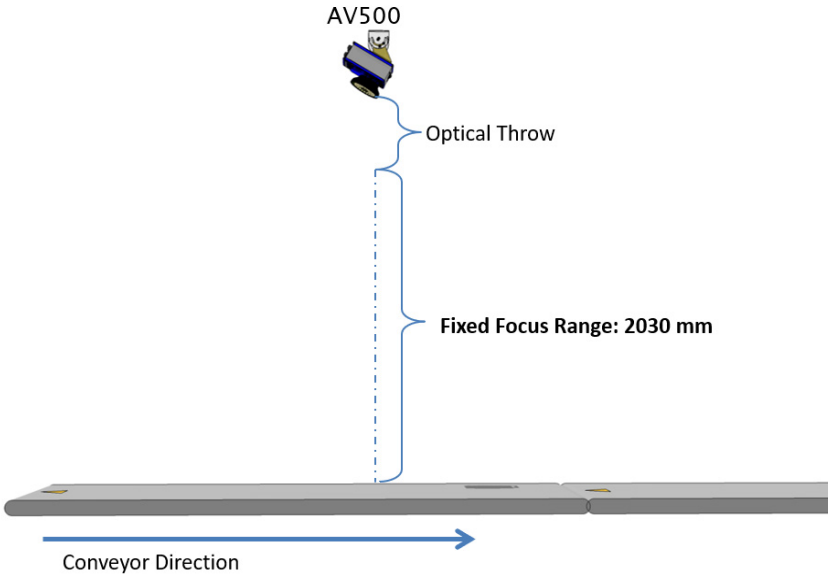
Select **Fixed, Dynamic, Dual Zone**, or **Sequential** from the drop-down.

Focus Settings
Imaging Calibration Wizard

Click on the **Imaging Calibration Wizard** button to calibrate Focus and Sensitivity. See “Imaging Calibration Wizard” on page 192.

Fixed Focus Mode

When Fixed Focus mode is selected, enter the fixed focus range in the field provided. This parameter indicates the fixed focus range used when a position sensor is not used. The possible values are from 0 to 32767 mm where 0 is the farthest valid station reading distance from the camera. The default setting is 0.

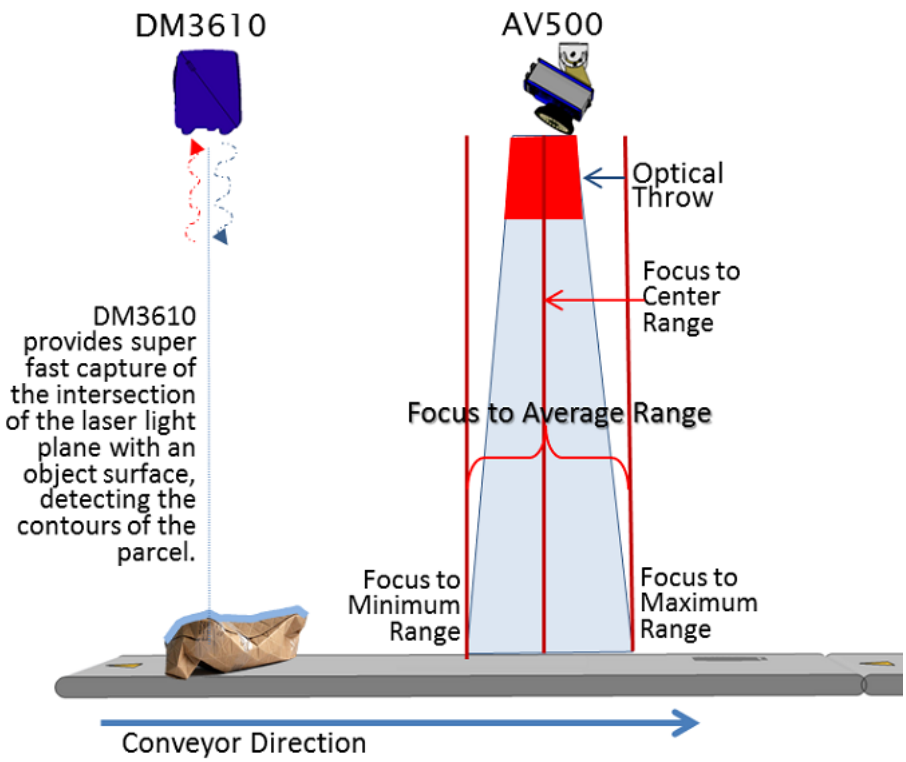


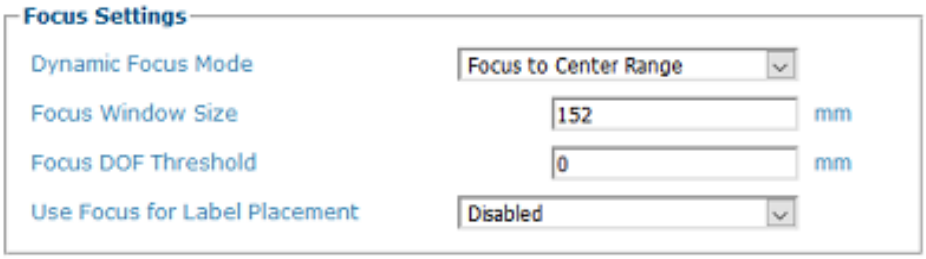
NOTE **The Depth Of Field (DOF) is dependent on the x dimension of the bar code (the narrowest part of a barcode's symbology). The AV500 focus should be set to the middle of the application's DOF.**

Fixed Focus Range (0-4095)

This distance must be greater than the Far Working Distance set in the **Device settings>camera>mounting>Mounting Calibration Wizard parameters**.

Dynamic Focus Mode





Dynamic Focus Mode (Imaging Calibration Wizard is not available)

Allows the AV500 to change focus per frame based on data received from a positioning sensor, usually a DM3610. To determine where to focus the AV500 dynamically, select one of the following from the drop-down:

- **Focus to Center Range:** Focuses the AV500 to the center of the range provided by the positioning sensor.
- **Focus to Average Range:** Focuses the AV500 to the average of the range provided by the positioning sensor.
- **Focus to Min Range (Near):** Focuses the AV500 to the minimum of the range provided by the positioning sensor.
- **Focus to Max Range (Far):** Focuses the AV500 to the maximum of the range provided by the positioning sensor.

Focus Window Size

Enter the value of the Size of the Focus Window.

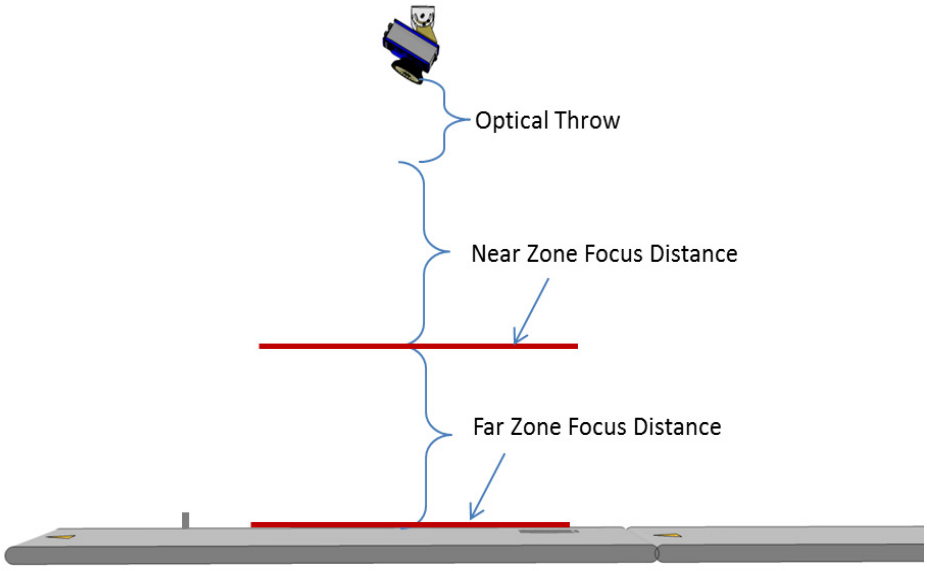
Focus DOF Threshold

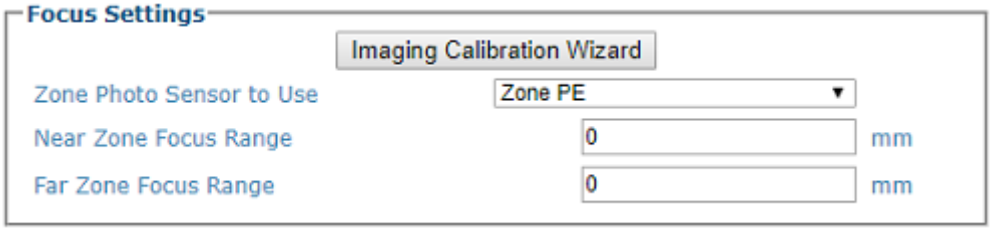
Enter the value of the Depth of Field Threshold.

Use Focus for Label Placement

Select Enabled or Disabled. If enabled, the PackTrack algorithm can use "focus data" from the Position Sensor to more accurately determine if a decoded symbol can be placed on a parcel.

DUAL ZONE





Zone Photo Sensor to Use

Identifies which relay input is used to provide the change of focus zone.

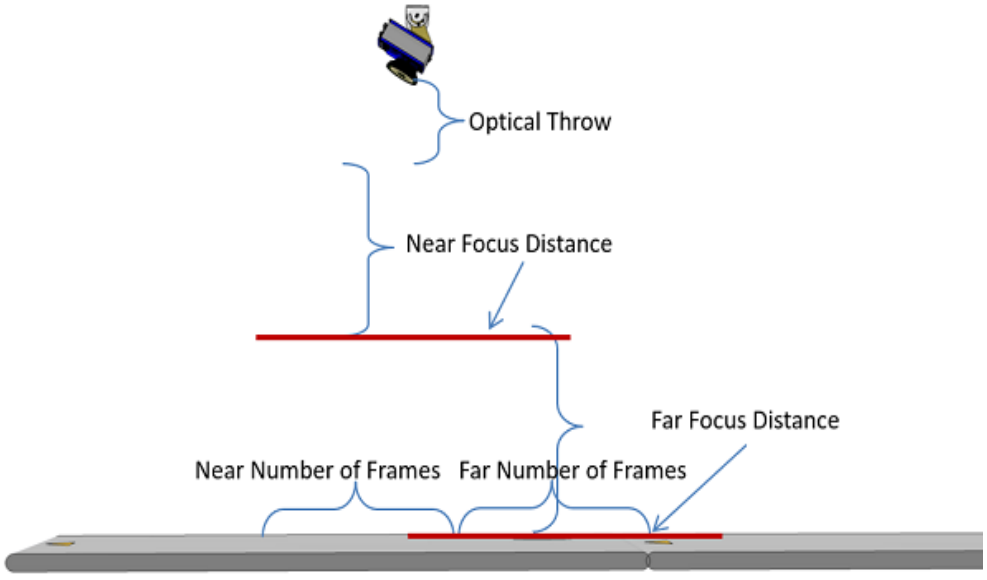
Near Zone Focus Distance

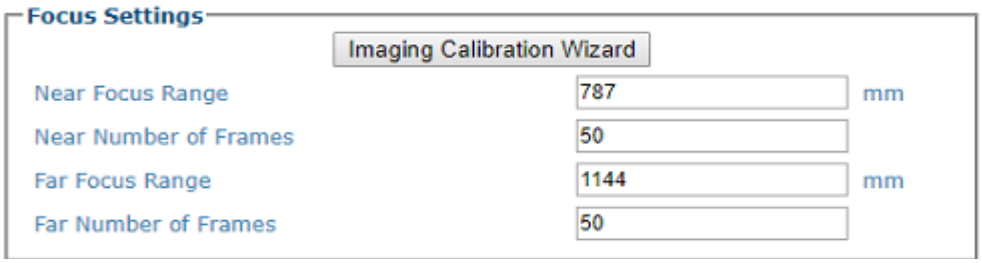
The distance from the back of the camera to the mid range of the near zone.

Far Zone Focus Distance

The distance from the back of the scanner to the Mid range of the far read zone.

SEQUENTIAL





The Sequential mode allows for the AV500 to read bar codes in two separate zones without the need of a photo sensor. the AV500 will set two separate focus zones and control the frames it keeps the focus for each zone

Near Focus Distance

Near Zone Focus Distance is the distance from the back of the scanner to the Mid range of the near read zone.

Near Number of Frames

Near Number of Frames determines the number of frames the AV500 will remain in the near zone until it changes its focus to the far zone.

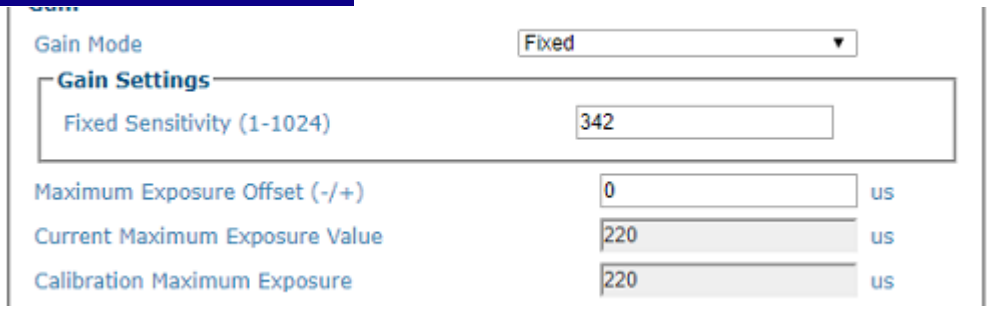
Far Focus Distance

Far Zone Focus Distance is the distance from the back of the scanner to the Mid range of the far read zone.

Far Number of Frames

Far Number of Frames determines the number of frames the AV500 will remain in the far zone until it changes its focus to the near zone.

Gain



Gain Mode

Select Profile or Fixed from the drop-down list.

When profile is selected the AV500 will adjust the image Sensitivity according to the identified distance from the camera. The closer the package is to the AV500 the lower the sensitivity. The farther the distance, the greater the Sensitivity adjustment.

Gain Settings

If Profile is selected, Sensitivity Table offset Factor

Sensitivity Table Offset Factor

Sensitivity Table Offset Factor, when used with the Dual Zone Focus Mode option will adjust the gain in the near zone (I need to still find out how it is effected when the Dynamic option is selected.)

If Fixed is selected, Fixed Sensitivity

Fixed Sensitivity (1-1024)

(1-1024)In the Fixed Sensitivity configuration the Sensitivity is adjusted to optimize the image intensity and is maintained through the DOF.

Maximum Exposure Offset (-/+)

This is the offset to be applied to the value in “Calibrated Maximum Exposure”. The result of “Calibrated Maximum Exposure” +/- “Maximum Exposure Offset” cannot be lower than 20 or greater than the value in “Calibrated Maximum Exposure”

Current Maximum Exposure Value

The result of “Calibrated Maximum Exposure” +/- “Maximum Exposure Offset”. This is the maximum amount of exposure the camera will use. Lower values will reduce motion blur at higher belt speeds.

Calibrated Maximum Exposure

The maximum exposure value calibrated in the factory. The “Current Maximum Exposure Value” cannot not exceed this value

Binary

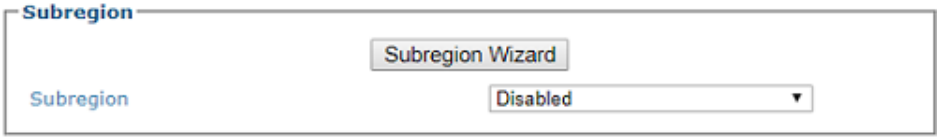
Binary Mode

Select Enable or Disable from the drop-down. Binary Mode enabled will use the least significant bit of each pixel to create a binary image.

Binary Margin (0-255)

If Binary Mode is enabled, enter the Binary Margin. Binary Margin is used to determine whether a pixel should be a 1 or a 0. Higher margin values will result in less noise (more white values) but less detail. Lower margin values will produce more detail but also more noise

Subregion



Subregion Wizard

Click the Subregion Wizard button (See “Subregion Wizard” on page 199) to access a tool to automatically draw a green rectangle around a region of the pattern specifying an Imaging Subregion used to determine what frames intersect a package (PackTrack). See left/right/top/bottom PackTrack functions.

Subregion

Select **Enable** or **Disable** from the drop-down.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Imaging Calibration Wizard

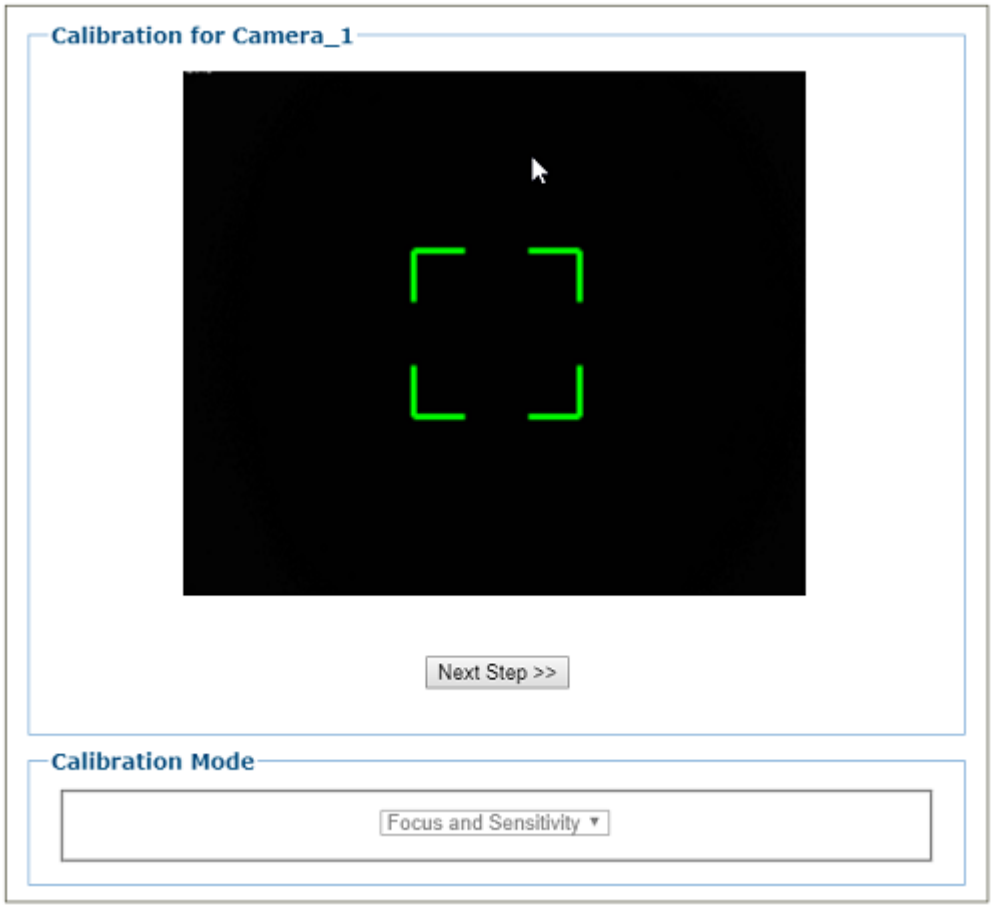
Use the **Imaging Calibration Wizard** to automatically calibrate focus and sensitivity for the Fixed, Dual and Sequential focus modes.

To access the Imaging Calibration Wizard:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Imaging**. The **Imaging window** opens. Click the **Imaging Calibration Wizard** button. The steps for this wizard are different based upon the focusing method you chose.

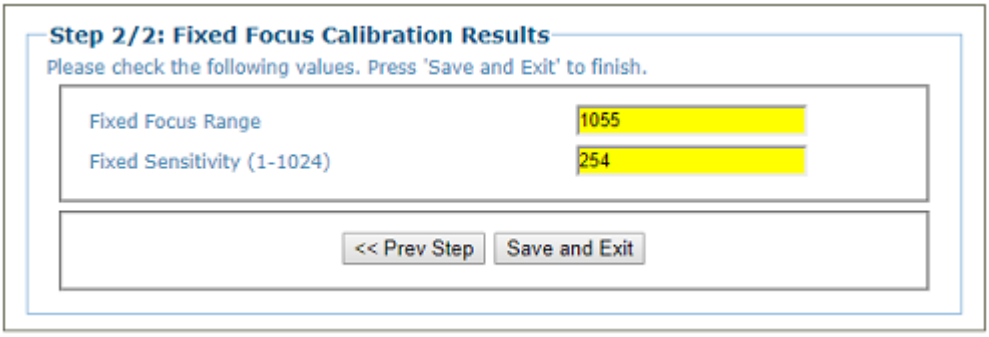
Fixed Focus Calibration

1. When you click the Imaging Calibration Wizard this is the first screen you will see. Click **Next Step>>**.

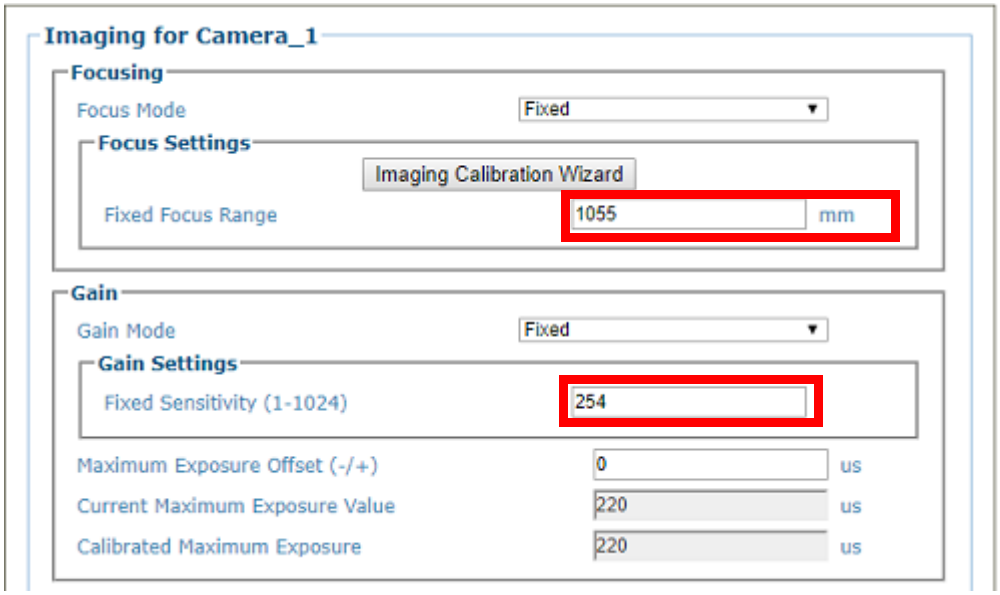


2. Place a Calibration Target, or clean barcode, in the middle of the desired working range. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.

3. You will hear the focusing mechanism as it moves into the optimal focusing position for the specific camera.

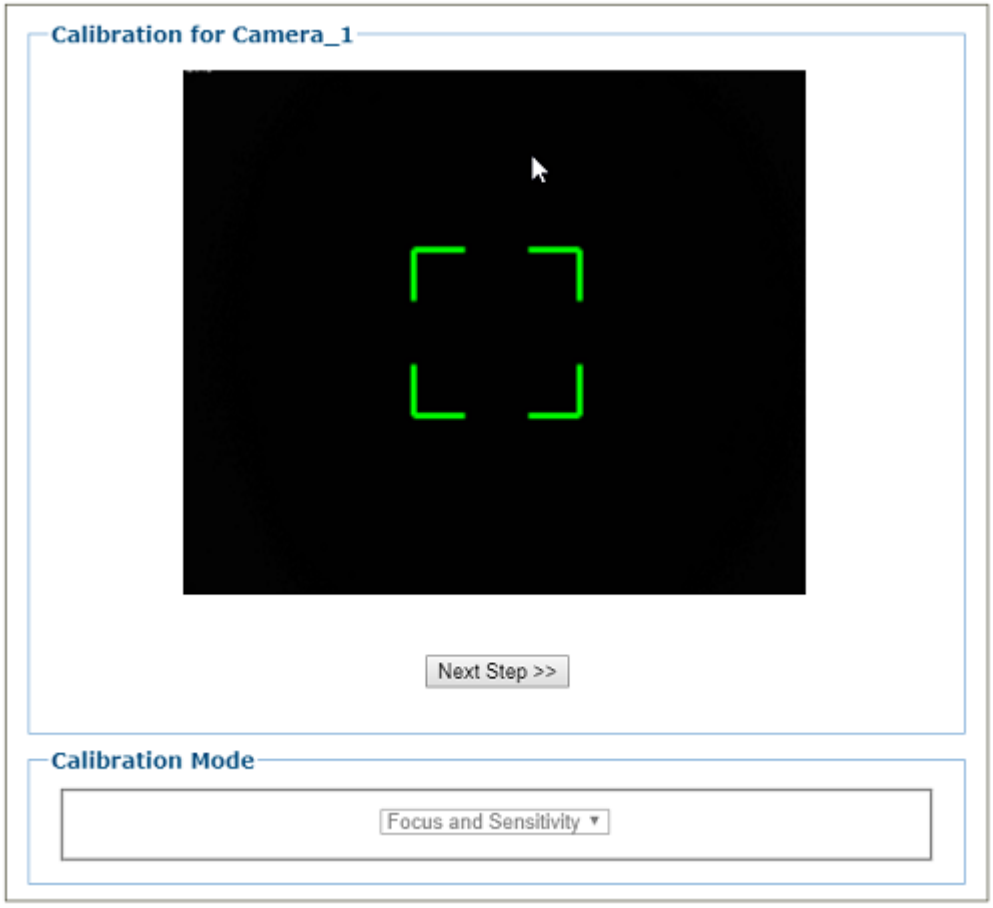


4. Click **Save and Exit** and the Fixed Focus Range and Sensitivity values are entered into the Imaging parameters based upon the wizard determinations.

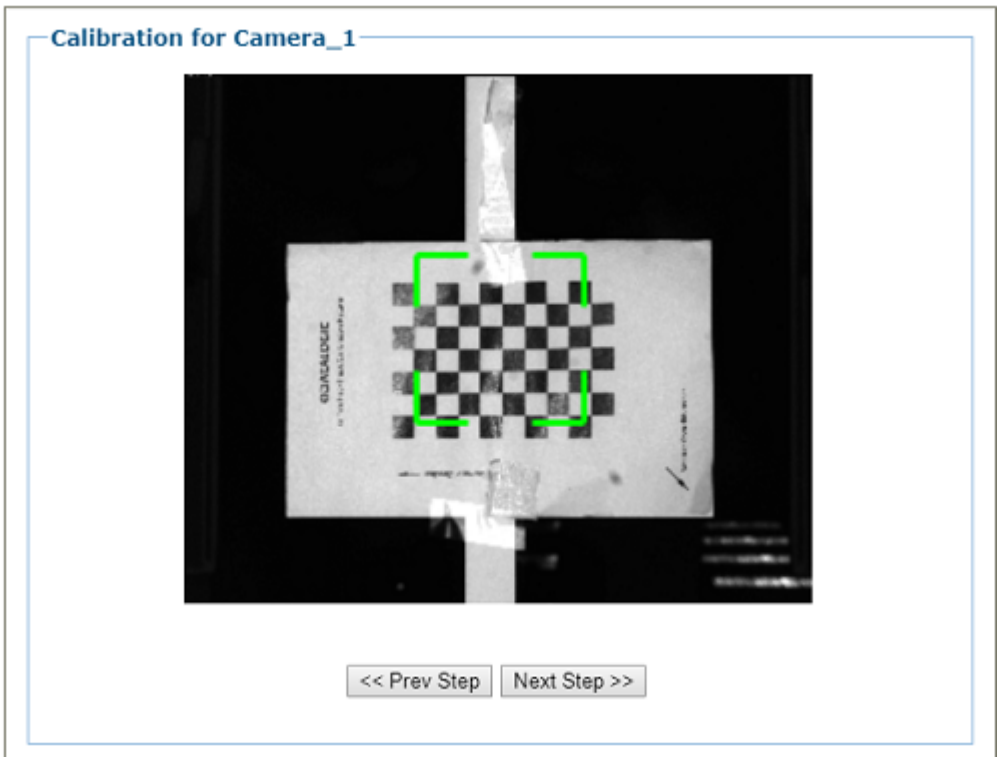


Dual Zone Calibration

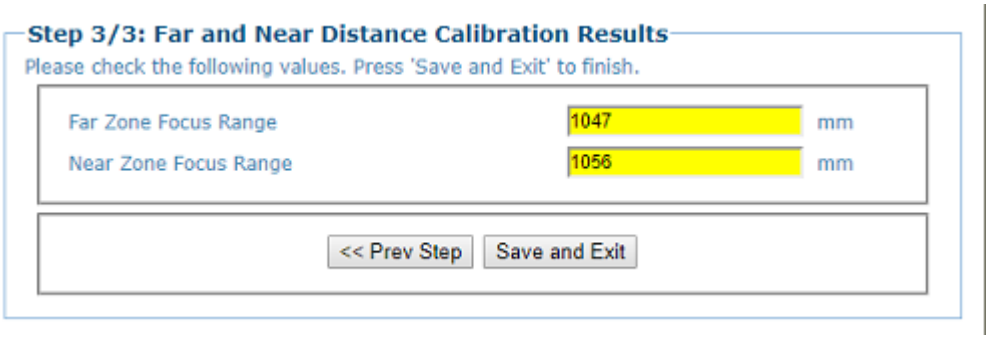
1. If you have selected Dual Zone focusing, and you click the Imaging Calibration Wizard this is the first screen you will see. Click **Next Step>>**.



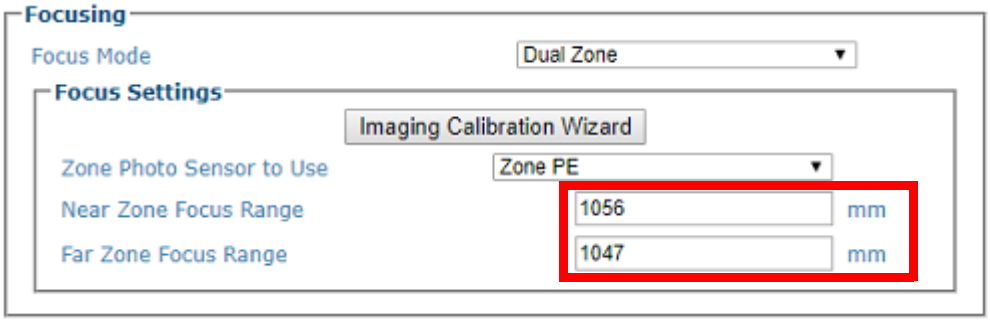
2. Place a Calibration Target, or clean barcode, in the center of the **far working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.



3. Place a Calibration Target, or clean barcode, in the center of the **near working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.

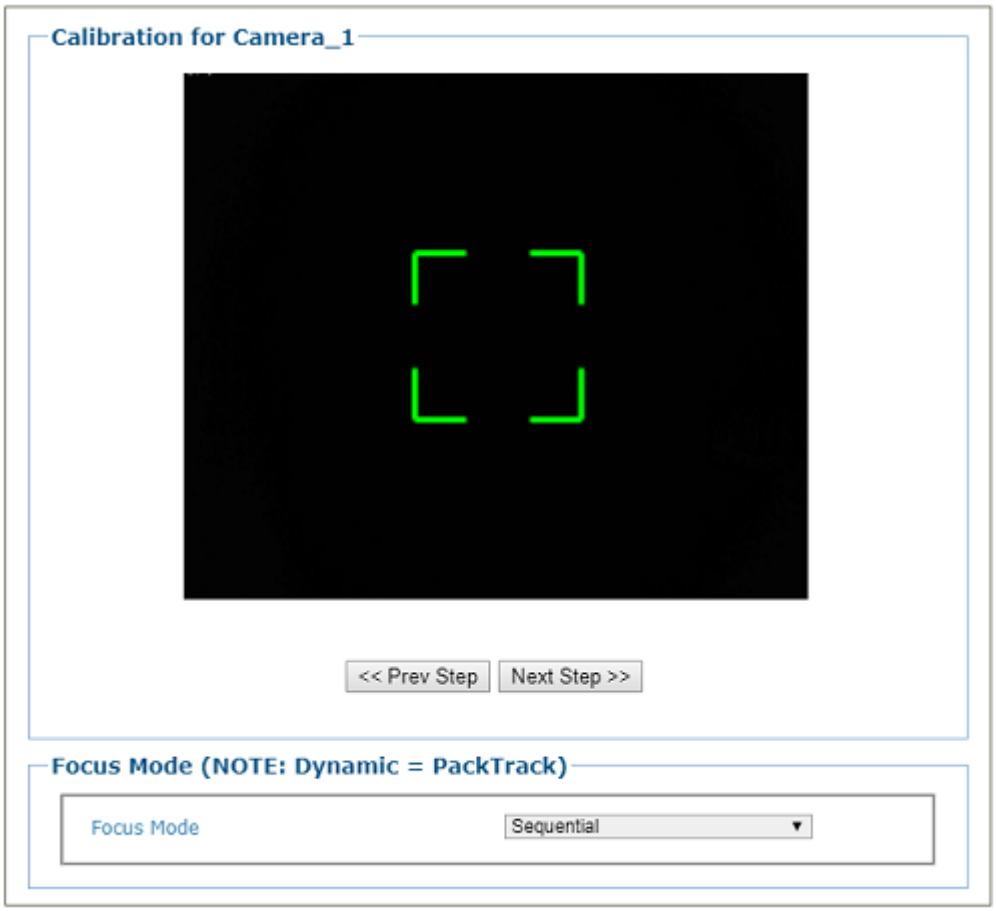


4. Click **Save and Exit** and the Near and Far Zone Focus Ranges are entered into the Imaging parameters based upon the wizard determinations

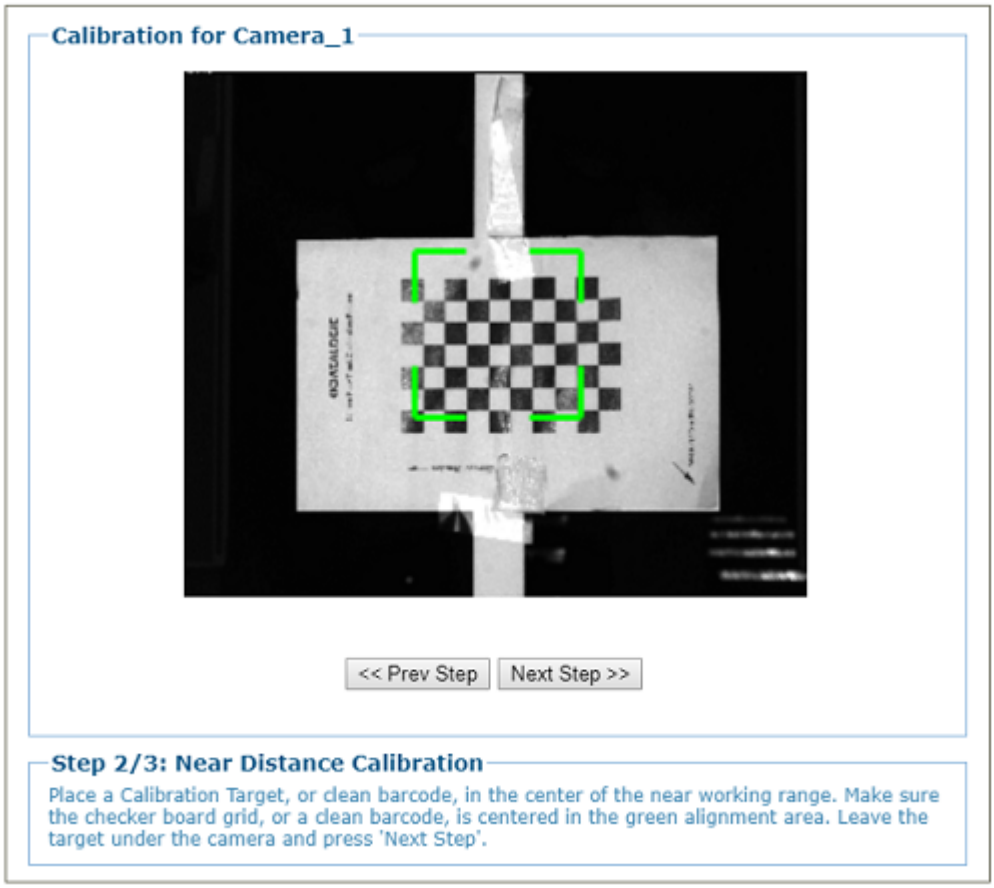


Sequential Calibration

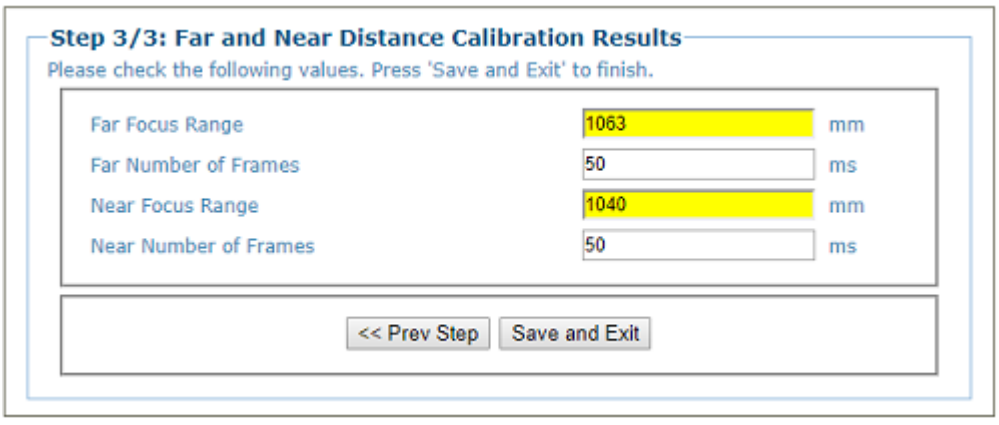
1. If you have selected Sequential focusing, and you click the Imaging Calibration Wizard click **Next Step>>**



2. Place a Calibration Target, or clean barcode, in the center of the **far working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press 'Next Step'

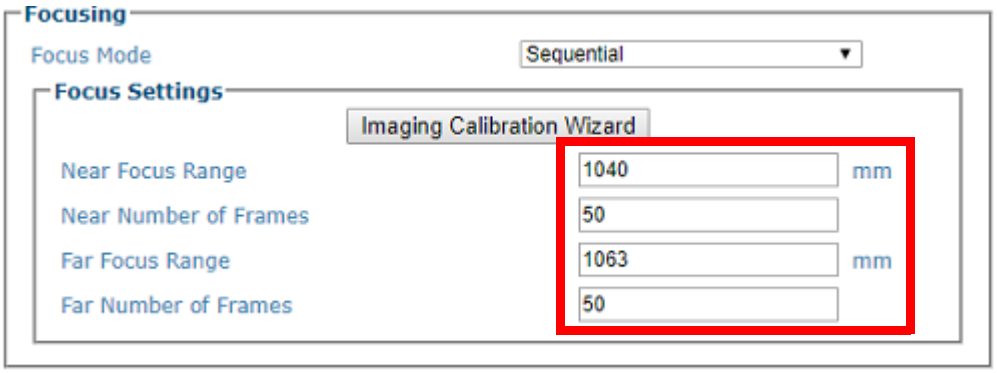


3. Place a Calibration Target, or clean barcode, in the center of the **near working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press 'Next Step'



4. Click **Save and Exit** and the **Far and Near Focus Ranges** are entered into the Image parameters based upon the wizard determinations.

5. You can enter the number of frames as desired.


Focusing
Focus Mode
Sequential
Focus Settings
Imaging Calibration Wizard
Near Focus Range
1040
mm
Near Number of Frames
50
Far Focus Range
1063
mm
Far Number of Frames
50

Subregion Wizard

Use the **Subregion Wizard** to automatically draw a green rectangle around a region of the pattern specifying the Imaging Subregion. The Imaging Subregion (if enabled) is used to determine what frames intersect a package (PackTrack). See left/right/top/bottom PackTrack functions.

To access the Subregion Wizard:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Imaging**. The **Imaging window** opens. Click the **Subregion Wizard** button.

2. Place a Calibration Target at the maximum distance from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press 'Next Step'.

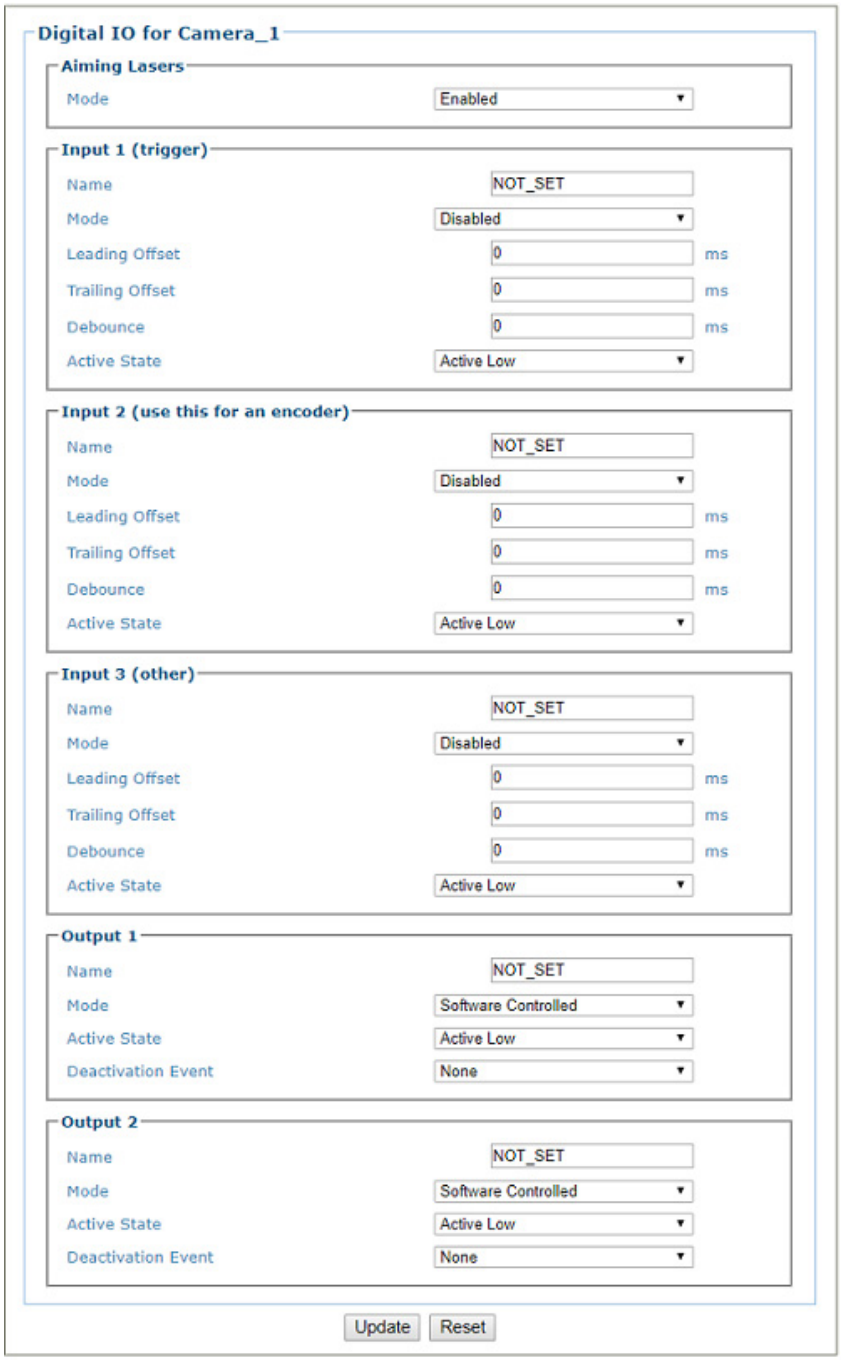
3. You can click "**Update**" on the Image Viewer page to transfer the subregion values back to the Imaging page, where you can submit them.

Device Settings | Camera #n | Digital IO

Use the **Digital IO** window to configure the inputs and outputs for the selected camera.

To view the Digital IO window:

1. In the menu tree under **Modify Settings,** navigate to **Device Settings | <Camera name> | Digital IO**. The **Digital IO** window opens.



2. Enter the appropriate information in the form as described below:

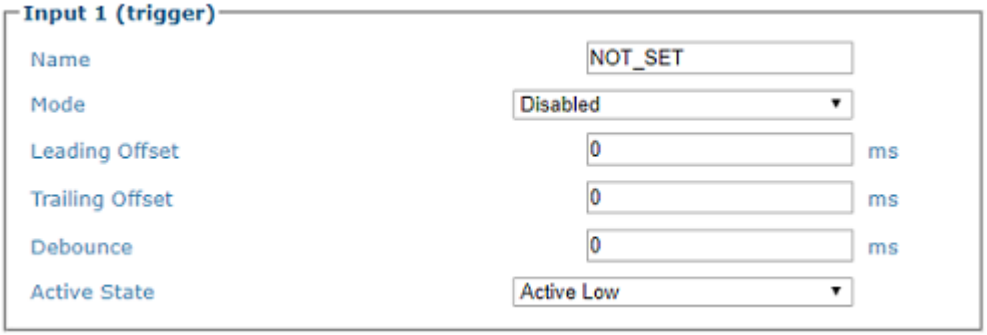
Aiming Lasers

Mode

Select Disabled or Enabled from the drop-down. When Enabled the AV500 will project two red LED's. This is to be used during installation to confirm the center of the AV500 image on the scanning surface. It can also be used for a presentation applications where the unit is set in the Continuous Focus Mode to identify the best position for presenting the bar code to the scanner.

INPUTS

Input 1 (Trigger)



Name

A text field that will allow the user to identify the purpose or function of the I/O option. An example of this may be Trigger, Zone 1 PE, etc.

Mode

Select one of the following from the drop-down.

- **Disabled**
- **Start and End Photo Sensor:** The Start and End Photo Sensor option is use when the area of coverage needed is larger than the time allowed with just a single photo sensor.
- **Dual Start Photo Sensor/Dual End Photo Sensor:** The Dual Start identifies the beginning of the trigger signal and the Dual End identifies the end of the trigger cycle
- **Zone Photo Sensor:** The Zone Photo Sensor is used to identify a near/far focusing area. When the Zone Photo Sensor is active the AV500 will adjust the focusing to accommodate the defined zone. The AV500 can accommodate multiple zones
- **Indicate Active Controller:** With some applications there can be two AV500 scanners that have the ability to be the array controller. The customer will supply an input to the controller they want to be the controller. Upon a reboot of the array the unit with the "Indicate Active Configuration" set by the customer will assume the controller responsibility.
- **Indicate Active Configuration:** When selected there will be two new menu options under the Configuration Names field; Primary Configuration Name and Secondary Configuration Name. This options allows for the AV500 to be used in an application where the conveyor can be run in either direction. When the bit goes high the AV500 will use a separate configuration file to accommodate the change in the conveyance direction.

The following options become available. Indicate the correct **Active** configuration.

- **Custom**

Leading Offset

Enter the offset distance prior to the trigger.

Trailing Offset

Enter the offset distance after the trigger.

Debounce

Enter the distance the trigger should be blocked to be considered a valid trigger.

Active State

Select one of the following from the drop-down:

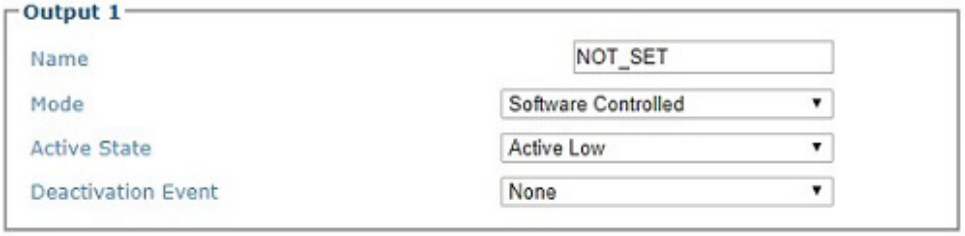
Active Low/Active High: The Active State allows the AV500 to accommodate the state of the

input signal.

NOTE

Input 2 and 3 have the same parameter options. Use Input 2 for an encoder.

OUTPUTS



Name

Enter a name to identify the output.

Mode

Select one of the following from the drop-down. These are events that trigger the output except "External Illumination". External Illumination mode allows an illumination to be controlled by the AV500 such that it will be synchronized with the internal illumination.

- **Software Controlled:** Custom
- **External Illumination**
- **Good Read**
- **Partial Read**
- **No Read**
- **Multiple Read**
- **Camera Error**
- **Trigger**
- **Ethernet/IP Out1:** Sends bit out
- **Ethernet/IP Out2:** Sends bit out

Active State

Select one of the following from the drop-down:

Active Low: Sets the bit open

Active High: Sets the bit closed

Deactivation Event

Select **None, Timeout, Distance f**rom the drop-down.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Settings | Camera #n | Serial Port

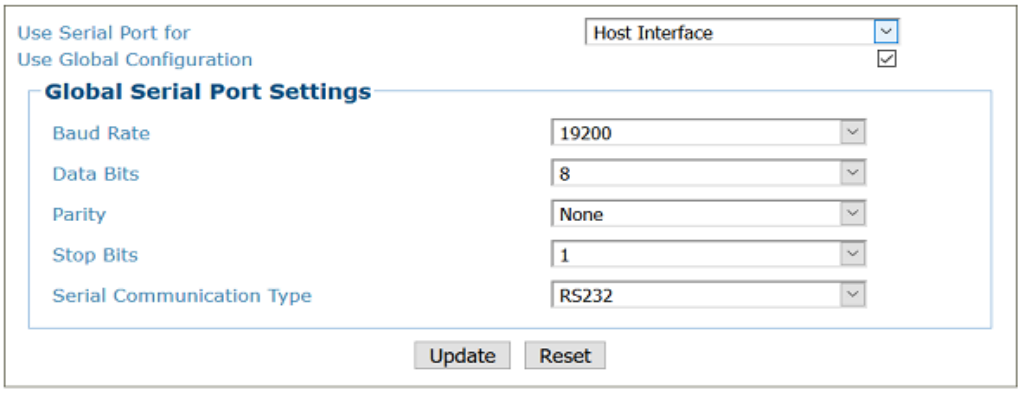
Use the Serial Port menu tree selections to set up communications through the serial Port. If necessary, you can later make modifications to the device settings using the same menu selections, including:

Focus | Host Port Settings

Use the **Focus Port** window to configure communication between the camera and the focusing device. The focus port is only used to match the focus device's communication configuration (light curtain, DM3610).

To edit the Focus Port settings:

1. In the menu tree under **Modify Settings,** navigate to **Modify Settings | Device Settings | Camera N | Focus | Host Port Settings**. The **Focus | Host Port Settings** window opens.



2. Enter the appropriate information in the form as described below:

Use Serial Port for

Select one of the following from the drop-down:

Host Interface: The Host Interface is used to communicate with the customers serial interface. The AV500 can either communicate RS232 or RS422.

Focus Input: The Focus Input is used to communicate with the focus device.

Use Global Configuration

Select the check box when using a serial focus device for one or more cameras. When the Use Global Configuration is selected all AV500's in the array can identify the Serial message from the Host/Focus input.

When it is not selected the menu will give the option of selecting a single AV500 in the array.

Baud Rate

Select a value from 1200 to 115200 from the drop-down list. Baud Rate is the transmission speed in a communication line.

Data Bits

Select 7 or 8 from the drop-down list. Data Bits is a parameter indicating the number of bits composing the data packet of the communication protocol frame.

Parity

Select None, Odd, or Even from the drop-down list. Parity is a parameter indicating the presence of a control bit in the communication protocol frame.

Stop Bits

Select 1 or 2 from the drop-down list. Stop Bits is a parameter indicating the number of stop bits in the data packet of the communication protocol frame.

Serial Communication Type

Select RS422 Full Duplex or RS232 from the drop-down list.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Settings | Camera #n | Ethernet

Use the Ethernet menu tree selections to set up communications through Ethernet. If necessary, you can later make modifications to the device settings using the same menu selections, including (click on the menu item to access that help window):

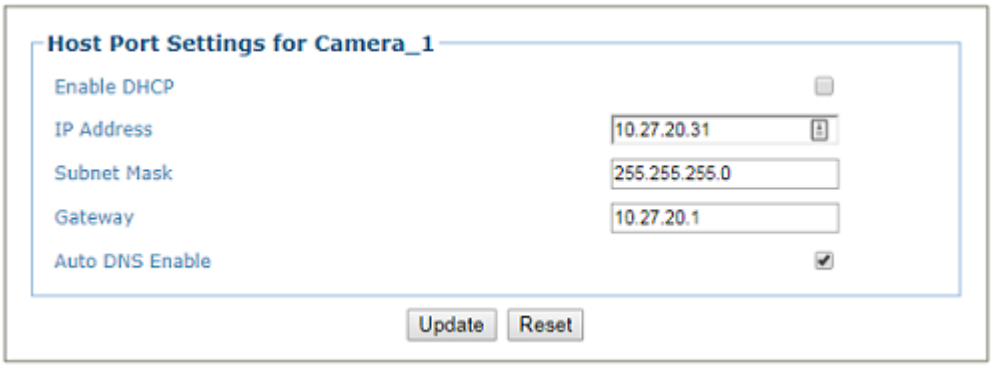
- “Ethernet | Host Port” on page 205
- “Ethernet | Image Port” on page 206
- “Ethernet | Advanced Routing” on page 206

Ethernet | Host Port

Use the **Host Port** window to set up network communications to the Host.

To edit the Host Port settings:

1. In the menu tree under **Modify Settings,** navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Host Port.** The **Host Port w**indow opens.



2. Enter the appropriate information in the form as described below:

Enable DHCP

Select the check box to use addresses assigned by a DHCP server. **When this option is not selected, the static IP options are made available.**

IP Address

Enter the device Internet Protocol (IP) network address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Subnet Mask

Enter the device subnet mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Auto DNS Enable

Select the check box to automatically assign a DNS address. When not selected, the DNS Address field is revealed. Available only in static IP mode (when DHCP is not selected).

DNS Address

Enter the address of the Secondary Domain Name System (DNS) in the field provided.

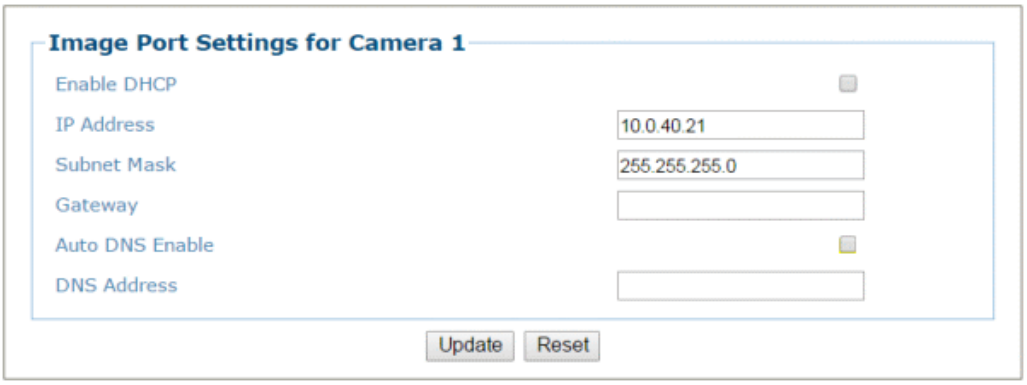
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Ethernet | Image Port

Use the **Image Port** window to set up network communications from the Image Port to a server.

To edit the Image Port settings:

1. In the menu tree under **Modify Settings**, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Image Port**. The **Image Port** window opens.



2. Enter the appropriate information in the form as described below:

Enable DHCP

Select the check box to use addresses assigned by a DHCP server. **When this option is not selected, the static IP options are made available.**

IP Address

Enter the device Internet Protocol (IP) network address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Subnet Mask

Enter the device subnet mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Auto DNS Enable

Select the check box to automatically assign a DNS address. When not selected, the DNS Address field is revealed. Available only in static IP mode (when DHCP is not selected).

DNS Address

Enter the address of the Secondary Domain Name System (DNS) in the field provided.

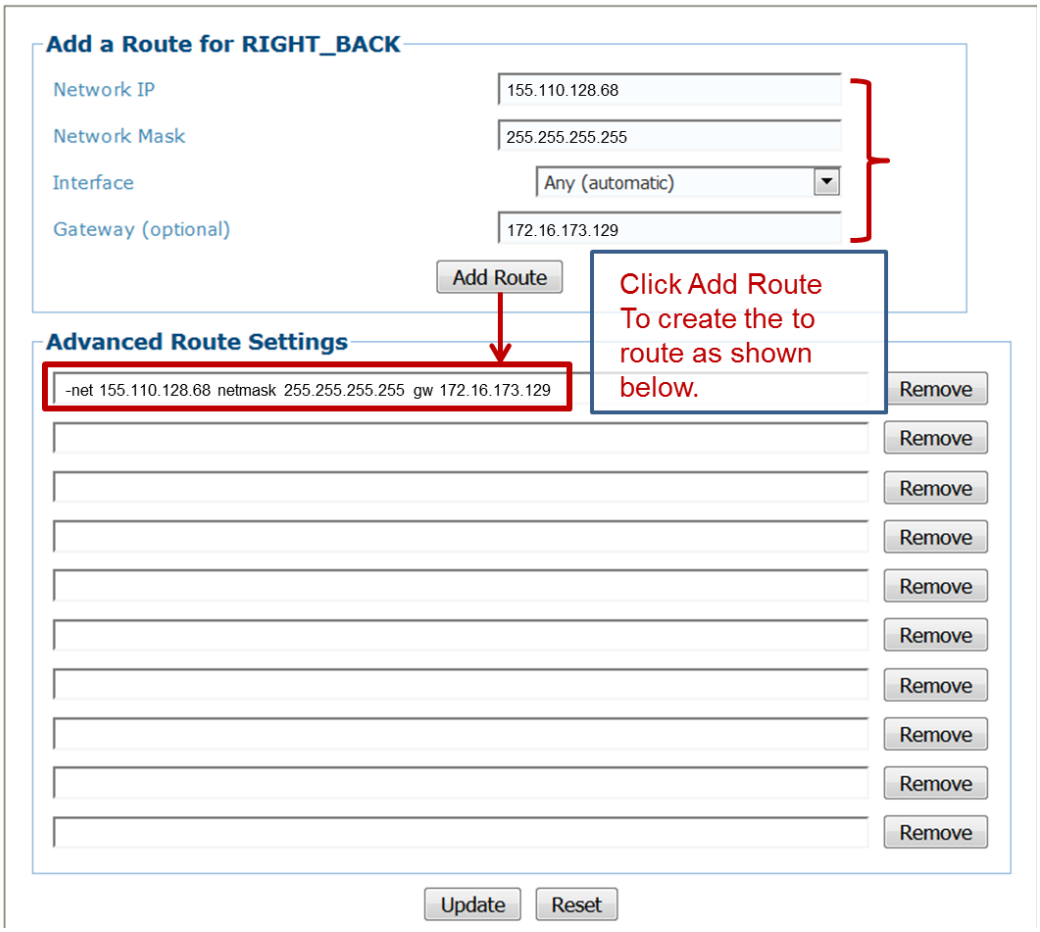
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Ethernet | Advanced Routing

Use the **Advanced Routing** window to make a string command to route to your network.

To edit the Image Port settings:

1. In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Advanced Routing.** The **Advanced Routing** window opens.



2. Enter the appropriate information in the form as described below:

Add a Route for Camera_1

Network IP

Enter the Internet Protocol (IP) address of the network in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode.

Network Mask

Enter the device network mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Interface

Select from the drop-down.

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only static. IP mode (when DHCP is not selected).

Advanced Route Settings

Displays the linux command created from the entries into the above fields.

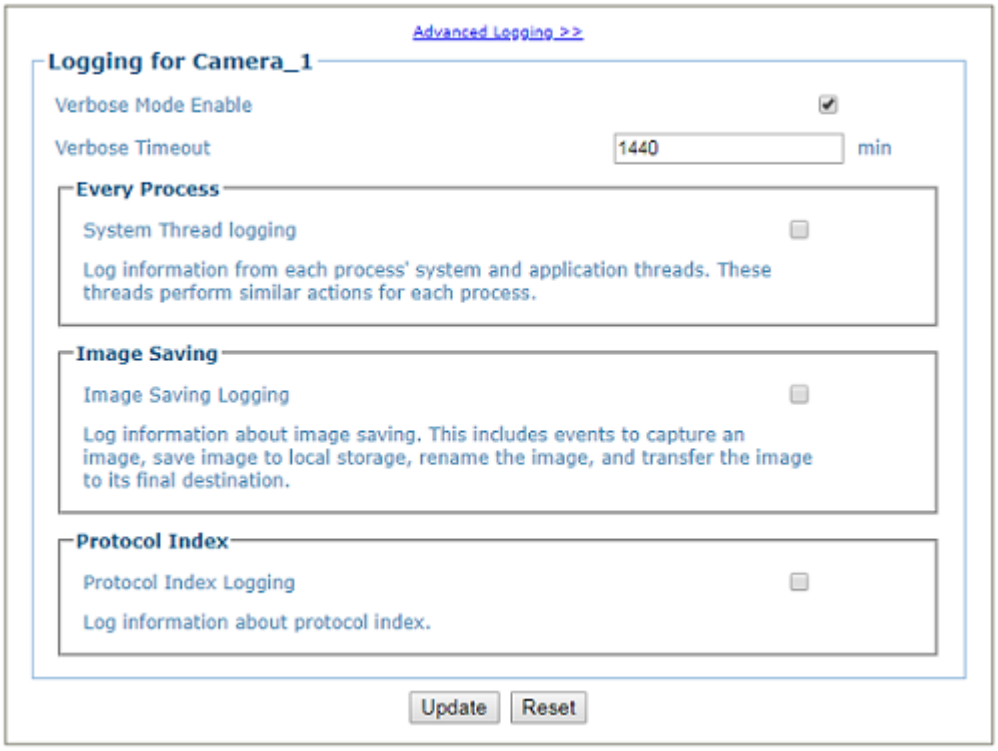
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to previously saved fields.

Device Settings | Camera #n | Logging

Use the **Logging configuration** window to configure how and what information is logged (saved).

To view the Logging configuration window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | Camera # (if applicable) | Logging**. The **Logging window** opens.



2. View the following camera information:

"Advanced Logging" on page 209

Click the link to go to the Advanced Logging window. The main Logging options will typically be all that is needed for standard systems. Advanced logging options are available for problem solving on cameras not connected with the standard decoder. Enabling them may fill the event buffer with unimportant information and therefore overwrite important information.

Verbose Mode Enable

Select the check box to verbose logging. When disabled, the debug log will provide data for Critical, Errors, Warnings, and Info in the log text.

Verbose Timeout

Enter the number of minutes before Verbose Mode will be automatically disabled.

Every Process

Select the check box to log information from each process' system and application threads. These threads perform similar actions for each process.

Image Saving

Select the check box to log information about image saving. This includes events to capture an image, save image to local storage, rename the image, and transfer the image to its final destination.

Protocol Index

Select the check box to Log information about protocol index.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to previously saved values.

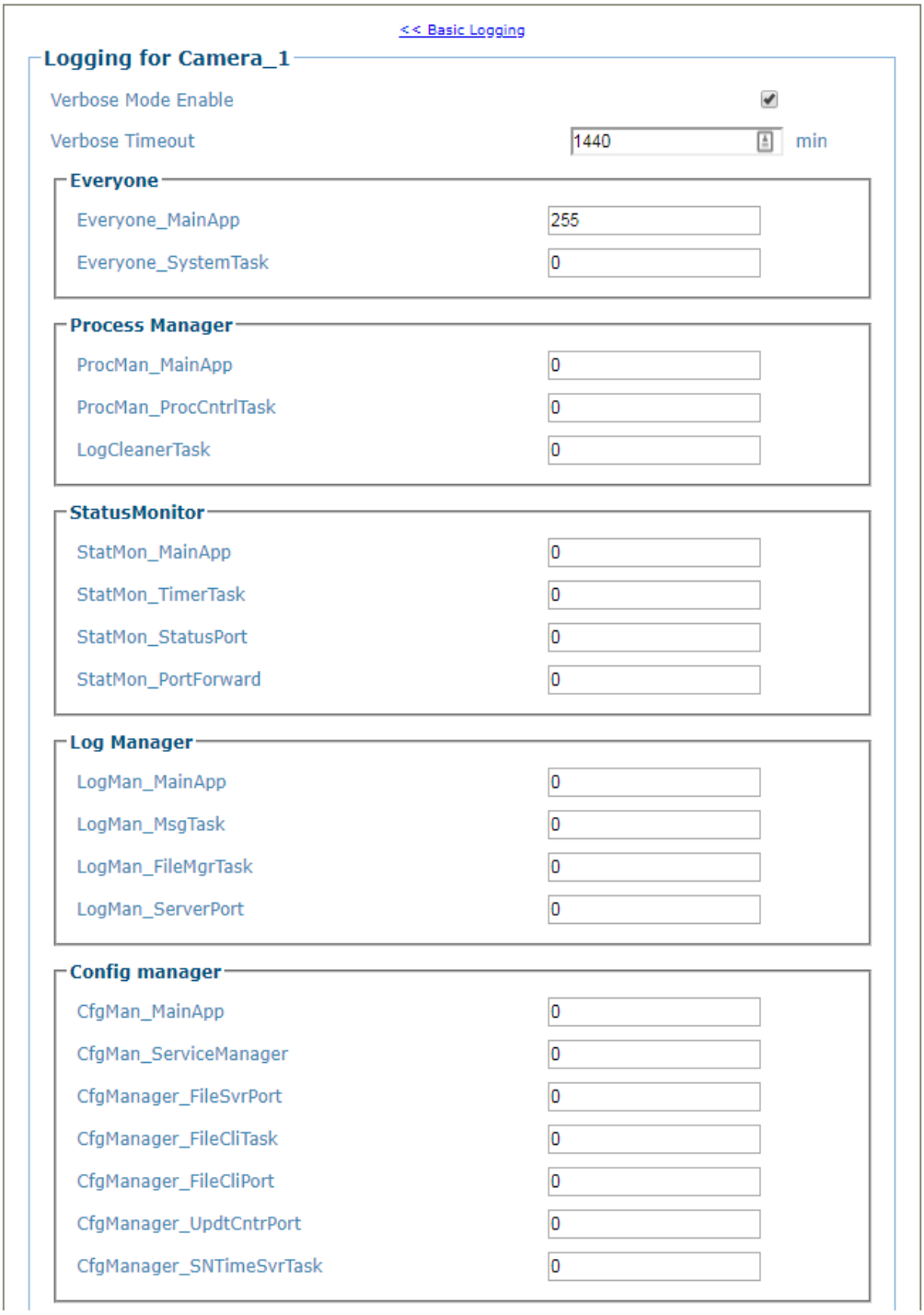
Advanced Logging

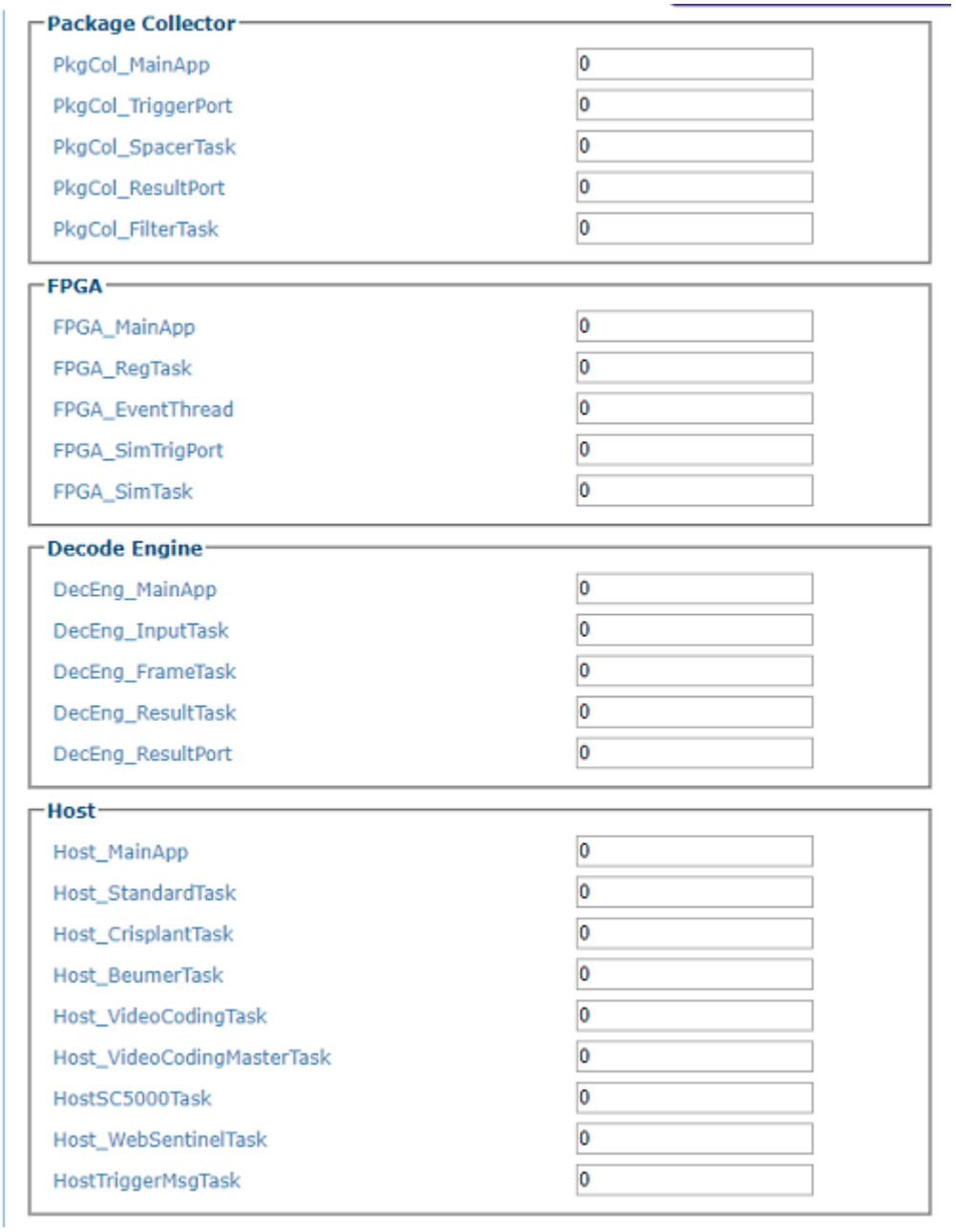
Use the **Advanced Logging** window to configure how and what information is logged (saved). The main Logging options have been identified to cover most logging needs, however, Advanced Logging can provide advanced data collection for troubleshooting purposes.

NOTE **Contact Datalogic Technical Support for proper use of the Advanced Logging options.**

To view the Advanced Logging window:

1. From the **Logging window**, click **Advanced Logging.** The **Advanced Logging** window opens.




Package Collector
PkgCol_MainApp 0
PkgCol_TriggerPort 0
PkgCol_SpacerTask 0
PkgCol_ResultPort 0
PkgCol_FilterTask 0
FPGA
FPGA_MainApp 0
FPGA_RegTask 0
FPGA_EventThread 0
FPGA_SimTrigPort 0
FPGA_SimTask 0
Decode Engine
DecEng_MainApp 0
DecEng_InputTask 0
DecEng_FrameTask 0
DecEng_ResultTask 0
DecEng_ResultPort 0
Host
Host_MainApp 0
Host_StandardTask 0
Host_CrisplantTask 0
Host_BeumerTask 0
Host_VideoCodingTask 0
Host_VideoCodingMasterTask 0
HostSC5000Task 0
Host_WebSentinelTask 0
HostTriggerMsgTask 0

Web Manager

WebMan_MainApp	0
WebMan_StatusTask	0
WebMan_WebDataTask	0
WebMan_ComTask	0
WebMan_ImgWebSock	0
WebMan_LogWebSock	0
WebMan_SysCfgWebSock	0
WebMan_SysStatWebSock	0
WebMan_DevStatWSPort	0
WebMan_DevTrackWSPort	0
WebMan_ImageWSPort	0
WebMan_LogWSPort	0
WebMan_SysCfgWSPort	0
WebMan_SysStatWSPort	0
WebMan_DevStatWebSock	0
WebMan_DevTrackWebSock	0
WebMan_WebSockToiMX	0
WebMan_CalibTask	0
WebMan_RtpLogTask	0
WebMan_ConvViewWebSock	0
WebMan_ConvWSPort	0
WebMan_StatWSPort	0
WebMan_GPIOWebSock	0
WebMan_XPressButtonWebSocK	0

Communication

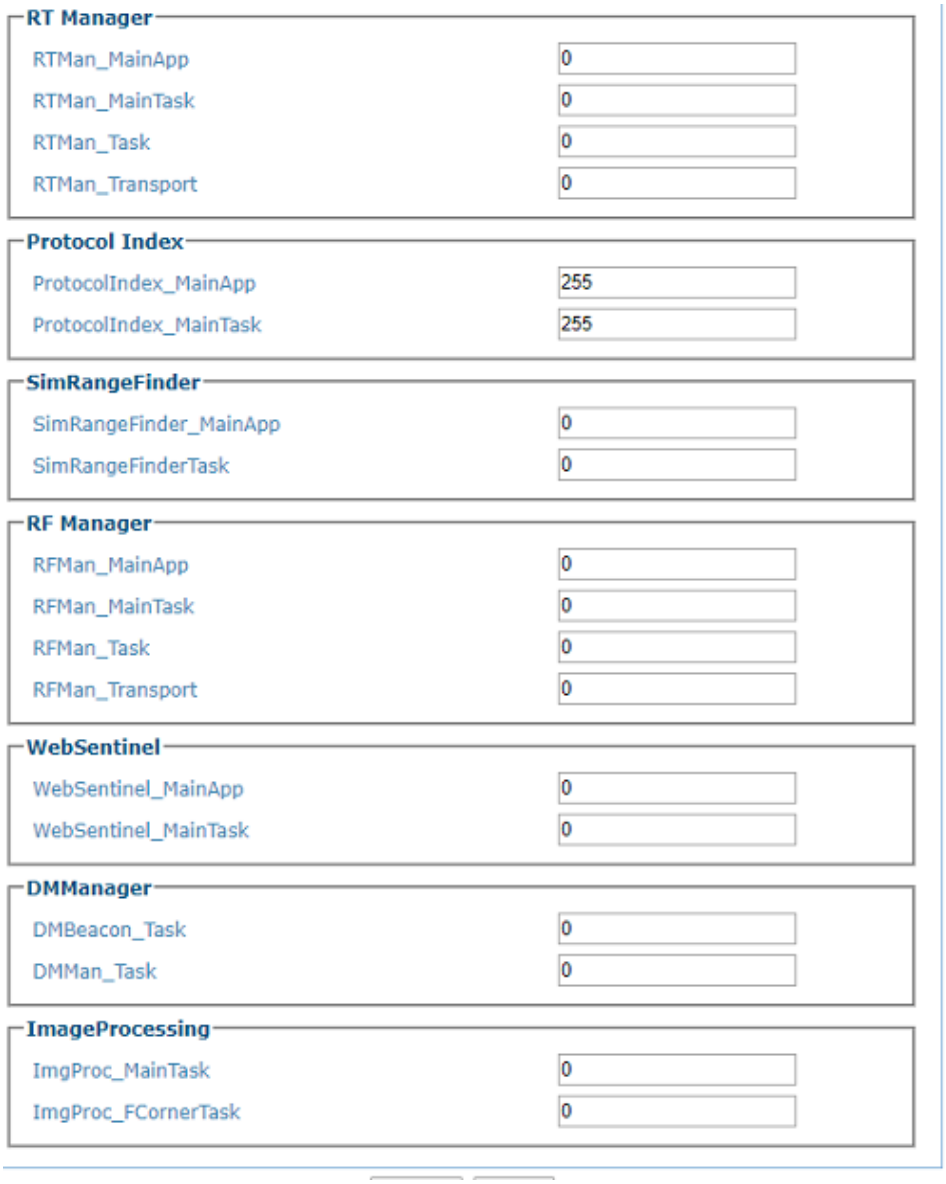
Comm_MainApp	0
Comm_UserPort	0
Comm_UserTask	0
Comm_PI_MCastPort	0
Comm_PI_MCastTask	0
Comm_PI_HeartBeatTask	0

Image Saving Master

ImgSaveMstr_MainApp	0
ImgSaveMstr_MainTask	0
ImgSaveMstr_MCastTask	0
ImgSaveMstr_MCastPort	0

Image Saving

ImgSave_MainApp	0
ImgSave_CreatorTask	0
ImgSave_SenderTask	0
ImgSave_HistoryTask	0
ImgSave_MCastTask	0
ImgSave_MCastPort	0
ImgSave_DirCleanerTask	0



2. View the following camera information.

Basic Logging

Click the link to return to the basic Logging window.

Verbose Mode Enable

Select the check box to verbose logging. When disabled, the debug log will provide data for Critical, Errors, Warnings, and Info in the log text. When enabled, further diagnostic log data is provided in the debug log.

Verbose Timeout

Enter the number of minutes before Verbose Mode will be automatically disabled.

Advanced Logging Parameters

Advanced Logging allows the user to modify logging parameters in several categories, including:

- Everyone
- Image Saving Master
- Image Saving
- Protocol Index

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

DIAGNOSTICS

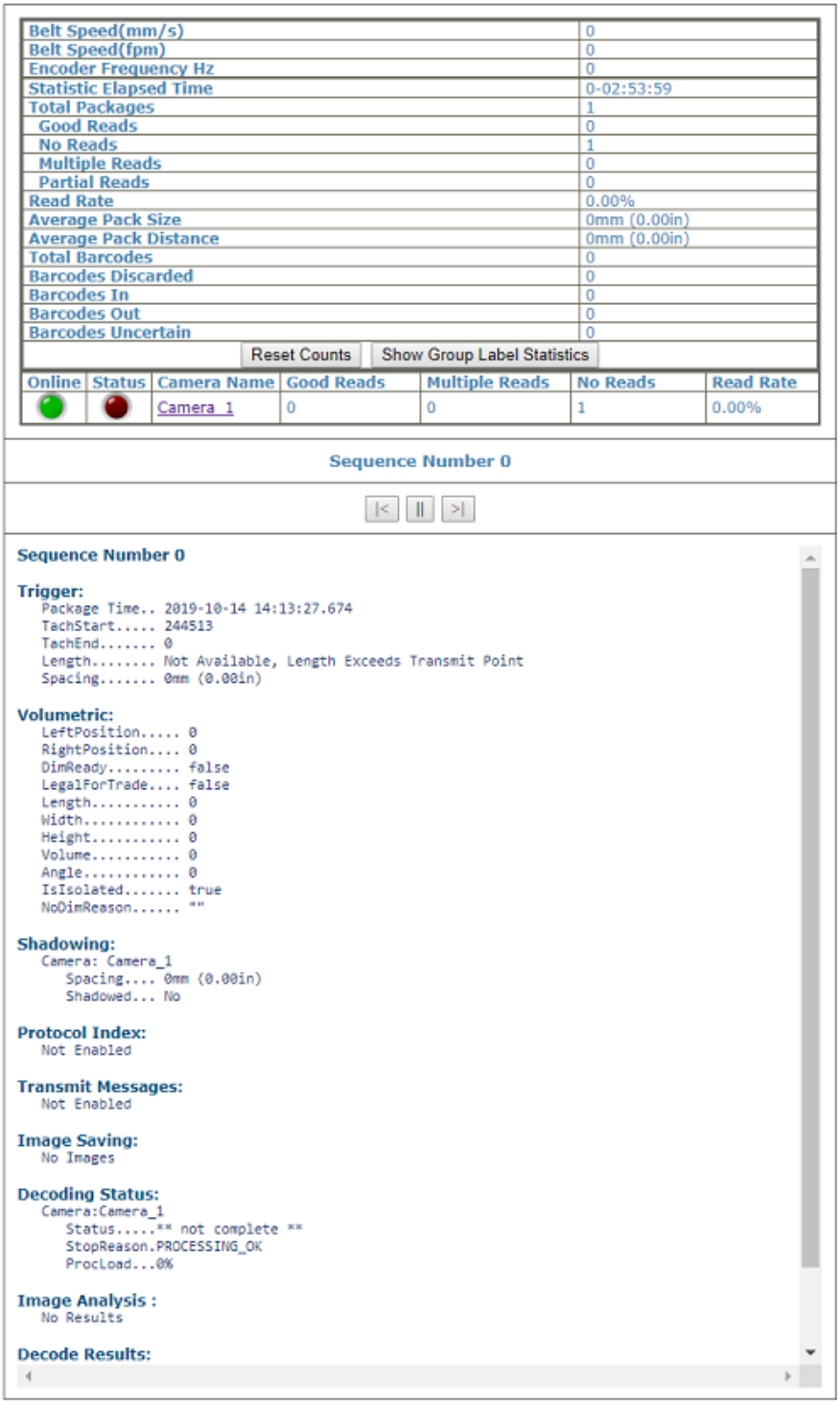
Use the Diagnostics Menu Tree selections to monitor system performance and identify maintenance or device degradation issues. You can continually monitor system performance using the following selections:

Diagnostics | System Status

Use the **System Status** to get an overview of how your system is running.

To access the System Status window:

1. In the menu tree under **Diagnostics**, click **System Status**. The **System Status** window opens.



2. From the System Status window, the following information is available:

NOTE

Statistics have been added to the AV500 to provide for future interface with DL-Stat.

Tunnel/Array Statistics

Belt Speed(mm/s)

Belt speed shown in millimeters per second.

Belt Speed(fpm)

Belt speed shown in feet per minute.

Encoder frequency Hz

The current encoder frequency computed from the current Belt Speed and the Encoder Resolution.

Statistic Elapsed Time

Time elapsed from the last reset or the last modification to the configuration of the system. This is reset at startup and when Reset Counts is clicked.

Total Packages

Package count since last reset.

Good Reads

Number of good packages read since last reset.

No Reads

Number of packages not read since last reset.

Multiple Reads

Number of packages read multiple times since last reset.

Partial Reads

Number of partially read packages since last reset.

Read Rate

Number of packages read out of total number of packages since last reset.

Average Pack Size

The average size of packages since last reset.

Average Pack Distance

The average distance between packages read since last reset.

Total Barcodes

The total number of barcodes read since last reset.

Barcodes Discarded

The total number of barcodes discarded since last reset.

Barcodes In

Total number of barcodes found on the packs detected by the system.

Barcodes Out

Total number of barcodes found outside the packs detected by the system.

Barcodes Uncertain

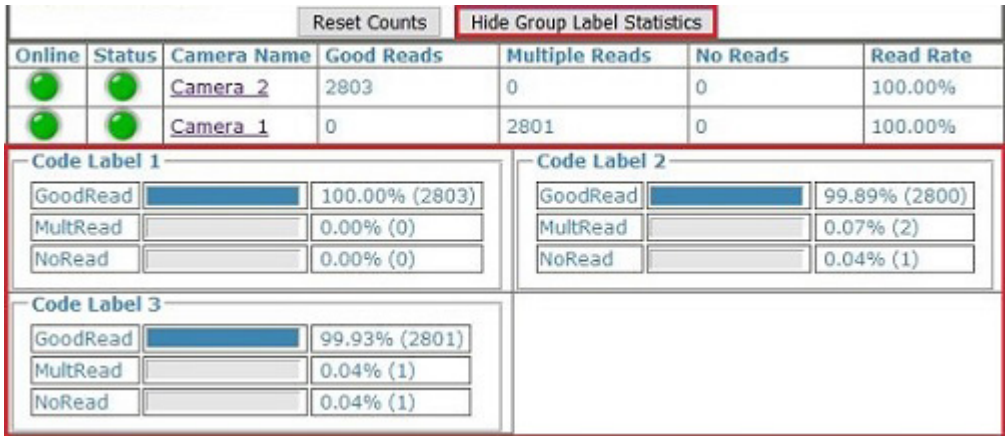
Total number of barcodes found that intersect more than one pack, and are therefore ambiguous.

Reset Counts (button)

Click to reset the counts to zero.

Show Group Label Statistics

Click the button to expose these statistics.



Click **Hide Group Label Statistics** to hide this information.

Package Information

Online

Green indicates the camera is connected to the cluster.
Red indicates the camera is not connected to the cluster.

Status

Green indicates the camera is functioning correctly.
Red indicates the camera has posted an error.

Camera Name

Displays the camera/device name.

Good Reads

Number of good barcode reads on that device since last reset.

Multiple Reads

Number of times a “Mult” condition has been met since last reset for the selected camera.

No Reads

Number of packages not read on that device since last reset for the selected camera.

Read Rate

The average number of packages successfully read on that device since last reset.

Sequence Number

The Sequence Number is the AV500's internal package counter. It will be reset when the AV500 is rebooted.

Back, Pause, Forward

Click the Back |<, Pause ||, and Forward >| buttons to navigate through recent statistics of previous trigger cycles.

Package Information

The following information is displayed:

Trigger: Tachometer information for each phase. The 'Trigger field provides the following information:

Package Time: Date and time that the AV500 saw the package

TachStart: the internal tachometer count seen at the start of the trigger

Tach End: The tachometer count at the end of the trigger signal

Length: Length of the package in millimeters and inches

Spacing: the space between the current and previous package. This is posted in millimeters and inches. When the AV500 is mounted to read multiple surfaces of the package (ie side and back) this parameter specifies a condition where one package, because of illegal spacing, blocks part of the surface of another package. The AV500 is able to detect this condition and will post pertinent information.

Volumetric: The Volumetric information is valid when the AV500 is connected to a DM3610. The AV500 will take the data it receives for the package from the DM3610 and fill the appropriate fieldsgeneral package size/position

Shadowing: Indicates camera spacing and whether there is shadowing

DM3610 Msg Tracking: When the DM3610 transmit message is set to Camera Message, the AV500 will receive the data without the need for any other configuration such as Protocol Index. When this is set and the message is not received within the correct package tach stamp, it will post the Msg Missed Window in this field.

Protocol Index: Protocol data if enabled. Identifies when the Protocol Index window opens and closes and the position of the parcel in tach/encoder pulses.

Transmit Messages: The Transmit Message field will identify the enabled communication Transport and the message that is transmitted out of that port.

Image Saving: Stored Images are displayed for each camera. Click on the link to access a view of that camera's images. Camera N's Images. see "Viewing Camera Images" on page 191, view of the cameras image for the select sequence number.

Decoding Status: Identifies the decoding status of each AV500 in the array and the processing load (how hard the processor has to work to decode the bar code). The higher the number the more processing time it took to identify the bar code data.

Image Analysis:

Decode Results: Posts the barcode data and indicates the camera that read the code

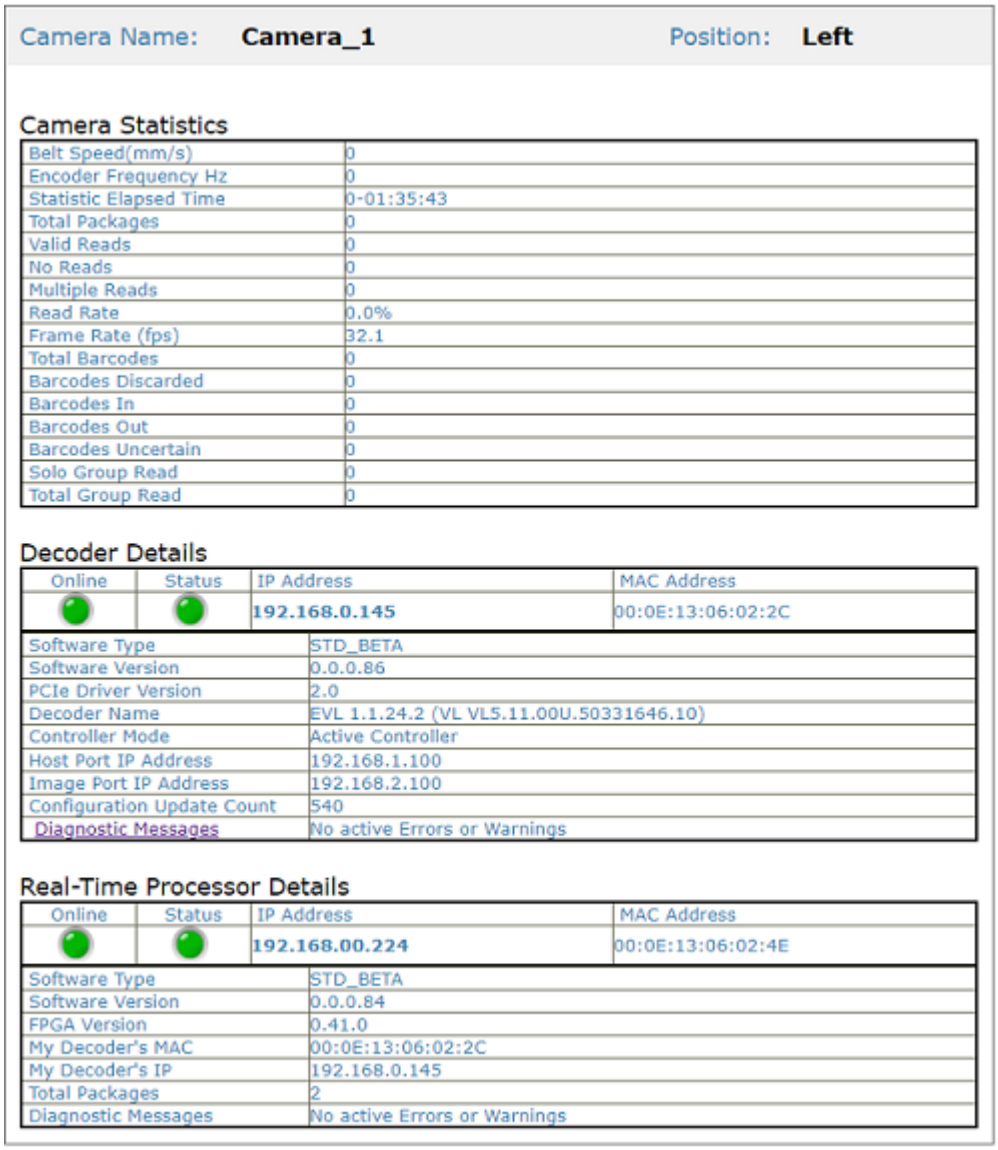
End of Sequence Number: Identifies the total number of packages with history stored in the camera

Camera Statistics

Statistics for each system camera are shown in rows with the following columns:

Camera Name

Displays the camera/device name. Click the device name to view details about that specific device:



Camera Name: **Camera_1** Position: **Left**

Camera Statistics

Belt Speed(mm/s)	0
Encoder Frequency Hz	0
Statistic Elapsed Time	0-01:35:43
Total Packages	0
Valid Reads	0
No Reads	0
Multiple Reads	0
Read Rate	0.0%
Frame Rate (fps)	32.1
Total Barcodes	0
Barcodes Discarded	0
Barcodes In	0
Barcodes Out	0
Barcodes Uncertain	0
Solo Group Read	0
Total Group Read	0

Decoder Details

Online	Status	IP Address	MAC Address
		192.168.0.145	00:0E:13:06:02:2C

Software Type	STD_BETA
Software Version	0.0.0.86
PCIe Driver Version	2.0
Decoder Name	EVL 1.1.24.2 (VL VL5.11.00U.50331646.10)
Controller Mode	Active Controller
Host Port IP Address	192.168.1.100
Image Port IP Address	192.168.2.100
Configuration Update Count	540
Diagnostic Messages	No active Errors or Warnings

Real-Time Processor Details

Online	Status	IP Address	MAC Address
		192.168.00.224	00:0E:13:06:02:4E

Software Type	STD_BETA
Software Version	0.0.0.84
FPGA Version	0.41.0
My Decoder's MAC	00:0E:13:06:02:2C
My Decoder's IP	192.168.0.145
Total Packages	2
Diagnostic Messages	No active Errors or Warnings

Belt Speed(mm/s)

Shown in millimeters per second.

Encoder frequency Hz

The current encoder frequency computed from the current Belt Speed and the Encoder Resolution.

Statistic Elapsed Time

Time elapsed from the last reset or the last modification to the configuration of the system. This is reset at startup and when Reset Counts is clicked.

Total Packages

Package count since last reset.

Valid Reads

Number of good packages read since last reset.

No Reads

Number of packages not read since last reset.

Multiple Reads

Number of times a “Mult” condition has been met since last reset.

Read Rate

The average number of packages successfully read since last reset.

Frame Rate (fps)

The number of frames per second.

Total Barcodes

Indicates the number of barcodes read from all the scanners, including Multiple Reads.

Barcodes Discarded

Barcodes that did not match an entry in the Barcode Settings Table.

Barcodes In

Total number of barcodes found on the packs detected by the system.

Barcodes Out

Total number of barcodes found outside the packs detected by the system.

Barcodes Uncertain

Total number of barcodes found that intersect more than one pack, and are therefore ambiguous.

Solo Group Read

Click to reset the counts to zero. Number of Group Labels read only by the single scanner.

Total Group Read

Click to reset the counts to zero. Total number of Group Labels read by the single scanner.

Decoder Details

Software Type

Software Version

PCIe Driver Version

Decoder Name

Controller Mode

Host Port IP Address

Image Port IP Address

Configuration Update Count

Diagnostic Messages

Real-Time Processor Details

Software Type

Software Version

FPGA Version

My Decoder's MAC

My Decoder's IP

Total Package

Diagnostic Messages

Diagnostic Message

Click on **Diagnostic Messages** and a **Diagnostic Messages** window opens.

Camera_1		Position: Top
Count	Severity	Description
0	Critical	FPGA_RFU1
0	Error	Failed to set space notification
0	Critical	IV Monitor failed to get an image buffer
0	Error	LogManager can't open a log file
0	Error	LogManager can't write to the log file
0	Error	PROCMAN_RFU1
0	Information	Application in startup list does not exist
0	Critical	Application failed to start
0	Information	Application failed to shutdown
0	Critical	Maximum Application restarts
0	Critical	Maximum system resets in one day
0	Information	Decoder load warning
0	Information	Decoder overload error
0	Error	Bad scanline data detected
0	Information	FPGA_RFU1
0	Information	FPGA_RFU2
0	Information	Driver returned an error
0	Error	Configuration not synchronized with cluster
0	Warning	Decoder CPU over temperature
0	Warning	Decoder board over temperature
0	Warning	Decoder rfu1 over temperature
0	Warning	Decoder rfu2 over temperature
0	Warning	Decoder Configuation read/write failure
0	Warning	Decoder version reade failure
0	Warning	Decode frame(s) discarded
0	Warning	Start/End Trigger out-of-sync
0	Warning	Start/End Trigger too short
0	Critical	Controller Camera is Offline
0	Error	Camera status not understood
1	**Error**	**Expected Camera is Offline**
0	Warning	Unexpected Camera is Online
0	Error	Unable to read Decoder IP address
0	Error	Unable to read Decoder MAC address
0	Error	RangeFinder is not Online
0	Warning	RangeFinder is not Expected
0	Warning	RangeFinder is not OK
0	Error	RangeFinder status not understood
0	Critical	Real-Time Processor is not Online
3	**Error**	**Real-Time Processor has Errors**
0	Error	Real-Time Processor status not understood
0	Error	Dimensioner Beacon not understood
0	Error	Far Working Distance Out of Range
0	Error	Fixed Focus Value Out of Range
0	Error	Error Configuring the Decode Engine
0	Warning	Real-time Processor has Warnings
0	Warning	Bottom Camera Distance to Scanline too Small
0	Warning	Distance to Scanline too small
0	Error	Image Saving Queue is Full. Check Connection Speed
0	Error	Not Saving BMP Image. Request Too Late
0	Error	Failed to Write Image to File System
0	Error	Failed to Login to FTP Server
0	Error	Failed to Write Image to FTP Server
0	Error	Failed to Write Image to Offline Viewer
0	Error	Image Transfer Falling Behind. Check Connection Speed
0	Error	Failed to Read Image from Ramdisk
0	Error	Failed to Allocate Memory for Image Transfer
0	Error	No ACK from Rangefinder after Parameter Update
0	Error	Could Not Save JPEG - Queue is Full
0	Error	Could Not Save JPEG - Compression Failed
0	Error	Could Not Save JPEG - Job Queue is Full
0	Error	Could Not Save JPEG - Waiting for FPGA
0	Warning	Could Not Save JPEG - Image Too Small
0	Warning	Could Not Save JPEG - Image Too Large
0	Warning	IV State Not Sent - Pkg Not Found
0	Warning	Software upgrade in progress
0	Error	Software upgrade failed
0	Warning	Unable to mount SMB/CIFS file share for image saving
0	Error	Camera with different SW version detected
0	Warning	Trigger tach is out of range. No transmit point
0	Error	Factory Reset Performed. Power Cycle Required
0	Information	Dimensioner is not Online
0	Information	Dimensioner IP address not valid for Sync Network
0	Error	More than one camera setup to multicast LC data
0	Error	Expected External Device is Offline
0	Warning	Unexpected External Device is Online
0	Error	Frame Acquisition is not running

Diagnostics | System Health

Use the **System Health** to get specific functional details on each AV500 in the array.

NOTE **This information will be used by Datalogic support in order to do more in-depth trouble-shooting if necessary.**

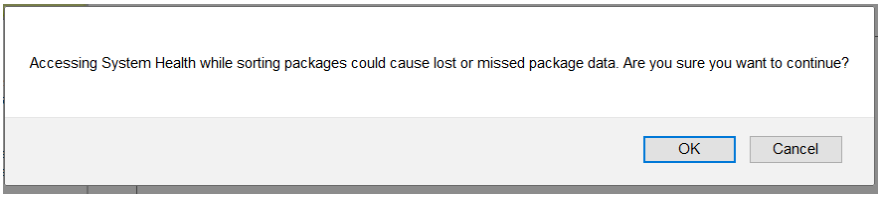
To access the System Health window:

1. In the menu tree under **Diagnostics**, click **System Health**. The **System Health** window opens.

Camera_1

Date and Time	Thu Mar 7 08:54:24 EST 2019
Motherboard	
Board Name	MA50
Board Sub Name	MA50
Manufacturer Name	OEM
Manufacturer Code	13
Manufacturer Date	2018.01.26
Serial Number	000003702197
Part Number	048020
EAN	04250186188092
Product Rev	A.1 (0x4131)
System BIOS Rev	907
BIOS Interface Rev	100
BIOS Interface Build Rev	001
Boot Counter	9080
Running Time	3927 hours
Temperature Sensors	
Current CPU Temperature	40 degrees C
Current Board Temperature	44 degrees C
Voltage Sensors	
Current 5V Standby Voltage	0.0 V
Current DC Voltage	12.6 V
System Configuration	
Serial Number	A14A00099
CCD Length	2448 pixels
Pixel Size	3 microns
Lens Focal Length	35.00 mm
Lens Focal Length Offset	0.00 mm
Minimum Range	835 mm
Maximum Range	2525 mm
Focus Table Num Coefficients	7
Focus Table Coefficient #1	2323.77
Focus Table Coefficient #2	18.5258
Focus Table Coefficient #3	-0.0446155
Focus Table Coefficient #4	4.14025E-05
Focus Table Coefficient #5	-1.94229E-08
Focus Table Coefficient #6	4.60406E-12
Focus Table Coefficient #7	-4.397E-16
Temperature Compensation Num Coefficients	0
Combo Board	
Software Version	3
DFM Degrees Moved	411767
Illumination On Time	699541 seconds
Aiming Laser On Time	668329 seconds
PIC Temperature	0.0 degrees C
LED Temperature	32 degrees C
Angle Sensor Temperature	36 degrees C

NOTE **Reviewing the System Health may have an adverse effect on the AV500's ability to decode bar codes. When the System health is enabled there will be a pop-up identifying this concern.**



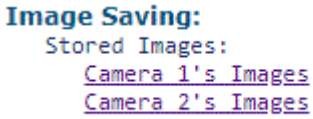
2. Select a device from the drop down list to view its **Motherboard, Temperature Sensor, Voltage Sensor, System Configuration, Focus Mechanism, Sensor Board and Illumination data.**

Viewing Camera Images

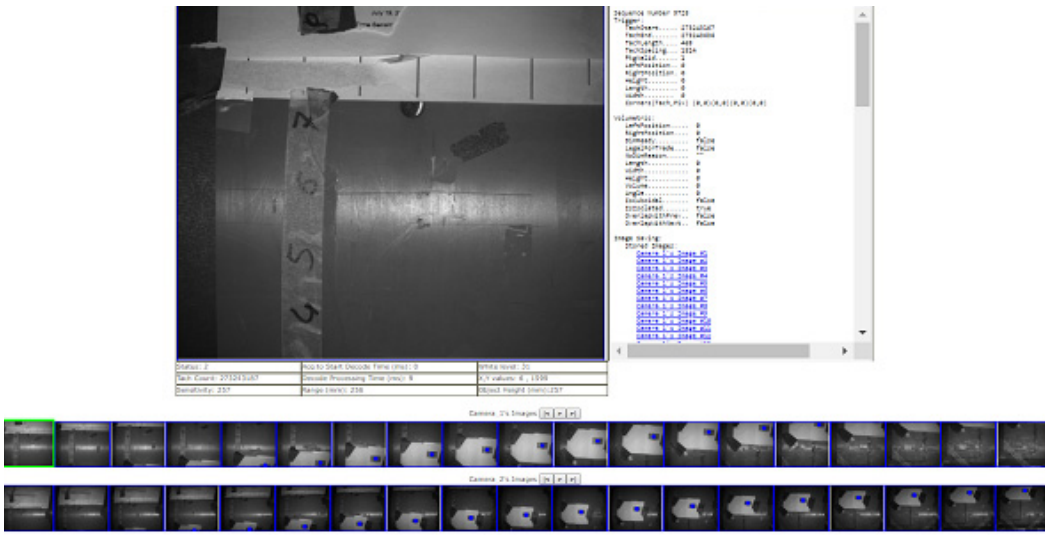
Use the **System Status** to view a specific camera's images.

To access the System Status window:

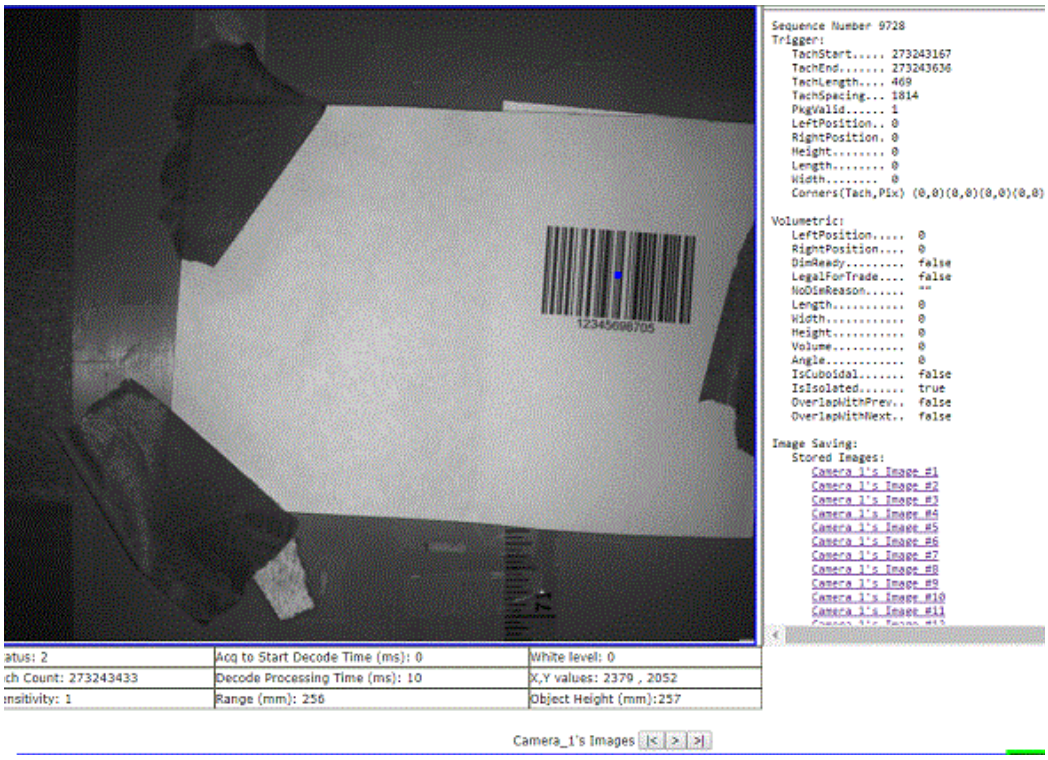
1. In the menu tree under **Diagnostics**, click **System Status.** The **System Status** window opens.



2. Click on a **Camera N's Images** and a window opens displaying a variety of image information.



All the frames associated with the trigger cycle are displayed. The following play buttons are available to proceed through the frames. Hover over a location in the image and the White level and X, Y values will display.



3. Click roll the wheel forward to zoom, click and roll the wheel backward to reverse the zoom.

4. Click |< to move backwards through the available images, >| to move forwards through the available images, or click > to proceed through the images in play mode.

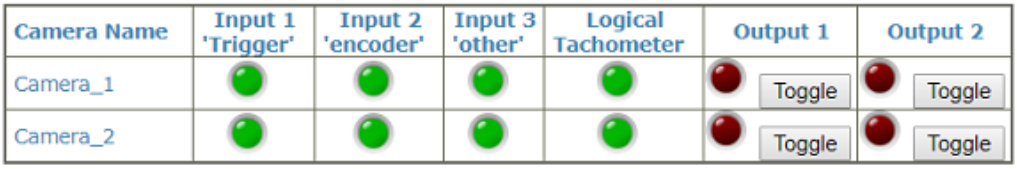
5. Click on any image to select it for the image viewer.

Diagnostics | Input/Output Status

Use the **Input/Output Status** window to view whether the PLC is seeing the data coming from the camera I/O. The Input 1, Input 2, and Input 3 indicator descriptions vary depending on the Device Setting>Digital IO selection. The Logical Tachometer is an internal clock. It is present whether the AV500 is set to Packtrack or Online mode

To access the Input/Output Status window:

1. In the menu tree under **Diagnostics**, click **Input/Output Status**. The **Input/Output Status** window opens.



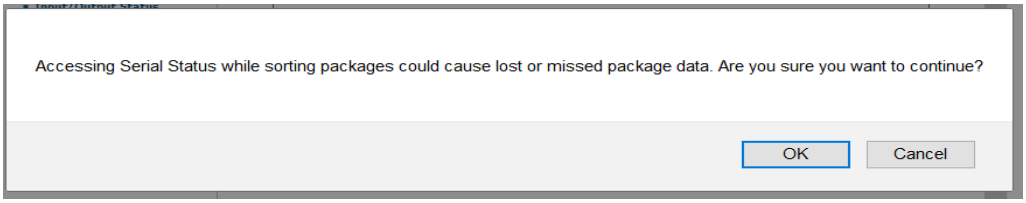
2. Output 1 and Output 2 columns allow the testing of the output bit by clicking the "Toggle" button. The Input 1, Input 2, and Input 3 indicators descriptions will vary depending on the Device Settings > Digital IO selections.

Diagnostics | Serial Comm Status

Use the **Serial Comm Status** window to view serial data from the camera.

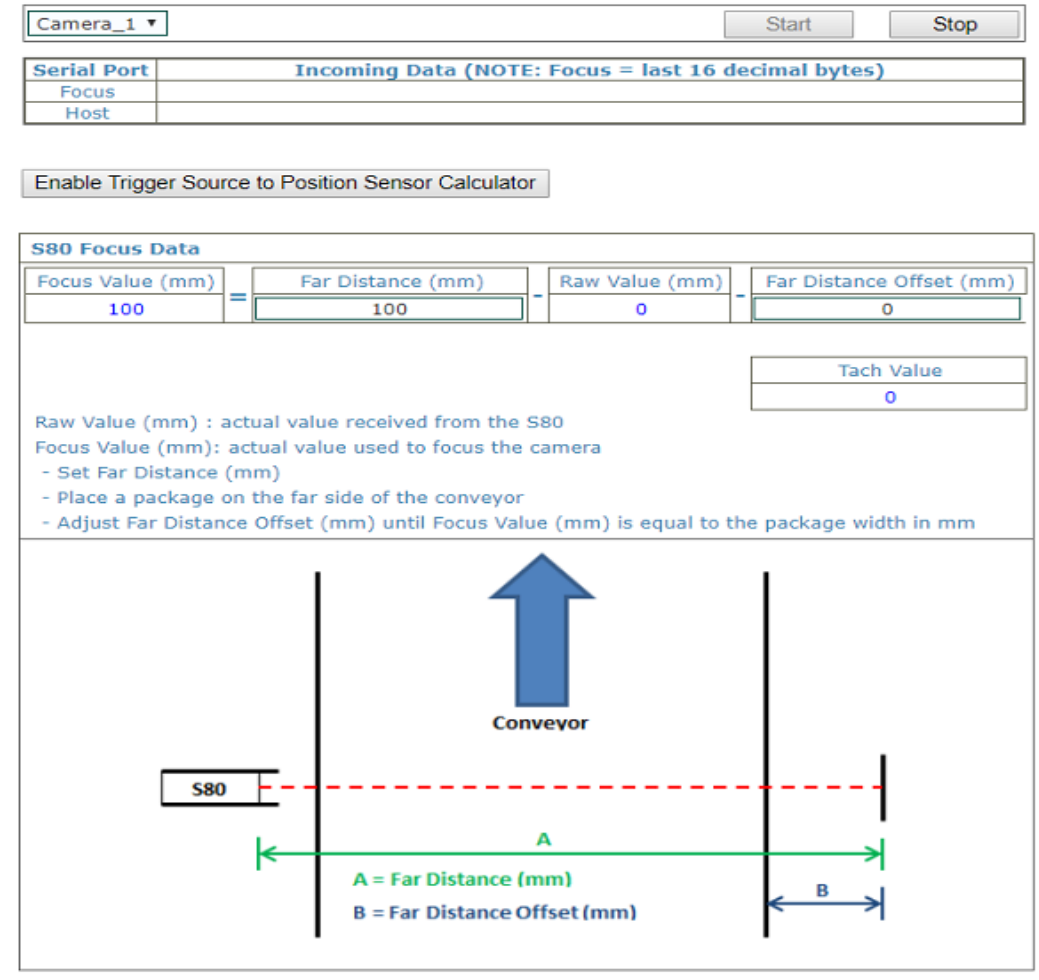
To access the Serial Comm Status window:

1. In the menu tree under **Diagnostics**, click **Serial Comm Status**. The **Serial Comm Status** window opens and displays serial messages received.



NOTE **Do not use this function while your sortation system is running.**

2. Click **Start** and the following options display:



3. Click **Enable Trigger Source to Position Sensor Calculator**.

4. Run a single package through the camera tunnel and the calculated Trigger Source to Position Sensor distance is displayed in red. This ability to learn the distance from the Trigger Source to the Position Sensor is useful when the camera is in Packtrack and connected to a tilt belt/cross belt system.

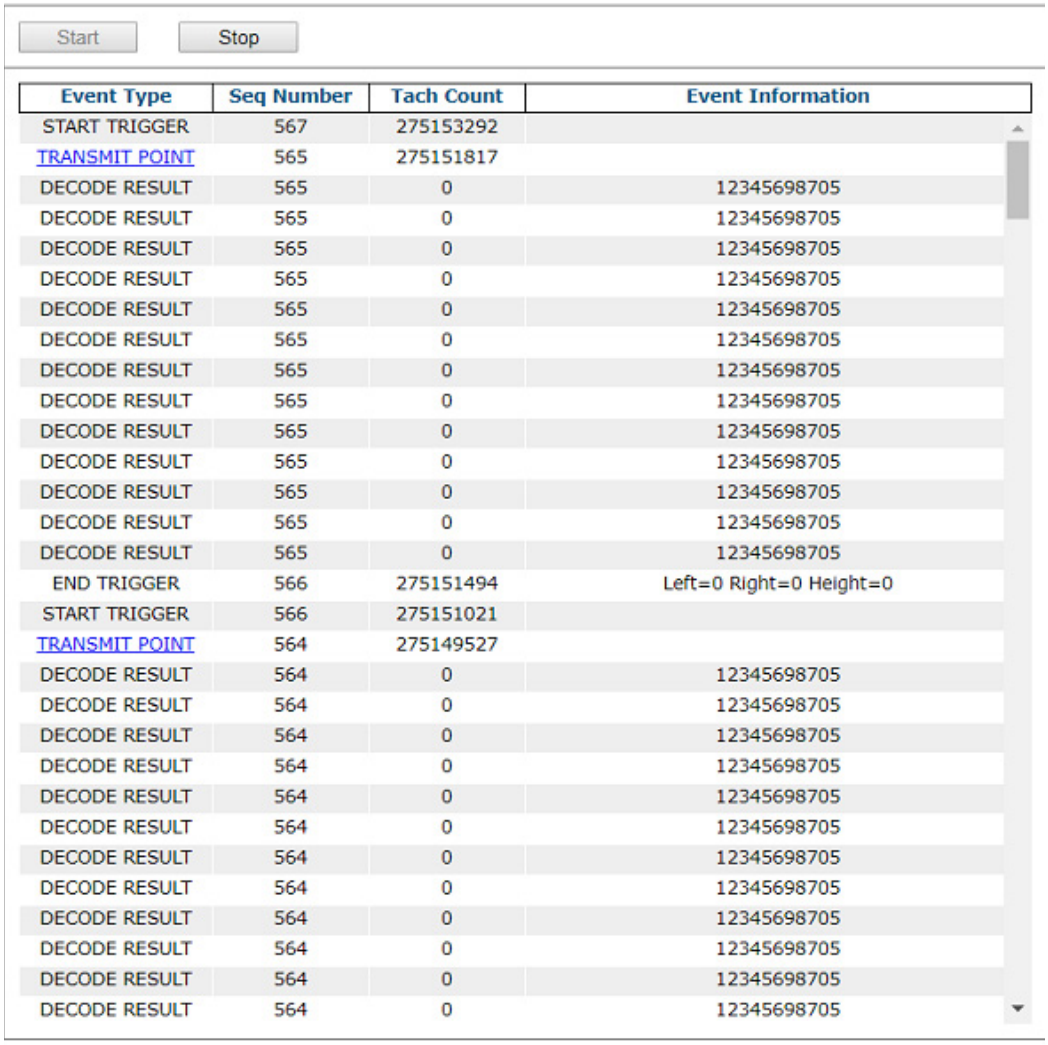
Diagnostics | Device Tracking

Use the **Device Tracking** window to view encoder/tachometer and trigger event information.

This will provide information such as start and end trigger, transmit point data, transmit message, sequence number, and etc)

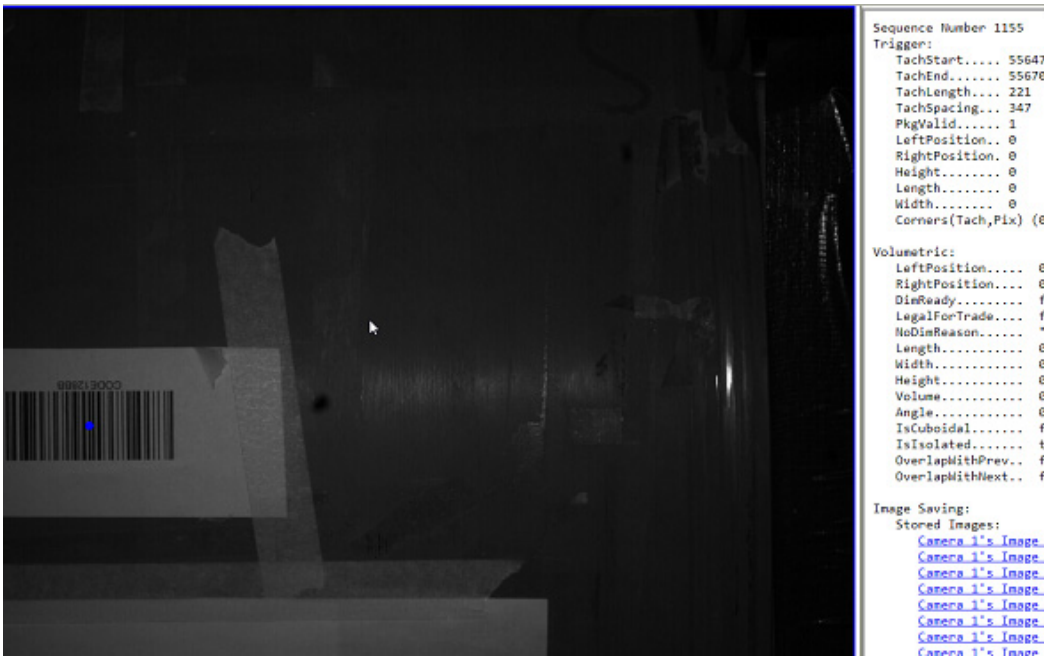
To access the Device Tracking window:

1. In the menu tree under **Diagnostics**, click **Device Tracking**. The **Device Tracking** window opens.



Event Type	Seq Number	Tach Count	Event Information
START TRIGGER	567	275153292	
TRANSMIT POINT	565	275151817	
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
END TRIGGER	566	275151494	Left=0 Right=0 Height=0
START TRIGGER	566	275151021	
TRANSMIT POINT	564	275149527	
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705

2. Click **Start** for a continuous feed of Event Type, Seq(uence) Number, Tach(ometer) Count, and Event Information data.
3. Click **Stop** to pause the feed.
4. Click on a **TRANSMIT POINT** link to view specific transaction data and image of last package.


Sequence Number 1155
Trigger:
TachStart..... 55647
TachEnd..... 55676
TachLength.... 221
TachSpacing... 347
PkgValid..... 1
LeftPosition.. 0
RightPosition. 0
Height..... 0
Length..... 0
Width..... 0
Corners(Tach,Pix) (0
Volumetric:
LeftPosition.....
RightPosition....
DimReady.....
LegalForTrade....
NoDimReason.....
Length.....
Width.....
Height.....
Volume.....
Angle.....
IsCuboidal.....
IsIsolated.....
OverlapWithPrev..
OverlapWithNext..
Image Saving:
Stored Images:
Camera 1's Image
Camera 1's Image
Camera 1's Image
Camera 1's Image
Camera 1's Image
Camera 1's Image
Camera 1's Image

Diagnostics | Image Viewer

Use the **Image Viewer** window to view and assess image quality and verify the Pack-Track calibration.

To access the Image Viewer window:

1. In the menu tree under **Diagnostics,** click **Image Viewer**. The **Image Viewer** window opens.

2. Select a **device** (named camera) from the drop-down list.

3. Select whether to view:
   - Live
   - Processed
   - Verify

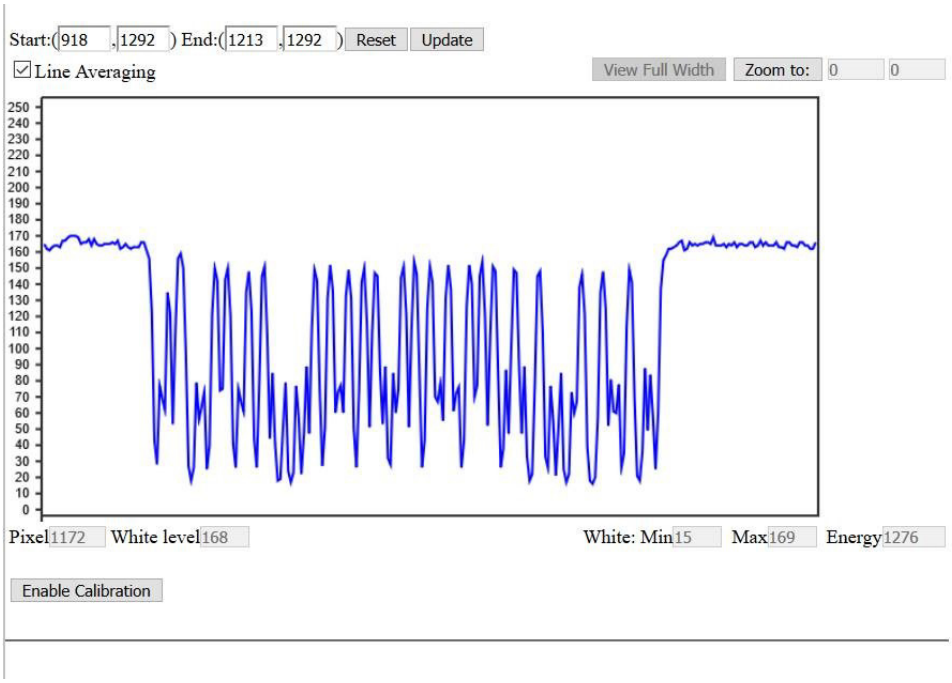
4. Select **Live** and click **Start** to view live captured images. The Image Viewer captures an image of the box. The White Level is displayed based on where the cursor is positioned. Toggle the **Illumination On/Off**.

5. Select a **down sampling number** from the drop-down list. Choose a lower number to see a fuller resolution of the image. Choose a higher number to view an image during operation.

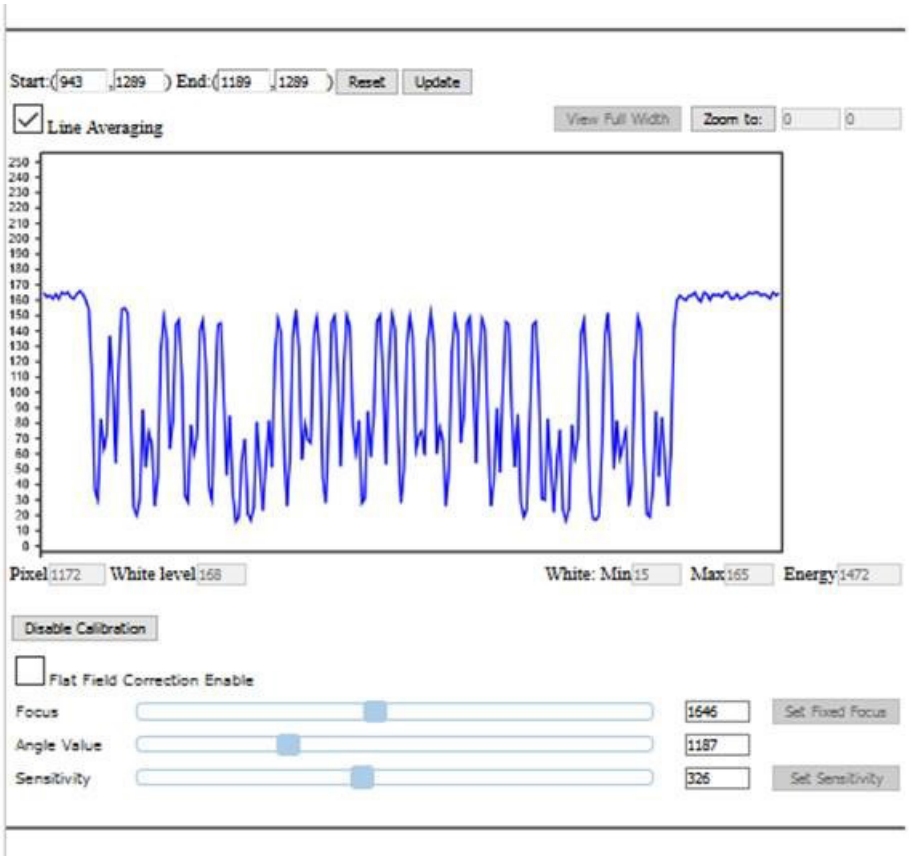
The White Level field displays the image white level based on where the cursor is positioned. The X,Y values field displays the cursor coordinates.

6. Click **Stop** to cease capturing images.
7. Click **Fit to Screen** to zoom the image to fill the view window.
8. Controls:
   - Click an image multiple times to zoom in.
   - Hold **<SHIFT>** and click an image multiple times to zoom out.
   - Roll the mouse wheel to zoom in or out.
   - Click, hold and slide to pan an image.
9. Click <**ALT**> and drag the mouse across the image.

10. The following view of your image light appears.

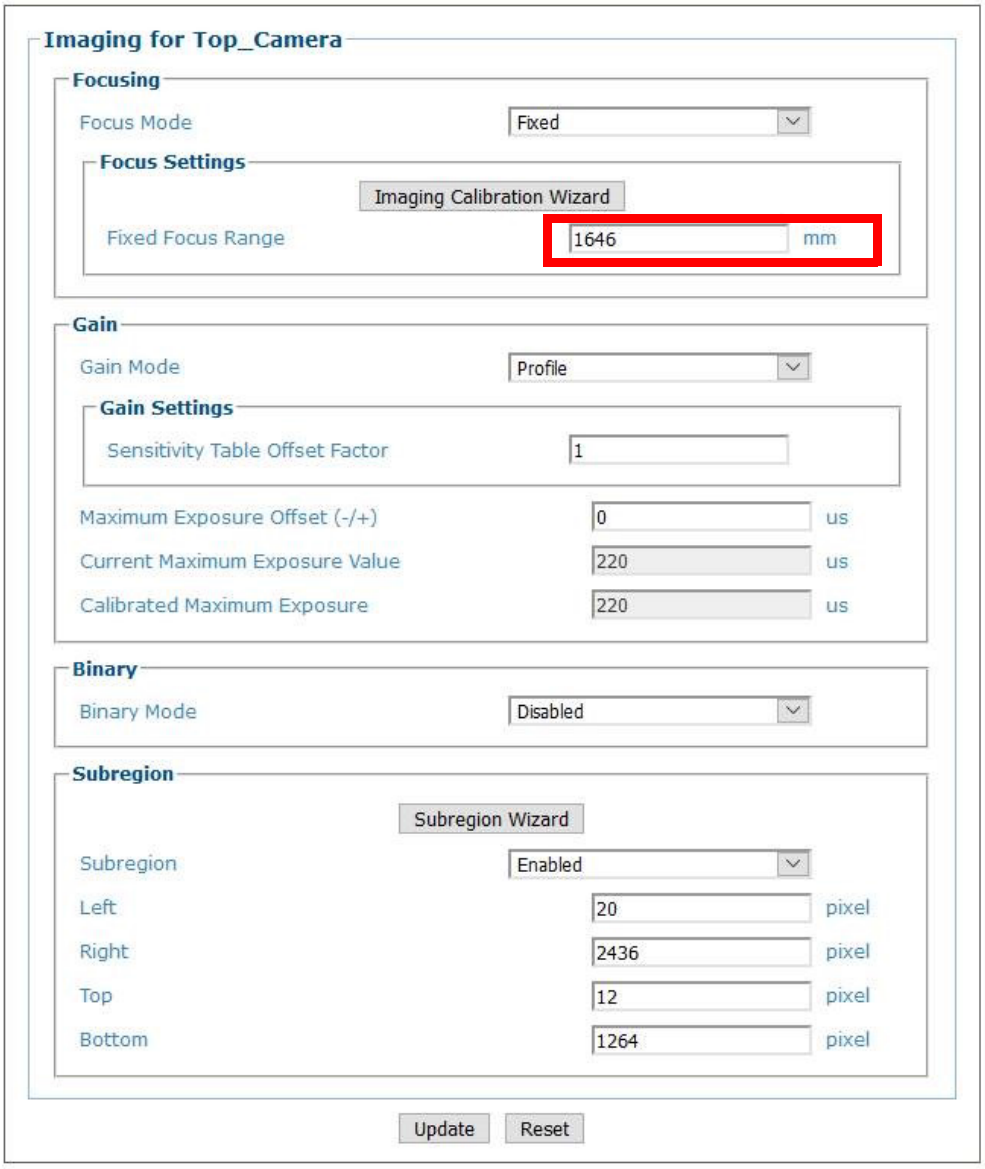


11. Click the **Enable Calibration** button to reveal sliders which allow you to adjust the Focus, Angle Value and Sensitivity.



12. If your image is not in focus, click on the focus slider to adjust until the image appears in focus.

13. When you have found the correct values, click **Set Fixed Focus** button and/or **Set Sensitivity**. The Fixed Focus Range parameter in the Device Imaging menu is updated with the value you defined in the Image Viewer.


Imaging for Top_Camera
Focusing
Focus Mode
Fixed
Focus Settings
Imaging Calibration Wizard
Fixed Focus Range
1646
mm
Gain
Gain Mode
Profile
Gain Settings
Sensitivity Table Offset Factor
1
Maximum Exposure Offset (-/+)
0
us
Current Maximum Exposure Value
220
us
Calibrated Maximum Exposure
220
us
Binary
Binary Mode
Disabled
Subregion
Subregion Wizard
Subregion
Enabled
Left
20
pixel
Right
2436
pixel
Top
12
pixel
Bottom
1264
pixel
Update
Reset

Diagnostics | Multiple Camera Viewer

The **Multiple Camera Viewer** allows you to view low resolution images from all system AV500s at the same time during a trigger cycle. The number of images shown depends on the number of AV500 cameras in the tunnel/array.

To access the Multiple Camera Viewer:

1. In the menu tree under **Diagnostics,** navigate to **Multiple Camera Viewer.** The **Multiple Camera Viewer** window opens.

2. Controls:
   - Click an image multiple times to zoom in.
   - Hold **<SHIFT>** and click an image multiple times to zoom out.
   - Roll the mouse wheel to zoom in or out.
   - Click, hold, and slide to pan an image.

Diagnostics | Log Viewer

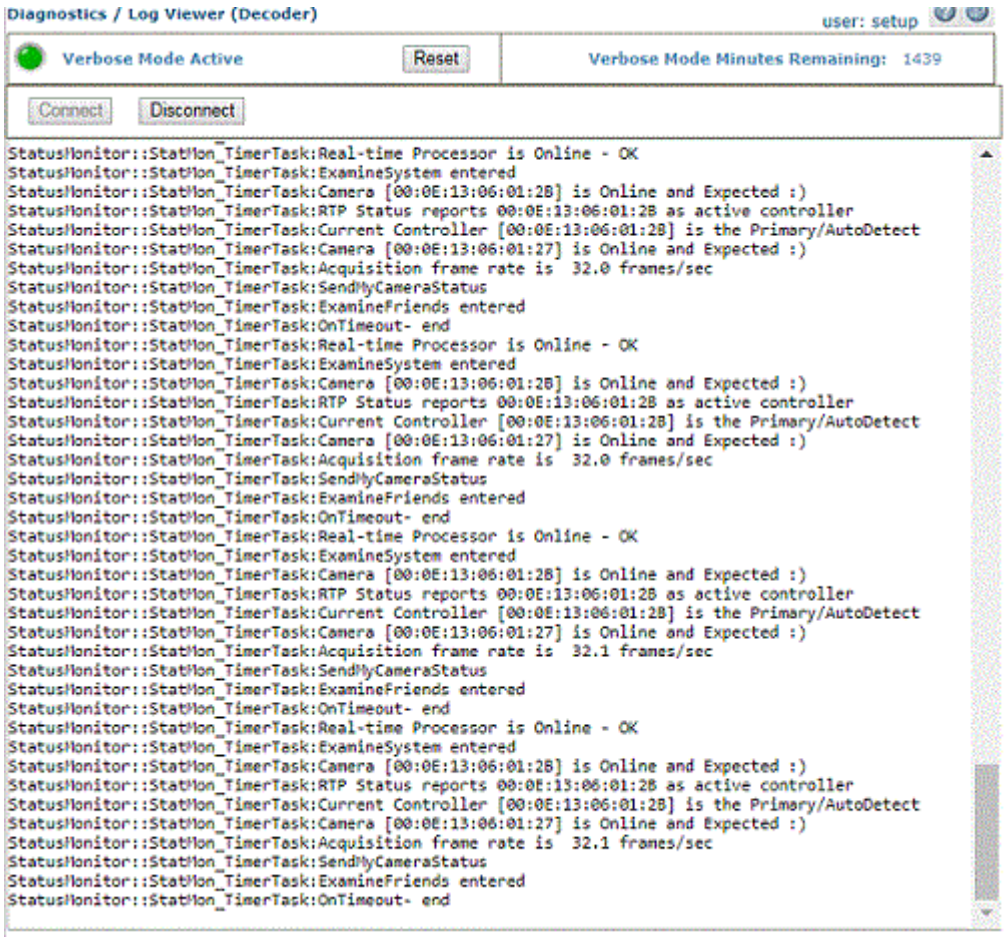
Use the **Log Viewer (Decoder)** window to view encoder/tachometer and trigger event information.

To access the Log Viewer (Decoder) window:

NOTE **The log view data will only post the data associated with the AV500 that the GUI interface is connected to. It does not post data from other AV500's in the tunnel.**

1. In the menu tree under **Diagnostics**, click L**og Viewer (Decoder).** The **Log Viewer (Decoder)** window opens.
2. Click **Connect** to view logged data from the decoder, the information posted on the Log Viewer window.
3. Click **Disconnect** to pause the data stream.

NOTE **Click Reset to re-enable Verbose Mode logging.**

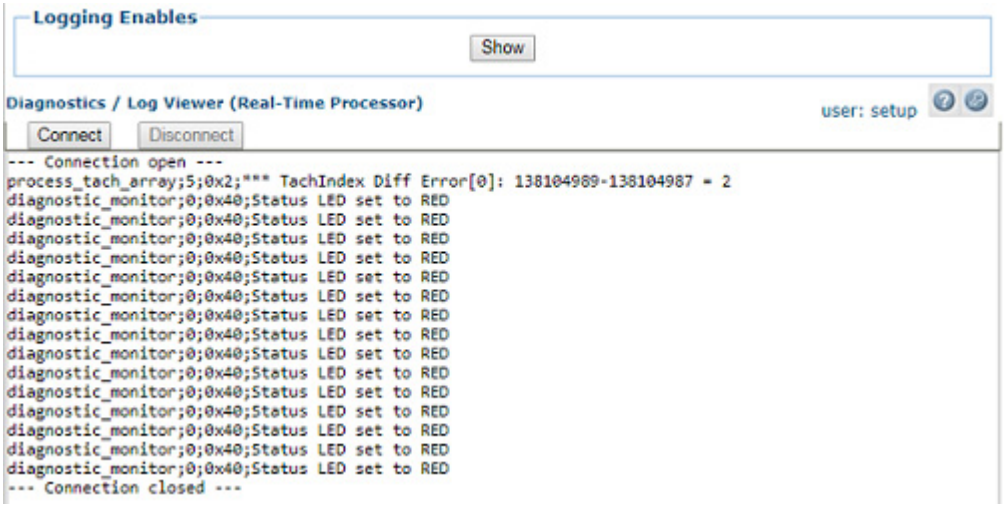


Diagnostics | Log Viewer (RTP)

Use the **Log Viewer (RT)** window to view encoder/tachometer and trigger event information.

To access the Log Viewer (RT) window:

1. In the menu tree under **Diagnostics**, click **Log Viewer (RT)**. The **Log Viewer (RT)** window opens.



NOTE

The RTP Log Viewer tool is used by Datalogic support to assist in diagnosing issues experienced by the AV500. If a log option is selected it will remain enabled until it is unselected or power is cycled to the unit.

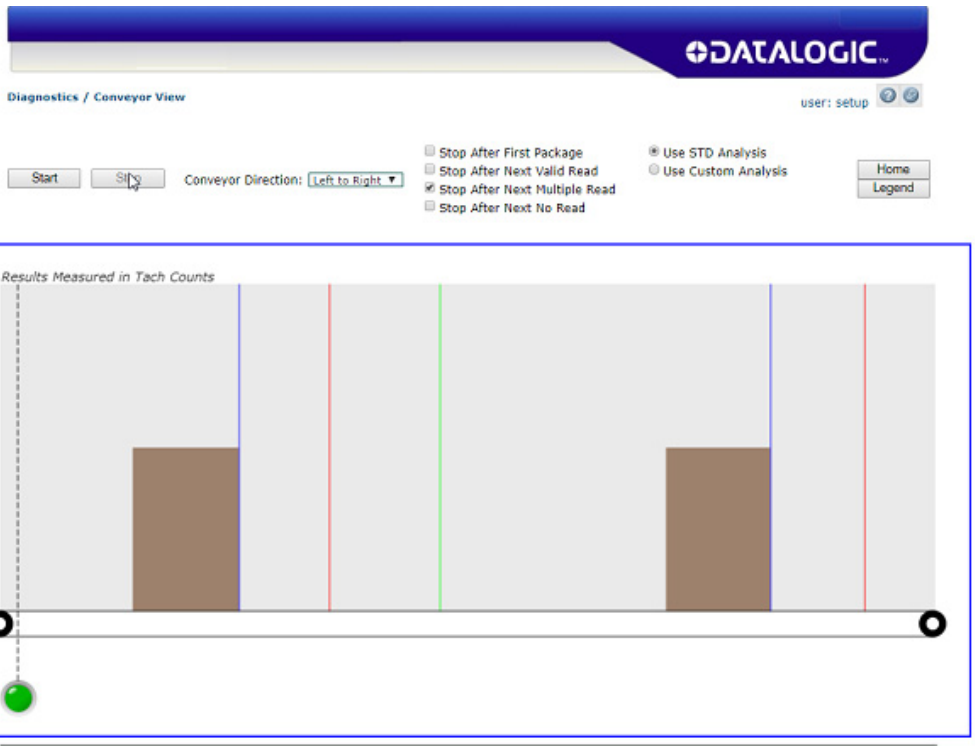
2. Click **Show** at the top of the window to view a Logging Enables table of processes.
3. Select the check boxes related to the named processes to display Logged Information pertaining to Critical, Error, Warning, Info, or Debug conditions.
4. Click **Connect** to view logged data from the real-time processes.
5. Click **Disconnect** to pause the data stream.

Diagnostics | Conveyor View

Use the **Conveyor View** window to view a representation of the packages currently on the conveyor.

To access the Conveyor View window:

1. In the menu tree under **Diagnostics,** click **Conveyor View**. The **Conveyor View** window opens.



The Protocol Index information will not be posted unless the option is enabled on the Transport and Logging pages.

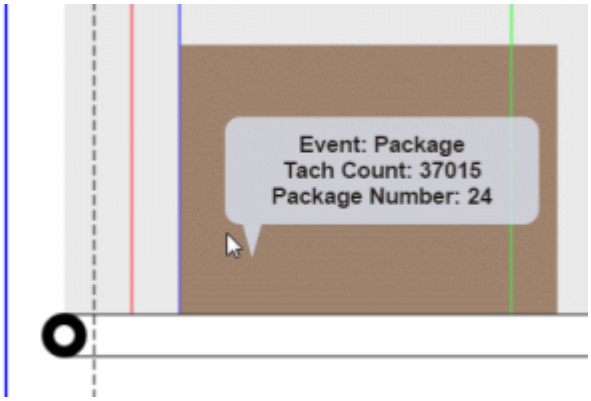
2. Select the check box(es) by the option(s) you want to use.
- Stop After First Package
- Stop After Next Valid Read
- Stop After Next Multiple Read
- Stop After Next No Read

3. Select Left to Right or Right to Left from the Conveyor Direction drop-down list to shift the orientation.

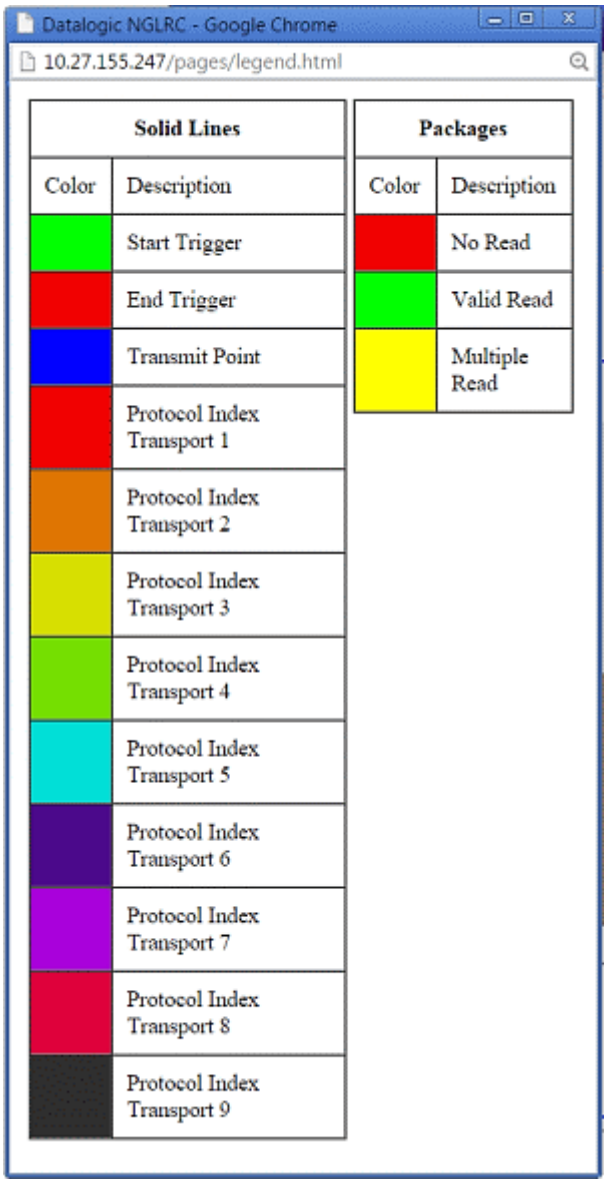
4. Select the Use STD (standard) Analysis or Use Custom Analysis option button. If the Use Custom Analysis option is selected, you can then select a numbered Transport from the drop-down list that appears.

5. Click **Start** to view a representation of packages moving along the conveyor, or click **Stop** to freeze the window

Hold the cursor of the package shown on the conveyor animation to view package information, including Event, Tach Count, and Package Number information.



6. Click **Legend** to view a color key for the **Conveyor View** animation. Click **Home** to return to **Modify Settings | System Info.**

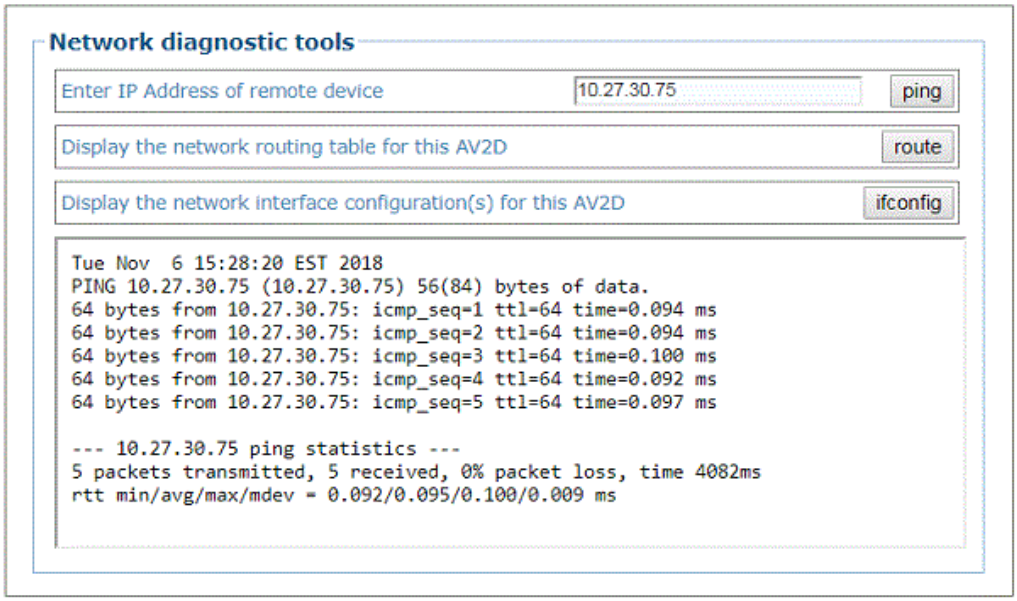


Diagnostics | Network Diagnostics

Use **Network Diagnostics** to diagnose network issues.

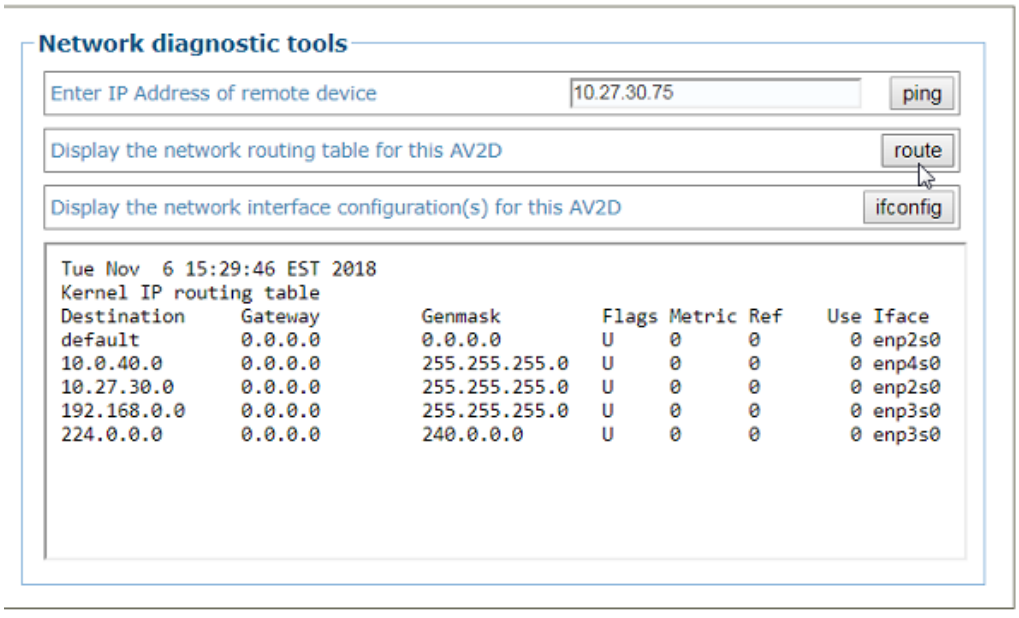
To access the Network Diagnostics window:

1. In the menu tree under **Diagnostics,** click **Network Diagnostics.** The **Network Diagnostics** window opens.

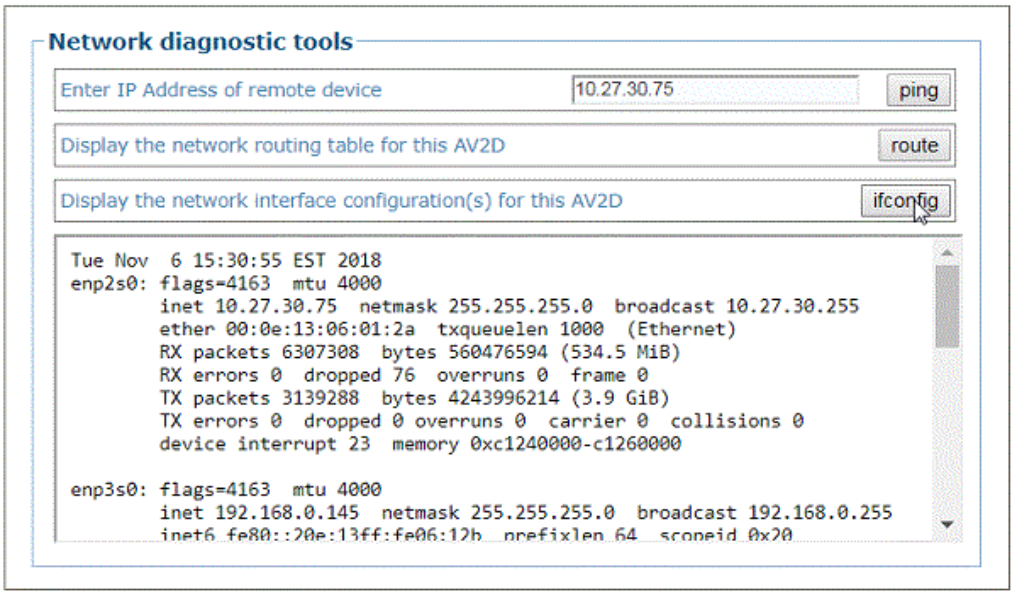


2. Enter the IP Address of the remote device you want to communicate with and click the **ping** button to send a message to that device.

3. Click **route** button to view Network routing table.



4. Select **ifconfig** button to view configuration information.

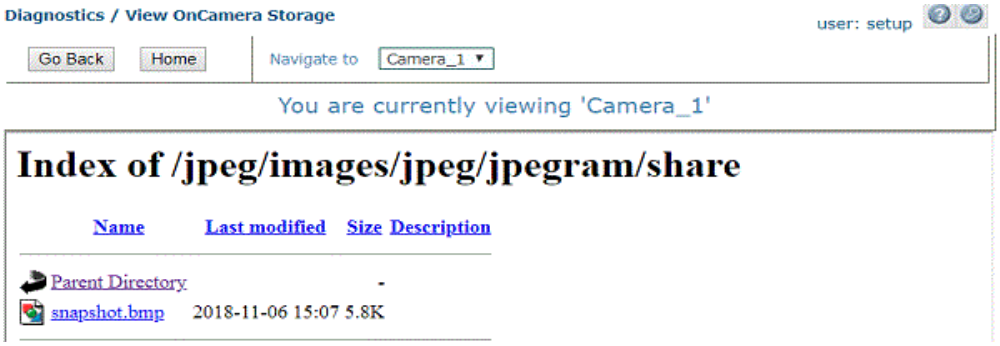

Network diagnostic tools
Enter IP Address of remote device
10.27.30.75
ping
Display the network routing table for this AV2D
route
Display the network interface configuration(s) for this AV2D
ifconfig
Tue Nov 6 15:30:55 EST 2018
enp2s0: flags=4163 mtu 4000
inet 10.27.30.75 netmask 255.255.255.0 broadcast 10.27.30.255
ether 00:0e:13:06:01:2a txqueuelen 1000 (Ethernet)
RX packets 6307308 bytes 560476594 (534.5 MiB)
RX errors 0 dropped 76 overruns 0 frame 0
TX packets 3139288 bytes 4243996214 (3.9 GiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
device interrupt 23 memory 0xc1240000-c1260000
enp3s0: flags=4163 mtu 4000
inet 192.168.0.145 netmask 255.255.255.0 broadcast 192.168.0.255

Diagnostics | View OnCamera Storage

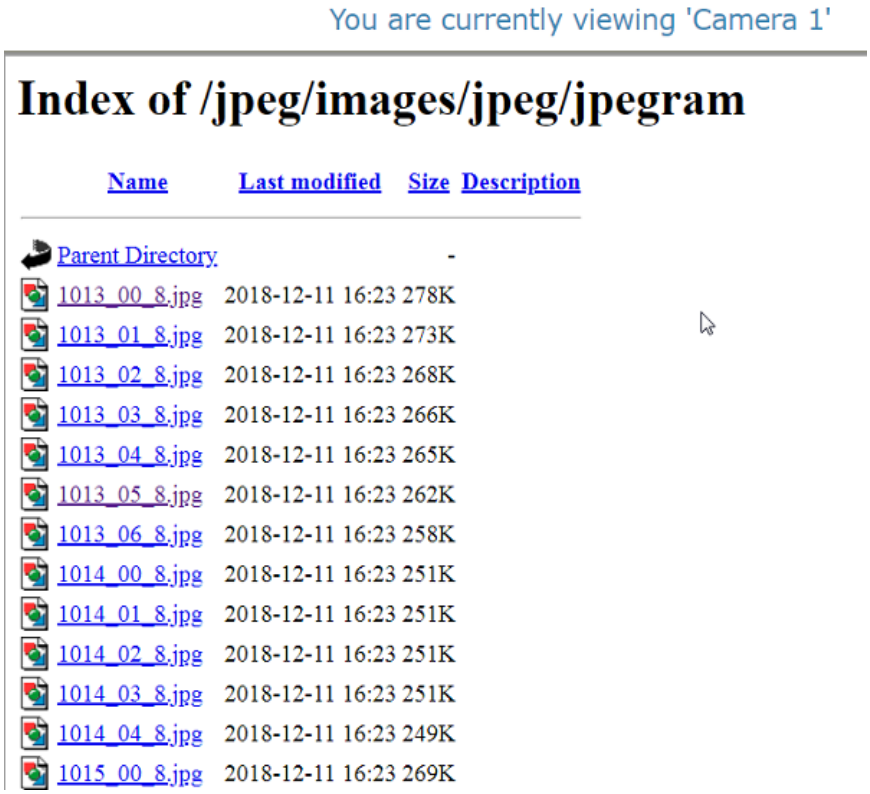
Use the **V**iew **OnCamera** Storage window to view stored images on a particular camera within your system.

To access the View OnCamera Storage window:

1. In the menu tree under Diagnostics, click View **OnCamera Storage**. The **View OnCamera Storage** window opens.



2. Click on **Parent Directory**, and a list of available saved images displays.



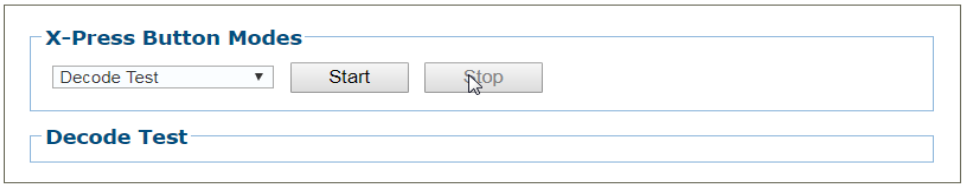
3. Click on an **image** in the list to view it.

Diagnostics | Xpress Buttons

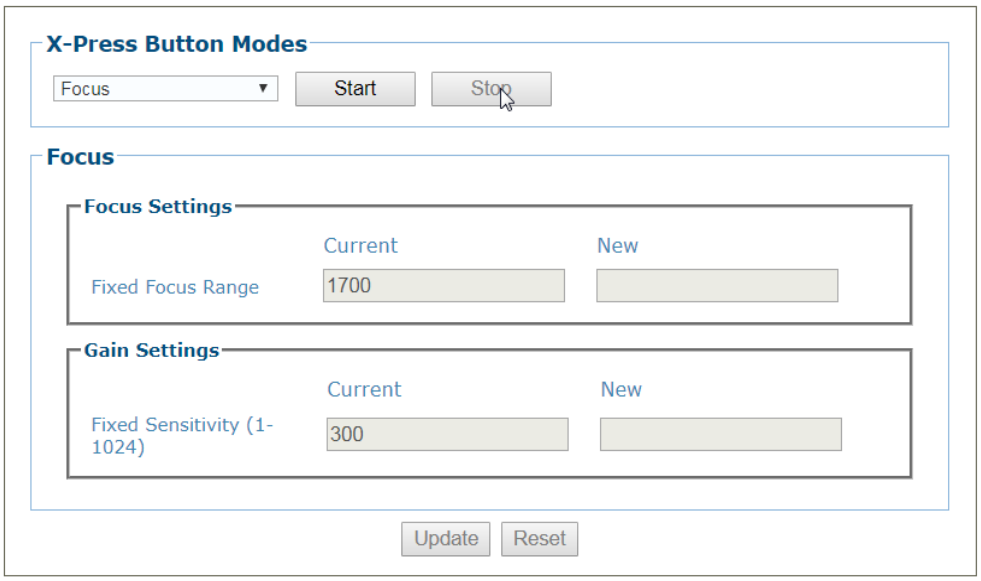
Use the **View OnCamera Storage** window to view stored images on a particular camera within your system.

To access the View OnCamera Storage window:

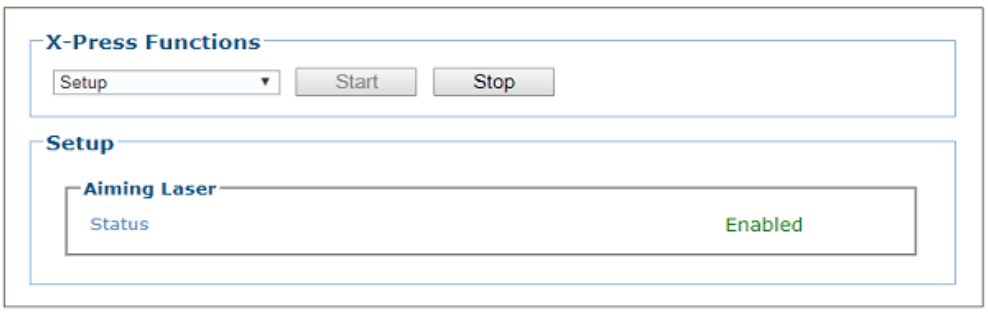
1. In the menu tree under **Diagnostics**, click **X-Press Buttons.**



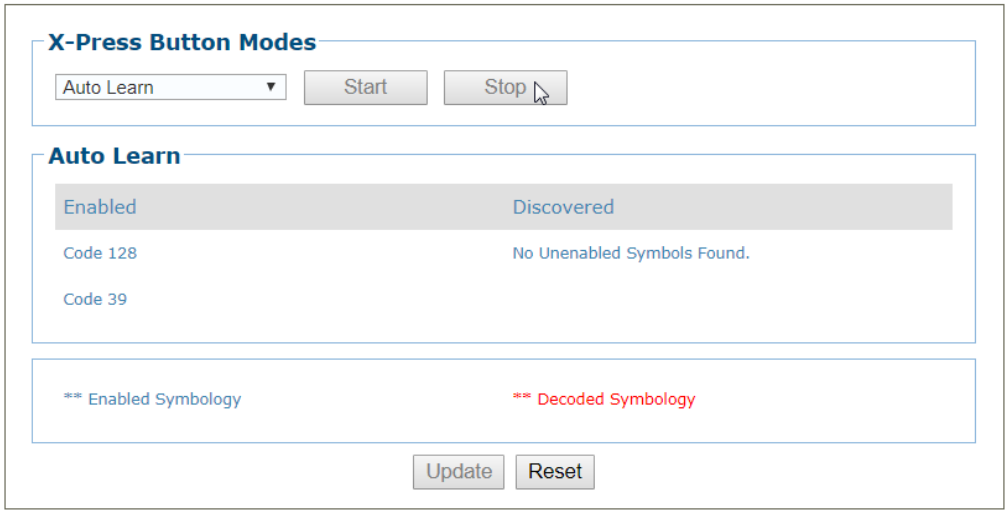
2. Select **Focus** from the drop-down and the following focus options appear.



3. Select **Setup** from the drop-down and the following setup option appears.



4. Select **Auto Learn** from the drop-down and the following auto learn options appear.



UTILITIES

Use the Utilities Menu selections to backup and restore system parameters, upgrade system software, or download system log information using the following selections:

Utilities | Advanced Cluster Configuration

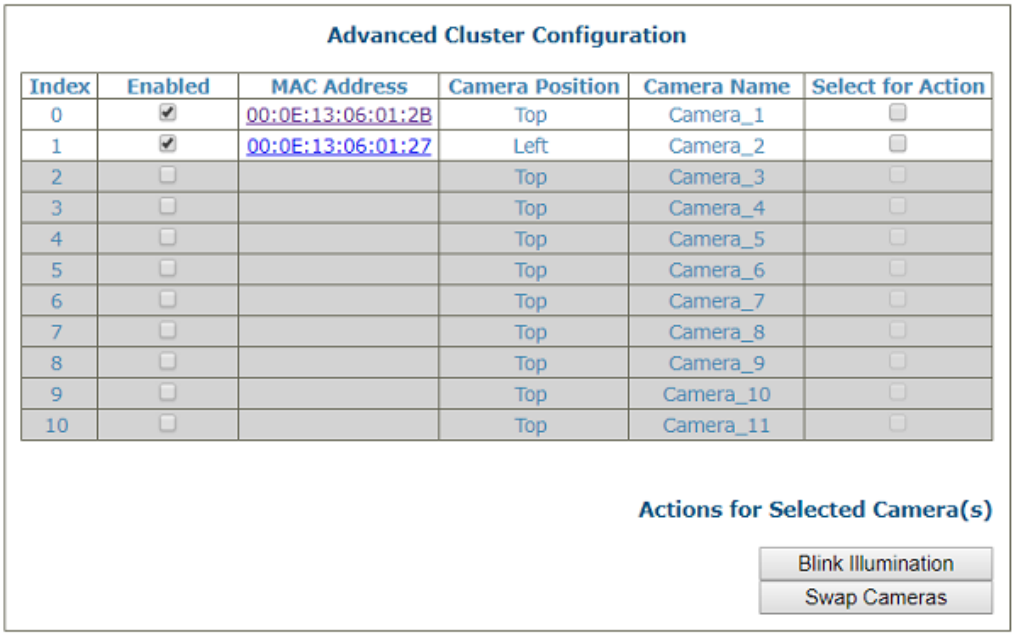
Use **Advanced Cluster Configuration** to reorganize the cameras in a Tunnel/Array. Due to the configuration of the Sync Network of the AV500, it is not possible to simply replace a failed AV500 with another camera in the same cluster (Sync Network).

The Advanced Cluster option allows for the task to be accomplished. For example, when putting a bottom AV500 in the Top mounting location. If the bottom AV500 is mounted in the top location it will still use the bottom parameters. The Advance Cluster option allows for the repositioning of the camera.

DO NOT use **Advanced Cluster Configuration** unless authorized by Datalogic Support. Using this function without Datalogic Support can harm system operation.

To access the Advanced Cluster Configuration window:

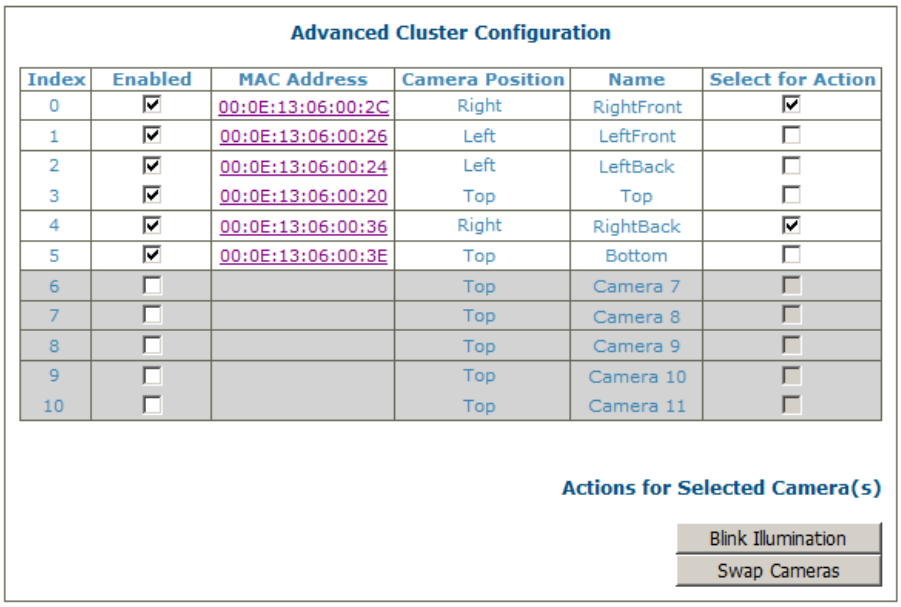
1. In the menu tree under **Utilities**, click **Advanced Cluster Configuration**. The **Advanced Cluster Configuration** window opens.



The enabled columns (not grayed out) show the AV500 cameras currently online in the system. If a camera is not online (grayed out) you can still select it for action.

To Swap Two Cameras in the same tunnel:

1. Select the check boxes in the **Select for Action** column corresponding to the cameras you want to swap.
2. Click **Swap Cameras.** The selected camera's swap MAC addresses.



Advanced Cluster Configuration

Index	Enabled	MAC Address	Camera Position	Name	Select for Action
0	☑	00:0E:13:06:00:2C	Right	RightFront	☑
1	☑	00:0E:13:06:00:26	Left	LeftFront	☐
2	☑	00:0E:13:06:00:24	Left	LeftBack	☐
3	☑	00:0E:13:06:00:20	Top	Top	☐
4	☑	00:0E:13:06:00:36	Right	RightBack	☑
5	☑	00:0E:13:06:00:3E	Top	Bottom	☐
6	☐		Top	Camera 7	☐
7	☐		Top	Camera 8	☐
8	☐		Top	Camera 9	☐
9	☐		Top	Camera 10	☐
10	☐		Top	Camera 11	☐

Actions for Selected Camera(s)

Blink Illumination

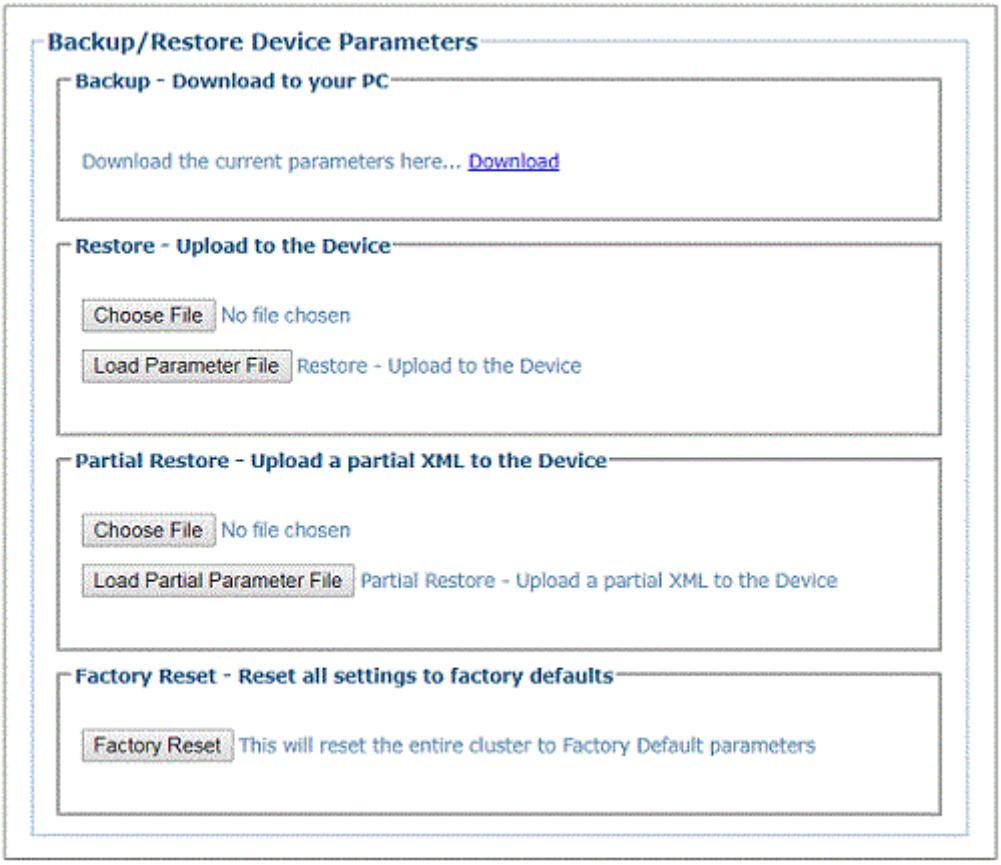
Swap Cameras

Utilities | Backup/Restore Parameters

Use **Backup/Restore Parameters** window to download system parameters to a camera or save them to a file.

To use the Backup/Restore Parameters functions:

1. In the menu tree under **Utilities**, click **Backup/Restore Parameters Info**. The **Backup/Restore Parameters window** opens.



2. From the **Backup - Download to your PC** section of the window, click Download. The parameter file is downloaded by the browser to your PC.

NOTE **Various browsers will handle file saving in different ways.**

3. From the **Restore - Upload to the Device** section of the window, click **Browse (or Choose File in Chrome)**. From the file window that opens, navigate to and select a previously saved parameter file.

NOTE **You must only restore a system with a restore file originally created from that system. DO NOT use a restore file from a different system. NEVER use on a configured system.**

4. Click **Load Parameter File** to upload the file to the system device(s).

To use the Factory Reset function:

1. Click **Factory Reset.** A confirmation box appears stating "**This will reset the entire cluster to Factory Default parameters.**"

2. Click **OK** to reset to the factory default, or click **Cancel t**o return to the Backup/ Restore Parameters window.

Do not use this Factory Reset option on a calibrated tunnel array. This option is only used during the initial configuration or under extreme measures. If it is applied the array will have to be re-calibrated.

Utilities | Software Upgrade

Use **Software Upgrade** window to load new versions of the camera system software.

NOTE

Please clear the PC's browser cache regularly or set up the browser to disable caching altogether. This is especially important after software upgrades to make sure updates in e-Genius are visible.

To use the Software Upgrade functions:

1. In the menu tree under **Utilities**, click **Software Upgrade Info.** The **Software Upgrade** window opens.

2. Click **Choose File**. From the file window that opens, navigate to and select the software upgrade file.
3. Click **Load SW Package** to upload the software upgrade to the device.
4. Select the **Skip software type compatibility check**, check box if you are certain the software is newer than that currently installed on the system.
5. Select **Force SW package to all camera's in the cluster** to update all of the cameras with the latest software downloaded.
6. Click **Application Installation History** to view historical software revision information about the application.

```
Mon Sep 9 13:32:30 UTC 2019 : Installing AV2D_VERSION STD_AV2D 0_0_0_94
Mon Oct 14 12:17:19 UTC 2019 : Installing AV2D_VERSION STD_AV2D 0_0_0_98
Thu Oct 17 13:23:25 UTC 2019 : Installing AV2D_VERSION STD_BETA 0_0_0_100
Fri Nov 1 14:42:33 UTC 2019 : Installing AV2D_VERSION STD_BETA 0_0_0_102
Wed Nov 20 15:37:10 UTC 2019 : Installing AV2D_VERSION STANDARD 1_0_0_0
```

7. Click **Operating System History** to view historical software patch information about the operating system.

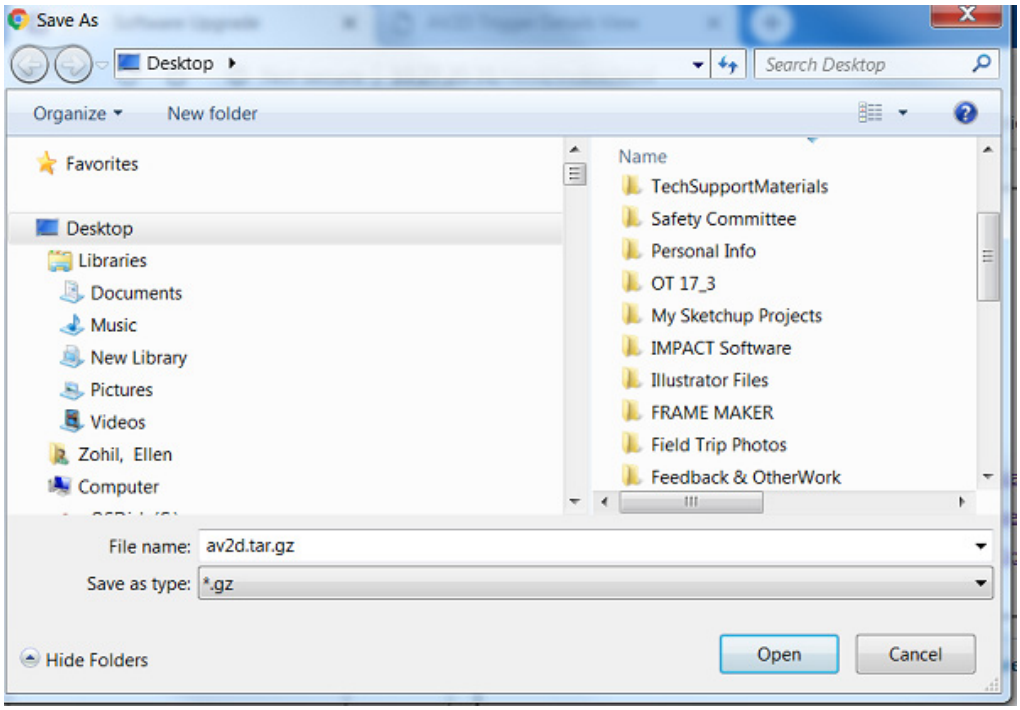
```
OS BASE 0_0_1_2 Feb 15, 2019

Mon Mar 11 15:18:12 UTC 2019 : Installing Patch -  av2d_InstallLibSSH2.tar.gz
Wed Jun 5 17:00:11 UTC 2019 : Installing Patch -  av2d_UpdatePCIeDriver_2.0.tar.gz
```

8. Click **RTP Operating System history** to view RTP (Real Time Processing) software revision historical information about the Real Time Processing OS.

```
Installing RTP STD_BETA 0_0_0_30
Installing RTP STD_BETA 0_0_0_37
Installing RTP STD_BETA 0_0_0_42
Installing RTP STD_BETA 0_0_0_50
Installing RTP STD_BETA 0_0_0_54
Installing RTP STD_BETA 0_0_0_62
Installing RTP STD_BETA 0_0_0_69
Installing RTP STD_BETA 0_0_0_82
Installing RTP STD_BETA 0_0_0_84
Installing RTP STD_BETA 0_0_0_90
Installing RTP STD_BETA 0_0_0_98
Installing RTP STD_BETA 0_0_0_102
Installing RTP STANDARD 1_0_0_0
```

9. Click **Download** to save a copy of the installed software to your PC.



Utilities | Download Logs

Use **Download Logs** window to download system information logs to your PC.

To use the Download Logs function:

1. In the menu tree under **Utilities,** click **Download Logs**. The **Download Logs** window opens.

Device Name	SyncNet IP	Status
Camera_1	192.168.0.145	getting file
Camera_1	192.168.0.145	Success
Camera_2	192.168.0.240	getting file
Camera_2	192.168.0.240	Success
All Devices		Click here to download debug logs

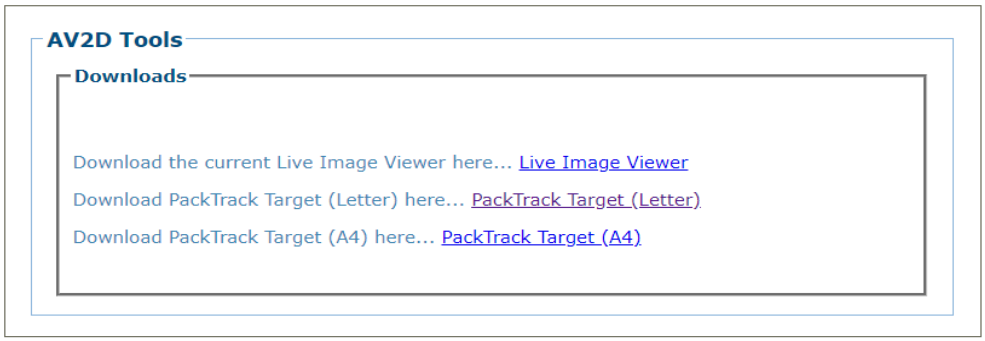
2. Click the link **Click here to download debug logs** to download the AllDebugLogs.tar.gz file to your PC.

Utilities | Download Tools

The **Download Tools** window provides links to tools stored on the AV500 that can be used for calibrating and testing the camera system. These include printable calibration targets and other helpful items. The items available may change depending on the camera version.

To view the available tool links:

1. In the menu tree under **Utilities**, click **Download Tools**. The **Download Tools** window opens.

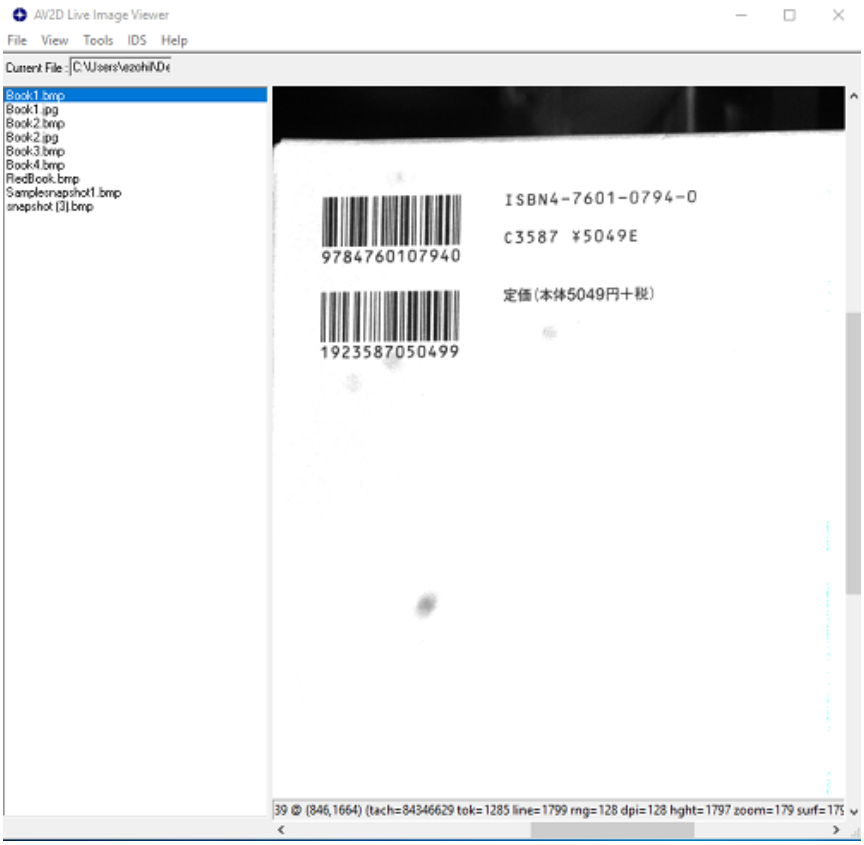


2. Click on a link to download the indicated tool to your computer.

Live Image Viewer

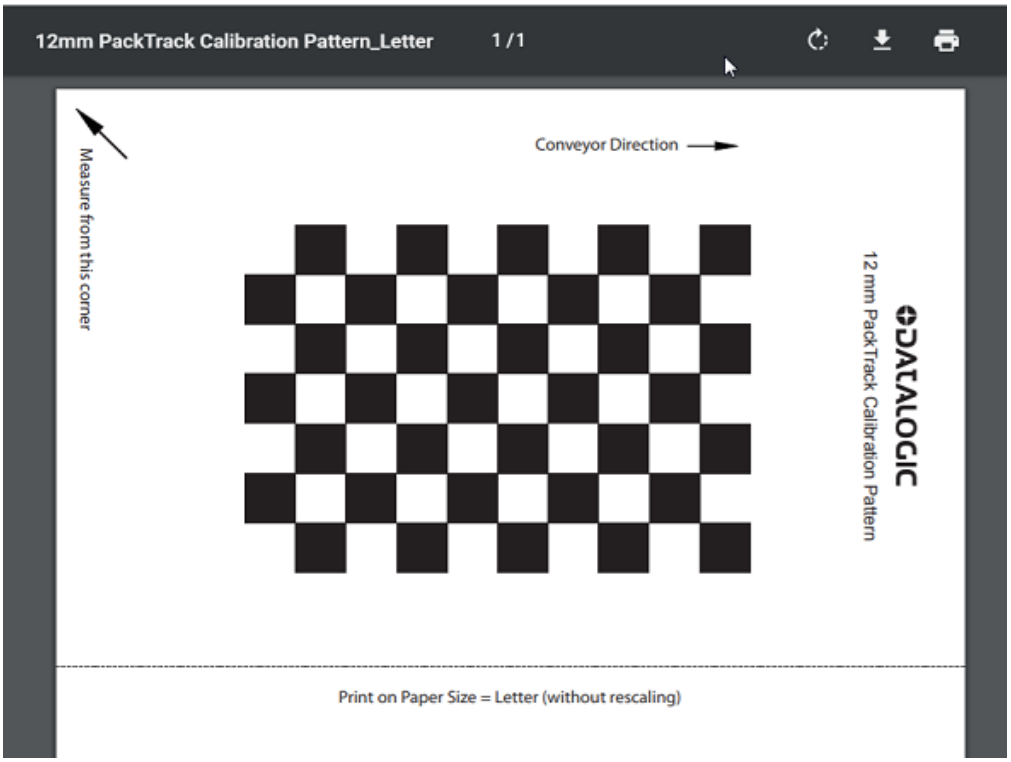
1. Click **Live Image Viewer** to download the tool. Extract the tool to your desired location.

2. Click on the exe to open. The following window opens.



PackTrack Target (Letter) and (A4)

1. Click **PackTrack Target** and the following target will display.



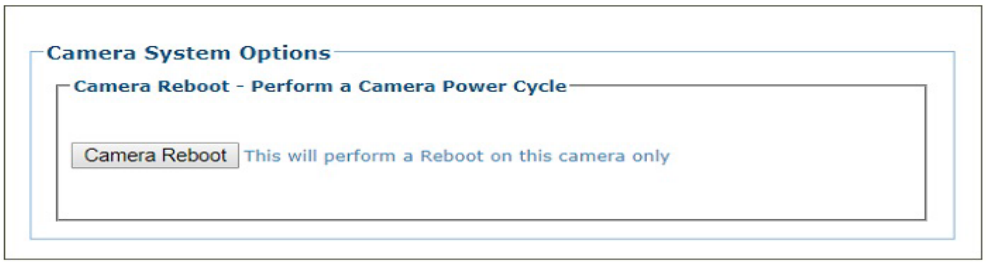
2. Click the printer icon to print the target to be used for calibration purposes.

Utilities | Camera Reboot

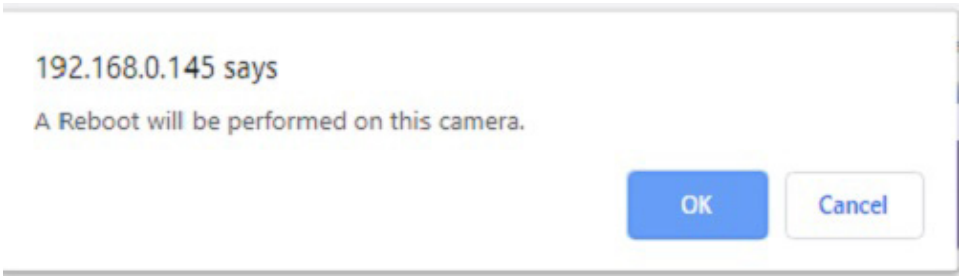
The Camera Reboot window allows you to reset a specific camera.

To reboot the camera:

1. In the menu tree under **Utilities,** click **Camera Reboot.** The **Camera System Options** window opens.



2. Click **Camera Reboot** and the following confirmation message appears**.**



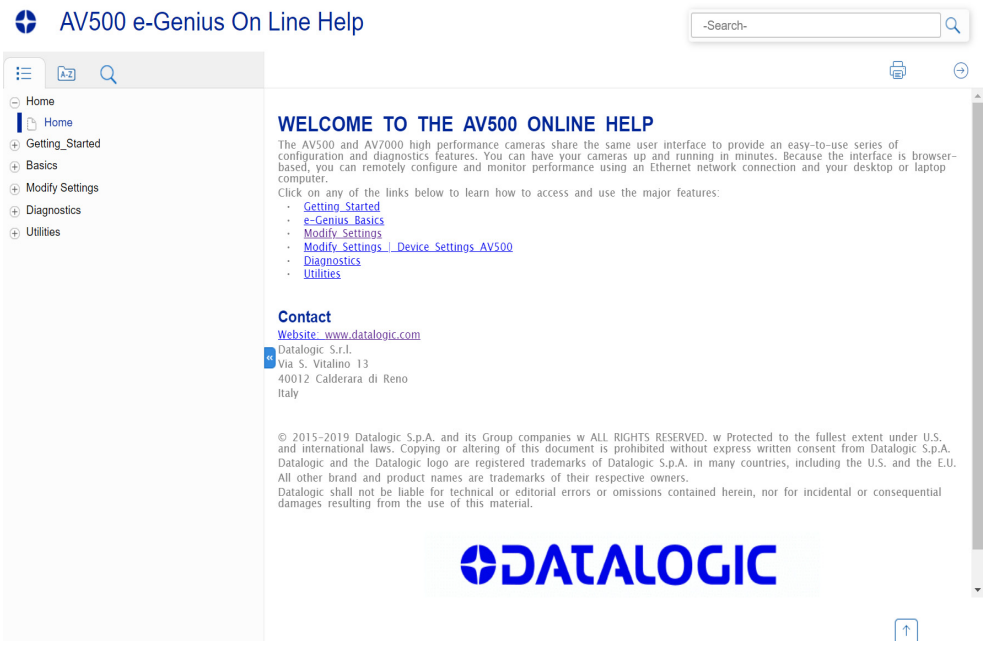
3. Click **OK** to continue the camera reset or **Cancel** to discontinue this process.

Utilities | Help and Logout

Utilities | Help

Use the **Help** selection to access the online help system.

In the menu tree under **Utilities**, click **Help**. The online help **Welcome** page opens in a new browser window.



Utilities | Logout

Click **Utilities | Logout** to exit e-Genius.

CHAPTER 5
FOCUSING DEVICE SETUP

The AV500 focusing position is computed by the camera based on the position of the package measured by a focusing device. The Datalogic focusing devices may be one or more of the following:

- S-60 Photocell
- AS1
- AREAscan™
- DLA Light Curtain
- (LCC-75xx AV7 Light Curtain)
- STI Light Curtain
- S-85 Positioning Sensor
- DM3610 Dimensioner

This section provides detailed procedures on setup and calibration of your AV500 Camera and the necessary focusing devices installed for your system.

The procedures outlined in this chapter should only be performed by a Datalogic trained technician. For further information on training, contact us through the Datalogic website at www.datalogic.com.

WHAT YOU WILL NEED

Items listed below are not required for every focusing option.

- Application Drawing (for structure, camera, mirror, sensor and focusing device positioning, and *Far Working Distance* for focusing)
- Application Specifications
- Laptop PC
- Tape Measure
- Sync Ethernet Cable Adapter
- Installation Kit (Test Boxes) (included with AV500)
- CH-3 Autofocus Test Chart (included with AV500)
- Dynamic Focus Target (included with AV500)
- Picket Fence/Step Ladder Test Chart

- RangerOScope (software): Download from **e-Genius, Utilities | Download Tools** window. Click **Tools** (Only when using for focusing)**.**
- CodeWord Viewer: Download from **e-Genius**, **Utilities | Download Tools** window. Click **Tools** (Only when using for focusing).
- Inventory All Equipment and Structure Parts

FIRST-TIME STARTUP

On initial power-up, the AV500 performs a series of self-diagnostic and LED tests. When the **STATUS** LED turns a steady green the power-up sequence is complete, and the camera is operational.

The AV500 cameras are shipped from the factory with these defaults:

- **Default User ID:** setup (case sensitive)
- **Default Password:** DLAset (case sensitive)
- Control Panel Buttons Enabled
- IP address - **192.168.0.145 (setup/sync controller),** 192.168.3.10 (Host), and 10.0.40.20 (Image)

UNDERSTANDING DATALOGIC FOCUSING OPTIONS

There are several Datalogic focusing options available for the AV500. Each option serves a different purpose in AV500 systems. They can be used alone or in combination with one another. Below is a list of the available options and an explanation of their purpose. The following sections detail how to focus each device when used in an AV500 system.

S-60 Photocell

The standard S-60 Photoelectric sensor is used in AV500 Camera Fixed Focus systems to detect the presence of an item entering the scanning area. This device works best in systems where packages are separated by an open space between the trailing edge of one package and the leading edge of the next.

AS1 AREAscan™

The **AS1** area sensors represent the ideal solution for the detection of very small objects, even when passing in different positions inside the controlled height and width. They can also help avoid multiple triggers on irregular shaped packages.

DL Light Curtain (LCC-75xx AV7 Light Curtain)

This device is used to detect the presence of objects as they enter the scanning area, as well as report the package heights ranging from 150 to 2500mm to the AV500.

S-85 Positioning Sensor

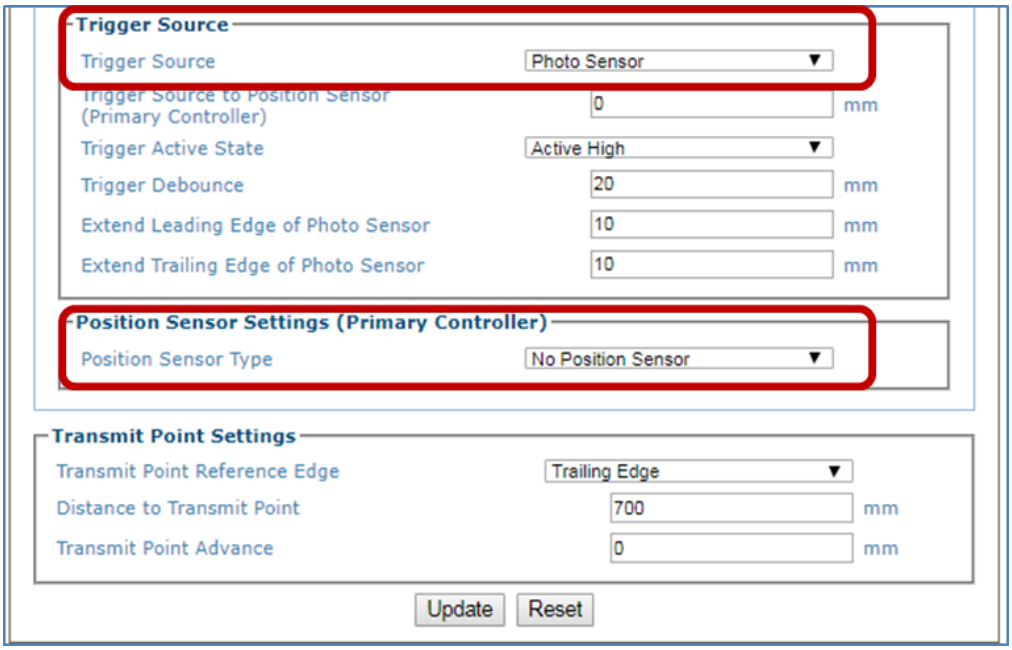
The S85 distance sensor with laser emission provides time of flight measurement between the S85 and an object located between the S85 and the calibrated far distance.

DM3610 Dimensioner

The DM3610 can be used to detect the presence of products as they enter the scanning area as well as report the package positions/heights and sequence number to all cameras in the system used in dimensioning are calibrated to have an accuracy of 2.5 mm [0.1 in], 5 mm [0.2 in] or 13 mm [0.5 in].

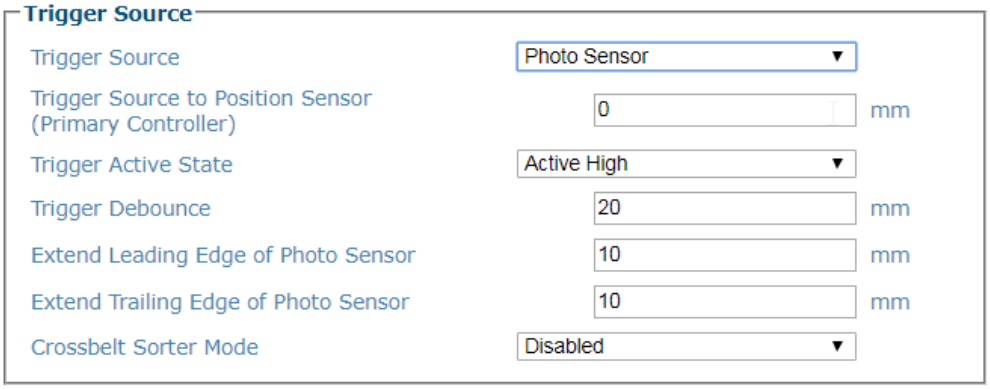
SETTING UP THE S-60 PHOTOCELL

Reference the **S-60 Installation Guide** (included with your S-60 kit) for complete information on connecting and aligning the Photocell. Make the following selections in the AV500 e-Genius application Operating Mode.



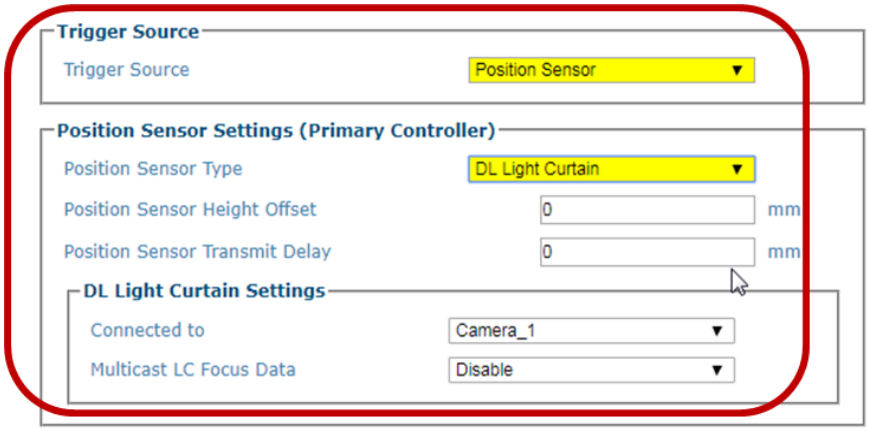
SETTING UP THE AS1 AREASCAN

Reference the **AS1 Series Instruction Manual** (included with your AS1 kit) for complete information on connecting and aligning the ASl. Make the following selections in the AV500 e-Genius application Operating Mode.



SETTING UP THE DS2 LIGHT CURTAIN

Reference the DS2 Instruction Manual available at www.datalogic.com for complete information on connecting and aligning the Light Curtain. Make the following selections in the AV500 e-Genius application Operating Mode.



NOTE

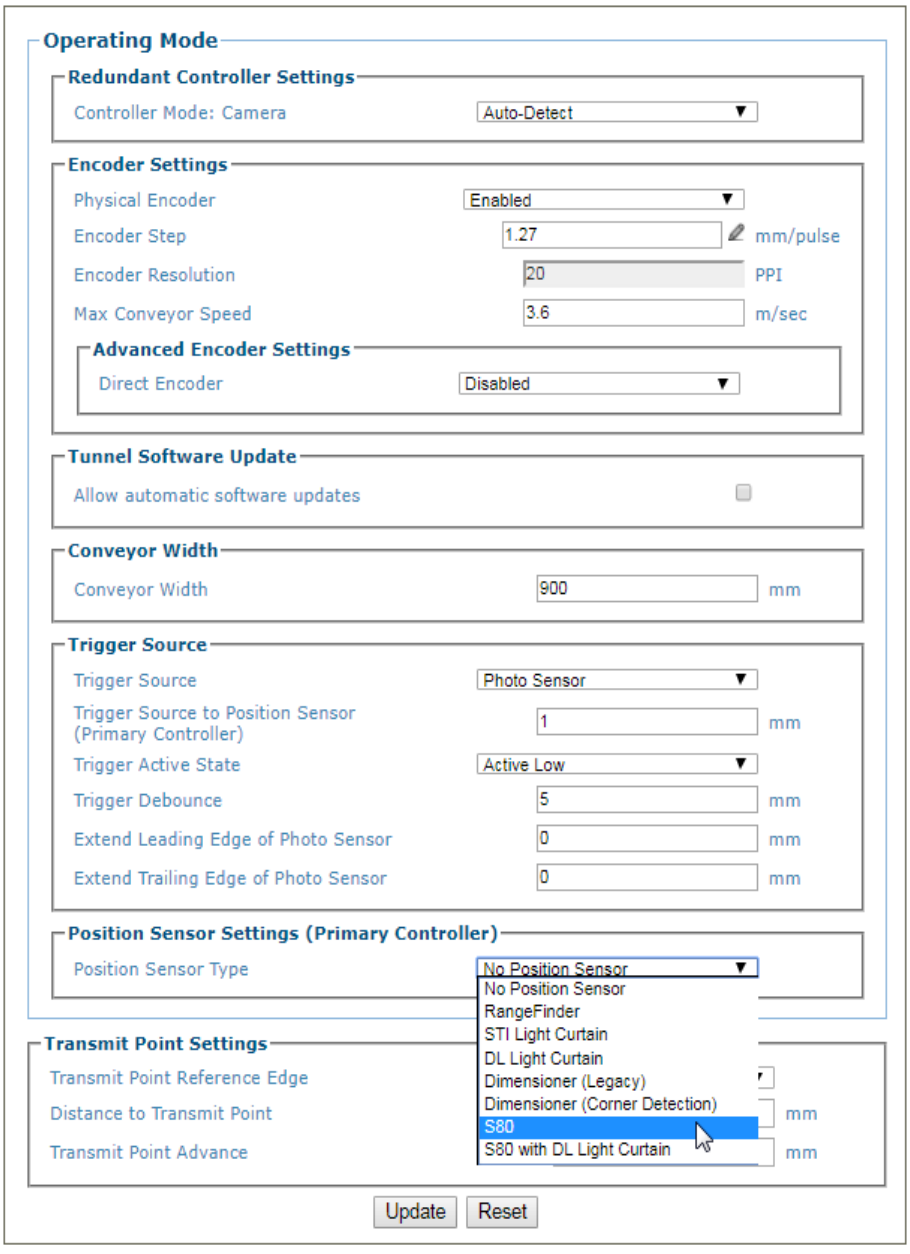
Make sure to connect the correct S85 to the correct camera.

6. The tach controller camera (with or without an S85 connected) tracks the connected S85's and DL light curtain to a point that is 127mm past the S85/LC that's located the furthest downstream from the PE (and closet to the first camera scan line)

AV500 Setup and Calibration

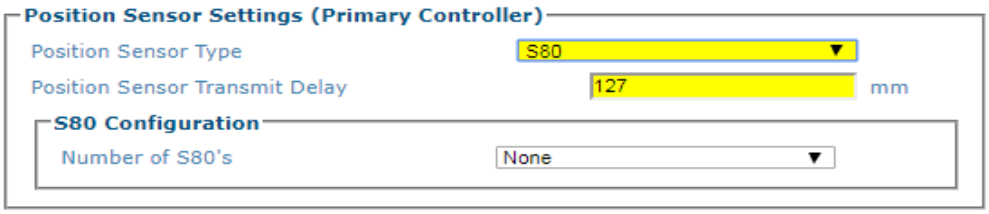
To calibrate the S85 Distance Sensors, follow these steps:

1. In e-Genius under Modify Settings, navigate to **Global Settings / Operating Mode**. The Operating Mode window opens.



2. Select the **Photo Sensor** as **Trigger Source** from the drop-down.

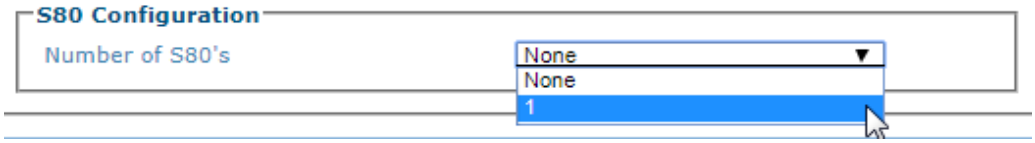
3. Select the **Position Sensor Type** from the drop-down. Select S85 or S85 with DL Light Curtain.



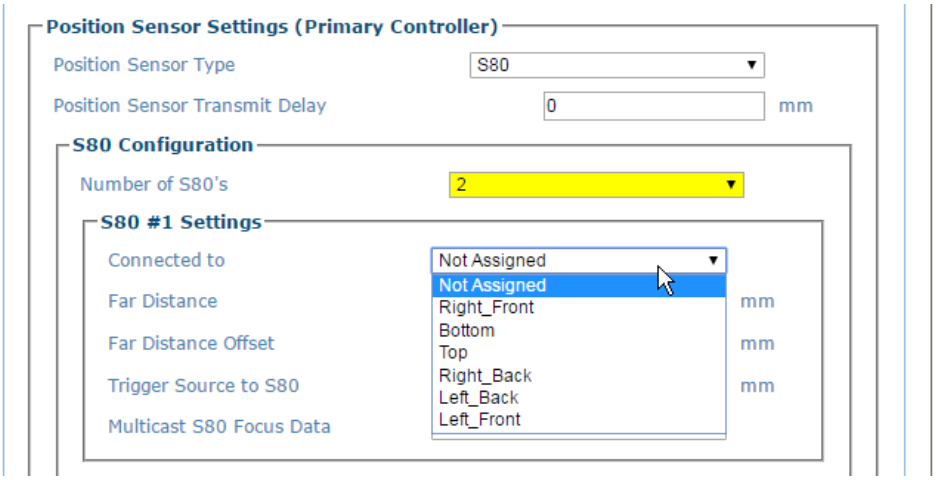
4. Enter the **Position Sensor Transmit Delay** as 127mm. This is required because the tach controller camera (with or without an S85 connected) tracks the connected

S85's and DL light curtain to a point that is 127mm past the S85/LC that's located the furthest downstream from the PE (and closet to the first camera scanline).

5. Select None or 1 from the **Number of S85's** drop-down.

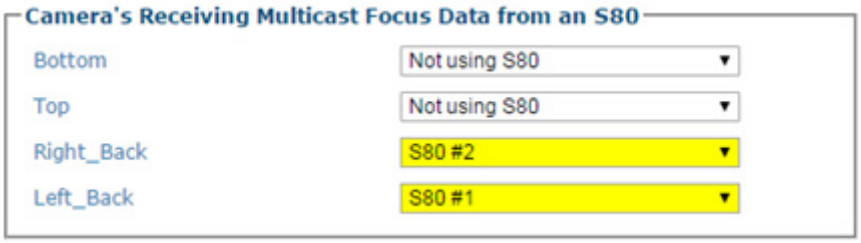


6. For each S85 used, select the correct camera from the **Connected to** drop-down.



7. If the S85 is required to share its focus information with other cameras on the same side of the conveyor, select **Enable** from the **Multicast S85 Focus Data** drop-down.

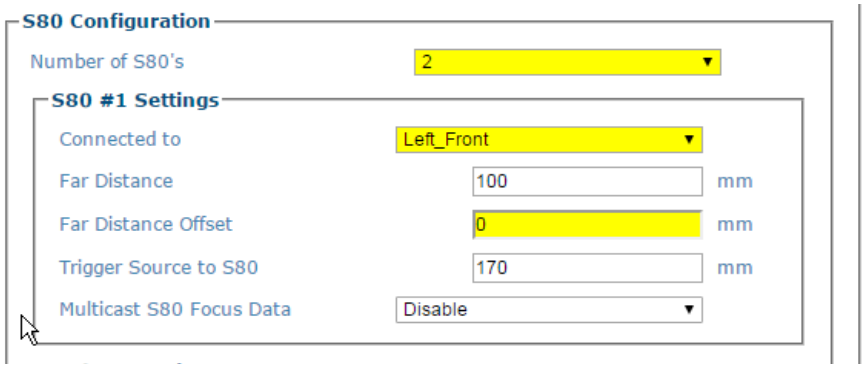
8. Once Multicast is enabled, **Camera's Receiving Multicast Focus Data from an S85** options appear.



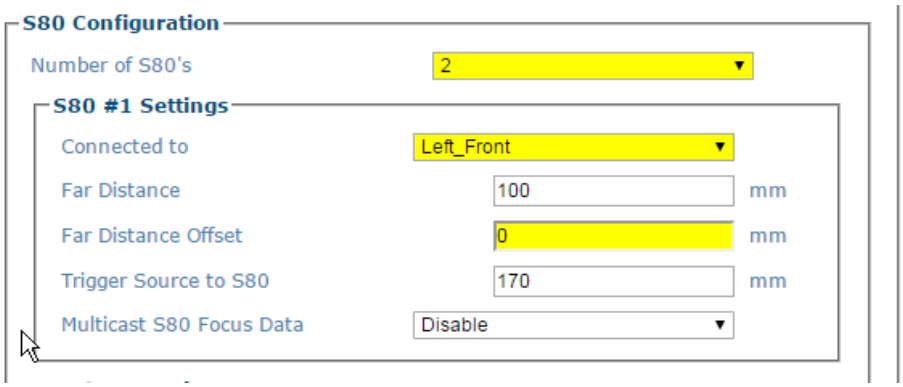
9. Select from the Multicast Focus Data drop-downs which cameras will use data from which S85.

10. Measure the distance from the trigger source to the first S85.

11. Enter this value into the **Trigger Source to S85** field. In this example 170 has been entered.



12. Click **Update** to save your changes.
13. In **e-Genius** under Diagnostics, navigate to **Serial Comm Status**. The Serial Communications Status window opens.
14. Remove all objects from the conveyor belt and click the **Start** button.
15. Determine the Far Distance (A).
16. Enter the displayed distance in the **Operating Mode > Far Distance** field. Click U**pdate** to save your changes.



17. Place an object of known width on the far edge of the conveyor and adjust the Far Distance Offset (B) until the focus value equals the object width.
18. To adjust the distance, press enter each time you make an adjustment.
19. Enter this displayed value in the **Operating Mode > Far Distance Offset** field.
20. Click **Update** to save your changes.

SETTING UP THE DM3610 DIMENSIONER

This focus setup is used to calibrate Dimensioner system focus data for AV500 Camera systems. DM3610 Dimensioners provide focus data for Datalogic cameras, including the AV500, NVS9000, and AV6010.

Refer to the DM3610 Dimensioner Reference Manual (or Two-Head Dimensioner Reference Manual) for complete information on installation and calibration of the DM3610. It is available for download from www.datalogic.com.

NOTE

For single Dimensioner applications, the DM3610 must be running software version 1.8.11 or greater. For multi-head applications, the DM3610's must be running 1.8.1 and the DC3000 must be version 1.3.60 or greater.

The Dimensioner scan line must be installed at least 500 mm [20 in] upstream from the nearest camera scan line.

The examples used in this guide use Imperial units i.e. inches. If the system is configured for metric, the unit of measure will be in mm.

Remember to reset these parameters to the application specifications after the calibration is complete.

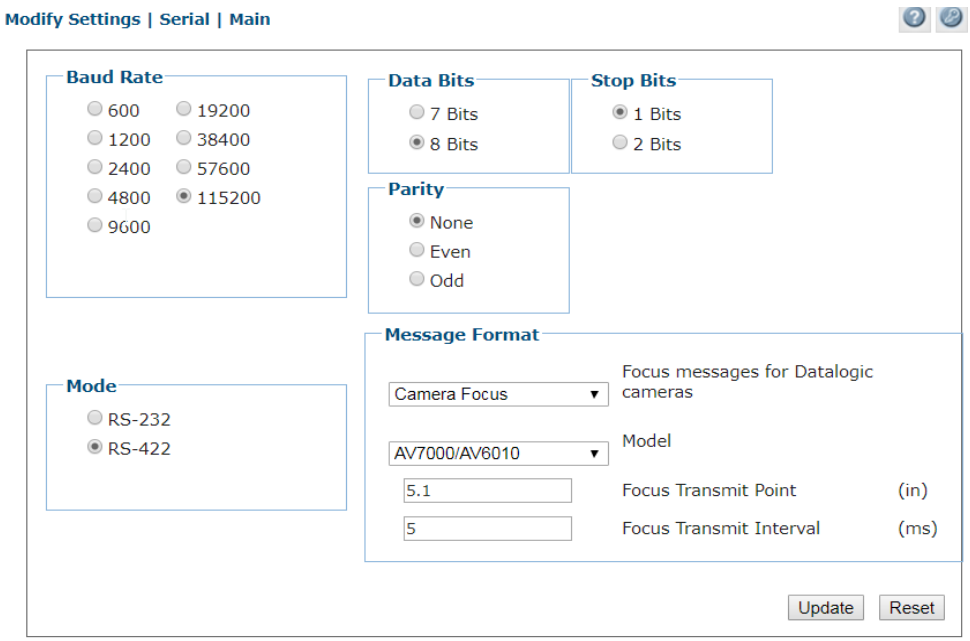
Preparation

Before beginning the DM3610 focusing process, a few preliminary settings are required.

NOTE

When working with a multi-head Dimensioning system, the focus setup steps apply to the unit designated as the "Tach Master" by the DC3000.

1. In the DM3610 e-Genius under **Modify Settings**, navigate to **Serial | Main** or **Aux** depending on the port wired to the AV500 (typically **Main,** consult your application interconnect diagrams for details). The **Serial | Main** window opens.



2. Make sure the selected **Baud Rate** matches that of the AV500 (AV500 uses the main port, RS485 (RS422), at 115200).

3. Under **Message Format**, select **Camera Focus** from the **Focus messages for Datalogic cameras** drop-down list.

4. Select the **Model** of camera for which you are focusing.

5. Enter the **Focus Transmit Point**. This is the distance the DM3610 waits until after the AV500 scan line has read, to transmit the message. This value correlates to a value in the AV500 settings. Default is 8 inches.

6. Enter the **Focus Transmit Interval**. This is the amount of milliseconds between data transmissions. It defines the frequency of the data transmissions from the DM3610(s).

7. Click **Update** to save the changes.

8. The distance between the far working distances of the cameras is considered the “Conveyor Width” and must also be entered in the **Conveyor Width** field in AV500 **Global Settings | Operating Mode.**

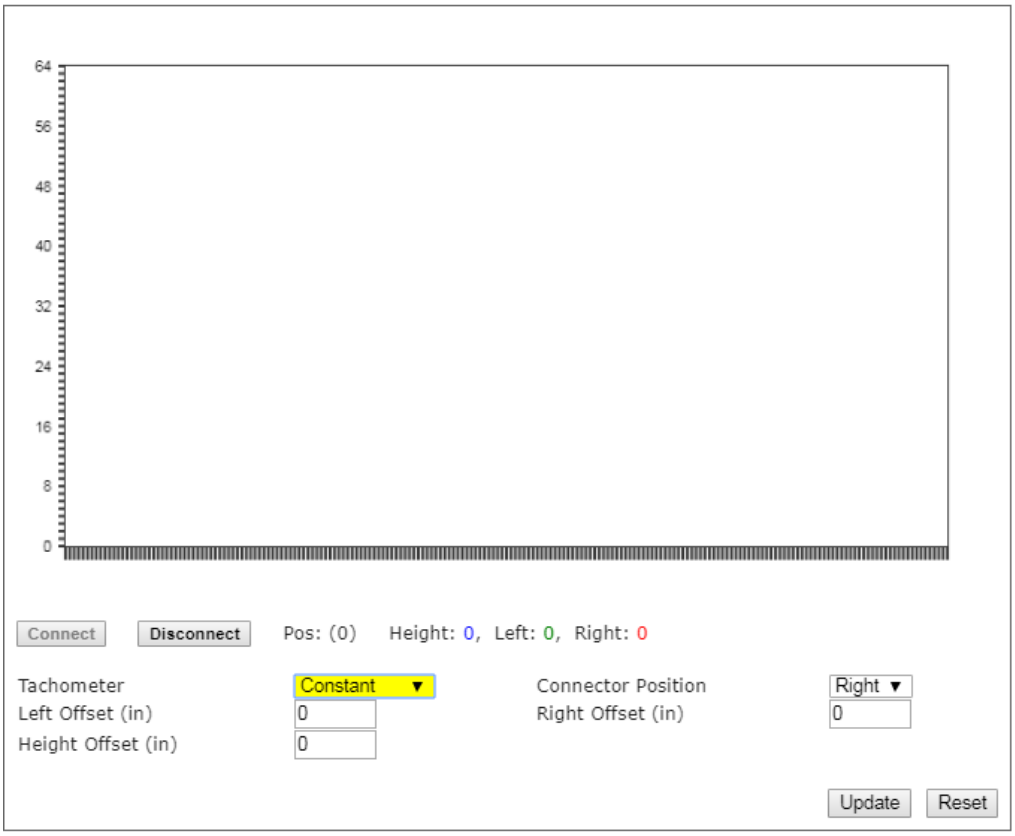
Understanding DM3610 Focusing and AV500 System Orientation

The goal of this focusing process is to correlate the DM3610 zero reference points to the far working distances of the cameras.

The DM3610 Left and Right Offsets will focus the DM3610 at the **Far Working Distances (Left and Right)** of the side AV500 cameras. These values are not necessarily the same. Reference the system application drawings for the exact prescribed Far Working Distances of each camera.

1. Navigate to **Diagnostics | Focus Setup**. The **Focus Setup** window opens,

If you navigate away from the Focus Setup page, the Constant Tach setting will automatically reset to Hardware Tach. Reset it, to continue the focus setup process.



2. From the **Tachometer** drop-down list, select **Constant**.

3. Verify that the values displayed for **Left Offset, Right Offset,** and **Height Offset** are all set to 0.

4. Referencing the direction of conveyor travel, view the Dimensioner from an upstream position. Determine if the connectors located on the side of the unit face left or right, see the image below.

Connector Position Right

Connector Position Left

5. From the **Connector Position** drop-down, select **Left** or **Right**.

6. Click **Update** to save the changes.

WARNING

When working with a DC3000 multi-head system, you must select a focus data source on the DC3000 Tach/Trigger/Transmit page. In applications involving side read cameras, select Head 1 and Head 2. For top read only applications, selecting a single head will suffice.

Adjusting DM3610 Left Focus Offset

1. Position a test box with a known width in the dimensioner line(s) so the side of the box is at the RIGHT side AV500 far working distance as specified by the application's installation drawing. In this example we will be using a box with a 3" width.

WARNING

When working with a DC3000 multi-head system, the text box must intercept all dimensioning lines

NOTE

When working with a DC3000 based Dimensioning system, please allow time for the constant tach signal to synchronize between the Master and Slave units.

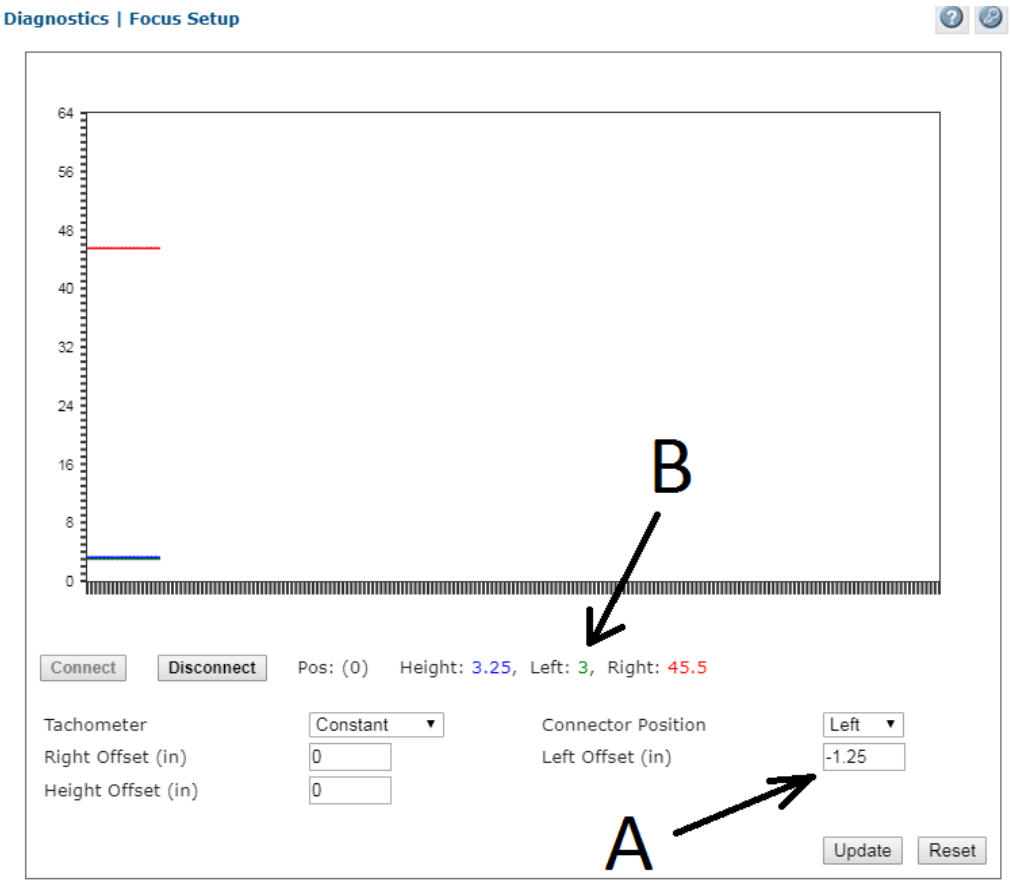
2. In the menu tree under **Diagnostics**, click **Focus Setup**. The **Focus Setup** Windows opens.

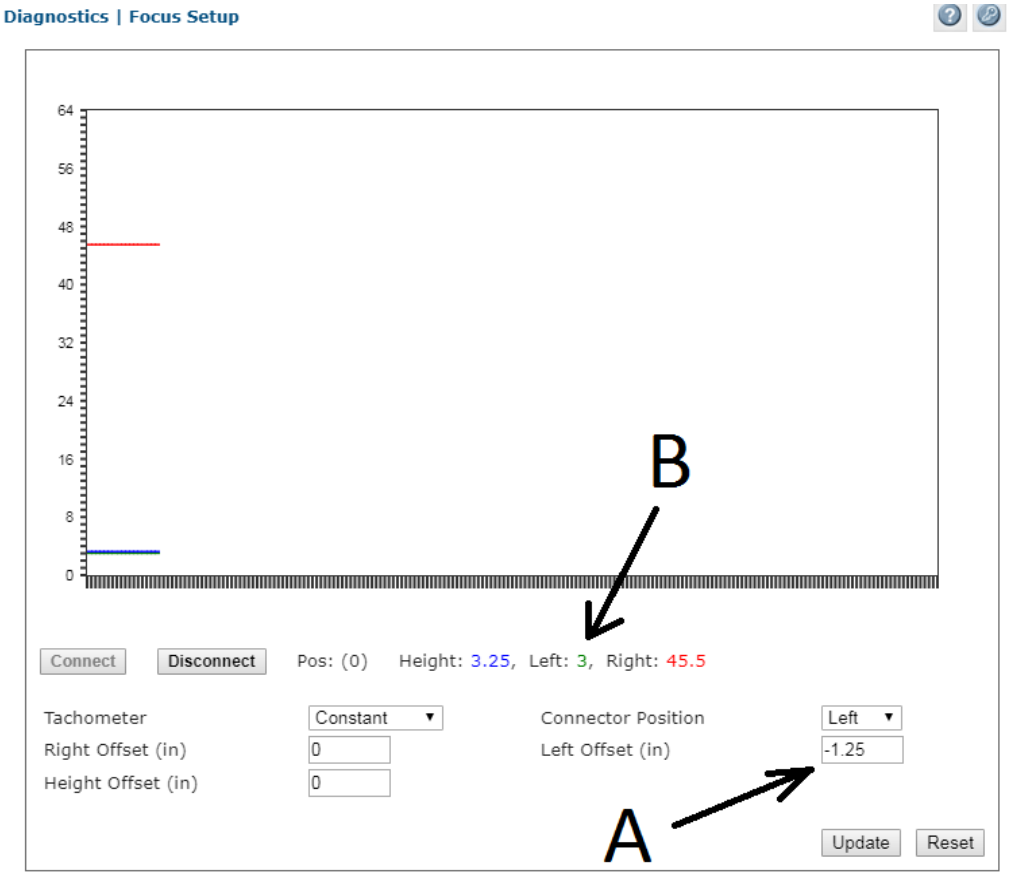
3. View the displayed data and determine what the left value is. In the displayed example above, the value is 4.25”.

4. Subtract the width of the test box, in our example it is 3”, from the value displayed for Left.

$$4.25 - 3 = 1.25$$

5. Enter the result as a NEGATIVE value in the Left Offset field. In this case you will enter -1.25.





6. The position value displayed for the Left is now 3.

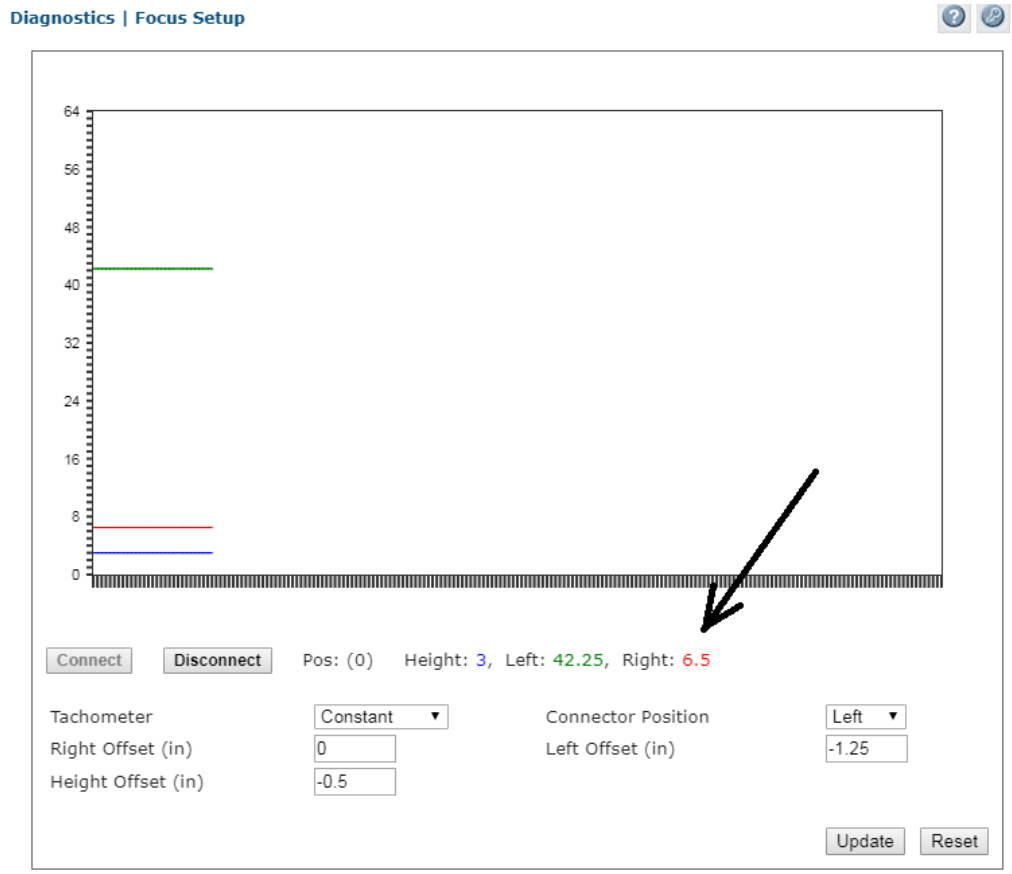
7. Click **Update** to save your changes.

Adjusting Right Focus Offset

When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Position the test box with a known width in the dimensioning line so the LEFT side of the box is at the RIGHT far working distance as specified by the application installation drawing.

2. View the displayed data and determine what the **RIGHT** value is. In our example the value is 6.5”.



3. Subtract the width of the test box from the value displayed for RIGHT.

   6.5 – 3 = 3.5

4. Enter the result into the RIGHT OFFSET field as a negative value, in our example it is -3.5.

5. Note the position value displayed for RIGHT is now 3.

6. Click **Update** to save the changes.
7. Test the system by inducting a series of application objects and bar codes. Use the AV500 imaging utility to verify that the cameras are focusing properly over the width and height of the conveyor.
8. Under **Tachometer**, select **Hardware/External** from the **Tach Source** drop-down list.
9. Click **Update**.

Adjusting Height Offset

When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Place the same test box in the center of the dimensioning line so the known distance side is facing up.
2. Determine the Height value as displayed by the DM3610. In the image below the 3” test box displays a height of 3.5.

CHAPTER 6
AV500 CALIBRATION

The AV500 Camera can be set up as a single unit or with multiple AV500s in a scanning array (tunnel). The AV500 camera system is a high-precision imaging system, and requires careful and accurate setup and calibration to function at its full potential.

REVIEW MOUNTING DRAWING AND APPLICATION SPECIFICATIONS

Make sure all equipment is mounted correctly based on the application drawings and specifications.

- **AV500 Deflection Mirror Alignment** - Reference the application drawing and *section "Installing the Deflection Mirror" on page 34* for deflection mirror placement and mounting.
- **Photoelectric Sensor, Trigger (if applicable)** - Mount the photoelectric sensor according to the application drawing, and with the following recommendations:
- Make sure the Photoelectric Sensor (PS) is square to the conveyor
- Make sure the PS is high enough off of the conveyor surface that it will not get false triggers from any part of the conveyor
- Make sure the PS is aligned properly to the reflector. (In a sender receiver application, make sure the two components are aligned correctly)
- Make sure the PS is xxxx mm [x in] or greater upstream from the scan line (if applicable).
- If using any one of the additional focusing devices, see Appendix 5, Focusing device Setup.

AV500 SOFTWARE UPDATE

If necessary, a Datalogic technician will update the AV500 CPU with the latest software. This must only be done by, or under the guidance of, a trained Datalogic technician.

DO NOT use a parameter file from any previous AV500 installations.

You will need to connect a laptop to the AV500 in order to perform static and dynamic calibration, You may use any of the three Ethernet ports; Image, Host or Sync:

- Sync IP:
- Host default IP:
- Image default IP:

- Sync Controller IP (the sync adapter cable must be used):

Your PC's IP address needs to match the camera system's IP Address range, see section **for information on connecting a laptop to the system. The Host and Image port IP addresses may have been changed for your application. Contact your system administrator for changes.**

Open a browser and enter cameras IP address into the browser's address field. When **e-Genius** opens, enter the case sensitive user name (setup) and password (DLAset).

e-Genius Calibration Presets

Before physical calibration is begun, a few settings need to be confirmed or modified in **e-Genius**. Your PC's IP address needs to match the camera system's IP Address range, *see section "Accessing e-Genius via AV500" on page 57* for information on connecting a laptop to the AV500.

System Info: Bring Each Camera into the Network

When power is applied to the AV500s for the first time each camera will need to be brought into the sync network using **e-Genius**.

1. From the menu tree, navigate to the **Modify Settings | System Info**. The **System Info** Page opens.
2. From the **Action** drop-down list, select the **Add to Cluster as new.**
3. Click **Update** to add the camera to the **This Cluster** table.
4. Once each AV500 has been added under **This Cluster**, its mounting positions will need to be identified. Click **Blink** in a camera's row in the table. That camera's illumination will light.
5. Once the camera has been identified, select its mounting position from the **Camera** Position drop-down list.
6. Click **Update** to save the configuration.

Operating Mode

In the menu tree under **Modify Settings**, navigate to **Global Settings | Operating Mode.** The **Operating Mode** window opens. See *section "Modify Settings | Global Settings | Operating Mode" on page 62* for an explanation of the **Operating Mode** options.

The following parameters must be set to match the application:

1. Encoder Settings - **Encoder Step Settings: Modify Settings | Global Settings | Operating Mode** > **Encoder Step. Conveyor speed:** Enter the conveyor speed (Formula: Max conveyor speed x 1.05). This is needed so the AV500 sets the exposure time parameter during calibration.
2. **Trigger Source:** Make sure the Trigger Active State is set correctly, To test this, navigate to **Diagnostics | Device Tracking**. Run two boxes through the system. Confirm that the start and end trigger corresponds to the correct **Seq Number.**
3. Transmit Point Settings
4. Other Important Application Dependent Parameters:

- **Modify Settings | Global Settings | Object Detection** *(See section "Modify Settings | Global Settings | Object Detection" on page 82*)
- **Modify Settings | Global Settings | Barcode Settings** *(See "Modify Settings | Global Settings | Barcode Settings" on page 83*)
- **Modify Settings | Global Settings | Communications** *(See "Communications" on page 128*)
- **Modify Settings | Global Settings | Output Format** *(See "Output Format" on page 140*)
- **Modify Settings | Global Settings | Image Saving** *(See "Image Saving" on page 149)*

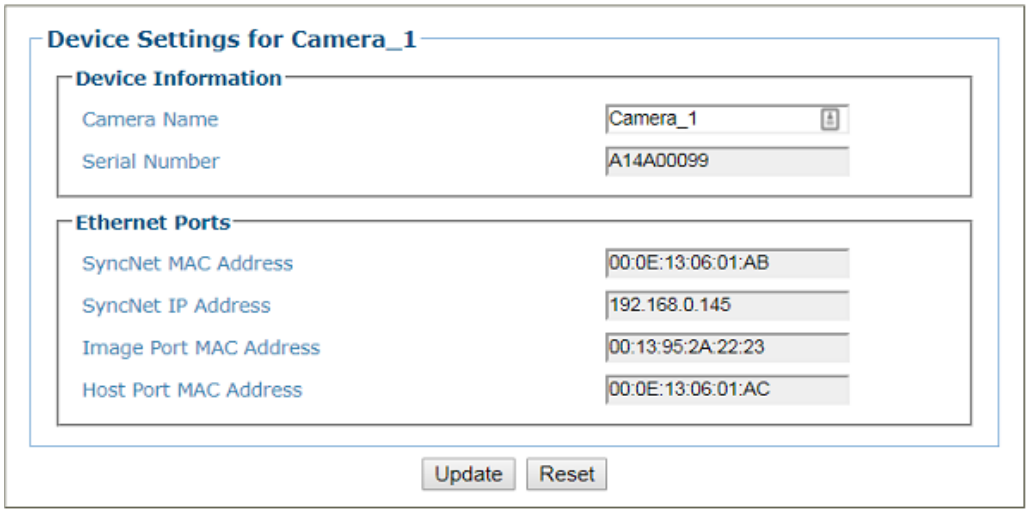
Device Settings

In the menu tree under **Modify Settings**, navigate to **Device Settings.** Since each camera is mounted separately, each AV500 camera in a system must be calibrated separately.

There will be a different **Device Settings** branch in the menu tree for each camera in an array. *See section "Modify Settings | Device Settings AV500" on page 158* for an explanation of the **Device Settings** options.

1. In the menu tree, navigate to **Modify Settings | Device Settings | Camera *N* | Device Info**. The **Device Info** window opens.

2. Enter a unique name for the camera; such as top left, front right, etc. The new name will appear in the **Name** column on the **System Info** window, and also in the menu tree under **Device Settings**.



3. Click **Update** to save the new name. Repeat this for each camera in the system.

If there are several cameras in your array, you may want to label them appropriately.

AV500 CALIBRATION

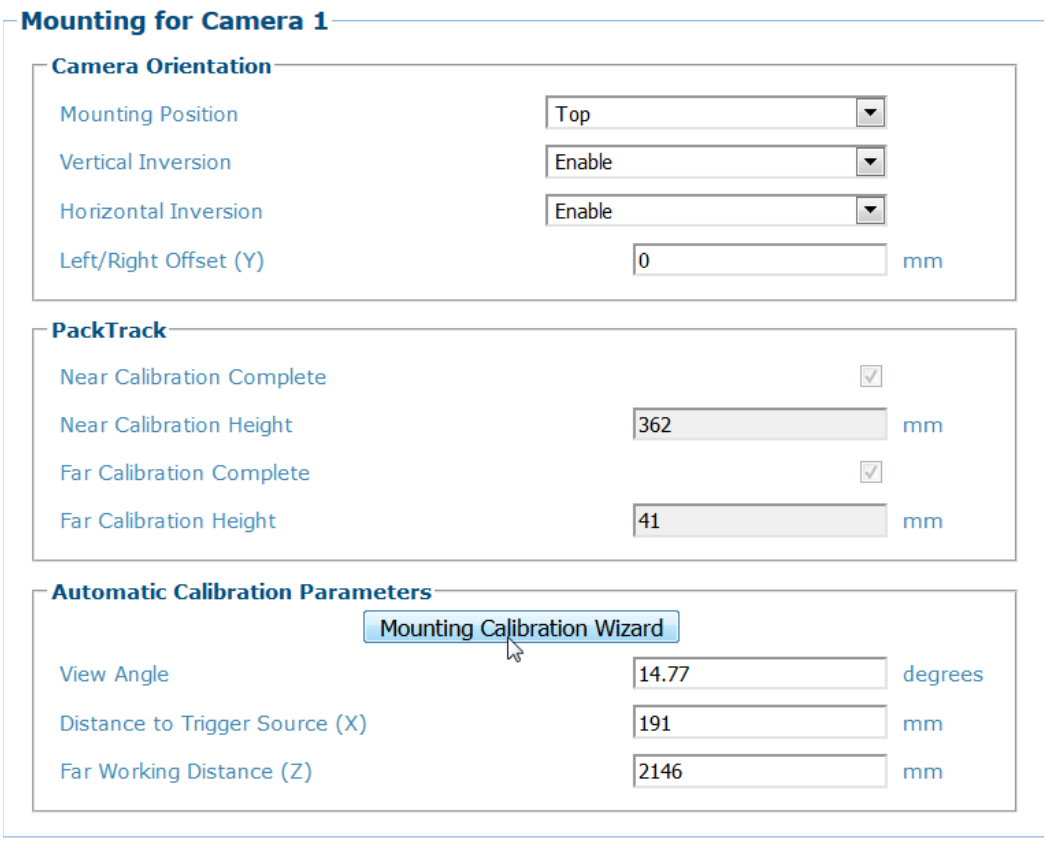
To properly calibrate your AV500s you must perform the following steps:

- Static Calibration
- Adjust the Image Gain
- Adjust the Focus
- Run Final Acceptance Test

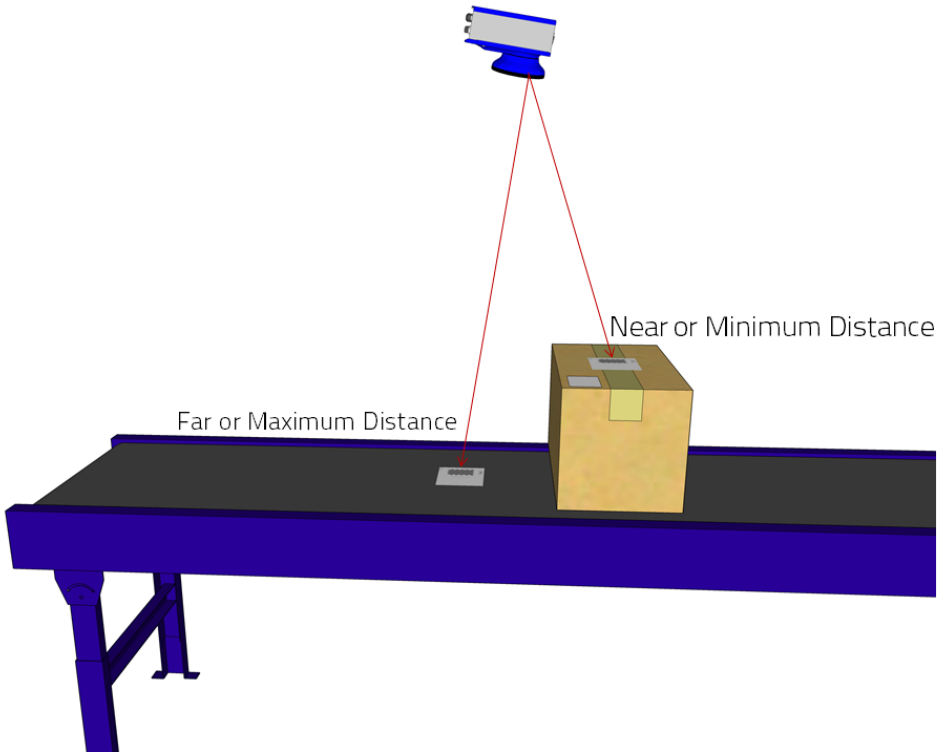
AV500 Static Calibration

Static calibration is used to set up and calibrate the camera while the conveyor is sitting still.

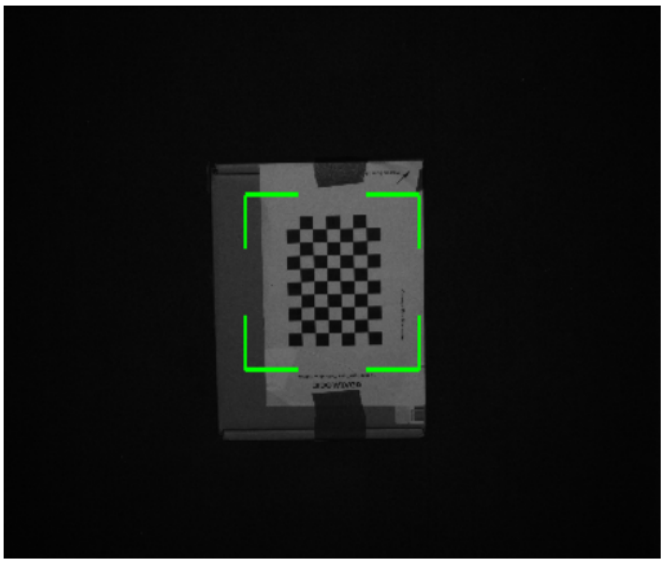
1. Navigate to **Modify Settings | Device Settings | Camera N | Mounting**. The **Mounting** window opens. *See "Device Settings | Camera #n | Mounting" on page 161.*



2. Click Mounting Calibration Wizard button Mounting and **Step 1/5:Far Distance Calibration Target Alignment** appears.



Mounting Calibration for Camera 1



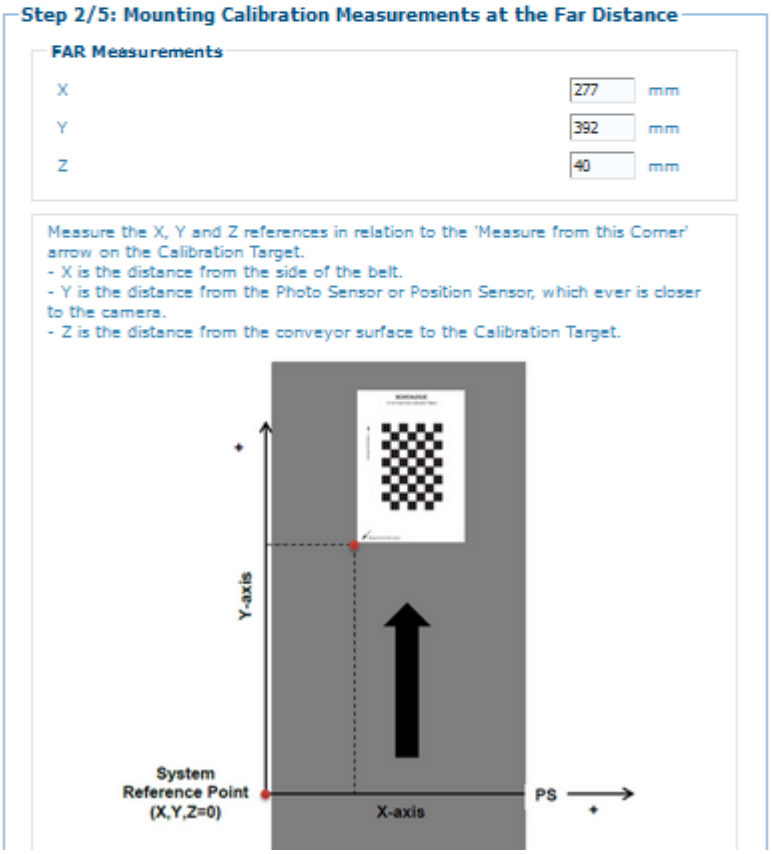
Next Step >>

Step 1/5: Far Distance Calibration Target Alignment

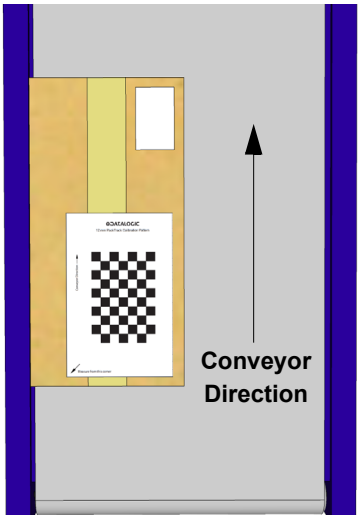
Place a Calibration Target at the maximum distance from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press 'Next Step'.

3. Place a calibration target at the maximum distance from the camera. Make sure the checker board grid is centered within the green alignment area. Make sure the Conveyor Direction arrow is pointing in the direction the conveyor is traveling. Leave the target under the camera and press **Next Step >>**.

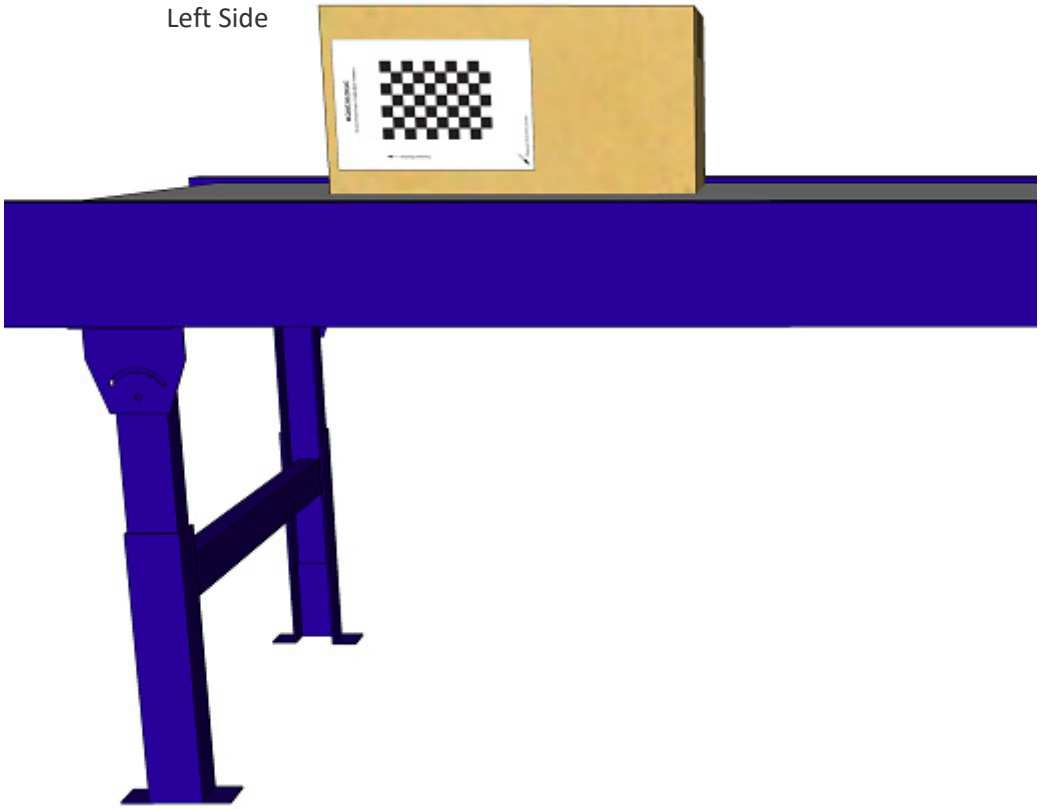
4. Step 2/5: Mounting Calibration Measurements at the Far Distance appears:



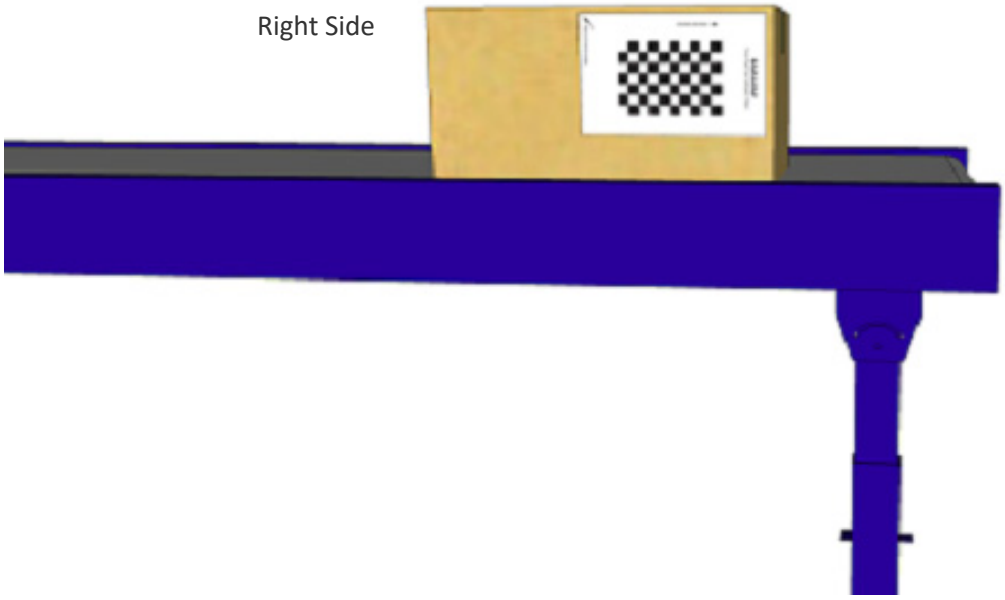
Top



Left Side

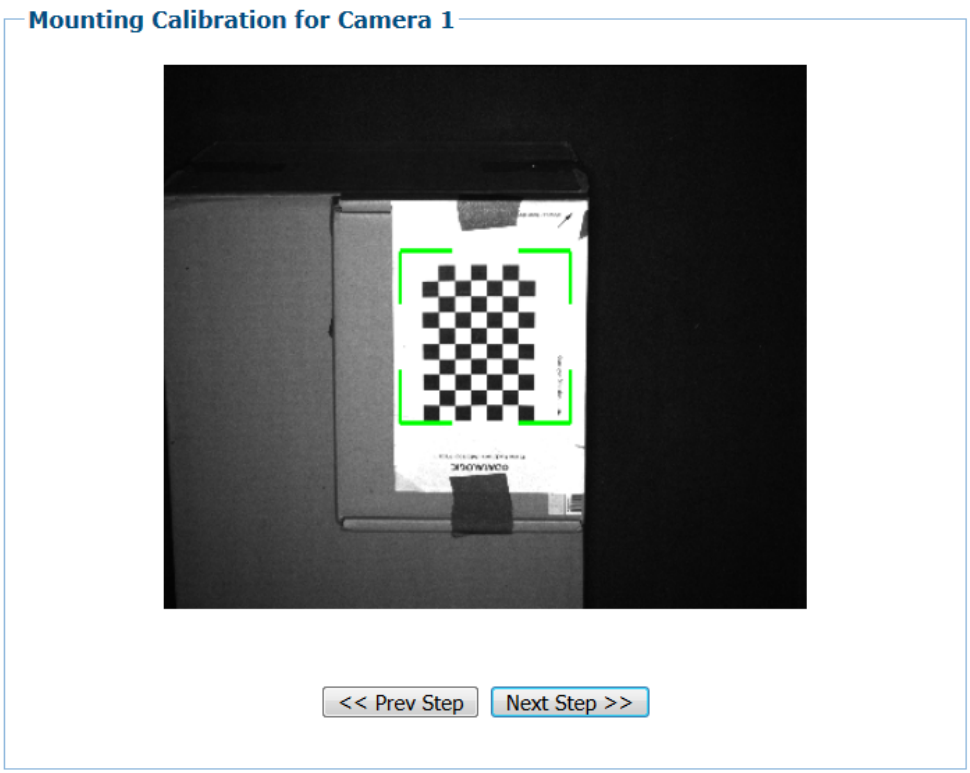


Right Side



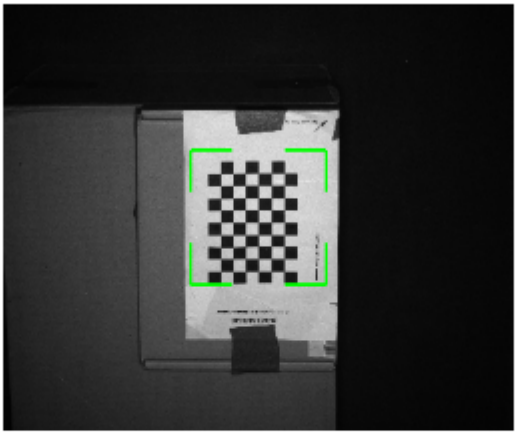
5. Measure the distance from the side of the belt to the Calibration Target.
6. Measure the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera, to the Calibration Target.
7. Measure the distance from the conveyor surface to the Calibration Target. Z=0

8. Enter those measurements into the Far Measurements fields.
9. Click **Next Steps >>.**
10. Step 3/5: Near Distance Calibration Target Alignment appears:



11. Place a target at the minimum distance and measure X, Y, and Z references
    - X is the distance from the side of the belt to the Calibration Target.
    - Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera, to the Calibration Target.
    - Z is the distance from the conveyor surface to the Calibration Target. Z=0
12. Enter those measurements into the Near Measurements fields.
13. Click **Next Steps >>.**

Mounting Calibration for Camera 1



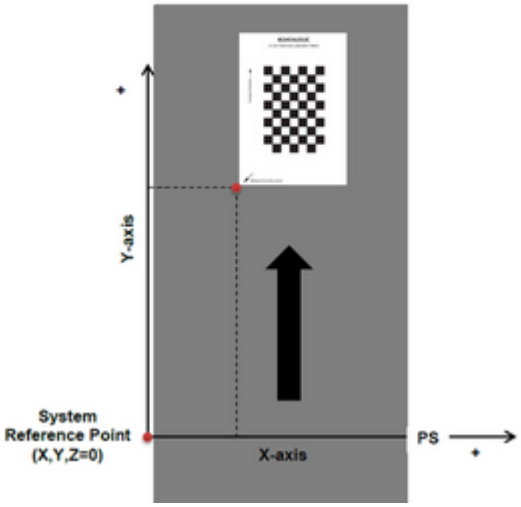
<< Prev Step | Next Step >>

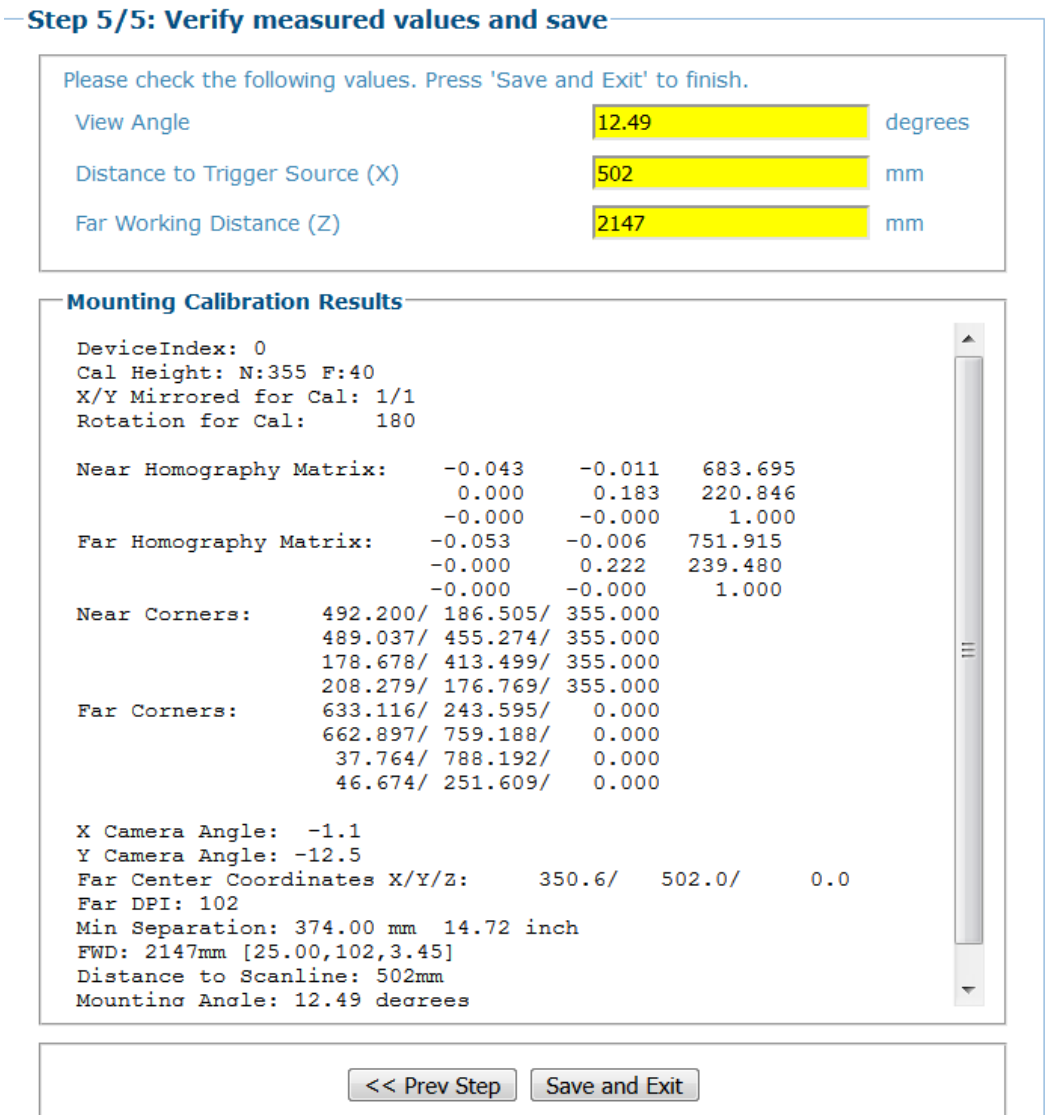
Step 4/5: Mounting Calibration Measurements at the Near Distance

NEAR Measurements

X	280	mm
Y	331	mm
Z	355	mm

Measure the X, Y and Z references in relation to the 'Measure from this Corner' arrow on the Calibration Target.
- X is the distance from the side of the belt.
- Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera.
- Z is the distance from the conveyor surface to the Calibration Target.





14. Check the values for far distance and near distance.
15. Click **Save** and **Exit** button.
16. Verify!

Other Camera Checks

Confirm communication with host.

- Serial (if applicable)
- Ethernet (if applicable)
- Confirm Protocol Index (if applicable)

Observe the System in Action.

Confirm that all cameras are reading the barcode correctly and that the scan point is communicating to the host.

CHAPTER 7
MAINTENANCE

OVERVIEW

This chapter provides instructions for maintaining optimum performance and life for your AV500 cameras. It provides specific information on:

- Maintenance Procedures
- Exterior Cleaning
- Mounting Hardware Checks
- Wiring Connection Checks

Item	Description
Soft-bristle brush	For cleaning the unit's exterior
Clean, soft cloths	For cleaning the unit's exterior
Cleaning solutions	Mild detergent solution for cleaning the unit's exterior. 70% denatured alcohol, 30% de-ionized water solution for cleaning exit window
Soft cotton swabs or	Use to clean illumination exit window

Due to the complex and application-specific nature of these installations, AV500 camera systems must be setup and serviced by authorized technicians trained by Datalogic.

Maintenance procedures in this chapter may be performed by an end user technician. Training is recommended if the end user intends to do more than the maintenance procedures provided in this chapter.

DO NOT OPEN THE UNIT. OPENING THE AV500 MAY VOID ITS WARRANTY.

CAUTION: Proceeding with any setup, calibration, or service procedures without proper training may void the warranty.

For further information on training, contact us through our website at www.datalogic.com.

RECOMMENDED MAINTENANCE FREQUENCY

The AV500 Camera System is designed for industrial environments. The recommended frequency for performing these maintenance tasks will depend on the application's environment. In general, these procedures are recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the equipment or when performance is degraded by accumulation of dust or dirt on the exit windows or deflection mirrors. By monitoring normal operations and performing weekly visual checks, you can establish a maintenance schedule that fits your application.

MAINTENANCE TASKS

Perform the maintenance tasks on an "as needed" basis to assure proper operation of the camera.

Task schedule frequency depends upon the application environment conditions. Harsh environments that expose the equipment to more heat, dust, and dirt will require these procedures be performed more frequently.

It only requires a few minutes to complete each maintenance task.

Exterior Cleaning

Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products. Before performing this maintenance task, be sure to shut down the unit.

The exterior cleaning procedure may be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system by disconnecting the power source.
3. Clean the exterior (except the windows) with a clean, soft-bristle brush. Be sure not to brush any dust, dirt, or debris onto the windows.
4. Carefully remove any dirt or debris in or around the connector panel.
5. Wipe the exterior with a clean, soft cloth dampened slightly with a mild detergent solution.

Cleaning the Illumination / Camera Window

Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Never apply cleaning solution directly to the camera window. Always apply the solution to a cloth, and then the cloth to the window. Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the deflection mirrors. The window cleaning procedure should be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Follow the exterior cleaning procedure before cleaning the window.
4. Check the window surface for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
6. Apply the cleaning solution to a lint-free cotton cloth.
7. Apply the cloth with cleaning solution to the camera and illumination window.
8. Remove any streaks or remaining moisture from the window with a dry, soft, lint-free cloth or lens paper.
9. Verify camera operation.

Cleaning the Deflection Mirror

Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Use care when cleaning the deflection mirror to assure that the alignment with the camera is not altered. Never apply cleaning solution directly to the mirror. Always apply the solution to a cloth, and then the cloth to the mirror. It is a good habit to pre-mark the mirror position, so if it does move it can be returned to the original position.

This procedure is recommended only if it is noticed that the environment is dirty enough that HEAVY deposits are appearing on the deflection mirrors. The cleaning procedure should be performed without removing the mirror from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the deflection mirror.
4. Check the deflection mirror for any dust, dirt, or smudges. If the deflection mirror needs to be cleaned, proceed to ***Step 5***.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the deflection mirror is particularly dirty or smudged, make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)

7. Apply the cleaning solution to a lint-free cloth.
8. Apply the cloth with the cleaning solution to the mirror.
9. Remove any streaks or remaining moisture from the mirror with a dry, soft, lint-free cloth or lens paper.
10. Verify camera operation.

Cleaning the Photoelectric Sensor

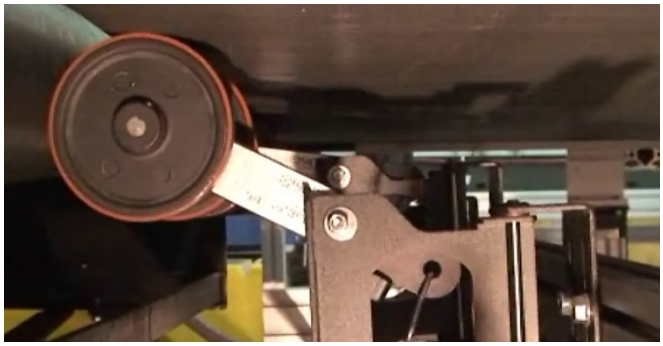
If your application uses the photoelectric sensor option as a hardware trigger, be sure to clean the photoelectric sensor periodically as outlined below.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Clean the photoelectric sensor's lens using the denatured alcohol solution and a cotton swab or lens paper.
4. Clean the reflector using the denatured alcohol solution and a cotton swab or lens paper.
5. Verify photoelectric sensor operation.

Cleaning the Tachometer

If your application uses the tachometer option for tracking purposes, be sure to clean the tachometer wheels periodically as outlined below.

1. Turn off the product transport.
2. Turn off the barcode reader by disconnecting the power source.
3. Using a clean, soft cloth, wipe the wheels of the tachometer clean using a mild detergent solution.
4. Before restarting the system, be sure the tachometer is making good contact with the product transport.
5. Verify tachometer operation.



Tighten Mounting Hardware

1. Check all AV500, Deflection Mirrors, CBX connection boxes, and power supply mounting hardware as applicable. Tighten as necessary. Do not over-tighten. Be sure not to disturb the equipment's alignment as it relates to the product transport.
2. Check the mounting hardware of the Photoelectric Sensor (if this option is being used). Tighten as necessary. Do not over-tighten.
3. Check the mounting hardware of the tachometer (if this option is being used). Tighten as necessary. Do not over-tighten.

Checking Camera System Connections

This is a safety check recommended for harsh environments where vibration may be a problem. *(See "Electrical Installation" on page 41)*

1. Check all wiring connections to the camera and illumination connector panels. Tighten any loose connections as necessary. Do not over-tighten.
2. Check all wiring connections to the CBX connection box. Tighten any loose connections as necessary. Do not over-tighten.
3. Check all cabling/conduit for signs of wear/damage. Repair/replace any damaged cable connections as necessary.

Verify Camera Operation

If after performing maintenance, the imaging system continues to perform below the normal operations experienced with the system under normal daily conditions, contact Datalogic through our website at www.datalogic.com.

Verify Photoelectric Sensor Operation

1. Block the Photoelectric Sensor emitter beam to confirm it is aligned properly with the reflector.
2. Verify that the TRIGGER LED on camera lights when photoelectric sensor beam is blocked.
3. If the photoelectric sensor's LED does not change status, adjust the photoelectric sensor so that it is properly aligned with the reflector.
4. If the TRIGGER LED on the barcode reader does not light when the photoelectric sensor's beam is blocked, check the cabling between the photoelectric sensor and CBX connection box for damage.

Verify Tachometer Operation

1. Rotate the tachometer wheel slowly.
2. The **TACH** LED on camera's connector panel should flash indicating the tachometer is operational.

Replacing the Fan

The fan of the AV500 is a field replaceable part. Request spare part number: 8900006713. Instructions are included.

Replacing the SD Card

If you are replacing a non-working AV500 in your array, remove the SD card from a non-working AV500 and insert ino the new unit. Follow these steps:

Tools Required

2.5 mm T Hex Wrench

1

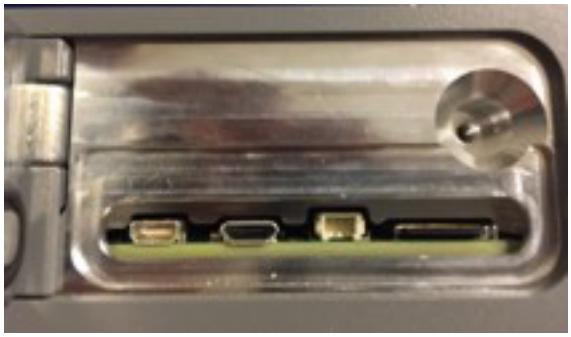
The SD Card is accessible via a hinged door on the left side of the AV500.

2

Remove the single two 3 mm hex screw from the access plate of the AV500.

3

Remove the SD Card by lightly pushing in the card which will then pop out.



Replace the existing SD card with the new one and push to insert the new card. Close the hinged door and re-tighten the screw.

CHAPTER 8
TECHNICAL FEATURES

This chapter provides detailed specifications for the AV500 Camera Systems. It provides specific information on:

- Electrical Features
- Optical Features
- Reading Features
- Human Machine Interface
- Software Features
- Environmental Features
- Physical Features

TECHNICAL SPECIFICATIONS

ELECTRICAL FEATURES		
Supply Voltage	24 VDC LPS	
Voltage Tolerance	24 VDC Nominal, +/-20%	
Power Consumption	2A	
Electrical Protection		
Communication Interfaces	Common	2 Ethernet TCP/IP, 2 serial communication
	Internal	SyncNet Technology
	Modes	Master/Slave, Ethernet Point to Point
	Programming Method	Multi-language browser-based, on board HTML web server interface
	Focus	Dynamic
Digital Inputs		
Digital Outputs		
Interfaces	High Speed USB 2.0 Host and Client with USB Type C connector	
Fieldbus	All common Fieldbus communications supported through various Field-bus modules installed in the CBX800 connection box.	
OPTICAL FEATURES		
Frame Rate	Up to 32 frames/sec	
Sensor Type	CMOS, 5.0M Pixels	
Optical Lens	16mm, 25mm, 35mm C-Mount Lens	
Readable Symbologies	All Standard 1D and 2D Symbologies	
HUMAN MACHINE INTERFACE		
Keypad	Single button, Test, Focus, Setup and Learn	
LED Indicators	Status, Com, Trigger, Good, Ready	
System		
Expansion slots	Micro-SD card slot: Compatible with Micro SC-HC cards; Data transfer up to 48 Mbps; User-accessible	
Memory	System RAM: 3 GB; eMMC Flash; 32 GB	
Microprocessor	2GHx Octa-core	
Operating System	Android v8.1 with GMS	
Real-time clock	Time and date stamping under software control	
SOFTWARE FEATURES		

Device Programming	Multi-language, browser-based, on board HTML web server interface
Readable Barcodes	All Standard 1D and 2D Symbologies
READING PERFORMANCE	
Camera	Resolution: 13 megapixel; Illumination: User controllable LED flash; Lens: Auto focus
Scan engine	2D Ultra slim area imager (supports 1D / 2D codes); Datalogic's 'Green Spot' for good-read feedback; Depth of Field: 8.5 to 50 cm / 3.3 to 19.7 in depending on bar code density and type; Resolution: VGA (640 x 480 pixels); Illumination: White LEDs; Aiming: 650nm VLD; Field of View: 48°H x 34°V
Print contrast	25%
Minimum element width	1D Linear: 0.0762 mm / 4 mils PDF: 0.127 mm / 6.6 mils Data Matrix: 0.195 mm / 7.5 mils
ENVIRONMENTAL FEATURES	
Temperature	Operating: 20° to 50° C [-4° to 122° F] Storage: -30° to 70° C [-22° to 158° F]
Relative Humidity	95% non condensing
Vibration Resistance	SINE vibration as per EN60068-2-6 10-50Hz : 0.4mm / 50-500Hz :2g 3h on the primary axis (perpendicular to the face of the camera)
Shock Resistance	As per EN60068-2-27, 15g / 11ms / 3 times up and 3 times down on the primary axis.
Protection Class	IP65
Fan Life	L10 @ 40°C : 50000h
PHYSICAL FEATURES	
Dimensions	200 x 126 x 130 mm / 7.87 x 4.96 x 5.12 inches
Weight	2900 g / 6.4 pounds
Enclosure	Aluminum Alloy
Service Options	Installation services and on-site training
SAFETY & REGULATORY	
Agency Approvals	The product meets necessary safety and regulatory approvals for its intended use.
Environmental Compliance	Complies to EU RoHS
WARRANTY	

READING FEATURES

FOV Calculation

Use the data in the following tables to calculate the FOV for your application. Range is measured from the back of the unit. FOV = 2*[(D-X)*tan(a/2)]

Range is measured from the back of the unit 15 degree angle, 16mm., 1.1 PPM

16 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near Left	525	-91	525	-91	525	-91	525	-91	525	-91	525	-91
Far Left	932	-204	1142	-261	1350	-317	1476	-350	1686	-405	2000	-489
Far Right	932	204	1142	261	1350	317	1476	350	1686	405	2000	489
Near Right	525	91	525	91	525	91	525	91	525	91	525	91
Near Left	525	-91	525	-91	525	-91	525	-91	525	-91	525	-91
Near	525		525		525		525		525		525	
Near FOV	182		182		182		182		182		182	
Far	932		1142		1350		1476		1686		2000	
Far FOV	408		522		634		700		810		978	

25 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near Left	660	-92	660	-92	660	-92	660	-92	660	-92	660	-92
Far Left	1402	-214	1730	-268	2056	-322	2252	-354	2580	-408	2600	-411
Far Right	1402	214	1730	268	2056	322	2252	354	2580	408	2600	411
Near Right	660	92	660	92	660	92	660	92	660	92	660	92
Near Left	660	-92	660	-92	660	-92	660	-92	660	-92	660	-92
Near	660		660		660		660		660		660	
Near FOV	184		184		184		184		184		184	
Far	1402		1730		2056		2252		2580		2600	
Far FOV	428		536		644		708		816		822	

35MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near Left	900	-91	900	-91	900	-91	900	-91	900	-91	900	-91
Far Left	1956	-215	2416	-268	2600	-290	0	0	0	0	0	0
Far Right	1956	215	2416	268	2600	290	0	0	0	0	0	0
Near Right	900	91	900	91	900	91	900	91	900	91	900	91
Near Left	900	-91	900	-91	900	-91	900	-91	900	-91	900	-91
Near	900		900		900		900		900		900	
Near FOV	182		182		182		182		182		182	
Far	1956		2416		2600							
Far FOV	430		536		580							

READING DIAGRAMS

The following reading diagrams are to be considered as references and are given for typical performance at 25°C using high quality grade A symbols: Code 128 (1D code) and-Data Matrix ECC 200 (2D code) from the Test Charts provided with the reader.

- Testing should be performed with the actual AV500 using application codes in order to evaluate whether maximizing application performance requires adjustments to the HW/SW configuration with respect to the Reference Conditions given under each diagram.
- The focus distance and reading distance ranges are measured from the surface of the mounting screws on the back of the unit.
- When defining a HW/SW configuration for the AV500 for conditions different from those of the reference diagrams, it is suggested to keep in mind the following rules:

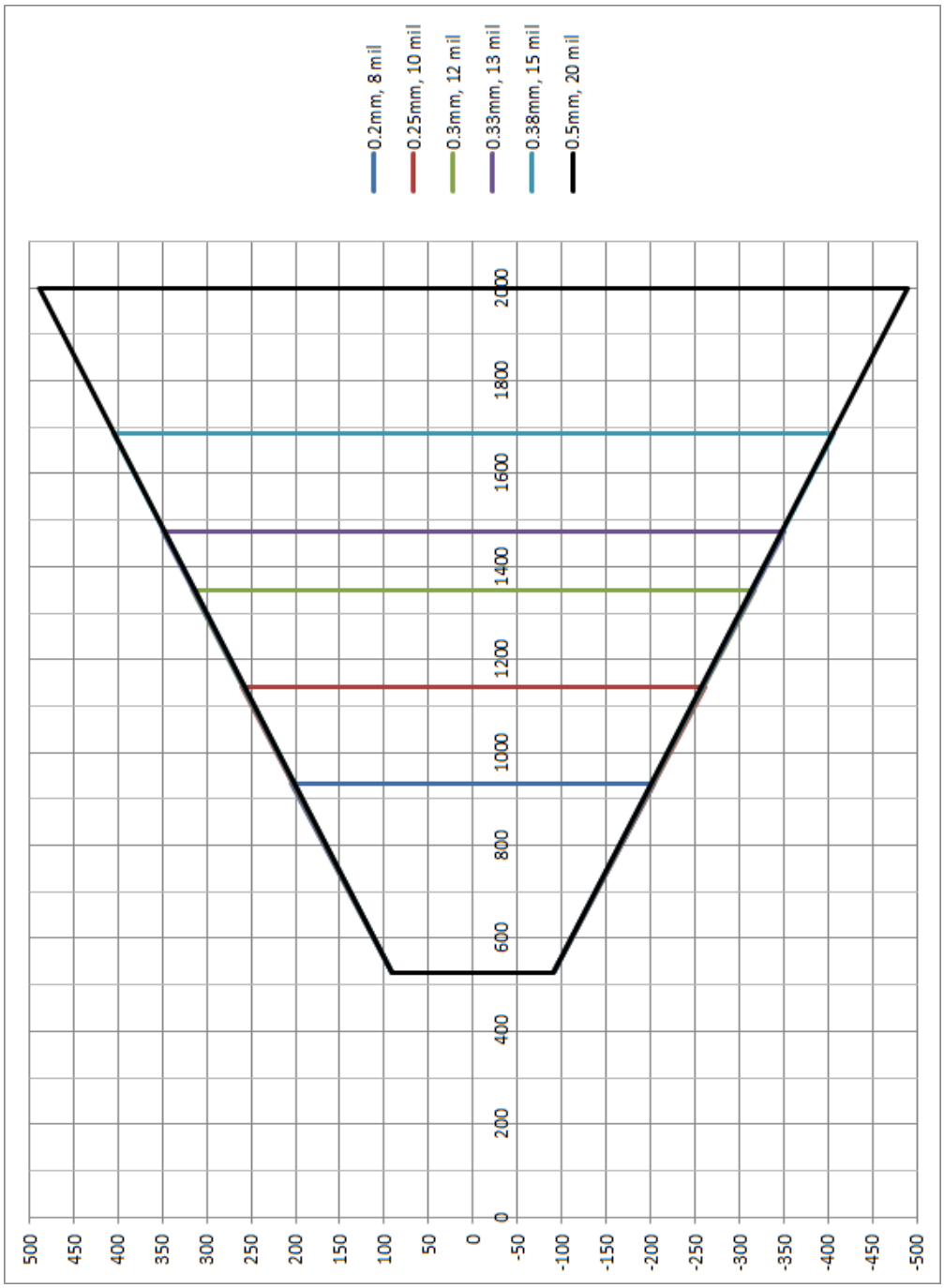
Changes in the diaphragm aperture influence the depth of field (reading distance range) and the luminosity of the image. Increasing the diaphragm aperture by one stop (i.e. from F/8 to F/5.6 or from F/11 to F/8) doubles the luminosity of the image, but can cause significant reduction in the reading distance range.

Changes in *Exposure Time* act directly proportional to the luminosity of the image and inversely proportional to the maximum code reading movement speed. Consequently, reducing the *Exposure Time* by half, reduces the luminosity of the image by half but doubles the theoretical code reading movement speed.

Changes in *Gain* act directly proportional to the luminosity of the image. Increasing the *Gain* value however, can reduce the quality of the acquired image. For example, for the purpose of only changing the luminosity of the image, the following three adjustments are equivalent: increase the diaphragm aperture by one stop; double the *Exposure Time*; double the *Gain*.

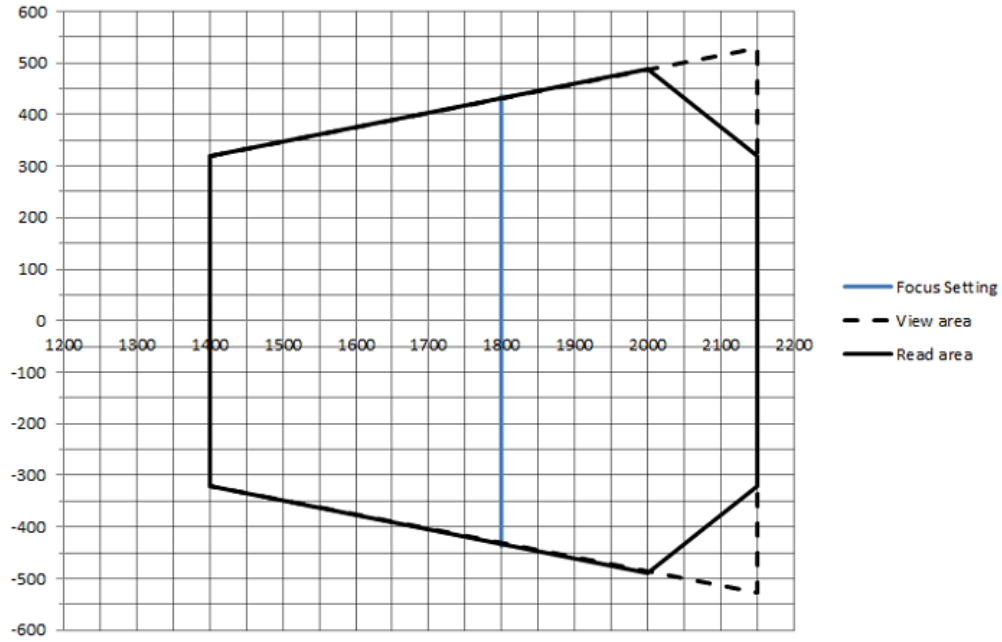
AV500 White Illumination 16 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



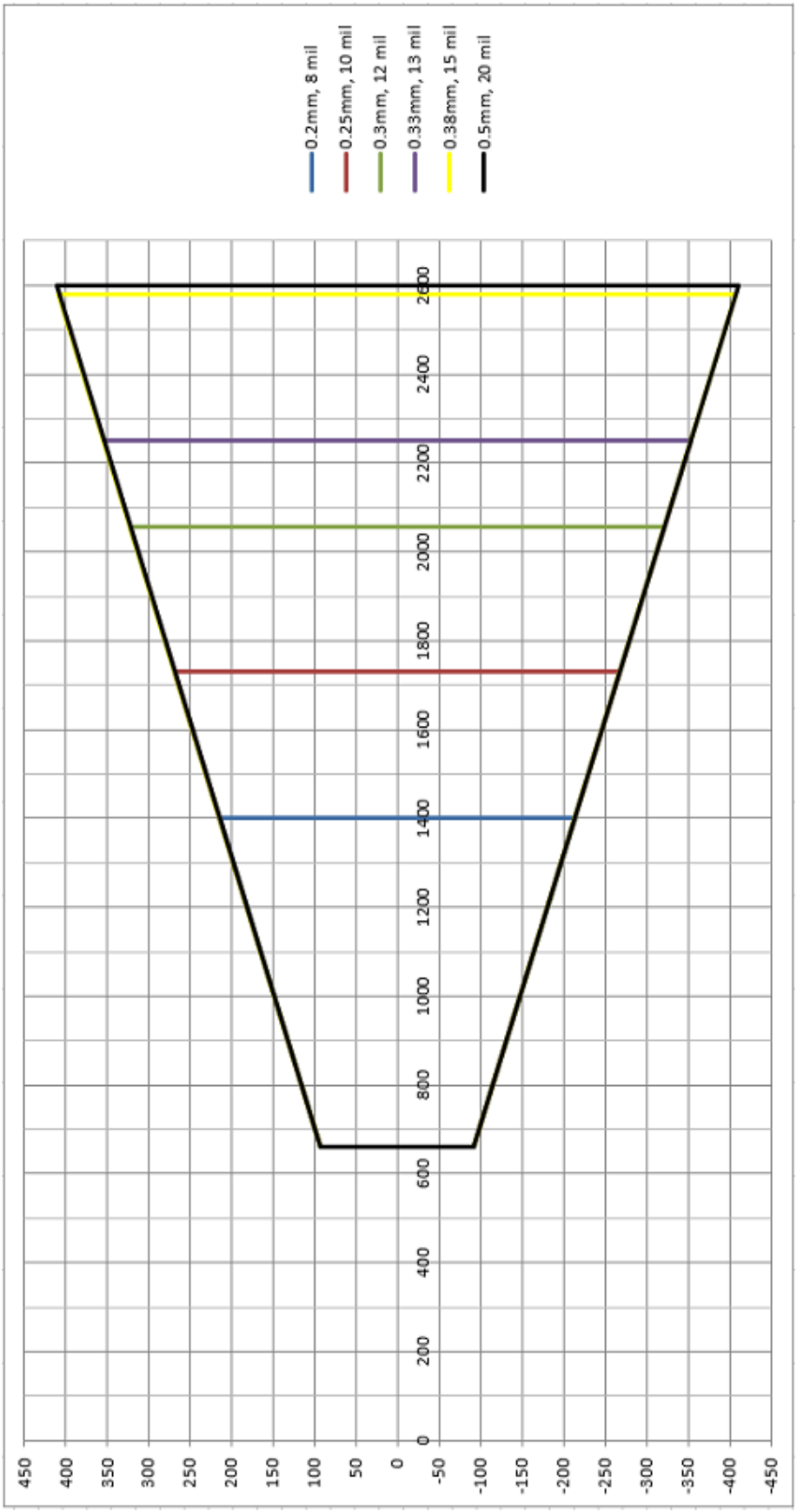
16mm F6 Application Example

20 mill code 128
640mm FOV
750mm DOF
Focus set to 1800mm
Belt speed 1 m/s



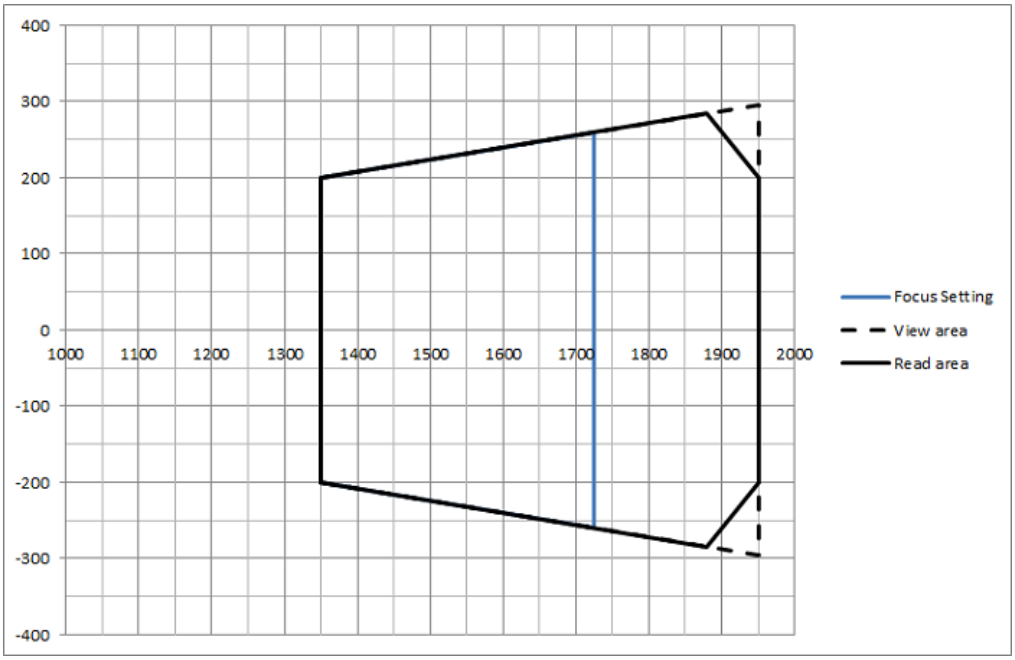
AV500 White Illumination 25 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



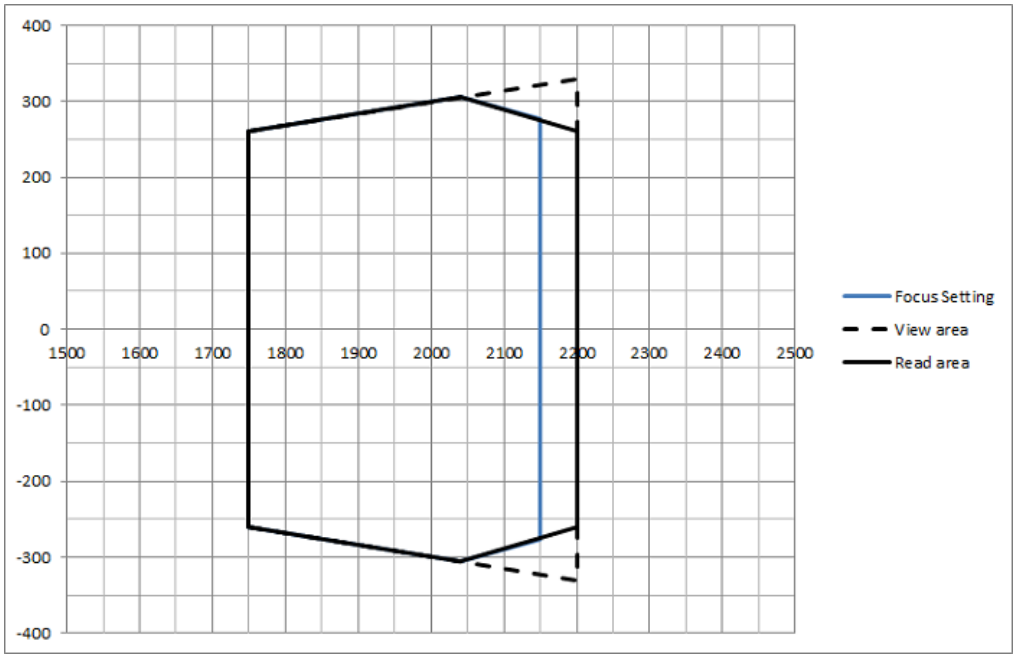
25mm F8 Application Example

12 mill code 128
400mm FOV
600mm DOF
Focus set to
1725mm
Belt speed 1 m/s



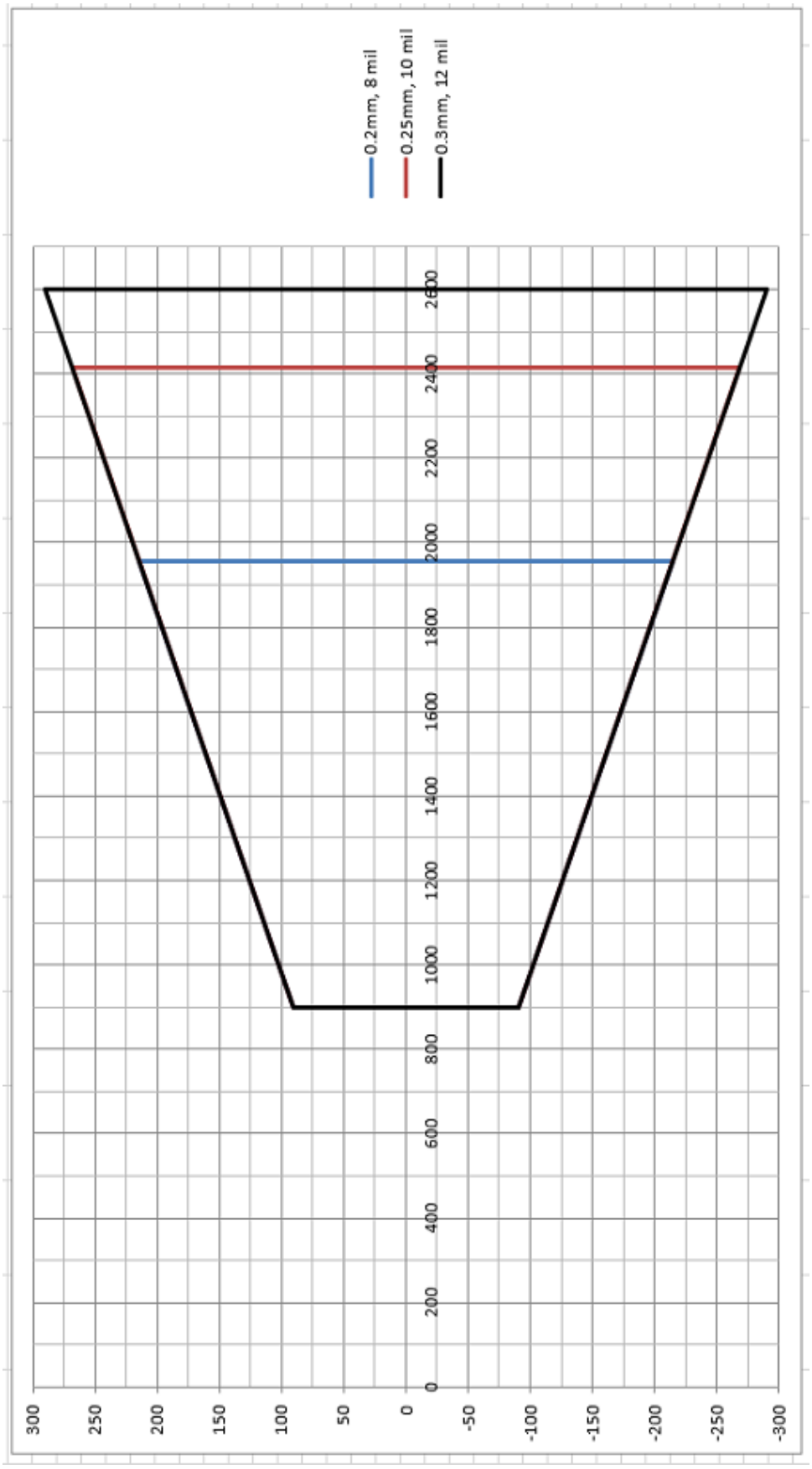
25mm F7 Application Example

13 mill code 128
520mm FOV
450mm DOF
Focus set to 2150mm
Exposure offset -
140us
Belt speed 2.5 m/s



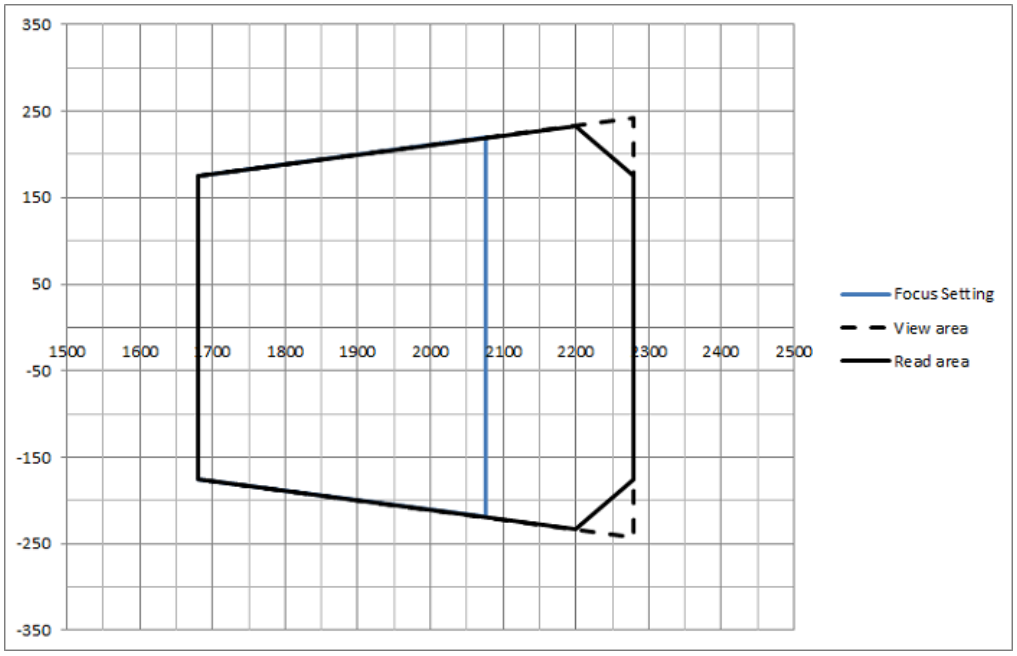
AV500 White Illumination 35 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



35mm F8 Application Example

10 mill code 128
640mm FOV
750mm DOF
Focus set to 1800mm
Belt speed 1 m/s



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DATALOGIC

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