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Download the Matrix 320 Product Reference Guide by reading the QR code here or see the paragraph below.



## SUPPORT THROUGH THE WEBSITE

Datalogic provides several services as well as technical support through its website.

Log on to [www.datalogic.com](http://www.datalogic.com).

For quick access, from the home page click on the search icon, and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

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

## PATENTS

See [www.patents.datalogic.com](http://www.patents.datalogic.com) for patent list.

This product is covered by one or more of the following patents:  
Utility patents: EP1172756B1, EP2517148B1, EP2616988B1, EP2649555B1, EP3016028B1, EP3092597B1, IT1404187, JP5947819B2, US10229301, US6808114, US6877664, US6997385, US7387246, US7433590, US7433590, US8245926, US8888003, US8915443, US9122939, US9349047, US9361503, US9798948, US10133895, US10229301, US10540532, ZL200980163411.X, ZL201080071124.9, ZL201180044793.1, ZL201280010789.8

# MATRIX 320™

## QUICK REFERENCE GUIDE

## Image Based Industrial Reader

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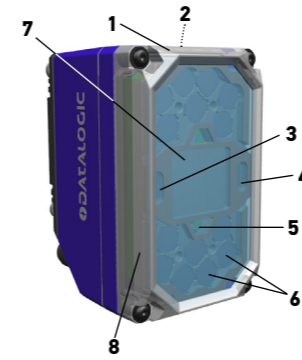
[www.datalogic.com](http://www.datalogic.com)



821007081 (Rev. B) October 2020

Matrix 320 comes with two different illuminators: with 14 LEDs and with 36 LEDs.

### Matrix 320 with 14 LEDs illuminator

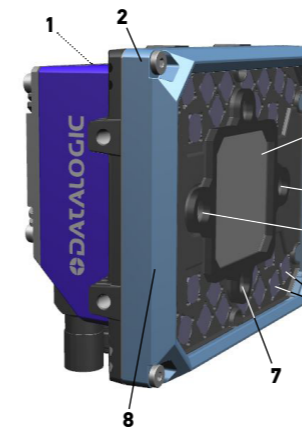


1	Lens Cover
2	HMI X-PRESS Interface
3	Green Spot
4	Red Spot
5	Aiming System Laser Pointers
6	Internal Illuminator
7	Lens
8	360° Feedback
9	Bracket Mounting Holes (4)
10	Ethernet Connection LED
11	Power - COM - I/O Connector
12	Ethernet Connector
13	Power On LED
14	Device Class and Warning Labels
15	Avoid Laser Exit Point Label

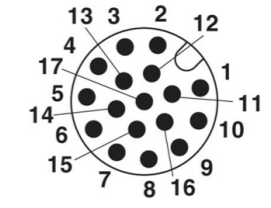


Connector block rotates to 0° and 90° position

### Matrix 320 with 36 LEDs illuminator



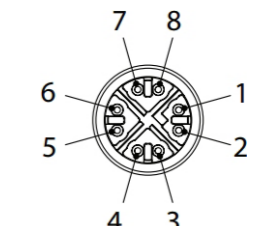
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M12 17-pole male Power, COM, and I/O connector

Pin	Name	Description
1	Vdc	Power supply input voltage +
2	GND	Power supply input voltage -
Connector case	CHASSIS	Connector case provides electrical connection to the chassis
6	I1A	External Trigger A (polarity insensitive)
5	I1B	External Trigger B (polarity insensitive)
13	I2A	Input 2 A (polarity insensitive)
3	I2B	Input 2 B (polarity insensitive)
9	O1	Output 1 * (NPN, PNP or PP short circuit protected and software programmable)
8	O2	Output 2 *
16	O3	Output 3
14	RX	Auxiliary RS232 RX
4	TX	Auxiliary RS232 TX
7	ID+	ID-NET network data +
15	ID-	ID-NET network data -
		<b>RS232 RS422 Full-Duplex</b>
17	Main Interface (SW selectable)	TX TX+
11		RX RX+ **
12		- TX-
10		- RX- **

\* Output 1 and Output 2 are opto-coupled when using a CBX.  
\*\* Do not leave floating. See Product Reference Guide for connection details.



M12 X-Coded female Ethernet Network connector

Pin	Name	Description
1	DA+	Bidirectional data DA+
2	DA-	Bidirectional data DA-
3	DB+	Bidirectional data DB+
4	DB-	Bidirectional data DB-
5	DD+	Bidirectional data DD+
6	DD-	Bidirectional data DD-
7	DC-	Bidirectional data DC-
8	DC+	Bidirectional data DC+

## INSTALLATION PROCEDURE

1. Physically mount the Matrix 320 reader.
2. Make the necessary electrical connections.
3. Configure the reader using the X-PRESS interface (simple configuration) or the DL.CODE software configuration program (complete configuration).

## HMI X-PRESS™ INTERFACE

In normal operating mode the colors and meaning of the five LEDs are illustrated in the following table:

READY (green)	indicates the device is ready to operate.
GOOD (green)	confirms successful reading.
TRIGGER (yellow)	indicates the status of the reading phase.
COM (yellow)	indicates active communication on main serial port.
STATUS (red)	indicates NO READ result.

During the reader startup (reset or restart phase), all the LEDs blink for one second.



HMI X-PRESS™

The single push button gives immediate access to the following relevant functions:

- Test Mode with bar graph visualization to check static reading performance.
- Aim/Autofocus turns on the laser LED to aim the reader at the target. The target should be placed 16 mm (14 LEDs model) or 30 mm (36 LEDs model) upwards and centered horizontally with respect to the aiming pattern (cross).
- Setup to self-optimize and auto-configure photometry parameters.
- Learn to self-detect and auto-configure for reading an unknown barcode (by type and length). Only one symbology can be saved using this method. Performing Autolearn on a second symbology will overwrite the first one.

## TECHNICAL SPECIFICATIONS

Electrical Features	
<b>Power</b>	
Supply Voltage	24 Vdc ± 10%
Consumption (including accessory internal illuminator)	Matrix 320 14 LEDs: 0.42 A, 10 W max. Matrix 320 36 LEDs: 0.62 A, 15 W max.
<b>Communication interfaces</b>	
Main: RS232, RS422 Full-Duplex	2400 to 115200 bit/s
Auxiliary: RS232	2400 to 115200 bit/s
<b>ID-NET</b>	
Ethernet (Built-in) supported application protocols	10/100/1000 Mbit/s TCP/IP, UDP, FTP, EtherNet/IP, Modbus TCP, PROFINET-IO
<b>Inputs</b>	
Input 1 (External Trigger) and Input 2	Opto-coupled and polarity insensitive
Max. Voltage	30 Vdc
Max. Input Current	10 mA
<b>Outputs <sup>1</sup></b>	
Output 1, 2 and 3	NPN, PNP, or PP short circuit protected
$V_{OUT}$ ( $I_{LOAD} = 0$ mA) max.	24 Vdc
$V_{OUT}$ ( $I_{LOAD} = 100$ mA) max.	3 Vdc
$I_{LOAD}$ max.	100mA

<sup>1</sup> When connected to the CBX connection boxes, the electrical features for Output 1 and 2 become the following:

Opto-coupled,  $V_{CE} = 30$  Vdc max.;  $I_{CE} = 40$  mA continuous max.; 130 mA pulsed max.;  $V_{CE\ saturation} = 1$  Vdc max. @ 10 mA;  $P_D = 90$  mW max. @ 50 °C ambient temperature.

Environmental Features	
Operating temperature <sup>2</sup>	0 to 45 °C (32 to 113 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)
Max. humidity	90% non condensing
Vibration resistance EN 60068-2-6	14 mm @ 2 to 10 Hz; 1.5 mm @ 13 to 55 Hz; 2 g @ 70 to 500 Hz; 2 hours on each axis
Bump resistance EN 60068-2-29	30 g; 6 ms; 5000 shocks on each axis
Shock resistance EN 60068-2-27	30 g; 11 ms; 3 shocks on each axis
Protection class <sup>3</sup> EN 60529	IP65 and IP67

Physical Features		
	Matrix 320 with 14 LEDs illuminator	Matrix 320 with 36 LEDs illuminator
Dimensions (with lens cover, connectors at 0°)	H x W x L 108.7 x 54 x 55.5 mm (4.3 x 2.1 x 2.2 in)	H x W x L 115.5 x 126 x 70.3 mm (4.6 x 4.9 x 2.8 in)
Weight (with lens and internal illuminator)	380 g (13.4 oz)	640 g (22.6 oz)
Material	Aluminum	

Software Features		
Readable Code Symbologies		
ID and Stacked	2D	Postal
<ul style="list-style-type: none"> <li>• PDF417 Standard and Micro PDF417</li> <li>• Code 128 (GS1-128)</li> <li>• Code 39 (Standard and Full ASCII)</li> <li>• Code 32</li> <li>• MSI</li> <li>• Standard 2 of 5</li> <li>• Codabar</li> <li>• Code 93</li> <li>• Pharmacode</li> <li>• EAN-8/13 - UPC-A/E (including Addon 2 and Addon 5)</li> <li>• GS1 DataBar Family</li> <li>• Composite Symbologies</li> </ul>	<ul style="list-style-type: none"> <li>• Data Matrix ECC 200 (Standard, GS1 and Direct Marking)</li> <li>• QR Code (Standard and Direct Marking)</li> <li>• Micro QR Code</li> <li>• MAXICODE</li> <li>• Aztec Code</li> <li>• DotCode</li> </ul>	<ul style="list-style-type: none"> <li>• Australia Post</li> <li>• Royal Mail 4 State Customer</li> <li>• Kix Code</li> <li>• Japan Post</li> <li>• PLANET</li> <li>• POSTNET</li> <li>• POSTNET (+BB)</li> <li>• Intelligent Mail</li> <li>• Swedish Post</li> </ul>

<b>Operating Mode</b>	Continuous, One Shot, Phase Mode, PackTrack
<b>Configuration Methods</b>	X-PRESS Human Machine Interface. Windows-based DL.CODE (Ethernet / Serial interface). Serial Host Mode Programming sequences.
<b>Parameter Storage</b>	Permanent memory (Flash)

Code Quality Metrics	
Standard	Supported Symbologies
ISO/IEC 16022 (always enabled)	Data Matrix ECC 200
ISO/IEC 18004 (always enabled)	QR Code
AIM DPM	Data Matrix ECC 200, QR Code
ISO/IEC 15416	Code 128, Code 39, Interleaved 2 of 5, Codabar, Code 93, EAN-8-13, UPC-A/E

<sup>2</sup> High ambient temperature applications should use metal mounting brackets and the heat sink provided in the package for heat dissipation.

<sup>3</sup> When correctly connected to IP67 cables with seals and the Lens Cover is correctly mounted.

Optical Features		
	Matrix 320 with 14 LEDs illuminator	Matrix 320 with 36 LEDs illuminator
Image Sensor	CMOS	
Image Format	2.0 Mpixel (1920 x 1080)	
Frame Rate	60 frames/s	
Pitch	± 35°	
Tilt	0° - 360°	
LED Safety	according to EN 62471	
Lenses	Liquid Lenses	
Lighting System	Internal illuminator (14 or 36 LEDs)	
Aperture Angle	34° for Liquid Lens 9mm / 20° for Liquid Lens 16mm	
Reading Range	min. 35 mm max. 1000 mm	min. 70 mm max. 1500 mm
Illumination	Internal illuminators with blue, red, white lights	
Aiming System	Laser cross red projection aiming	
Polarizing Filter	Polarizing cover accessory	
User Interface		
LED indicators	Power, Ready, Good; Trigger; Com, Status, (Ethernet Network); Good Read (Green Spot)	
Keypad button	Configurable via DL.CODE	

## COMPLIANCE

### General

For installation, use and maintenance it is not necessary to open the reader. Only connect Ethernet and dataport connections to a network which has routing only within the plant or building and no routing outside the plant or building.

### Power Supply

ATTENTION: READ THIS INFORMATION BEFORE INSTALLING THE PRODUCT

This product is intended to be installed by **Qualified Personnel** only. This product is intended to be connected to a UL Listed Direct Plug-in Power Unit marked LPS or "Class 2".

### EMC Compliance

In order to meet the EMC requirements:

- connect reader chassis to the plant earth ground by means of a flat copper braid shorter than 100 mm;
- for CBX connections, connect pin "Earth" to a good Earth Ground;
- for direct connections, connect your cable shield to the locking ring nut of the connector.

### 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.

**Warning:** this is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### LED Safety

For all Datalogic Matrix 320 compatible internal illuminators, LED emission is classified into Risk Group 1 according to EN 62471:2010.

### Laser Safety

This product conforms to the applicable requirements of IEC 60825-1 and complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice N° 56, date May 8, 2019. This product is classified as a Class 2 laser product according to IEC 60825-1 regulations.



**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 beam can be switched on or off through a software command.

The following warning label content is applied to each of the laser equipped products indicated on the opposite page.



Produit(s) conforme selon 21CFR 1040.10 sauf des dérogations relatives à la Laser Notice N° 56, data Mai 8, 2019.

Dans le paquet il y a l'étiquette(s) pour les pays où le texte d'avertissement en français est obligatoire. Le(s) mettre sur le produit à la place de la version anglaise.



## WARRANTY

Datalogic warrants that the Products shall be free from defects in materials and workmanship under normal and proper use during the Warranty Period. Products are sold on the basis of specifications applicable at the time of manufacture and Datalogic has no obligation to modify or update Products once sold. The Warranty Period shall be **two years** from the date of shipment by Datalogic, unless otherwise agreed in an applicable writing by Datalogic.

Datalogic will not be liable under the warranty if the Product has been exposed or subjected to any:

- (1) maintenance, repair, installation, handling, packaging, transportation, storage, operation or use that is improper or otherwise not in compliance with Datalogic's instruction;
- (2) Product alteration, modification or repair by anyone other than Datalogic or those specifically authorized by Datalogic;
- (3) accident, contamination, foreign object damage, abuse, neglect or negligence after shipment to Buyer;
- (4) damage caused by failure of a Datalogic-supplied product not under warranty or by any hardware or software not supplied by Datalogic;
- (5) any device on which the warranty void seal has been altered, tampered with, or is missing;
- (6) any defect or damage caused by natural or man-made disaster such as but not limited to fire, water damage, floods, other natural disasters, vandalism or abusive events that would cause internal and external component damage or destruction of the whole unit, consumable items;
- (7) use of counterfeit or replacement parts that are neither manufactured nor approved by Datalogic for use in Datalogic-manufactured Products;
- (8) any damage or malfunctioning caused by non-restoring action as for example firmware or software upgrades, software or hardware reconfigurations etc.;
- (9) loss of data;
- (10) any consumable or equivalent (e.g. cables, power supply, batteries, etc.); or
- (11) any device on which the serial number is missing or not recognizable.

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