ESD

While the DE01 scan module is protected from ESD up to ±2.0Kv@ connector, care should be taken in handling the module.

During installation it is recommended to apply standard ESD handling procedures, such as operating in a properly grounded working area using wrist straps.

Electrical and Communication Connections:

The DE01 needs to be powered with 3.0-5V DC, through the side 10 pole ZIF connector. To preserve image quality a low-noise power supply is required. The requirement for the power supply peak-to-peak noise is ≤150mV on the power supply lines (the lower the better). The ZIF connection also provides I/O and communications which is specific to the model of scanner being used. The default UART communication parameters are 115,200 Baud, No Parity, 8 Data Bits, 1 Stop bit. Please follow the below diagrams for electrical interface:

Power and I/O connections

Item	Level	Description
VCC	3.0V – 5.0 V	The engine full operation is guaranteed within this voltage range.
I/O level	VOHmin=2.6V VOH nom=3.0V	The driving capability of the output pins is 4mA max.The internal engine digital supply is 3.0V. The I/O output voltage is 3.0V nominal. All the inputs are 5V tolerant if the engine is powered with VCC. If the input pin 2 is not powered, the inputs must be not driven high.

DE01-002 USB HID connections

Pin	Signal	I/O type	Description
1	LED_CTRL1	O	Push pull out to a LED circuit.
2	VCC	PWR	Main power supply.
3	RESERVED	I	Do not use,internal pull up to VCC with a 180K.
4	nILLUMINATION_ENABLE	I	Active low external 100K pull to VCC required.
5	nSCAN_ENABLE	I	Active low external 100K pull to VCC required.
6	USB_D-	O	D- USB signal.
7	USB_D+	O	D+ USB signal.
8	LED_CTRL2/BEEP	O	Push pull PWM out to a beeper circuit.
9	GND	GND	Main power ground.
10	RESERVED	I	Do not use,external pull up to VCC with a 100K required.

DE01-001 UART connections

Pin	Signal	I/O type	Description
1	UART_TX	O	RS232 transmission port.
2	VCC	PWR	Main power supply.
3	CTS (if function enabled)	I	Internal pull up to VCC with a 180K.
4	nILLUMINATION_ENABLE	I	Active low external 100K pull to VCC required.
5	nSCAN_ENABLE	I	Active low external 100K pull to VCC required.
6	LED_CTRL2/BEEP	O	Push pull PWM out to a beeper circuit.
7	LED_CTRL1	O	Push pull out to a LED circuit.
8	RTS (if function enabled)	O	If not in use, external pull up to VCC with a 100K required.
9	GND	GND	Main power ground.
10	UART_RX	I	RS232 receiving port (3).

The DE01 scan engines' 10-pole ZIF connector has a pitch of 0.5mm and is series 6299 from Kyocera - ordering code 04 6299 610 020 846+. Mates to this can be used. In addition the .3mm cable can be accommodated on the host with Molex 512811094 and 527451097. The designer should take care to note the connections through the ribbon cable correctly.

For further details and requirements related to the flat cable, please refer to the manufacturer's datasheet. In order to reduce radiated emissions it is strongly recommended to adopt an EMI-shielded flat cable.

Programming

The two models of the DE01 include the DE01-001, which utilizes a UART interface, and the DE01-002 ,which utilizes a USB interface. The DE01 operates in a triggered scanning mode. This means the scanner will start the scanning process when it receives a trigger. The UART version of the DE01 can utilize either a hardware or software trigger in order to start the scanning process and provide decoded barcode data. The USB model utilizes a USB HID interface. As a result no software driver is required and the reader simply provides data to the host interface via the USB HID interface. The USB version of the DE01 requires a hardware trigger. The UART version of the reader supports bi-directional communications. This allows the user to configure and trigger the reader via the reader's software interface. The DE01 software interface is described in detail in the DE01 Software Interface guide.

In order for the DE01 to start scanning it is first necessary to issue the Open Command. After the Open Command the DE01 is ready to process all other commands including the Start command which will Start the reading phase and decode process. Note all values in the below commands are Hex values.

Open Command: 0x20 0x40 0x01 0x21 0x01 0x9D 0xB4
Reader Response:0x20 0x40 0x02 0x2D 0x01 0x01 0x74 0x2E
Start Command: 0x20 0x40 0x00 0x23 0x31 0xCD
Reader Response:0x20 0x40 0x00 0x2D 0xB0 0x09

On issuing the Start Command the DE01 will turn on its green aiming LED and begin to process images to decode a barcode. On finding a barcode the reader will decode and transmit data to the host. Note that the proper communications settings need to be set in the host. These are listed in the Electrical and Communications settings of this quick start guide.

Once a barcode is read and transmitted the DE01 will end the reading phase, turn off its green LED, and will wait for another Start command to begin looking for another code. To end the trigger before a barcode is found the host can issue the Stop Command. This is shown in the below command example. Note the Open Command needs to have been sent to the DE01 at some point prior to sending the Stop Command:

Stop Command: 0x20 0x40 0x00 0x24 0x70 0x0F
Reader Response:0x20 0x40 0x00 0x2D 0xB0 0x09

DE01-ACC-001/002 Demo Test Board

The DE01-ACC-001 and DE01-ACC-002 are accessory demo test boards that are designed to provide the user with a easy way to begin testing and understanding the DE01 reader. The 001 model of the board includes RS232 transceiver and RJ45 interface. The 002 model includes micro USB connector. Both models include onboard hardware trigger and built in beeper. The 001 version also requires a 5V DC power supply.

Diamond Technologies also provides an accessory communication and power cable for the 001 RS232 version of the demo test board. This is part number CAB-DSE-002.

Regulatory

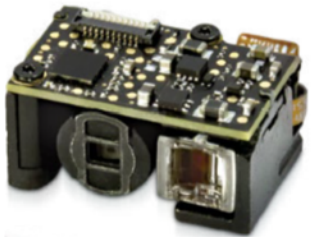
IEC 62471 Exempt risk group.
RoHS Compliant

READING PERFORMANCE

IMAGER SENSOR	Linear 2500 pixels, 600 FPS
LIGHT SOURCE	Aiming and Illumination: Green LED
PRINT CONTRAST RATIO (MIN)	15%
FIELD OF VIEW	47°
READING ANGLE	Pitch: +/- 75°; Roll (Tilt): +/-45°;Skew (Yaw): +/- 70°
READING INDICATORS	Green Spot good read confirmation (optional), Audible Beeper
RESOLUTION (MAXIMUM)	1D Linear: 2.5 mils

DE01 Ultra Compact Embedded Barcode Scan Module

Quick Reference Guide



Model: DE01-001, DE01-002

Manual Version 1.00

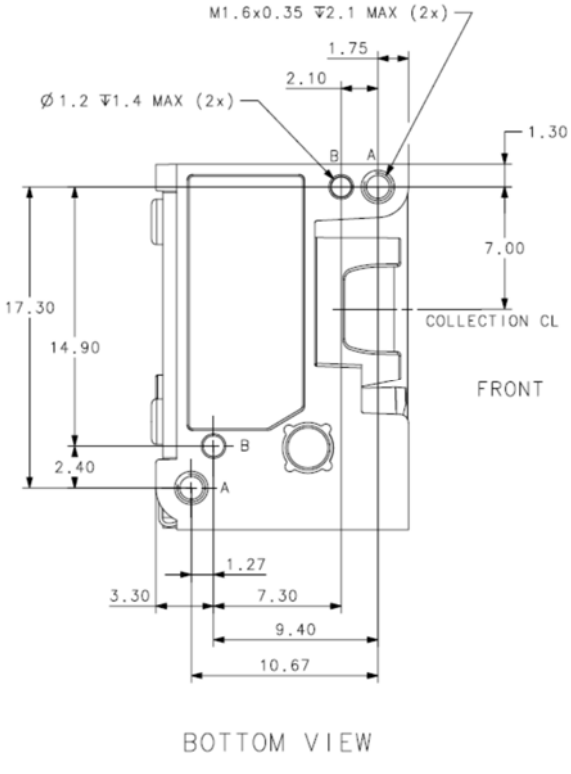
Diamond Technologies
Getting data where it needs to be.

The Diamond Technologies DE01 is an ultra compact image based embedded barcode scan module designed for integration into OEM equipment such as Lab instrumentation, Medical Devices, Kiosks, Automated machines, and customer facing applications. This ultra compact, reliable, barcode module provides image based reading of all standard 1D barcodes. The reader includes a bright green aiming pattern and outputs for user feedback.

The reader includes patented, highly accurate, decode software libraries. The reader's decoded output is provided to the host system through either UART or USB interface depending on model. The reader's hardware and software has been designed for the user to easily integrate the module into a host system. This guide provides the basic instructions for that integration.

Physical Mounting:

The DE01 provides (2) M1.6X.35mm thread mounting holes on the bottom of the module. See image. The recommended mounting torque is 0.15 Nm.



BOTTOM VIEW