# ⬥DATALOGIC

## Matrix 220™

### QUICK REFERENCE GUIDE

Download the Matrix 220 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.

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.

## INSTALLATION PROCEDURE

1. **Physically mount the Matrix 220 reader.**
2. **Make the necessary electrical connections.**
3. **Configure the reader using the X-PRESS interface (AIM, SETUP, LEARN and TEST for 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 a NO READ result. |

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

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

| | |
|---|---|
| ↗ | Test Mode with bar graph visualization to check static reading performance. |
| ⎍ | Aim turns on the LED pointers to aim the reader at the target. **The target should be centered horizontally and vertically with respect to the aiming squares.** |
| ✓ | 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 type can be saved using this method. Performing Autolearn on a second symbology will overwrite the first one. |

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**Matrix 220™**



① Reading Window (ESD model shown)
② Bracket Mounting Holes (2)
③ Power On LED
④ Ethernet Connection LED
⑤ 90° Rotating Connector Block
⑥ HMI X-PRESS™ Interface
⑦ Ethernet Connector
⑧ Power - COM - I/O Connector
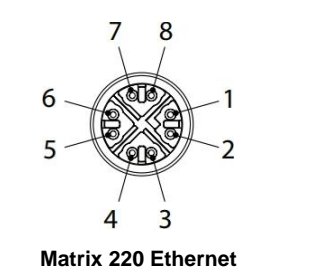⑨ Power Over Ethernet Connector
⑩ COM, Trigger Connector

**Standard Model**

**PoE Model**

**General View**

**DPM Model**

⑪ Lens
⑫ LED Aiming System
⑬ Red Spot (No Read)
⑭ Green Spot (Good Read)

**Standard Model**

⑮ Non Polarized Illuminators
⑯ Polarized Illuminators
⑰ Diffused Illuminators
⑱ Standard Illuminators (Top/Bottom)

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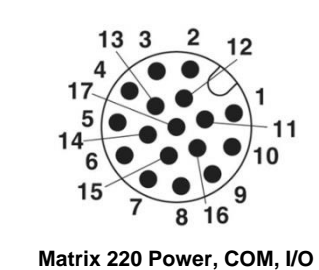
**Matrix 220 Power, COM, I/O**
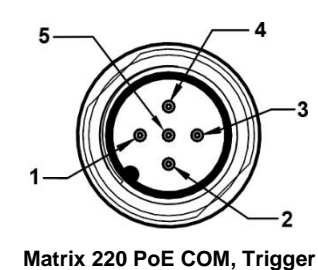
**Matrix 220 PoE COM, Trigger**

**Matrix 220 Ethernet**

### M12 17-pin Power, COM, and I/O Connector Pinout

| Pin | Name | Function |
|---|---|---|
| 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 or PNP 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 + |
| 15 | ID- | ID-NET™ network - |

| Pin | Name | RS232 | RS422 Full-Duplex |
|---|---|---|---|
| 17 | Main Serial Port (sw selectable) | TX | TX+ |
| 11 | | RX | *RX+ |
| 12 | | - | TX- |
| 10 | | - | *RX- |

* do not leave floating. See Reference Manual for connection details.

### M12 5-pin COM, Trigger Connector Pinout (PoE models)

| Pin | Name | Function |
|---|---|---|
| 1 | I1A | External Trigger A (polarity insensitive) |
| 2 | RX | RS232 Main Serial Receive data signal |
| 3 | TX | RS232 Main Serial Transmit data signal |
| 4 | I1B | External Trigger B (polarity insensitive) |
| 5 | GND | RS232 Main Serial Reference signal |

PoE models do not supply power to External Trigger.

### M12 8-Pin Standard Ethernet Network Connector pinout

| Pin | Name | Function |
|---|---|---|
| 1 | TX+ | Transmit data (positive pin) |
| 2 | TX- | Transmit data (negative pin) |
| 3 | RX+ | Receive data (positive pin) |
| 4 | RX- | Receive data (negative pin) |
| 5 | nc | Not Connected |
| 6 | nc | Not Connected |
| 7 | nc | Not Connected |
| 8 | nc | Not Connected |

### M12 8-Pin Power Over Ethernet Network Connector pinout

| Pin | Name | Function |
|---|---|---|
| 1 | TX+ | Transmit data (positive pin) |
| 2 | TX- | Transmit data (negative pin) |
| 3 | RX+ | Receive data (positive pin) |
| 4 | RX- | Receive data (negative pin) |
| 5 | DC1- | DC Power (negative pin) |
| 6 | DC2- | DC Power (negative pin) |
| 7 | DC1+ | DC Power (positive pin) |
| 8 | DC2+ | DC Power (positive pin) |

# TECHNICAL FEATURES

| ELECTRICAL FEATURES | | |
|---|---|---|
| **Power** Supply Voltage (Vdc) Consumption (A) Max. | **Standard Models** 10 to 30 Vdc 0.40 – 0.14 A (4.2 W) | **PoE Models** 48 Vdc 0.10 A (4.8 W) |
| **Communication Interfaces** Main - RS232, RS422 full-duplex | 2400 to 115200 bit/s | |
| Auxiliary - RS232 | 2400 to 115200 bit/s | |
| ID-NET™ | Up to 1Mbaud | |
| Ethernet [1] | 10/100 Mbit/s | |
| **Inputs:** | Opto-coupled and polarity insensitive (see Product Reference Guide for details) | |
| Max. Voltage | 30 Vdc | |
| Max. Input Current | 10 mA | |
| **Outputs:** | NPN or PNP short circuit protected (see Product Reference Guide for details) | |
| $V_{OUT}$ ($I_{LOAD}$ = 0 mA) Max. | 30 Vdc | |
| $V_{OUT}$ ($I_{LOAD}$ = 100 mA) Max. | 3 Vdc | |
| $I_{LOAD}$ Max. | 100 mA | |
| **OPTICAL FEATURES** (see Product Reference Guide for details) | | |

| PHYSICAL FEATURES | |
|---|---|
| Dimensions Std Matrix 220 connector at 0° Std Matrix 220 connector at 90° ESD Matrix 220 connector at 0° ESD Matrix 220 connector at 90° | H x W x L 78 x 47 x 38 mm (3.1 x 1.9 x 1.5 in) 58 x 47 x 58 mm (2.3 x 1.9 x 2.3 in) 78 x 47 x 43 mm (3.1 x 1.9 x 1.7 in) 58 x 47 x 63 mm (2.3 x 1.9 x 2.5 in) |
| Weight | 173 g. (6.1 oz.) |
| Material | Aluminium with plastic protective window cover |
| **ENVIRONMENTAL FEATURES** | |
| Operating Temperature [2] | -10 to 50 °C (14 to 122 °F) [3] |
| 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 |
| Shock Resistance EN 60068-2-27 | 30g; 11 ms; 3 shocks on each axis |
| Protection Class[4] EN 60529 | IP65 and IP67 |
| **USER INTERFACE** | |
| LED Indicators | Power; Ready, Good, Trigger, Com, Status; Ethernet Network; Green Spot; (see Product Reference Guide for other LEDs) |
| Other | X-PRESS™ Keypad Button (configurable via DL.CODE™) |

| SOFTWARE FEATURES | | | |
|---|---|---|---|
| **Readable Code Symbologies** | | | |
| **1-D and stacked** | | **2-D** | **POSTAL** | **Digimarc Barcode** |

| 1-D and stacked | | 2-D | POSTAL | Digimarc Barcode |
|---|---|---|---|---|
| • PDF417 Standard and Micro PDF417 • Code 128 (GS1-128) • Code 39 (Standard and Full ASCII) • Code 32 • MSI • Standard 2 of 5 • Matrix 2 of 5 • Interleaved 2 of 5 | • Codabar • Code 93 • Pharmacode • EAN-8/13 - UPC-A/E (including Addon 2 and Addon 5) • GS1 DataBar Family • Composite Symbologies | • Data Matrix ECC 200 (Standard, GS1 and Direct Marking) • QR Code (Standard and Direct Marking) • Micro QR Code • MAXICODE • Aztec Code | • Australia Post • Royal Mail 4 State Customer • Kix Code • Japan Post • PLANET • POSTNET • POSTNET (+BB) • Intelligent Mail • Swedish Post | • DWCODE™[5] |

| | |
|---|---|
| Operating Mode | CONTINUOUS, ONE SHOT, PHASE MODE |
| Configuration Methods | X-PRESS™ Human Machine Interface Windows-based SW (DL.CODE™) via Ethernet Host Mode Programming sequences sent over Serial or Ethernet TCP interfaces |
| Parameter Storage | Permanent memory (Flash) |

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[1] The embedded Ethernet interface supports application protocols: TCP/IP, EtherNet/IP, Profinet IO, Modbus TCP, OPC UA.

[2] High ambient temperature applications should use metal mounting bracket for heat dissipation.

[3] Operating temperature is 0 to 50 °C (32 to 122 °F) for the following models: 937900034, 937900035, 937900036, 937900037, 937900038, 937900039, 937900040, 937900041, 937900042, 937900057, 937900058, 937900059, 937900060.

[4] When correctly connected (fully tightened) to IP67 cables with seals.

[5] DWCODE models available.

# PATENTS

See www.patents.datalogic.com for patent list.

Matrix 220 is covered by one or more of the following patents:

Design patents: EP004735694

Utility patents: EP0996284B1, EP0999514B1, EP1014292B1, EP1128315B1, EP1396811B1, EP1413971B1, EP2517148B1, EP2649555B1, JP4435343B2, JP4571258B2, US6512218, US6616039, US6808114, US6997385, US7053954, US7387246, US7433590, US8058600, US8368000, US8888003, US8915443, US9268982, US9430689, US9798948, ZL200980163411.X

# COMPLIANCE

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.

## 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;
- connect pin "Earth" of the CBX connection box to a good Earth Ground;

## 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.

## 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 own expense.

## EAC COMPLIANCE

Customs Union:
The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian mark of conformity.

## LED SAFETY

According to IEC 62471:2006 all models are exempt (Risk Group 0).
According to EN 62471:2008, using limits stated in the directive 2006/25/EC, all models are exempt (Risk Group 0), except model Matrix 220 3U2-01U which is Risk Group 3.

**Note**: for Matrix 220 3U2-01U, the measure of the NEAR UV radiation power complies with the Risk Group 0 limit stated by the directive 2006/25/EC only at a distance of 370 mm and farther, instead of the standardized distance of 200 mm.

# POWER SUPPLY

**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".