

MX-U81 Processor with PNP (sourcing) I/O

QUICK REFERENCE GUIDE

DESCRIPTION

This guide covers MX-U Processor model MX-U81-4-P-1. This model provides PNP (sourcing) inputs and outputs. The MX-U81 machine vision processor offers the most powerful and flexible way to solve even complex machine vision applications.



- Rugged IP20 housing
- Low Maintenance
- Industrial Application Design
- 16 Inputs and Outputs
- Up to 4 USB 3.0 cameras
- Gigabit Ethernet
- USB 3.0 camera communication
- Easily Accessed connectors

SYSTEM SPECIFICATIONS

MX-U81 Processor: Intel Core i7 2.3 GHz
Storage: 16 GB RAM - 128 GB SSD
Dedicated USB 3.0 camera ports: 4
Additional USB 3.0 ports: 4
Plus the following:

- HD graphics (1920x1200)
- 2 x 10/100/1000 Mbps Base-T Network Interface
- Ethernet/IP, Modbus TCP, OPC, PROFINET communications supported
- 1 x RS232 port
- 16 x Optically Isolated Digital In + 16 x Optically Isolated Digital Out
- Microsoft Windows OEM Embedded Standard 7 64-bit

SUPPLY VOLTAGE CONNECTION

<p>Power Connector + 24VDC Supply Plus GND Functional Ground* - 24VDC Supply Minus *Connect to ground using a conductor with minimum 2.5 mm² cross-section</p>	
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STATUS LEDs AND BUTTONS

<ol style="list-style-type: none"> Power, green HDD, Yellow Link, Yellow Run, Green Power Button Reset Button 	
<p>Power Button: Press and release to turn on the unit or shut down the OS and switch off the unit. Press and hold to switch off without OS shutdown. Reset Button: Triggers a hardware and PCI reset. The unit is restarted.</p>	

HASP KEY USB PORT

<ol style="list-style-type: none"> Reset Button USB Port for Hasp Key <p>To enable cameras and licenses, insert the provided Hasp key in the USB port (labeled USB5), located behind the Front Cover.</p>	
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CONNECTORS

<ol style="list-style-type: none"> USB 3.0 Keyboard/Mouse Ethernet 2 Ethernet 1 RS232 (COM 1) Display Port DVI for Monitor Supply Voltage USB 3.0 Cameras (x 4) 37-pin D-Sub Digital I/O 	<p>Top View</p>
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COMMUNICATIONS

Camera communication and power are provided by the USB 3.0 camera ports. Maximum cable length is 5 meters. Use only Datalogic provided cables. Camera trigger and strobe output are provided by an external 6-pin I/O cable with no connection to the processor. Use cable 606-0672-xx (unterminated) or cable 606-0674-xx (with terminal block 661-0399 or 248-0140). Refer to the MX-U81 Hardware Guide.

DIGITAL I/O CONNECTIONS

37 pin D-Sub Digital I/O connector

Use cable 606-0675-xx (with terminal block 248-0110) or remove one end for pigtail. Cable and terminal numbers are listed in the following table. Use shielded cable for all connections. **Note:** Do not disconnect the cable at the connector while power is on.

Pin/Terminal Number	Color Code	Signal Name
1	Black	Input Minus (Note 1)
2	Brown	Input 1- and Event 1-
3	Red	Input 2- and Event 2-
4	Orange	Input 3-
5	Yellow	Input 4-
6	Green	Input 5-
7	Blue	Input 6-
8	Purple	Input 7-
9	Gray	Input 8-
10	White	Input 9-
11	Pink	Input 10-
12	Light Green	Input 11-
13	Black/White	Input 12-
14	Brown/White	Input 13-
15	Red/White	Input 14-
16	Orange/White	Input 15-
17	Green/White	Input 16-
18	Blue/White	Output Plus (Note 2)
19	Purple/White	No Connection
20	Red/Black	No Connection
21	Orange/Black	Output 1
22	Yellow/Black	Output 2
23	Green/Black	Output 3
24	Gray/Black	Output 4
25	Pink/Black	Output 5
26	Pink/Red	Output 6
27	Pink/Blue	Output 7
28	Pink/Green	Output 8
29	Light Blue	Output 9
30	Light Blue/Black	Output 10
31	Light Blue/Red	Output 11
32	Light Blue/Blue	Output 12
33	Light Blue/Green	Output 13
34	Gray/Red	Output 14
35	Gray/Green	Output 15
36	Purple/Black	Output 16
37	Blue/Black	Output Plus (Note 2)

Pin 1 → Female Connector Solder Side

NOTES:
1: Common Minus for input ports (External 12 to 24VDC Minus)
2: Common Plus for output ports (Not an output voltage source. External 12 to 24VDC Plus is required)

DIGITAL I/O SPECIFICATIONS

Inputs	Specification
Format	Opto-coupler isolated input
Resistance	4.7kΩ
On current	2.0 mA or more
Off current	0.16 mA or less
Response Time	Within 200 μsec

Outputs	Specification
Format	Opto-coupler isolated open emitter output
Output voltage	35 VDC (max)
Output current	100mA (per channel max)
Residual voltage	0.5V or less (Output current ≤50mA)
output on	1.0V or less (Output current ≤100mA)
Response Time	Within 200 μsec

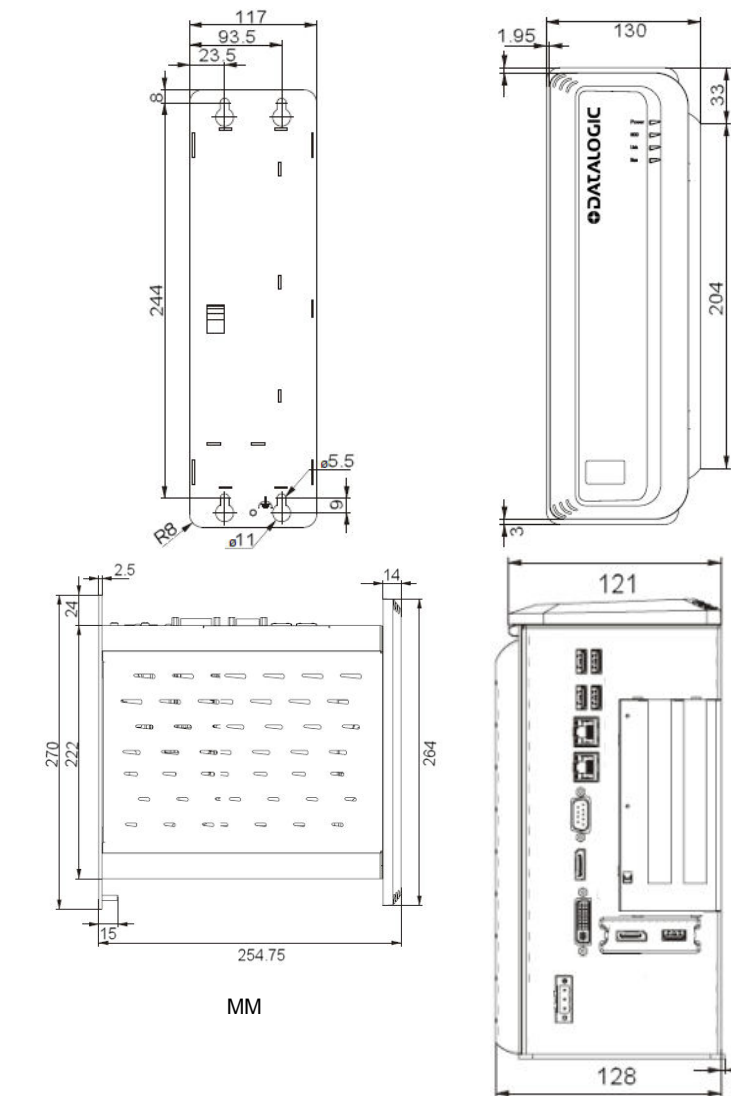
DIGITAL I/O CABLES AND TERMINALS

Cable	Part Number
Digital I/O 37-pin to Terminal Block 248-0110	606-0675-xx
Digital I/O 37-pin to pigtail (remove one end)	606-0675-xx

I/O CONFIGURATION

Use Vision Program Manager (VPM) software on the processor to create vision programs and configure input and output response. Refer to the Impact Reference Guide for programming details.

MECHANICAL DIMENSIONS

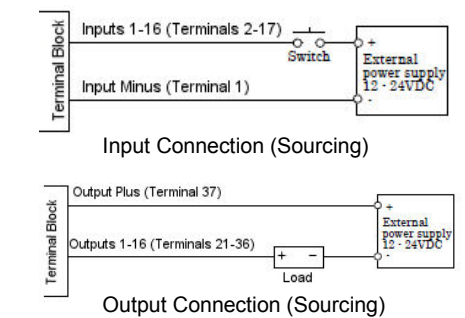


CAMERA CABLES, TERMINALS, AND CONFIGURATION

Camera trigger and strobe output are provided by an external 6-pin I/O cable with no connection to the processor. Use cable 606-0672-xx (unterminated) or cable 606-0674-xx (with terminal block 661-0399 or 248-0140). Refer to the U-Series Hardware Guide.

Cable	Part Number
Camera Trigger and Strobe: 6-pin to Terminal Block 248-0140 or 661-0399	606-0674-xx
Camera Trigger and Strobe: 6-pin to pigtail	606-0672-xx

EXAMPLE I/O CIRCUIT DIAGRAMS



TECHNICAL DATA

Supply voltage (Vs)	24 VDC ± 25%
Nominal Current Draw	5.5 A at 24 VDC
Inputs	16 opto-isolated
Input current	ON: 2.0 mA or more Off: 0.16 mA or less
Outputs	16 opto-isolated current sourcing
Output Voltage	35 VDC (max)
Output current	100 mA max per output
Output saturation voltage	< 1 V
Network interface	10/100/1000 Mbps Ethernet x 2
Camera interface USB 3.0	5 Gigabit/s max 1.5 A Max per connection
Dimensions	130 × 270 × 254.75 mm
Data retention	Non-volatile SSD memory
Temperature	Operating: 0 °C to 55 °C Storage: -20 °C to 60 °C
Relative Humidity (30 °C)	Operating: 10 to 90% Storage: 5 to 95%
Vibrations (EN60068-2-6)	2 to 8 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Shock resistance (EN60068-2-27)	11 MS (15 G)
Housing material	Galvanized plate, plastic
Mechanical protection (EN 60529)	IP20
Weight	2050 g

Patent. See www.patents.datalogic.com for patent list.
This product is covered by one or more of the following patents:
Utility patents: EP0996284B1, EP0999514B1, EP1014292B1, EP1128315B1, EP1396811B1, EP1413971B1, JP4435343B2, JP4571258B2, US6512218, US6616039, US6808114, US6997385, US7053954, US7387246, US8058600, US8368000
DATALOGIC reserves the right to make modifications and improvements without prior notification.

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

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.

DATALOGIC S.r.l.
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www.datalogic.com

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Support Through The Website
Datalogic provides several services as well as technical support through its website. Log on to www.datalogic.com and click on the **SUPPORT** link which gives you access to: **Downloads** by selecting your product model from the dropdown list in the Search by Product field for specific Data Sheets, Manuals, Software & Utilities, and Drawings; **Repair Program** for On-Line Return Material Authorizations (RMAs) plus Repair Center contact information; **Customer Service** containing details about Maintenance Agreements; **Technical Support** through email or phone.

MX-U81 Processor with NPN (sinking) I/O

QUICK REFERENCE GUIDE

DESCRIPTION

This guide covers MX-U Processor model MX-U81-4-N-1. This model provides NPN (sourcing) inputs and outputs. The MX-U81 machine vision processor offers the most powerful and flexible way to solve even complex machine vision applications.



- Rugged IP20 housing
- Low Maintenance
- Industrial Application Design
- 16 Inputs and Outputs
- Up to 4 USB 3.0 cameras
- Gigabit Ethernet
- USB 3.0 camera communication
- Easily Accessed connectors

SYSTEM SPECIFICATIONS

MX-U81 Processor: Intel Core i7 2.3 GHz
Storage: 16 GB RAM - 128 GB SSD
Dedicated USB 3.0 camera ports: 4
Additional USB 3.0 ports: 4
Plus the following:

- HD graphics (1920x1200)
- 2 x 10/100/1000 Mbps Base-T Network Interface
- Ethernet/IP, Modbus TCP, OPC, PROFINET communications supported
- 1 x RS232 port
- 16 x Optically Isolated Digital In + 16 x Optically Isolated Digital Out
- Microsoft Windows OEM Embedded Standard 7 64-bit

SUPPLY VOLTAGE CONNECTION

<p>Power Connector + 24VDC Supply Plus GND Functional Ground* - 24VDC Supply Minus *Connect to ground using a conductor with minimum 2.5 mm² cross-section</p>	
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STATUS LEDs AND BUTTONS

<ol style="list-style-type: none"> Power, green HDD, Yellow Link, Yellow Run, Green Power Button Reset Button 	
<p>Power Button: Press and release to turn on the unit or shut down the OS and switch off the unit. Press and hold to switch off without OS shutdown. Reset Button: Triggers a hardware and PCI reset. The unit is restarted.</p>	

HASP KEY USB PORT

<ol style="list-style-type: none"> Reset Button USB Port for Hasp Key <p>To enable cameras and licenses, insert the provided Hasp key in the USB port (labeled USB5), located behind the Front Cover.</p>	
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CONNECTORS

<ol style="list-style-type: none"> USB 3.0 Keyboard/Mouse Ethernet 2 Ethernet 1 RS232 (COM 1) Display Port DVI for Monitor Supply Voltage USB 3.0 Cameras (x 4) 37-pin D-Sub Digital I/O 	<p>Top View</p>
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COMMUNICATIONS

Camera communication and power are provided by the USB 3.0 camera ports. Maximum cable length is 5 meters. Use only Datalogic provided cables. Camera trigger and strobe output are provided by an external 6-pin I/O cable with no connection to the processor. Use cable 606-0672-xx (unterminated) or cable 606-0674-xx (with terminal block 661-0399 or 248-0140). Refer to the MX-U81 Hardware Guide.

DIGITAL I/O CONNECTIONS

37 pin D-Sub Digital I/O connector
 Use cable 606-0675-xx (with terminal block 248-0110) or remove one end for pigtail. Cable and terminal numbers are listed in the following table. Use shielded cable for all connections. **Note:** Do not disconnect the cable at the connector while power is on.

Pin/Terminal Number	Color Code	Signal Name
1	Black	Output Minus (Note 1)
2	Brown	Input 1- and Event 1-
3	Red	Input 2- and Event 2-
4	Orange	Input 3-
5	Yellow	Input 4-
6	Green	Input 5-
7	Blue	Input 6-
8	Purple	Input 7-
9	Gray	Input 8-
10	White	Input 9-
11	Pink	Input 10-
12	Light Green	Input 11-
13	Black/White	Input 12-
14	Brown/White	Input 13-
15	Red/White	Input 14-
16	Orange/White	Input 15-
17	Green/White	Input 16-
18	Blue/White	Input Plus (Note 2)
19	Purple/White	No Connection
20	Red/Black	Output Minus (Note 1)
21	Orange/Black	Output 1
22	Yellow/Black	Output 2
23	Green/Black	Output 3
24	Gray/Black	Output 4
25	Pink/Black	Output 5
26	Pink/Red	Output 6
27	Pink/Blue	Output 7
28	Pink/Green	Output 8
29	Light Blue	Output 9
30	Light Blue/Black	Output 10
31	Light Blue/Red	Output 11
32	Light Blue/Blue	Output 12
33	Light Blue/Green	Output 13
34	Gray/Red	Output 14
35	Gray/Green	Output 15
36	Purple/Black	Output 16
37	Blue/Black	Output Plus (Note 3)

Pin 1 → Male Connector Solder Side

NOTES:
 1: Common Minus for output ports (External 12 to 24VDC Minus)
 2: Common Plus for input ports (External 12 to 24VDC Plus)
 3: Common Plus for output ports (Not an output voltage source. External 12 to 24VDC Plus is required)

DIGITAL I/O SPECIFICATIONS

Inputs	Specification
Format	Opto-coupler isolated input
Resistance	4.7kΩ
On current	2.0 mA or more
Off current	0.16 mA or less
Response Time	Within 200 μsec

Outputs	Specification
Format	Opto-coupler isolated open collector output
Output voltage	35 VDC (max)
Output current	100mA (per channel max)
Residual voltage output on	0.5V or less (Output current ≤50mA) 1.0V or less (Output current ≤100mA)
Response Time	Within 200 μsec

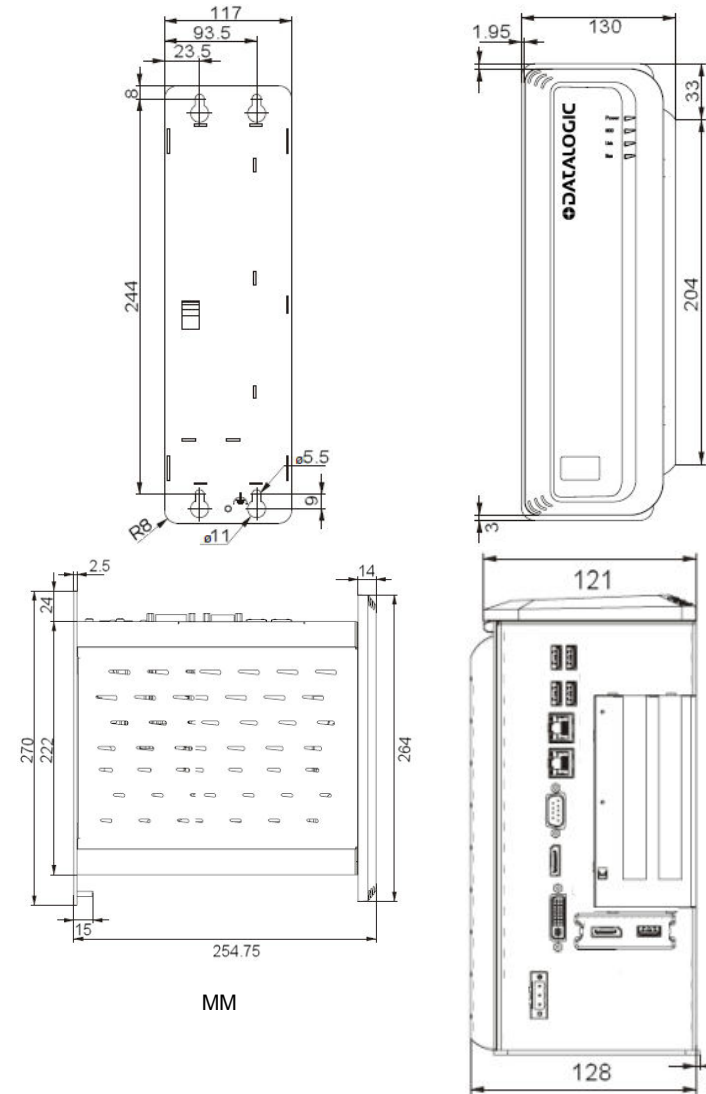
DIGITAL I/O CABLES AND TERMINALS

Cable	Part Number
Digital I/O 37-pin to Terminal Block 248-0110	606-0675-xx
Digital I/O 37-pin to pigtail (remove one end)	606-0675-xx

I/O CONFIGURATION

Use Vision Program Manager (VPM) software on the processor to create vision programs and configure input and output response. Refer to the Impact Reference Guide for programming details.

MECHANICAL DIMENSIONS

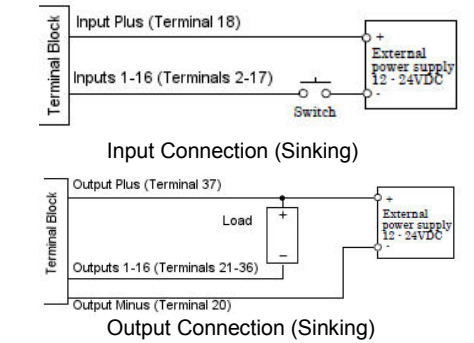


CAMERA CABLES, TERMINALS, AND CONFIGURATION

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Cable	Part Number
Camera Trigger and Strobe: 6-pin to Terminal Block 248-0140 or 661-0399	606-0674-xx
Camera Trigger and Strobe: 6-pin to pigtail	606-0672-xx

EXAMPLE I/O CIRCUIT DIAGRAMS



TECHNICAL DATA

Supply voltage (Vs)	24 VDC ± 25%
Nominal Current Draw	5.5 A at 24 VDC
Inputs	16 opto-isolated
Input current	ON: 2.0 mA or more Off: 0.16 mA or less
Outputs	16 opto-isolated current sinking
Output Voltage	35 VDC (max)
Output current	100 mA max per output
Output saturation voltage	< 1 V
Network interface	10/100/1000 Mbps Ethernet x 2
Camera interface USB 3.0	5 Gigabit/s max 1.5 A Max per connection
Dimensions	130 x 270 x 254.75 mm
Data retention	Non-volatile SSD memory
Temperature	Operating: 0 °C to 55 °C Storage: -20 °C to 60 °C
Relative Humidity (30 °C)	Operating: 10 to 90% Storage: 5 to 95%
Vibrations (EN60068-2-6)	2 to 8 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Shock resistance (EN60068-2-27)	11 MS (15 G)
Housing material	Galvanized plate, plastic
Mechanical protection (EN 60529)	IP20
Weight	2050 g

Patent. See www.patents.datalogic.com for patent list.
 This product is covered by one or more of the following patents:
 Utility patents: EP0996284B1, EP0999514B1, EP1014292B1, EP1128315B1, EP1396811B1, EP1413971B1, JP4435343B2, JP4571258B2, US6512218, US6616039, US6808114, US6997385, US7053954, US7387246, US8058600, US8368000
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 Customs Union:
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 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.
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