Matrix-1000™

QUICK REFERENCE GUIDE

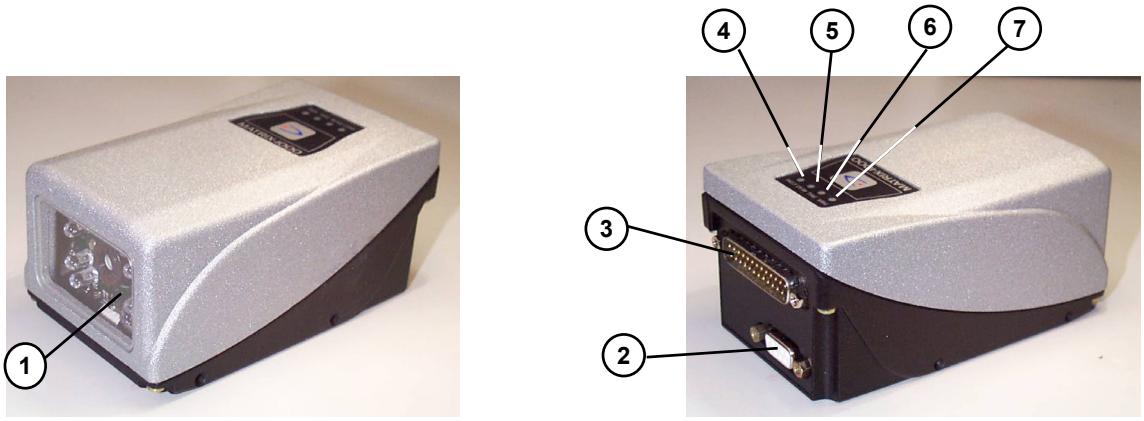

Figure A

① Reading Window
② Auxiliary Interface
③ Main/Auxiliary Interface
④ Main Tx LED
⑤ Good Read LED
⑥ External Trigger LED
⑦ Power On LED

NOTE

For further details on product installation, see the complete Installation Manual available on the CD included with this product.

Compliance:

- **This product is intended to be installed by Qualified Personnel only.**
- This product is intended to be connected to a UL Listed Computer which supplies power directly to the reader or a UL Listed Direct Plug-in Power Unit marked LPS or “Class 2”, rated 10 to 30 V, minimum 1 A.
- 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 the main interface cable shield to pin 1 of the reader 25-pin connector;
  - use two clip-on ferrite sleeves (type Stewart 28A2029-0A0) on the main interface cable near the reader 25-pin connector;

N2468
CLASS 1 LED PRODUCT

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.

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TO EN 60825-1:2001

Model Description:

MATRIX - 10X1

Optics

2 = High Density (HD)
3 = Standard Density (STD)
4 = Low Density (LD)
5 = Medium Range (MR)

ELECTRICAL FEATURES	
Power	
Supply Voltage	10 to 30 Vdc
Power Consumption	4 W max.; 2.5 W typical
Communication Interfaces	
Main - RS485 half-duplex	2400 to 115200 bit/s
Auxiliary - RS232	2400 to 115200 bit/s
Input	
External Trigger	Opto-coupled and polarity insensitive
Output	
OUT3	Opto-coupled
OPTICAL FEATURES	
Image Sensor	Matrix CCD
Image Format	VGA (640x480)
Lighting System	LED array
Wavelength	630 ~ 670 nm
Max LED Output Power	0.7 mW
LED Safety Class	Class 1 to EN60825-1
USER INTERFACE	
LED Indicators	PWR, TRIG, READ, COM
SOFTWARE FEATURES	
Readable Code Symbologies	
1-D and stacked	
• PDF417 Standard • Code 128 (EAN 128) • Code 39 (Standard and Full ASCII) • Interleaved 2 of 5 • Codabar	• Code 93 • EAN-8/13 - UPC-A/E (including Addon 2 and Addon 5) • RSS14, RSS14 Stacked, RSS Limited, RSS Expanded, RSS Expanded Stacked
2-D	
• Data Matrix ECC 200	• QR Code
POSTAL	
• Australia Post • Royal Mail 4 State Customer • Kix Code • Japan Post	• PLANET • POSTNET, POSTNET (+BB) • POSTNET + PLANET, POSTNET (+BB) + PLANET
Operating Mode	ONE-SHOT, CONTINUOUS, PHASE MODE
Configuration Mode	By means of VisiSet™ configuration software
Parameter Storage	Permanent memory (Flash)
MECHANICAL FEATURES	
Dimensions	121 x 73 x 57 mm (4.76 x 2.87 x 2.24 in.)
Weight	330 g.
Material	Magnesium alloy
ENVIRONMENTAL FEATURES	
Operating Temperature	0 to 40 °C (32 to 104 °F)
Storage Temperature	-20 to 70 °C (-4 to 158 °F)
Max. Humidity	90% non condensing
Vibration Resistance	IEC 68-2-6 test FC; 14 mm @ 2 to 10 Hz 1.5 mm @ 13 to 55 Hz 2 G @ 70 to 200 Hz 2 hours on each axis
Shock Resistance	IEC 68-2-27 test EA 30 G; 11 ms; 3 shocks on each axis
Protection Class	IP64 (sealed connectors required)

READING FEATURES	
Frame Rate	up to 30 frames / sec
Pitch	10° - 35°
Readable Codes per Frame	up to100
Tilt	0° - 360°

MODELS	Focus Distance mm (in)	Field of View [1] mm (in)	ppi [2]	Typ. Linear and Stacked Code Resolution mm (mils)	Typ. 2D Code Resolution mm (mils)	Reading Distance [3] mm (in)	
						min.	max.
1021 HD	115 (4.52)	25 × 19 (0.98 × 0.75)	653	0.10 (4)	0.19 (7.5)	105 (4.13)	125 (4.92)
1031 SD	155 (6.10)	34 × 26 (1.34 × 1.02)	478	0.15 (6)	0.25 (10)	135 (5.31)	180 (7.08)
1041 LD	110 (4.33)	54 x 40 (2.13 × 1.57)	300	0.20 (8)	0.38 (15)	90 (3.45)	140 (5.51)
1051 MR	210 (8.26)	95 × 70 (3.74×2.75)	170	0.30 (12)	0.60 (24)	150 (5.90)	250 (9.84)

[1] @ focus distance
[2] Pixels per inch @ focus distance
[3] Measurement conditions:

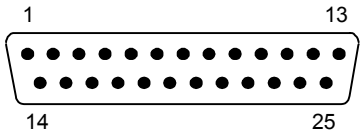
- Test chart: provided with the reader
- Still code at the center of the FOV
- Code symbology: Data Matrix ECC 200
- Code resolution: Typ. 2D Code Resolution
- Tilt angle: 45°
- Pitch angle: 15°
- Decode mode: Predictable

Accessories:

Order no.	Accessory	Description
93A051190	CAB-6001	cable to C-BOX100 1 m
93A051200	CAB-6002	cable to C-BOX100 2 m
93A051210	CAB-6005	cable to C-BOX100 5 m
93A051271	CAB-6010	cable to C-BOX100 10 m
93ACC1510	C-BOX 100	passive connection box
93A301000	C-BOX 300	Connection box PROFIBUS
93A301030	C-BOX 310	Connection box PROFIBUS with display
93A301010	C-BOX 400	Connection box DeviceNet
93A301040	C-BOX 410	Connection box DeviceNet with display
93ACC1718	PG6002	AC/DC power supply unit (US)
93ACC1719	PG6001	AC/DC power supply unit (UK)
93ACC1720	PG6000	AC/DC power supply unit (EU)
93A201090	GFC-MATRIX	90° deflection mirror

Electrical Connections:

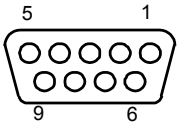
The Matrix-1000™ reader provides a 25-pin male D-sub connector for connection to power supply, Host interface (Main and Auxiliary), and input/output signals.



25-pin male D-Sub Connector

25-pin male D-sub connector pinout		
Pin	**Name**	**Function**
1	SHIELD	Cable shield internally connected by capacitor to the chassis
2	RTX485+	RX or TX data of RS485 Half Duplex Main Interface - positive pin
4	RTX485-	RX or TX data of RS485 Half Duplex Main Interface - negative pin
7	SGND	Reference GND of RS485 Half Duplex Main Interface
3,5	NC	
20	RXAUX	Received data of RS232 Auxiliary Interface (referred to GND)
21	TXAUX	Transmitted data of RS232 Auxiliary Interface (referred to GND)
8, 22	NC	Not connected
11, 12	NC	Not connected
16	OUT 3 +	Configurable digital output 3 - positive pin
17	OUT 3 -	Configurable digital output 3 - negative pin
18	EXT_TRIG A	External trigger (polarity insensitive)
19	EXT_TRIG B	External trigger (polarity insensitive)
6, 10	NC	Not connected
14, 15, 24	NC	Not connected
9,13	VS	Supply voltage - positive pin
23, 25	GND	Supply voltage - negative pin

A separate 9-pin female D-sub connector provides access to the auxiliary port.



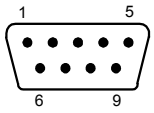
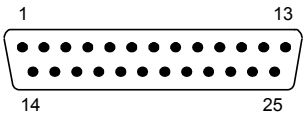
9-pin female D-Sub Connector

9-pin female D-sub connector pinout		
Pin	**Name**	**Function**
2	TXAUX	Transmitted data of RS232 Auxiliary Interface
3	RXAUX	Received data of RS232 Auxiliary Interface
5	GND	Reference GND of RS232 Auxiliary Interface
1,4,6,7,8,9	N.C.	Not connected

CAUTION

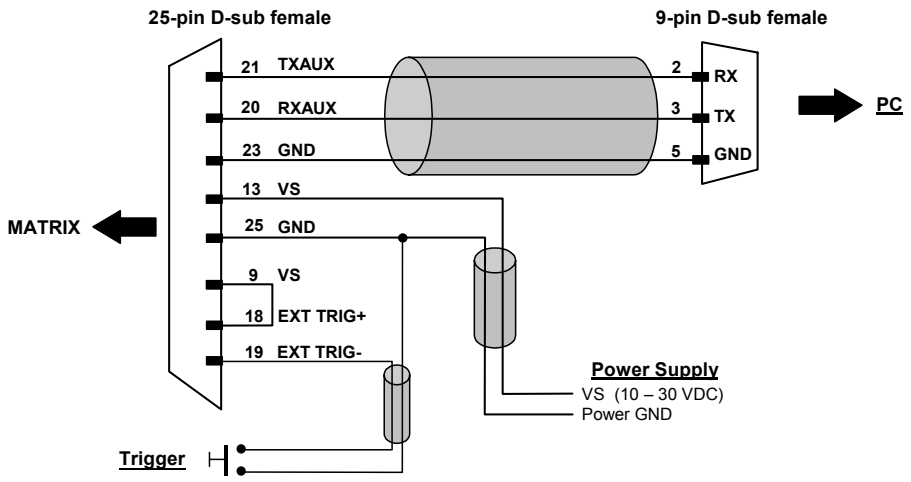
Do not connect GND and SGND to different (external) ground references. GND and SGND are internally connected through filtering circuitry which can be permanently damaged if subjected to voltage drops over 0.8 Vdc.

User Interface:

RS232 PC-side connections			
			
9-pin male connector		**25-pin male connector**	
Pin	**Name**	**Pin**	**Name**
2	RX	3	RX
3	TX	2	TX
5	GND	7	GND
7	RTS	4	RTS
8	CTS	5	CTS

How To Build A Simple Interface Test Cable:

The following wiring diagram shows a simple test cable including power, external (push-button) trigger and PC RS232 COM port connections.



Test Cable for Matrix-1000™

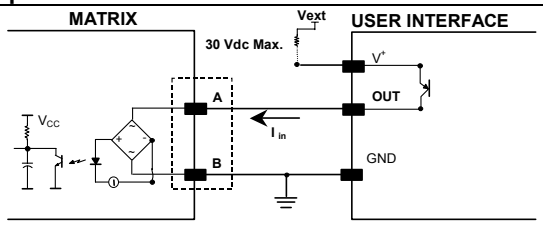
C-BOX 100 pinout for Matrix-1000™:

The table below gives the pinout of the C-BOX 100 terminal block connectors. Use this pinout when the Matrix-1000™ reader is connected by means of the C-BOX 100:

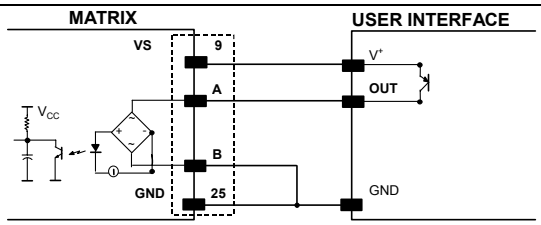
C-BOX 100 Terminal Block Connectors	
Power	
1, 3, 5	VS
2, 4, 6	GND
7, 8	EARTH GROUND
20, 40	Reserved
Inputs	
27	EXT TRIG A (polarity insensitive)
28	EXT TRIG B (polarity insensitive)
29, 30	NC
31, 33	NC
32, 34	NC
36	NC
Outputs	
21, 22	NC
23, 24	NC
25	OUT 3+
26	OUT 3-
Auxiliary Interface	
35	TX AUX
37	RX AUX
38, 39	GND
Main Interface	
	RS485 Half-Duplex
11, 15	RTX485+
12, 16	RTX485-
17	NC
18	NC
10, 14, 19	SGND
9, 13	RS485 Cable Shield

Input / Output Connections:

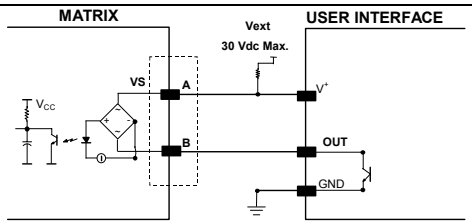
Input



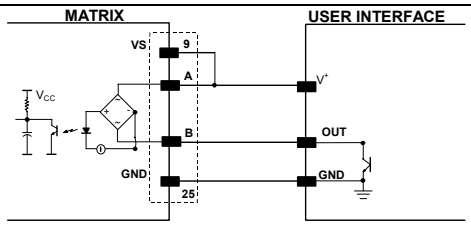
Input PNP command using external power



Input PNP command using Matrix-1000™ power



Input NPN command using external power

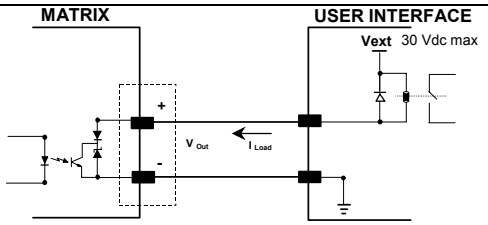


Input NPN command using Matrix-1000™ power

The electrical features of the input are:

INPUT	| V_{AB} | Min.	| V_{AB} | Max.	I_{IN} Max.
Open	0 V	2 V	0 mA
Closed	4.5 V	30 V	10 mA

Output



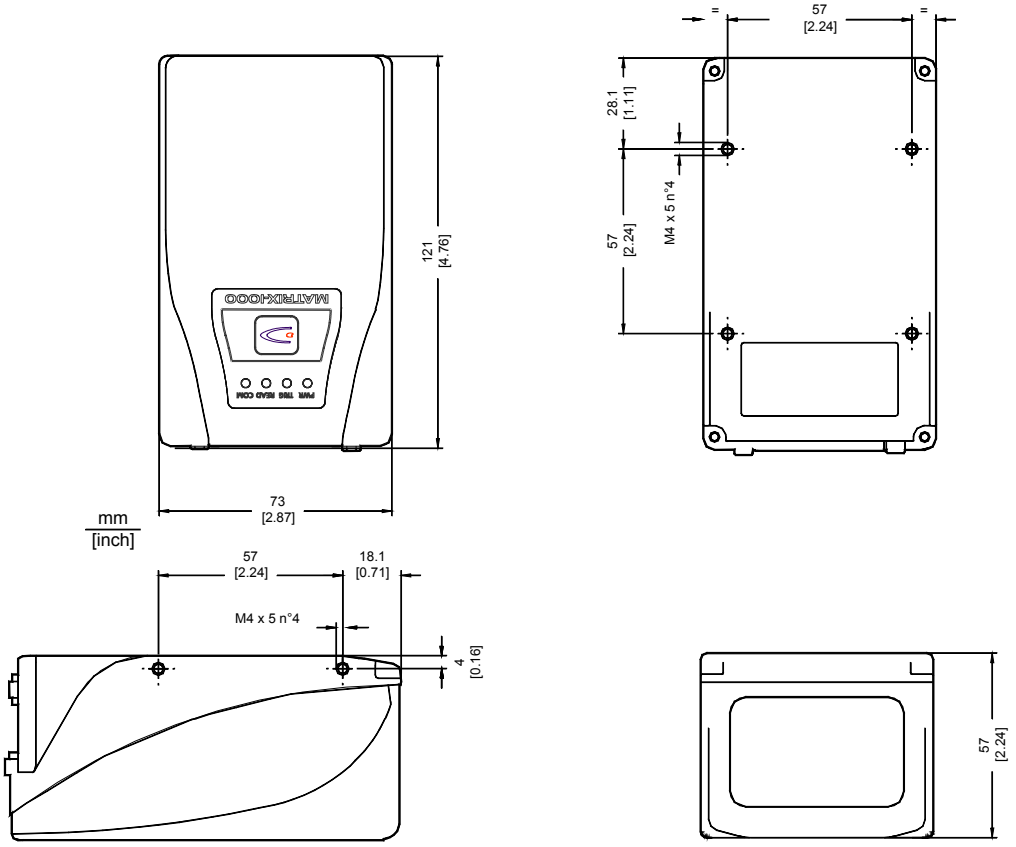
Open collector output connection

The electrical features of the output are the following:

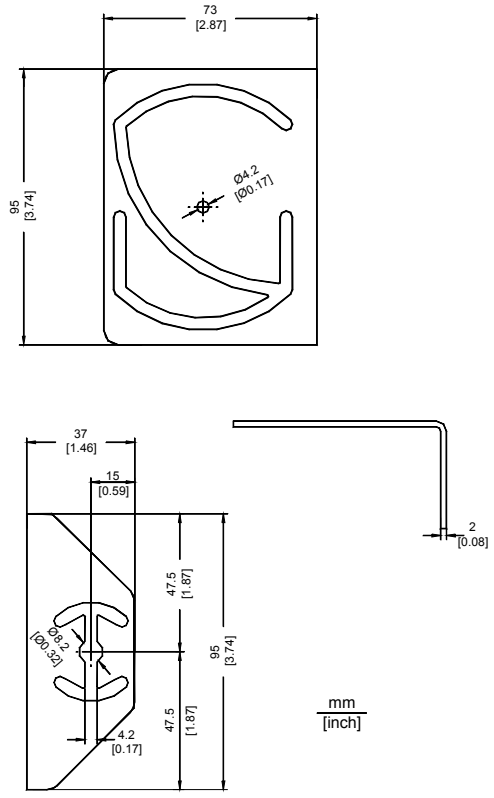
OUTPUT	I_{Load}	V_{Out}
Open	0 mA	30 Vdc Max
Closed	10 mA	1.8 Vdc Max

$P_D = V_{out} \times I_{load}$ = 170 mW Max.

Mechanical Installation:



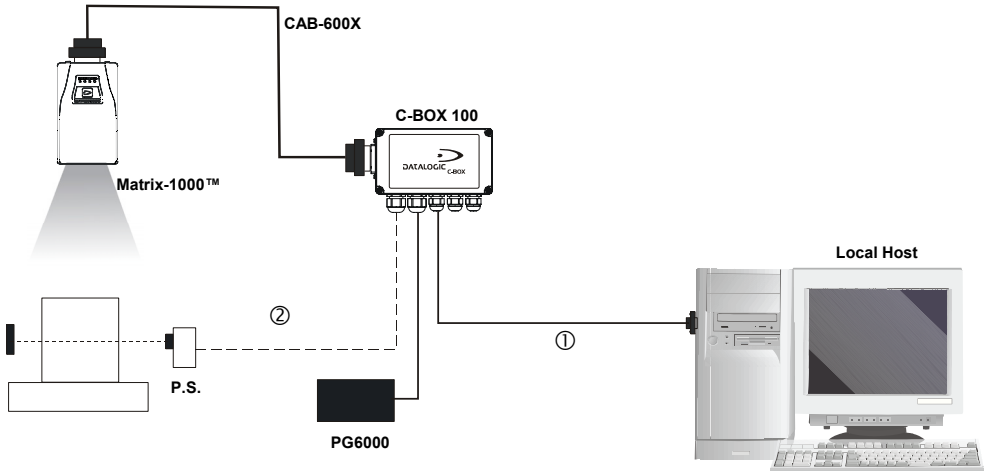
Overall Dimensions



Mounting Bracket Dimensions

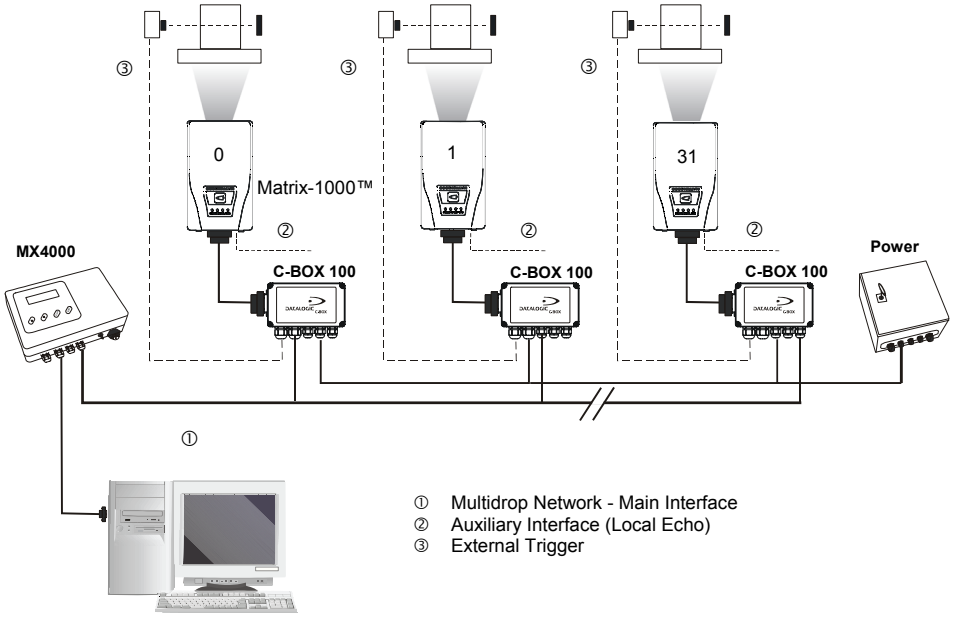
Connectivity:

Point-to-Point



① Auxiliary Interface (Local Echo)
② External Trigger

Multiplexer



① Multidrop Network - Main Interface
② Auxiliary Interface (Local Echo)
③ External Trigger

DATALOGIC S.p.A.,
Via Candini, 2
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Bologna - Italy

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MATRIX-1XXX

e tutti i suoi modelli
and all its models
et tous ses modèles
und seine modelle
y todos sus modelos

sono conformi alle Direttive del Consiglio Europeo sottoelencate:
are in conformity with the requirements of the European Council Directives listed below:
sont conformes aux spécifications des Directives de l'Union Européenne ci-dessous:
der nachstehend angeführten Direktiven des Europäischen Rats:
cumple con los requisitos de las Directivas del Consejo Europeo, según la lista siguiente:

89/336/EEC EMC Directive	e and et und y	**92/31/EEC, 93/68/EEC**	emendamenti successivi further amendments ses successifs amendements späteren Abänderungen succesivas enmiendas

Basate sulle legislazioni degli Stati membri in relazione alla compatibilità elettromagnetica ed alla sicurezza dei prodotti.
On the approximation of the laws of Member States relating to electromagnetic compatibility and product safety.
Basée sur la législation des Etates membres relative à la compatibilité électromagnétique et à la sécurité des produits.
Über die Annäherung der Gesetze der Mitgliedsstaaten in bezug auf elektromagnetische Verträglichkeit und Produktsicherheit entsprechen.
Basado en la aproximación de las leyes de los Países Miembros respecto a la compatibilidad electromagnética y las Medidas de seguridad relativas al producto.

Questa dichiarazione è basata sulla conformità dei prodotti alle norme seguenti:
This declaration is based upon compliance of the products to the following standards:
Cette déclaration repose sur la conformité des produits aux normes suivantes:
Diese Erklärung basiert darauf, daß das Produkt den folgenden Normen entspricht:
Esta declaración se basa en el cumplimiento de los productos con la siguientes normas:

EN 55022, August 1994:	LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT (ITE)
EN 61000-6-2, October 2001:	ELECTROMAGNETIC COMPATIBILITY (EMC). PART 6-2: GENERIC STANDARDS – IMMUNITY FOR INDUSTRIAL ENVIRONMENTS

Lippo di Calderara, 14/09/04

Ruggero Cacioppo
Quality Assurance Supervisor