INSTALLATION AND OPERATION MANUAL

POWERSCAN
PSCAN-D-1D-D2

Division 2 Barcode Reader

PEPPERL+FUCHS

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PSCAN-D-1D-D2 Division 2 Barcode Reader

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Safety

General safety instructions

- The plant owner is responsible for its planning, installation, commissioning, operation, maintenance, and disassembly.

- Installation and commissioning of all devices must be performed by a trained professional only.

- Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended purpose.

- Laws and regulations applicable to the usage or the intended purpose must be observed.

- The devices are only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

- The Declaration of Conformity, Certificate of Compliance, Statement of Conformity, EC type-examination certificate and data sheets are an integral part of this document.

- The data sheet contains the electrical data of the Declaration of Conformity, the Certificate of Compliance, and the EC-type-examination certificate.

- The documents mentioned are available from http://www.pepperl-fuchs.com or your local Pepperl+Fuchs representative.

Delivery, transport, and storage

- Check the packaging and contents for damage.

- Check if you have received every item and if the items received are the ones you ordered.

- Keep the original packaging. Always store and transport the device in the original packaging.

- Always store the device in a clean and dry environment. The permitted storage temperature (see datasheet) must be considered.

PSCAN-D-1* intended use

The PSCAN-D-1D-D2 EX barcode reader can be used in Class I/Div. 2, Class II/Div. 2, and Class III/Div.2 hazardous areas. The barcode reader is able to read all standard 1-D code families. An audible beep will be heard once a successful scan is completed. Bidirectional communication between barcode reader and host is also possible.

Supply and communication of the barcode reader is made by a nonincendive barrier that is required for Div. 2 installation. The devices are only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Installation and commissioning

The installation instructions in accordance with IEC/EN 60079-14 must be observed. If devices have already been operated in general electrical systems, they may no longer be installed in electrical systems used in combination with hazardous areas. The respective peak values of the field device and the associated apparatus with regard to explosion protection should be considered when connecting nonincendive field devices.

Technical data

Data for Use in Conjunction with Hazardous Areas	
Voltage (U)	10 VDC
Current (I)	500 mA
Capacitance (C)	250 µF
Inductance (L)	75 µH
Operating Temperature	
Ambient temperature	-10 ºC to 50 ºC (14 ºF to 122 ºF)

Hazardous location label

Laser safety compliance

The barcode reader conforms to the following applicable requirements at the date of manufacture:

- EN 60825-1
- CDRH 21 CFR 1040

The laser light is visible to the human eye and is emitted from the output window.

Warning! Laser Light

STOP

Warning

- The human eye can be damaged.
- Do not stare into beam of the laser light.
- Any changes to the device are forbidden. These could cause a dangerous laser light.
- Please consider the procedures described in these operating instructions.
- Prevent the laser beam from hitting reflective surfaces such as mirrors, etc.

A warning label is attached to the barcode reader describing the laser and laser category. The device is a class 2 laser. It is not necessary to open the barcode reader for installation, application, or maintenance. Labels cannot be attached to a laser diode. Hence, the respective values are listed below:

Laser Class 2M
EN 60825-1

Maximum Output	0.9 mW
Wavelength according to Class 2 N-60825-1 and CDRH21CFR 1040	630-690 nm

Repair and maintenance

The devices must not be repaired, changed, or manipulated. If there is a defect, the product must always be replaced with an original device.

Applied standards and guidelines

Electromagnetic compatibility	NE 21
Low voltage	ANSI/UL 60950-1-2007
Explosion protection	ANSI/ISA-12.12.01-2007; CSA C22.2 No. 213-M1987, R2008

Product specifications

PSCAN-D-1D-D2 function

The PSCAN-D-1D-D2EX barcode reader can be used in Class I/Div. 2 and Class II/Div. 2 hazardous areas. The barcode reader is able to read all standard 1-D code families. After a successful read, a beep to indicate a good read is sent out for easy operation. In addition, a bidirectional communication is possible. Supply and communication of the barcode reader is made by a nonincendive interface.

Additional functions include:
Aiming system
First, a partial trigger produces a red spot for easy aiming. By completely pressing the trigger, a line appears to start code scanning.

GL-technics (3 green lights)

A good read is shown via an audio signal, green LEDs on upside and underside, plus a green scan line directly on the barcode.

Using PSCAN-D-1D-D2 readers

The PSCAN-D-1* barcode reader automatically scans barcodes up to a certain distance. See the Reading characteristics chart on page xx. Simply aim and pull the trigger. Code scanning is performed along the scan line emitted from the reading window. The line must cross the entire code.
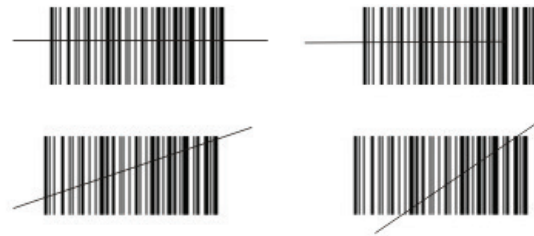
Best reading angles

For good reading performance, do not hold the barcode reader vertically. Use the reading angles in the figure below.

Device components
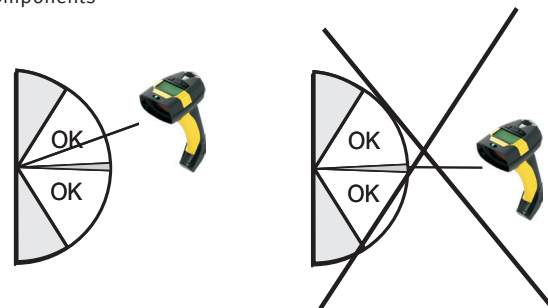
- Barcode reader
- Connecting cable consisting of a helix cable 3 m and a male 4-pin connector (M12 connector) mounted.

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Reading characteristics

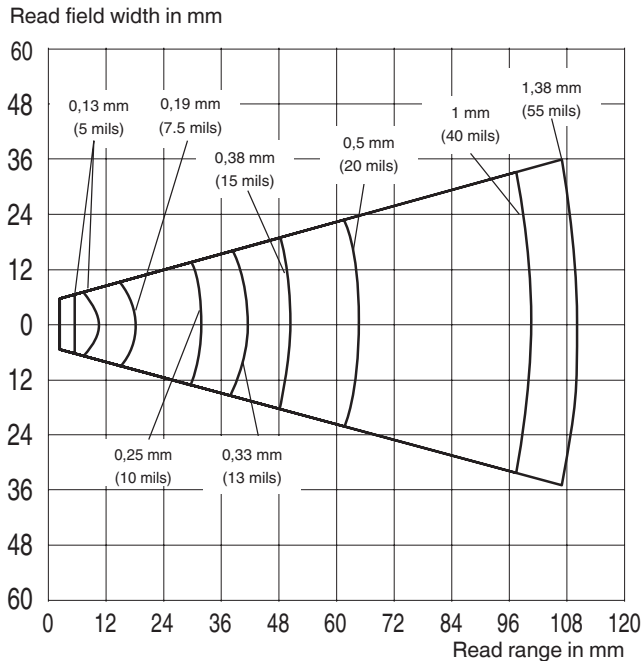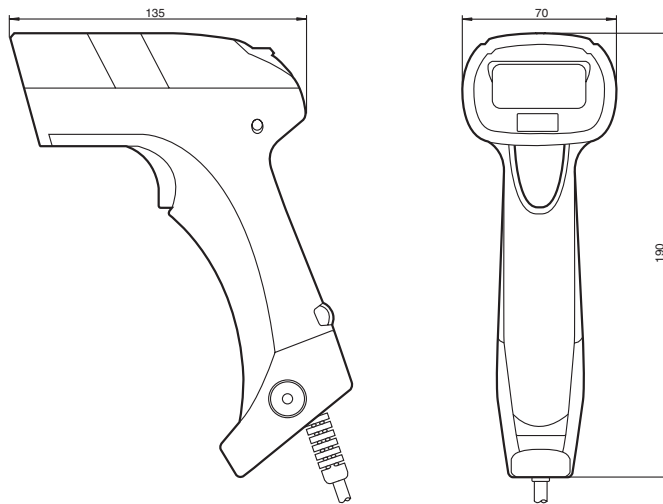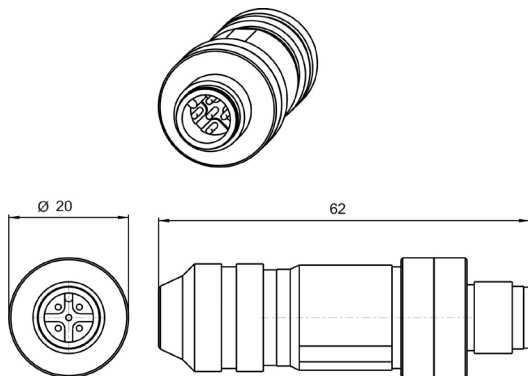Read field width in mm

0,13 mm (5 mils)
0,19 mm (7.5 mils)
0,38 mm (15 mils)
0,5 mm (20 mils)
1 mm (40 mils)
1,38 mm (55 mils)
0,25 mm (10 mils)
0,33 mm (13 mils)

Read range in mm

PSCAN dimensions (mm)

135

70

190

4-pin connector dimensions (mm)

Ø 20

62

PSCAN-D-1D-D2-20-10-N	
General specifications	
Readable codes	2/5 Family, Code 39, (plus Code 32, Clip 39), EAN/UPC, EAN 128, Code 128, Code 93, CODABAR, Code 49, Code MSI, Code 11, Code 16K, ISBN/ISSN, ISBT 128, GS1DataBarTM (once RSS)
Laser class	Class 2 - EN 60825-1, CDRH
Scan rate	30 to 40 s-1
Beam deviation angle	Max. 42 °
Resolution	0.076 mm (3 mils)
Light type	Laser diode 630 to 680 nm
Electrical specifications	
Operating voltage	5 VDC
Electromagnetic compatibility	120 mA
Ambient conditions	
Operating temperature	-10 °C to 50 °C (14 °F to 122 °F)
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Relative humidity	90% noncondensing
Electromagnetic compatibility	NE 21
Low voltage	ANSI/UL 60950-1-2007
Explosion protection	ANSI/ISA-12.12.01-2007; CSA C22.2 No. 213-M1987, R2008
Mechanical specifications	
Protection degree	IP44
Weight	340 g
Dimensions	190 mm x 135 mm x 70 mm
Cable length	3 m stretched
Data for use in conjunction with hazardous area	
Voltage (U)	5.8 VDC
Current (I)	495 mA
Capacitance (C)	250 µF
Inductance (L)	75 µH

PSCAN-D-1D-D2-20-10-N Accessories	
Accessory	**Model number**
Div. 2 nonincendive barrier for USB connection	SK-PC-D2-UN2-10-HS
Div. 2 nonincendive barrier for RS232 connection	SK-PC-D2-RN2-10-HS
Scanner holder	Scanner-Holder-VisuNet-RM/PC
Replacement cable for PSCAN-D-1D-D2 for USB mode	CBL-PSCAN-M12-4-USB
Replacement cable for PSCAN-D-1D-D2 for RS232 mode	CBL-PSCAN-M12-4-RS232

Holder for barcode reader

Dimensions

M12 connector, male 4-pin

Female 4-pin receptacle
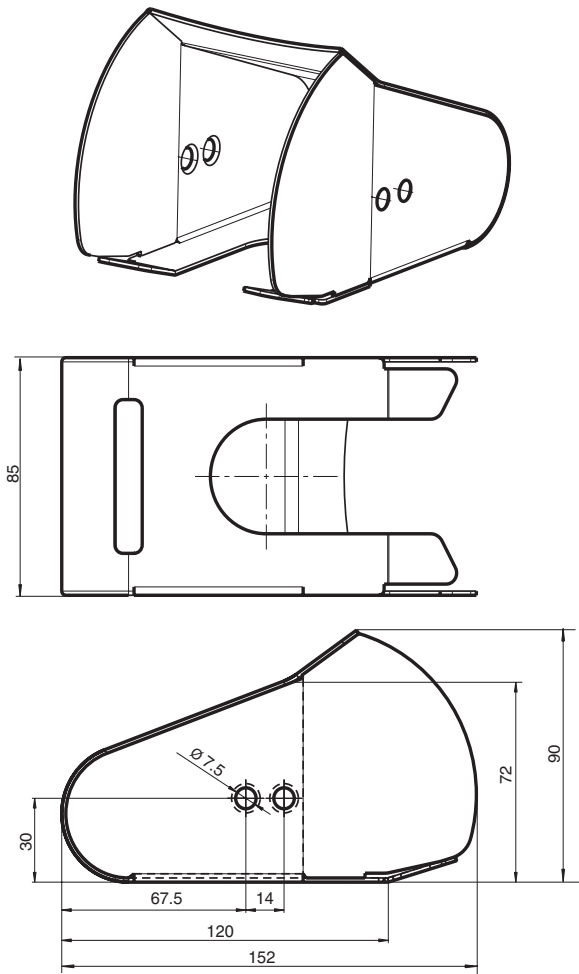
Replacement connection cable

The PSCAN-D-1D-D2 connecting cable is a cable for replacement for the barcode reader PSCAN-D-1D-D2. The mounting instructions are found in the Maintenance and Repair section on page 80.
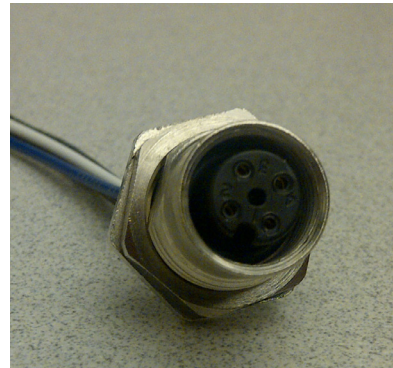
Connection cable

Connector RJ45

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Installation

Preparation

Unpacking the unit

1. Check that all package contents are present and undamaged. If anything is damaged, inform the shipper and contact the supplier.

2. Check that all items are present and correct based on your order and the shipping documents.

3. Keep the original packing material in case you need to store or ship the unit at a later time

If you have any questions, please contact Pepperl+Fuchs.

Installation wiring

When connecting the barcode reader wiring to the SK-PC-D2 nonincendive barrier, please follow the tables below. The color coding is based on the Pepperl+Fuchs cable accessories that are sold with the PSCAN-D-1D-D2.

Field side barrier connection			
SK-PC-D2-UN2-10-HS		**SK-PC-D2-RN2-10-HS**	
Terminal	**Wire Color**	**Terminal**	**Wire Color**
V+	Brown	V+	Brown
D+	Blue	D+	Blue
D-	White	D-	White
V-	Black	V-	Black
PC side barrier connection			
SK-PC-D2-UN2-10-HS		**SK-PC-D2-RN2-10-HS**	
Terminal	**Wire Color**	**Terminal**	**Wire Color**
D+	Green	D+	Red (Tx)
D-	White	D-	Brown (Rx)
Ground	Black	Ground	Yellow (Gnd)

Field side

CH1 CH1 CH1 CH1
V+   D+   D-   V-

SK-PC-D2-xN2-10-HS

CH1 CH1
D+   D-

PWR PWR GND GND
+   -

PC side

NOTE: Color codes are in reference to Pepperl+Fuchs cable assemblies

| Field side barrier connection			
SK-PC-D2-UN2-10-HS		**SK-PC-D2-RN2-10-HS**	
Cable length	15' (4.6 m)	Cable length	45' (13.7 m)
PC side barrier connection			
SK-PC-D2-UN2-10-HS		**SK-PC-D2-RN2-10-HS**	
Cable length	6' (1.8 m)	Cable length	45' (13.7 m)
Total distance (PC to barcode reader)			
SK-PC-D2-UN2-10-HS		**SK-PC-D2-RN2-10-HS**	
Cable length	18' (5.5 m)	Cable length	50' (15.2 m)

Status Indicators

The barcode reader has two indicator LEDs, a good read spot, and a beeper. They signal several operating conditions that are described in the following table.

H=	High tone
L=	Low tone
*=	Tone and intensity are user-configurable
#=	The data entry "good read tone" is user-configurable with all beeper commands in the Reading Parameters section.

Start up	
Beeper*	**Meaning**
LLLL	Parameter loading correctly
H H H H long tones	Parameter loading error, reading, or writing error in the nonvolatile memory
HLHL	Hardware error in EEPROM

Configuration	
Beeper*	**Meaning**
HHHH	Correct entry or exit from configuration mode
L	Good read of a command
LLLL	Command read error

Reader data entry			
Beeper*	**LED**	**Good read spot**	**Meaning**
One beep	On	On	Correct read of a code in normal mode
HL			TX buffer full (when FIFO is enabled)
H long	On	On	Successful advanced format concatenation
HHHH			Timeout expired - operation not completed
HH long			Error in advanced data formatting
	Off	Off	Ready to read a code
	On	Off	Ready to read a code

Mounting the holder for the barcode reader

(1)   (2)   (3)   (1)

Edge protection

13
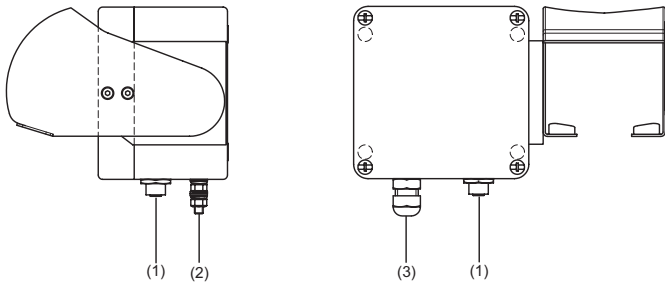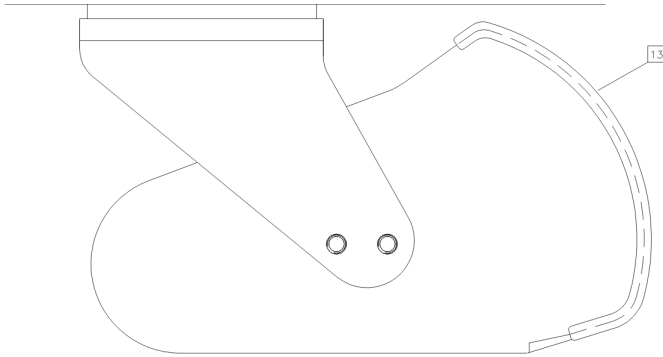
Hole pattern holder for the barcode reader

46
2

Ø 4.5 (2x)
Ø 3.5
32
16
58.5
(8.5)
9
42
50
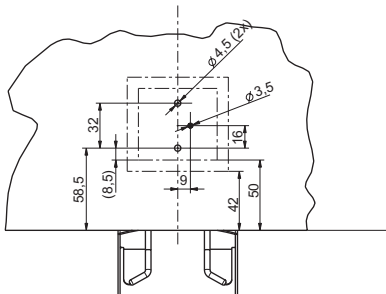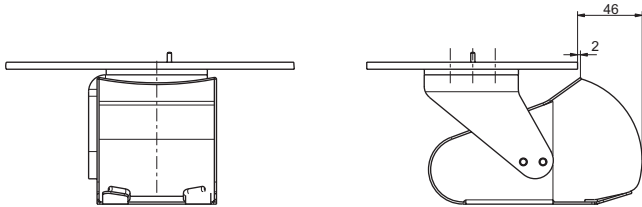
Holder for the barcode reader, top view
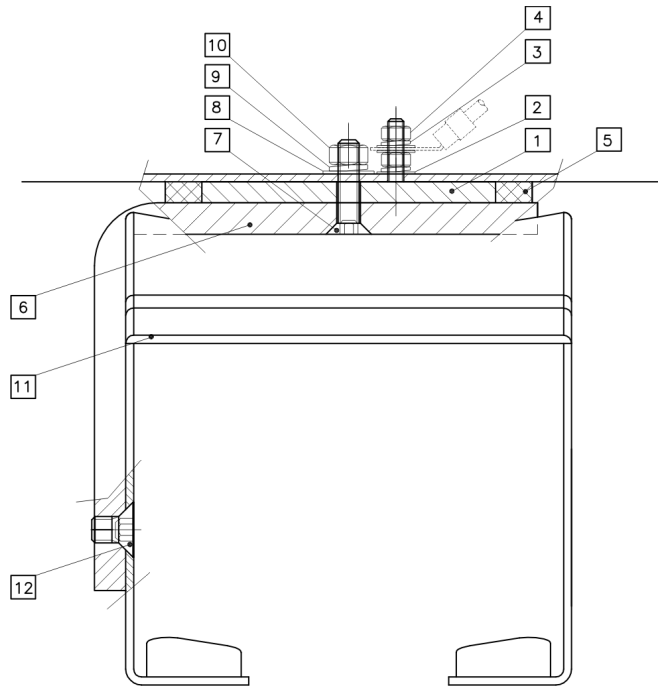
1	Distance plate
2	M3 washer
3	M3 lock washer
4	Hex nut
5	Gasket
6	Adapter (bracket)
7	M4 countersunk head screw (2)
8	M4 washer (2)
9	M4 nut (2)
10	M4 nut (2)
11	Holder for barcode reader
12	M5 countersunk head screw (2)

Contact holes

1. Contact 2 holes for fastening the holder for barcode reader (2x Ø 4.5).

2. Contact 1 hole for the earth stud for equipotential bonding (1x Ø 3.5).

Installing the earth stud

Connect the earth stud with the equipotential bonding of the system. (cross section min. 4 mm2).

1. Earth stud

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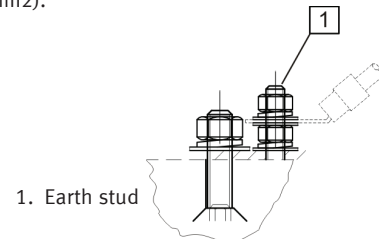
Configuration

Reading configuration barcodes

This manual can be used for complete setup and configuration of your reader by following the setup procedures in this chapter. If you wish to change the default settings, this manual provides complete configuration of your reader in an easy way.

To configure your reader:

1) Open the folded page in manual with the hex-numeric table and keep it open during the device configuration.

2) Read the Enter Configuration code ONCE.

3) Modify the desired parameters in one or more sections following the procedures given for each group.

4) Read the Exit and Save Configuration code ONCE.

PSCAN-D-1D-D2 SETUP

1. Read the restore default parameters code below.

Restore PSCAN-D-1D-D2 Default

Interface selection
RS-232

Standard

USB

USB-KBD

USB-KBD-ALT-MODE

USB-KBD-APPLE

When configuring USB-COM, the relevant files and drivers must be installed from the USB Device Installation software, which can be downloaded from the web site http://www.scanning.datalogic.com

USB-COM*

USB-IBM-Table Top

USB-IBM-Hand Held

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USB reader configuration

The USB interface is available for the PScan-D-1D-D2 device and is compatible with the following Operating Systems:

Windows 98 (and later)   IBM POS for Windows
Mac OS 8.0 (and later)   4690 Operating System

USB Start-up

As with all USB devices, upon connection, the host performs several checks by communicating with the device. During this phase, normal operations are suspended (the LED on the PSCAN-D-1D-D2 reader blinks). Two basic conditions must be met before the device is ready—the correct USB driver must be loaded and sufficient power must be supplied to the reader.

1. For all systems, the correct USB driver for the default USB-KBD interface is included in the host operating system and will either be loaded automatically or will be suggested by the O.S. and should therefore be selected from the dialog box (the first time only). Normally, the host supplies sufficient power to the device and the start-up phase ends correctly. (The reader's LED stops blinking and the reader emits the beep OK signal). In rare cases, if the host does not supply sufficient power to the device, a dialog box will appear on the host and the device will be blocked (the reader's LED continues blinking). In this case, disconnect the USB device cable at the host (the reader's LED stops blinking), and then try a different USB port as indicated by the operating system message. (The device emits the beep OK signal. You can now read codes).

2. At this point, you can read the USB interface configuration code according to your application. Load drivers from the O.S. (if requested). When configuring the USB-COM interface, the relevant files and drivers must be installed from the USB Device Installation software, which can be downloaded at http://www.scanning.datalogic.com.

The device is ready. Successive start-ups will automatically recognize the previously loaded drivers

Changing default settings

Once your reader is set up, you can change the default parameters to meet your application needs. Refer to the preceding paragraphs for initial configuration in order to set the default values and select the interface for your application. In this manual, the configuration parameters are divided into logical groups making it easy to find the desired function based on its reference group.

The following parameter groups are common to all interface applications:

DATA FORMAT parameters regarding the messages sent to the host system.

POWER SAVE manages overall current consumption in the reading device.

READING PARAMETERS control various operating modes and indicator status functioning.

DECODING PARAMETERS maintain correct barcode decoding in certain special reading conditions.

CODE SELECTION parameters allow configuration of a personalized mix of codes, code families, and their options.

ADVANCED FORMATTING PARAMETERS allow code concatenation and advanced formatting of messages

RS232 parameters

- Baud rate
- Parity
- Data bits
- Stop bits
- Handshaking
- Ack/nack protocol
- FIFO
- Inter-character delay
- Rx timeout
- Serial trigger lock

1. Read the **Enter Configuration** code ONCE.

2. Read configuration codes from the desired groups.

- Read the code and follow the procedure given
- ◆ Default value

3. Read the **Exit and Save Configuration** code ONCE.

$+$\ˣ

Restore PSCAN-D default

Default serial interface	
Parameter	Default
Baud rate	9600
Parity	Disabled
Data bits	8
Stop bits	1
Handshaking	Disabled
ACK/NAK protocol	Disabled
FIFO	Enabled
Inter-character delay	Disabled
Rx timeout	5 seconds
Serial trigger lock	Disabled
Default data format	

Parameter	Default
Code identifier	Disabled
Custom code identifier	Disabled
Header	No
Terminator	No
Field adjustment	Disabled
Field adjustment character	Disabled
Code length Tx	Not transmitted
Character replacement	Disabled
Default power save	
Parameter	Default
Sleep state	Disable
Enter sleep timeout	0.6 seconds
Default reading parameter	
Parameter	Default
Trigger type	Hardware trigger
Trigger signal	Trigger active level
Trigger click	Disabled
Trigger-off timeout	Disabled
Flash mode	On 1 second, off 0.6 seconds
Reads per cycle	1
Safety time	0.5 seconds
Beeper intensity	High intensity
Beeper tone	Tone 2
Beeper type	Monotone
Beeper length	Short

Enter Configuration

RS-232

Exit and Save Configuration

BAUD RATE

300 baud

600 baud

1200 baud

2400 baud

4800 baud

◆ 9600 baud

19200 baud

38400 baud

PARITY

◆ none

even parity

odd parity

Enter Configuration

RS-232

Exit and Save Configuration

DATA BITS

7 bits

◆ 8 bits

9 bits

STOP BITS

◆ 1 stop bit

2 stop bits

HANDSHAKING

◆ disable

hardware (RTS/CTS)

software (XON/XOFF)

RTS always ON

Enter Configuration

RS-232

Exit and Save Configuration

ACK/NACK PROTOCOL

◆ disable

enable

FIFO

disable

◆ enable

INTER-CHARACTER DELAY

☞ delay between characters transmitted to Host

Read 2 numbers from the table where:
00 = DELAY disabled
01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled

Enter Configuration

RS-232

Exit and Save Configuration

RX TIMEOUT

timeout control in reception from Host

Read 2 numbers from the table where:

00 = TIMEOUT disabled
01-99 = TIMEOUT from **.1** to **9.9** seconds

◆ rx timeout 5 seconds

SERIAL TRIGGER LOCK

◆ disabled

enable and select characters

Read 2 characters from the Hex/Numeric table in the range 00-FE where:

− First Character enables device trigger

− Second Character inhibits device trigger until the first character is received again.

USB Parameters

USB-COM

- Handshaking
- Ack/Nack protocol
- FIFO
- Inter-character delay
- Rx timeout
- Serial trigger lock

USB-KBD

- Keyboard nationality
- FIFO
- Inter-character delay
- Inter-code delay
- USB keyboard speed

USB-IBM

- No parameter selection required

1. Read the Enter Configuration code ONCE.

2. Read configuration codes from the desired groups.

- Read the code and follow the procedure given

◆ Default value

3. Read the Exit and Save Configuration code ONCE.

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Enter Configuration

USB-COM

Exit and Save Configuration

HANDSHAKING

◆ disable

hardware (RTS/CTS)

software (XON/XOFF)

RTS always ON

ACK/NACK PROTOCOL

◆ disable

enable

FIFO

disable

◆ enable

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USB-COM

INTER-CHARACTER DELAY

delay between characters transmitted to Host

☞

Read 2 numbers from the table where:
00 = DELAY disabled
01-99 = DELAY from 1 to 99 milliseconds

◆ delay disabled

RX TIMEOUT

timeout control in reception from Host

☞

Read 2 numbers from the table where:
00 = TIMEOUT disabled
01-99 = TIMEOUT from **.1** to **9.9** seconds

◆ rx timeout 5 seconds

SERIAL TRIGGER LOCK

◆ disabled

enable and select characters

☞

Read 2 characters from the Hex/Numeric table in the range 00-FE where:

– First Character enables device trigger
– Second Character inhibits device trigger until the first character is received again.

ENTER CONFIGURATION

Exit and Save Configuration

USB-KBD

KEYBOARD NATIONALITY

Not Available for USB-KBD-ALT-MODE Interface
This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian

English (UK)

French

German

Italian

Spanish

Swedish

◆ USA

ENTER CONFIGURATION

USB-KBD

Exit and Save Configuration

The Japanese and Eastern Block Keyboard Nationality selections are valid only for IBM AT compatible PCs.

Japanese

Russian (Latin)

Russian (Cyrillic)

Hungarian

Slovenian, Croatian, Serbian (Latin)

Romanian

Czech Republic

FIFO

disable

◆ enable

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Exit and Save Configuration

USB-KBD

INTER-CHARACTER DELAY

delay between characters transmitted to Host

Read 2 numbers from the table where:
- 00 = DELAY disabled
- 01-99 = DELAY from **1** to **99** milliseconds

◆ delay disabled

INTER-CODE DELAY

delay between codes transmitted to Host

Read 2 numbers from the table where:
- 00 = DELAY disabled
- 01-99 = DELAY from **1** to **99** seconds

◆ delay disabled

USB KEYBOARD SPEED

◆ Normal

Fast

Data format

- Code identifier
- Custom code identifier
- Header
- Terminator
- Special keys
- Field adjustment
- Field adjustment character
- Code length Tx
- Character replacement

Default reading parameter	
Parameter	Default
Flash mode	On 1 second, off 0.6 seconds
Reads per cycle	1
Safety time	0.5 seconds
Beeper intensity	High intensity
Beeper tone	Ton 2
Beeper type	Monotone
Beeper length	Short
Good read spot duration	Medium
Aiming system	Disabled

Default decoding parameters	
Parameter	Default
Ink spread	Enabled
Overflow control	Enabled
Interdigit control	Enabled
Decoding safety	One read
Puzzle solver	Disabled

Default code selection	
Parameter	Default
EAN /UPC - family	EAN 8/EAN 13 / UPC A/UPC E Check digit control No conversion
2/5 family	Interleaved 2/5 Check digit control and transmission Variable code length: 4-55 characters
Code 39 family	Standard Code 39 No check digit control Variable code length: 1-99 characters
Code 128 family	Code 128 Check digit control without transmission Add GS before code = disabled
Code 93	Disabled
Codabar family	Disabled
MSI	Disabled
Code 11	Disabled
Code 16K	Disabled
Code 49	Disabled
GS1 DATABAR codes	Disabled

Default advanced formatting	
Parameter	Default
Concatenation	Disabled
Advanced formatting	No advanced formatting enabled

To change the default values

1. Read the "Enter Configuration" code once.
2. Read configuration codes from the desired groups or follow the procedure given for this code group.
3. When desired you can change further configuration codes directly.
4. Read the "Exit and Save Configuration" code once.

Code identifier

Code	AIM standard	Datalogic standard	Custom
2/5 interleaved	]Iy	N	
2/5 industrial	]Xy	P	
2/5 normal 5 bars	]Sy	O	
2/5 matrix 3 bars	]Xy	Q	
EAN 8	]E4	A	
EAN 13	]E0	B	
UPC A	]Xy	C	
UPC E	]Xy	D	
EAN 8 with 2 ADD ON	]E5	J	
EAN 8 with 5 ADD ON	]E6	K	
EAN 13 with 2 ADD ON	]E1	L	
EAN 13 with 5 ADD ON	]E2	M	
UPC A with 2 ADD ON	]Xy	F	
UPC A with 5 ADD ON	]Xy	G	
UPC E with 2 ADD ON	]Xy	H	
UPC E with 5 ADD ON	]Xy	I	
Code 39	]Ay	V	
Code 39 full ASCII	]Ay	W	
CODABAR	]Fy	R	
ABC CODABAR	]Xy	S	
Code 128	]Cy	T	
EAN 128	]Cy	k	
ISBT 128	]C4	f	
Code 93	]Gy	U	
CIP/39	]Xy	Y	
CIP/HR	]Xy	e	
Code 32	]Xy	X	
MSI	]My	Z	
Code 11	]Hy	b	
Code 16 K	]K0	p	
Code 49	]Ty	q	
GS1 DataBar™ expanded and stacked	]e0	t	
GS1 DataBar limited	]e0	v	
GS1 DataBar 14 linear and stacked	]e0	u	

Reference

AIM standard identifiers are not defined for all codes: the X identifier is assigned to the code for which the standard is not defined. The y value depends on the selected options (check digit tested or not, check digit tx or not, etc.).

When customizing the Datalogic Standard code identifiers, one or two identifier characters can be defined for each code type. If only one identifier character is required, the second character must be selected as FF (disabled).

The code identifier can be singly disabled for any code by simply selecting FF as the first identifier character.

Write in the custom character identifiers in the table above for your records.

Enter Configuration

DATA FORMAT

Exit and Save Configuration

CODE IDENTIFIER

◆ disable

Datalogic standard

AIM standard

custom

CUSTOM CODE IDENTIFIER

☞ define custom code identifier(s)

① Read the above code.
(Code Identifiers default to Datalogic standard, see table on previous page).

② Select the code type from the code table in the **Message formatting** section, pages 72-79 for the identifier you want to change.

③ You can define 1 or 2 identifier characters for each code type. If only 1 identifier character is required, the second character must be selected as **FF** (disabled). Read the hexadecimal value corresponding to the character(s) you want to define as identifiers for the code selected in step ②: valid characters are in the range **00-FD**.

Example: To define Code 39 Code Identifier = **@**

Read   define custom code identifier(s)   +   Code 39   +   **40**   +   **FF**

Enter Configuration

‖‖ ‖ ‖‖‖‖‖‖

Exit and Save Configuration

‖‖ ‖ ‖‖‖‖‖‖

DATA FORMAT

HEADER

no header

‖‖ ‖ ‖ ‖‖‖‖‖‖‖‖ ‖‖

one character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖‖ ‖

two character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖‖ ‖

three character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖‖ ‖

four character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖‖ ‖

five character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖ ‖‖

six character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖ ‖ ‖

seven character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖ ‖‖

eight character header

☞ ‖‖ ‖ ‖‖ ‖‖‖‖‖‖ ‖‖

After selecting **one** of the desired Header codes, read the character(s) from the HEX table. Valid characters are in the range **00-FE**.

Example:

four character header

‖‖ ‖ ‖‖ ‖‖‖‖‖‖‖ ‖ + **41** + **42** + **43** + **44** = Header **ABCD**

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Enter Configuration

DATA FORMAT

Exit and Save Configuration

TERMINATOR

no terminator

one character terminator

two character terminator

three character terminator

four character terminator

five character terminator

six character terminator

seven character terminator

eight character terminator

After selecting **one** of the desired Header codes, read the character(s) from the HEX table. Valid characters are in the range **00-FE.**

Example:

two character terminator

+ **0D** + **0A** = Terminator **CR LF**

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DATA FORMAT

FIELD ADJUSTMENT

◆ disable field adjustment

Field adjustment allows a number of characters *n*, to be added to or subtracted from the barcode read. The adjustment can be different for each enabled code type. To <u>define</u> the field adjustment:

① Read the enable field adjustment code:

enable field adjustment

☞
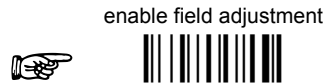
② Select the code type from the <u>Code Identifier Table</u>, page 75.

③ Select the type of adjustment to perform:

right addition

left addition

right deletion

left deletion

④ Read a number in the range **01 - 32** from the Hex/Numeric Table to define how many characters to add or delete:

Conditions:

- Adjustment is only performed on the barcode data, the Code Identifier and Code Length Transmission fields are not modified by the field adjustment parameter.

- If the field setting would subtract more characters than exist in the barcode, the subtraction will take place only to code length 0.

- You can set up to a maximum of 10 different field adjustments on the same barcode family or on different barcode families.

<u>**Example:**</u> To add 4 characters to the right of Standard Code 39 Codes:

enable field adjustment   Code 39   right addition

Read   +   +   +   **04**

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DATA FORMAT

FIELD ADJUSTMENT CHARACTER

① Read the field adjustment character code:

field adjustment character

☞

② Read the hexadecimal value corresponding to the character you want to use for field adjustment. Valid characters are in the range **00-FE**.

Example:

To define the field adjustment character = **A**:

field adjustment character

Read   + **41**

CODE LENGTH TX

◆ code length not transmitted

code length transmitted in variable-digit format

code length transmitted in fixed 4-digit format

The code length is transmitted in the message after the Headers and Code Identifier characters. The code length is calculated after performing any field adjustment operations.

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Enter Configuration

Exit and Save Configuration

DATA FORMAT

CHARACTER REPLACEMENT

◆ disable character replacement

This parameter allows up to three characters to be replaced from the barcode read. These substitutions are stored in memory. To underline define each character replacement:

① Read one of the following character replacement codes:

first character replacement

☞

second character replacement

☞

third character replacement

☞

② From the Code Identifier Table on page 75, read the Code Identifier for the desired code family.
0 = character replacement will be effective for all code families.

③ From the Hex/Numeric Table read two characters corresponding to the Hex value (**00**-**FE**), which identifies the character to be replaced.

④ From the Hex/Numeric Table read two characters corresponding to the Hex value (**00**-**FE**), which identifies the new character to replace.

FF = the character to be replaced will be substituted with no character, that is, it will be removed from the code.

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Enter Configuration

‖‖‖‖‖‖‖‖‖

DATA FORMAT

Exit and Save Configuration

‖‖‖‖‖‖‖‖‖

Example:

The following strings define:

1. *First Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **0** character with the **1** character.

2. *Second Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **A** character with the **B** character.

first character replacement		Code 39		ASCII characters corresponding to the HEX value for character **0**		ASCII characters corresponding to the HEX value for character **1**
‖‖‖‖‖‖‖‖‖	+	‖‖‖‖‖‖‖	+	**30**	+	**31**
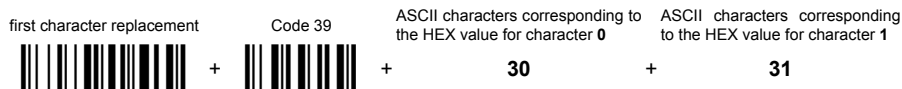
For Code 39 codes containing the string "**0**123", the contents transmitted will be "**1**123".

second character replacement		Code 39		ASCII characters corresponding to the HEX value for character **A**		ASCII characters corresponding to the HEX value for character **B**
‖‖‖‖‖‖‖‖‖	+	‖‖‖‖‖‖‖	+	**41**	+	**42**
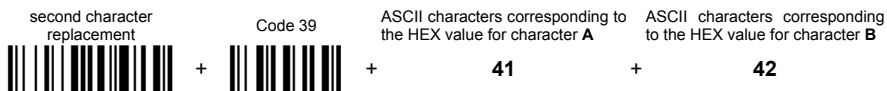
For Code 39 codes containing the string "**A**BCD", the contents transmitted will be "**B**BCD".

Reading parameters

- Trigger type
- Trigger signal
- Trigger click
- Trigger-off timeout
- Flash mode
- Reads per cycle
- Safety time
- Beeper intensity
- Beeper tone
- Beeper type
- Beeper length
- Good read spot duration
- Aiming system
- Cradle beeper intensity

1. Read the Enter Configuration code ONCE.

2. Read configuration codes from the desired groups.

- Read the code and follow the procedure given
- ◆ Default value

Read the Exit and Save Configuration code ONCE.

Enter Configuration

READING PARAMETERS

Exit and Save Configuration

TRIGGER TYPE

◆ hardware trigger

Restores TRIGGER MODE

software trigger

Enables FLASH MODE

always on

TRIGGER SIGNAL

◆ trigger active level

trigger active pulse

TRIGGER CLICK

◆ disable

enable

READING PARAMETERS

TRIGGER-OFF TIMEOUT

trigger-off timeout

Read 2 numbers in the range 00-99:
- 00 = disables the trigger-off timeout
- 01-99 = corresponds to a max. 99-sec. delay after the trigger press to allow the reader to turn off automatically.

◆ trigger-off timeout disabled

FLASH MODE

"FLASH" ON duration

"FLASH" OFF duration

Read 2 numbers in the range 01-99:
01 to 99 = from .1 to 9.9 seconds.

◆ Flash-ON = 1 sec. Flash-OFF = 0.6 sec

READS PER CYCLE

◆ one read per cycle

multiple reads per cycle

Enter Configuration

‖‖|‖|‖‖|‖‖||‖‖

READING PARAMETERS

Exit and Save Configuration

‖‖||‖|‖‖|‖‖|‖

SAFETY TIME

☞

safety time

‖‖||‖|‖‖||‖‖|

Limits <u>same</u> code consecutive reading.

Read 2 numbers in the range 00-99:
   00 = no same code consecutive reading until reader is removed (no decoding) for at least 400 ms.
01-99 = timeout from .1 to 9.9 seconds before a consecutive read on same code.

◆ safety time = 0.5 sec

BEEPER INTENSITY

* very low intensity

‖‖||‖|‖|‖|‖‖‖|‖‖

low intensity

‖‖||‖|‖‖|‖‖|‖|‖‖|

medium intensity

‖‖||‖|‖‖|‖‖‖|‖‖|‖

◆ high intensity

‖‖||‖|‖‖|‖‖‖|‖‖||‖

*   This sets the beeper OFF for data entry, while for all other beeper signals it has the meaning "very low intensity". The Beeper Intensity parameter is effective for all operating conditions

---

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Enter Configuration

READING PARAMETERS

Exit and Save Configuration

BEEPER TONE

tone 1

◆ tone 2

tone 3

tone 4

BEEPER TYPE

◆ monotone

bitonal

BEEPER LENGTH

long

◆ short

Enter Configuration

READING PARAMETERS

Exit and Save Configuration

GOOD READ SPOT DURATION

disable

short

◆ medium

long

AIMING SYSTEM

◆ disabled

enabled

CRADLE BEEPER INTENSITY

disable

low intensity

medium intensity

◆ high intensity

Decoding parameters

- Ink spread
- Overflow control
- Interdigit control
- Decoding safety
- Puzzle solver™

STOP

Warning

Before changing these parameter values, be aware that these parameters are intended to enhance the decoding capability of the reader for particular applications. Used incorrectly, they can degrade the reading performance or increase the possibility of a decoding error.

1. Read the Enter Configuration code ONCE, available at the top of each page.
2. Read configuration codes from the desired groups.
   ◆ = Default value
3. Read the Exit and Save Configuration code ONCE, available at the top of each page.

Enter Configuration

Exit and Save Configuration

DECODING PARAMETERS

INK SPREAD

disable

◆ enable

OVERFLOW CONTROL

disable

◆ enable

INTERDIGIT CONTROL

disable

◆ enable

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Enter Configuration

Exit and Save Configuration

DECODING PARAMETERS

DECODING SAFETY

◆ one read

(decoding safety disabled)

two reads

three reads

four reads

Required number of good reads before accepting code.

PUZZLE SOLVER™

◆ disable

enable

In the case of damaged or poorly printed codes, this parameter allows reading multiple parts of the single code to reconstruct it.

To read codes using this technology, simply move the illuminated bar over the code so that each line of the code is scanned. During this process a series of brief "ticks" indicates that reading is proceeding correctly.

Conditions:

• This parameter is only valid for the following codes:

EAN 8 without Add-on	EAN 13 without Add-on	UPC A without Add-on
Code 128	Code 39	

• **For Code 39, Check digit control is forced.**

• PuzzleSolver™ is not valid for ISBT 128 code.

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Code selection

- Auto-configuration
- EAN/UPC family
- 2/5 family
- Code 39 family
- Code 128 family
- Codabar family
- Code 93
- MSI
- Code 11
- Code 16K
- Code 49
- Gs1 databar codes

1. Read the Enter Configuration code ONCE.

2. Read configuration codes from the desired groups.

- Read the code and follow the procedure given

◆ Default value

3. Read the Exit and Save Configuration code ONCE.

Code selections may be performed according to two different procedures:

- **Auto configuration,** allowing an automatic recognition and selection of the code families to be read;
- **Manual configuration**, requiring configuration and selection of each code family to be read.

Auto configuration

- The following codes do not require reading the Enter and Exit configuration codes.

In auto configuration mode the reader enters a particular state, during which it reads, recognizes and saves all information received from the decoding of an existing code (with the exception of MSI, Code 49 and Code 16k code types). In this way, the code families will be automatically configured.

It is possible to configure up to 10 code types, whose length is variable and check digit ignored.

If reading different codes belonging to the same family, information about the last code will overwrite the information about the previous one.

STOP

Warning

Follow the given procedure to auto-configure the desired code families:

If no code is read during the auto-configuration procedure (step 2), the configuration will be empty and therefore the reader will be unable to read codes.

1. Read the following code to enter the auto-configuration mode:

auto-configuration
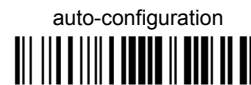
2. Read an existing code belonging to the code families that you need to configure.

3. Read the following code to save the configuration automatically and return to the reader's normal functioning:

save auto-configuration

If you need to change the configuration, repeat the auto-configuration procedure, follow the manual configuration by setting the parameters for each single code family. Be careful that in the latter case all reader parameters will be restored.

Enter Configuration

CODE SELECTION

Exit and Save Configuration

DISABLE ALL CODE FAMILIES

NOTE

The reader allows up to 10 code selections. This does not limit the number of CODES enabled to 10, as it depends on the code family.

Single selections

- **ONE** combination code from the EAN family

- **ONE** code from the 2/5 family

Example

5 code selections:

1. **2/5 Interleaved**

2. **2/5 Industrial**

3. Code 128 + EAN 128

4. Code 39 Full ASCII + Code 32

5. **UPC A/UPC E**

6. etc.

In this section all SINGLE code selections are underlined and in bold.

Enter Configuration

Exit and Save Configuration

CODE SELECTION

EAN/UPC FAMILY

disable the family

① Read the desired family code

NOTE: Since the EAN/UPC without ADD ON code selection is enabled by default, to correctly enable another selection, first disable the family.

EAN 8/EAN 13/UPC A/UPC E with and without ADD ON

WITHOUT ADD ON

◆ **EAN 8/EAN 13/UPC A/UPC E**

EAN 8/EAN 13

UPC A/UPC E

WITH ADD ON 2 AND 5

EAN 8/EAN 13/UPC A/UPC E

EAN 8/EAN 13

UPC A/UPC E

Enter Configuration

CODE SELECTION

Exit and Save Configuration

WITH ADD ON 2 ONLY

EAN 8/EAN 13

UPC A/UPC E

WITH ADD ON 5 ONLY

EAN 8/EAN 13

UPC A/UPC E

WITH AND WITHOUT ADD ON

◆ **EAN/UPC with and without ADD ON no Autodiscrimination**

EAN/UPC Autodiscrimination ADD ON by Prefix

By setting the EAN/UPC Autodiscrimination ADD ON by Prefix, the desired prefixes must be selected by reading the corresponding codes given in the following section, since no prefix is configured by default.

Enter Configuration

‖‖|‖|‖‖|‖‖|‖‖

Exit and Save Configuration

‖|‖|‖‖|‖‖|‖‖

CODE SELECTION

SELECT EAN/UPC PREFIXES

> **NOTE**
>
> *When scanning the following codes, barcodes starting with the selected prefixes will be read and transmitted only if the ADD ON is present. If no ADD ON is found, the barcode will not be read. Barcodes starting with different characters are read regardless of ADD ON presence and transmitted always without ADD ON.*

◆ **Cancel All Selections**

‖|‖|‖‖|‖‖|‖‖‖

OR

select one or more of the following prefixes:

378/379

‖‖|‖|‖‖|‖‖‖‖‖‖|‖|‖‖‖|‖‖‖‖‖|‖‖

434/439

‖|‖|‖‖|‖‖‖‖‖‖|‖‖|‖‖‖‖‖‖|‖‖

414/419

‖‖|‖|‖‖|‖‖‖‖‖|‖‖|‖‖‖‖‖‖|‖‖‖

977

‖|‖|‖|‖‖|‖‖‖‖‖‖|‖‖|‖‖

978

‖|‖|‖|‖‖|‖‖‖‖‖‖‖|‖‖|‖‖

979

‖|‖|‖|‖‖|‖‖‖‖‖‖‖|‖‖|‖‖

The commands above are not mutually exclusive. They can be used to configure more than one set of prefixes simultaneously.

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Enter Configuration

CODE SELECTION

Exit and Save Configuration

Example:

The following string allows reading and transmitting with ADD ON all EAN/UPC starting with the 434/439, 977 and 978 prefixes:

1. EAN/UPC Autodiscrimination ADD ON by Prefix.

2. 434/439: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 434/439 prefixes.

3. 977: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 977 prefix.

4. 978: enables reading and transmission with ADD ON of all EAN/UPC barcodes starting with 978 prefix.

EAN/UPC Autodiscrimination ADD ON by Prefix

+

434/439

+

+

977

+

978

To clear the current prefix selections:

1. *Cancel all Selections*

Cancel All Selections

Enter Configuration

‖‖ ‖ ‖‖‖‖‖

CODE SELECTION

Exit and Save Configuration

‖‖ ‖ ‖‖‖‖‖

EAN/UPC CHECK DIGIT TX SELECTIONS

For each code type in this family you can choose to transmit the check digit or not

CHECK DIGIT TRANSMISSION

NO CHECK DIGIT TRANSMISSION

◆ EAN 8

‖‖ ‖ ‖‖‖ ‖ ‖‖ ‖‖‖

EAN 8

‖‖ ‖‖ ‖ ‖‖ ‖‖ ‖‖

◆ EAN 13

‖‖ ‖ ‖‖ ‖ ‖‖‖‖

EAN 13

‖‖ ‖ ‖ ‖ ‖‖ ‖‖ ‖‖

◆ UPC A

‖‖ ‖ ‖ ‖ ‖‖‖‖‖

UPC A

‖‖ ‖ ‖ ‖ ‖‖‖‖‖‖

◆ UPC E

‖‖ ‖ ‖ ‖‖‖ ‖‖‖‖

UPC E

‖‖ ‖ ‖ ‖‖ ‖‖‖‖

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Enter Configuration

CODE SELECTION

Exit and Save Configuration

CONVERSION OPTIONS

UPC E to UPC A conversion

UPC E to EAN 13 conversion

UPC A to EAN 13 conversion

EAN 8 to EAN 13 conversion

Enable only ISBN conversion

Enable only ISSN conversion

Enable both ISBN and ISSN
conversion

Disable both ISBN and ISSN
conversion

Enter Configuration

CODE SELECTION

Exit and Save Configuration

2/5 FAMILY

disable the family

① Read the desired family code

② Read a check digit selection

◆ **Interleaved 2/5**

☞

CHECK DIGIT TABLE

no check digit control

Normal 2/5 (5 Bars)

☞

◆ check digit control and transmission

Industrial 2/5 (IATA)

☞

check digit control without transmission

Matrix 2/5 (3 Bars)

☞

③ Read **4** numbers for the code length where:

– **First 2 digits** = minimum code length.

– **Second 2 digits** = maximum code length.

The maximum code length is **99** characters.

The pharmaceutical code below is part of the 2/5 family but has no check digit or code length selections.

Code CIP/HR

French pharmaceutical code

The minimum code length must always be less than or equal to the maximum.

Examples:
0199 = variable from 1 to 99 digits in the code.
1010 = 10 digit code length only.

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Enter Configuration

CODE SELECTION

Exit and Save Configuration

CODE 39 FAMILY

disables the family
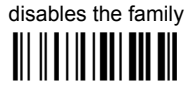
① Read the desired family code

② Read a check digit selection

CHECK DIGIT TABLE

◆ **Standard Code 39**

☞

◆ no check digit control

Full ASCII Code 39

☞

check digit control
and transmission

check digit control
without transmission

The pharmaceutical codes below are part of the Code 39 family but have no check digit selections.

Code CIP39

French pharmaceutical code

Code 32

Italian pharmaceutical code
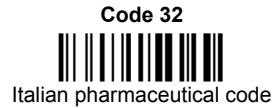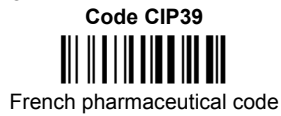
CODE LENGTH (optional)

The code length selection is valid for the entire Code 39 family

Read the code + **4** numbers for the code length where:
First 2 digits = minimum code length.
Second 2 digits = maximum code length.

set code length

The maximum code length is **99** characters.
The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

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CODE SELECTION

CODE 128 FAMILY

disable the family

① Read the desired family code
◆ Code 128

control without transmission of
check digit

ISBT 128

enabling ISBT 128 automatically
disables Puzzle Solver™.

EAN 128

control without transmission of
check digit

Transmit GS Before Code

Code EAN 128 uses the ASCII <GS> character to separate a variable length code field from the next code field. This character can also be transmitted before the code.

◆ disable

enable

If the <GS> character has been modified in the Character Replacement parameter, the new character is affected by this command.

CODE LENGTH (optional)

The code length selection is valid for the entire Code 128 family and is calculated on the output string.

Read the code + **4** numbers for the code length where:

set code length

First 2 digits = minimum code length.

Second 2 digits = maximum code length.

The maximum code length is **99** characters.
The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

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Enter Configuration

CODE SELECTION

Exit and Save Configuration

CODE 93

◆ disable the code

Code 93

control without transmission
of check digit

CODABAR FAMILY

◆ disable the family

① Read the desired equality control code

② Read a start/stop transmission selection

START/STOP CHARACTER TRANSMISSION

Standard Codabar

☞

no start/stop character equality control

no transmission

Standard Codabar

☞

start/stop character equality control

transmission

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CODE SELECTION

The Codabar ABC code below uses a fixed start/stop character transmission selection.

Codabar ABC

no start/stop character equality control but transmission.

Codabar ABC Forced Concatenation

enable Codabar ABC with forced concatenation

non start/stop character equality control but transmission

CODE LENGTH (optional)

The code length selection is valid for the entire Codabar family

Read the code + **4** numbers for the code length where:

set code length

First 2 digits = minimum code length.

Second 2 digits = maximum code length.

The maximum code length is **99** characters.
The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

START/STOP CHARACTER CASE IN TRANSMISSION

The start/stop character case selections below are valid for the entire Codabar family:

transmit start/stop characters in lower case

transmit start/stop characters in upper case

Subject to modifications

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Enter Configuration

CODE SELECTION

Exit and Save Configuration

MSI

◆ disable the family

Enable the code by selecting one of the check digit selections.

no check digit control

MOD10 check digit control
no check digit transmission

MOD10 check digit control
check digit transmission

MOD11 - MOD10 check digit control
no check digit transmission

MOD11 - MOD10 check digit control
check digit transmission

MOD10 - MOD10 check digit control
no check digit transmission

MOD10 - MOD10 check digit control
check digit transmission

Enter Configuration

CODE SELECTION

Exit and Save Configuration

CODE 11

◆ disable the family

Enable the code by selecting one of the check digit selections.

no check digit control

Type C check digit control
check digit transmitted

Type C check digit control
check digit not transmitted

Type K check digit control
check digit transmitted

Type K check digit control
check digit not transmitted

Type C and Type K
check digit control
check digits transmitted

Type C and Type K
check digit control
check digits not transmitted

Enter Configuration

CODE SELECTION

Exit and Save Configuration

CODE 16K

◆ disable the code

Code 16K

To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief "ticks" indicates that reading is proceeding correctly.

CODE 49

◆ disable the code

Code 49

To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief "ticks" indicates that reading is proceeding correctly.

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CODE SELECTION

GS1 DATABAR™ CODES

◆ disable the family

DISABLE CODE

ENABLE CODE

disable GS1 DataBar Expanded Linear and Stacked

enable GS1 DataBar Expanded Linear and Stacked

disable GS1 DataBar Limited

enable GS1 DataBar Limited

disable GS1 DataBar 14 Linear and Stacked

enable GS1 DataBar 14 Linear and Stacked

To read stacked codes, simply move the reader over the code so that each line of the code is scanned. During this process a series of brief "ticks" indicates that reading is proceeding correctly.

Advanced formatting

- Concatenation
- Advanced formatting

👆 **NOTE**   Please follow the setup procedure carefully for these parameters

1. Read the Enter Configuration code ONCE.

2. Read configuration codes from the desired groups.

- Read the code and follow the procedure given
- ◆ Default value

3. Read the Exit and Save Configuration code ONCE.

Enter Configuration ‖‖‖‖‖‖‖‖

ADVANCED FORMATTING

Exit and Save Configuration ‖‖‖‖‖‖‖‖

CONCATENATION

◆ disable
‖‖‖‖‖‖‖‖‖

enable
‖‖‖‖‖‖‖‖‖

Permits the concatenation of two codes defined by code type and length. It is possible to set a timeout for the second code reading and to define code transmission if the timeout expires.

The order of transmission is CODE 1-CODE 2.

Define Concatenation

1   **Code 1**

code ID

☞ ‖‖‖‖‖‖‖‖

Read the code type from the Code Identifier Table, page 75.

code length

☞ ‖‖‖‖‖‖‖‖

Read a number in the range **01-99** from the Hex/Numeric Table.

ADVANCED FORMATTING

---

2   **Code 2**

code ID

☞

Read the code type from the Code Identifier Table , page 75.

code length

☞

Read a number in the range **01-99** from the Hex/Numeric Table.

---

3   **Concatenation Result Code ID**

use code 1 ID

use code 2 ID

Since you can concatenate codes from different families, you must select the Code ID character of the resulting code. The Code ID character will be sent in the output message only if it is enabled according to the Code Identifier selection (Datalogic, AIM, or Custom).

---

4   **Concatenation Timeout**

timeout

☞

Read two numbers in the range **00** to **99**
00= no timeout
01-99 = timeout from 1 to 99 seconds

Define the timeout, which determines the valid waiting period between the two codes, in order to accept concatenation. If the timeout expires, the resulting action will be based on the following selection. (HHDII)

Exit and Save Configuration

ADVANCED FORMATTING

5   **Transmission after Timeout**

no code transmitted
after timeout

only code 1 transmitted
(if read) after timeout

only code 2 transmitted
(if read) after timeout

either code 1 or code 2 transmitted
after timeout

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ADVANCED FORMATTING

ADVANCED FORMATTING

Advanced formatting has been designed to offer you complete flexibility in changing the format of barcode data **before** transmitting it to the host system. This formatting will be performed when the barcode data meets certain criteria, which you will define in the following procedure.

Up to 4 advanced code management formats can be defined and saved in memory. For each format you must complete the entire configuration procedure:

Read the **Enter Configuration** Command
Step 1 Begin Format Definition 1, 2, 3, or 4
Steps 2 - 4 Define Match Code Conditions
Step 5 Divide Code into Fields
Step 6 Define Code Fields
Steps 7 - 8 Add up to 2 Additional Fields
Step 9 Define Field Transmission
Step 10 Apply or Not Standard Message Formatting
Step 11 End Format Definition 1, 2, 3, or 4

Define another? YES / NO

Enable Advanced Formats 1, 2, 3, 4
Define No Match Result
Read the **Exit and Save Configuration** Command

Enter Configuration

ADVANCED FORMATTING

Exit and Save Configuration

1   **Begin Format Definition**

begin Format 1 definition

begin Format 2 definition

begin Format 3 definition

begin Format 4 definition

2   **Match Code Type**

match code type

Read the above code + the code type to match from the Code Identifier Table, page 75.

OR   any code type

3   **Match Code Length**

match code length

Read the above code + two numbers in the range **01** to **99** for the exact code length.

OR   any code length

ADVANCED FORMATTING

---

4   **Match with Predefined Characters**

no match

OR

match with 1 character

☞

match with a 2-character string

☞

match with a 3-character string

☞

match with a 4-character string

☞

After selecting the predefined match code, read the character(s) from the HEX table. Range of characters = **00-FE**.

Example:
Match code with the 2-character predefined string = "@@".

Match with a 2-character string

Read   + **40** + **40**

AND   position of first character in predefined string

☞

Read the above code + two numbers in the range **01** to **99** representing the character position in the code where the first character of the predefined string must be found.

Read **00** if the match string can be found in any character position.

Exit and Save Configuration

ADVANCED FORMATTING

---

5   **Divide Code into Fields**

divide code into fields

☞

Read one number in the range **1** to **5** to divide the code into fields.

---

6   **Define Code Fields**

define code fields

Each code field length can be set by either:

a) defining a field separator character to be found in the code itself. In this case you can choose to **discard** the code separator character or **include** it as the last character of the field.

OR BY

b) defining a match character to be found consecutively repeated in the code itself. In this case the field ends with the first character that does not match.

OR BY

c) specifying a specific character length up to the maximum of 99 characters.

OR BY

d) selecting the last field as variable length (if any).

You must define the same number of fields as selected in step 5, including fields that will not be transmitted.

ADVANCED FORMATTING

DEFINE FIELD 1 BY:
EITHER

field separator

a) ☞

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator   include separator

OR

match character

b) ☞

Read the match character from the HEX table. Range of characters = **00-FE**.

OR

field length

c) ☞

Read two numbers in the range **01** to **99** to define the field length.

OR

this is the last field (variable length)

d) ☞

AND

Field 1 Terminators

no field terminators

1 field terminator   2 field terminators

☞   ☞

Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**.

Exit and Save Configuration

ADVANCED FORMATTING

DEFINE FIELD 2 BY:
EITHER

a) ☞ field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator   include separator

OR

b) ☞ match character

Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c) ☞ field length

Read two numbers in the range **01** to **99** to define the field length.

OR

d) ☞ this is the last field (variable length)

AND

Field 2 Terminators

no field terminators

☞ 1 field terminator   ☞ 2 field terminators

Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**.

ADVANCED FORMATTING

DEFINE FIELD 3 BY:
EITHER

a) ☞

field separator

||||||||||||||||

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator   include separator

||||||||||||| ||||||||||||

OR

b) ☞

match character

||||||||||||||||

Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c) ☞

field length

||||||||||||||||

Read two numbers in the range **01** to **99** to define the field length.

OR

d) ☞

this is the last field (variable length)

||||||||||||||||

AND

Field 3 Terminators

no field terminators

||||||||||||||||

1 field terminator   2 field terminators

☞ |||||||||||||||| ☞ ||||||||||||||||

Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**.

Exit and Save Configuration

ADVANCED FORMATTING

DEFINE FIELD 4 BY:
EITHER

a) ☞
field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator   include separator

OR

b) ☞
match character

Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c) ☞
field length

Read two numbers in the range **01** to **99** to define the field length.

OR

d) ☞
this is the last field (variable length)

AND

Field 4 Terminators

no field terminators

1 field terminator   2 field terminators

☞   ☞

Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**.

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Exit and Save Configuration

ADVANCED FORMATTING

DEFINE FIELD 5 BY:
EITHER

a) ☞

field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator   include separator

OR

b) ☞

match character

Read the match character from the HEX table. Range of characters = **00-FE**.

OR

c) ☞

field length

Read two numbers in the range **01** to **99** to define the field length.

OR

d) ☞

this is the last field (variable length)

AND

Field 5 Terminators

no field terminators

1 field terminator   2 field terminators

☞   ☞

Read the field terminator character(s) from the HEX table. Valid range of characters for all readers = **00-FE**.

Exit and Save Configuration

ADVANCED FORMATTING

---

7   **First Additional Fixed Field**

no fixed field

1 character fixed field

2 character fixed field

3 character fixed field

4 character fixed field

5 character fixed field

6 character fixed field

After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters **= 00-FE**.

Example:

4 Character Fixed Field

+ **4D** + **41** + **49** + **4E** =   **MAIN**

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ADVANCED FORMATTING

8　　　　　　　　**Second Additional Fixed Field**

no fixed field

☞ 1 character fixed field

☞ 2 character fixed field

☞ 3 character fixed field

☞ 4 character fixed field

☞ 5 character fixed field

☞ 6 character fixed field

After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**.

Example:

3 Character Fixed Field

+ 53 + 45 + 54 =   SET

Exit and Save Configuration

ADVANCED FORMATTING

|||‖|‖|‖‖|‖‖|

---

9   **Field Transmission**

number of fields to transmit

‖|‖|‖|‖‖‖‖|‖‖

Read one number in the range **1** to **7** for the number of fields to transmit. **Include only fields to be transmitted.**

Field Order Transmission

Read the codes corresponding to the fields to transmit in the order in which they are to be transmitted. A field can be transmitted more than once. See example.

field 1

‖|‖‖|‖‖|‖|

field 2

‖|‖‖|‖|‖|‖

field 3

‖|‖‖|‖|‖|

field 4

‖|‖‖|‖‖|‖|

field 5

‖|‖‖|‖|‖|

additional field 1

‖|‖‖|‖‖|‖

additional field 2

‖|‖‖‖|‖|‖

Example:

The barcode is divided into 3 defined fields plus 1 additional fixed field.

Transmit in the order: Field 2, Additional Field 1, Field 1, Field 2.

Number of Fields
to Transmit   Field 2   Additional Field 1   Field 1   Field 2

‖|‖|‖‖|‖‖| + **4** + ‖|‖‖|‖| + ‖|‖‖|‖| + ‖|‖‖|‖|+ ‖|‖‖|‖|

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Exit and Save Configuration

ADVANCED FORMATTING

||| ||| |||||| |||

---

10   **Standard Formatting**

do not apply standard formatting

||| ||| ||||||| ||| |||

apply standard formatting

||| ||| |||||||||| |||

PSCAN-D-1D-D2: After performing Advanced Formatting on the barcode read, Standard Formatting (Headers, Code Length, Code ID, Terminators) can be applied to the message to be transmitted.

---

11   **End Format Definition**

end Format 1 definition

||| ||| |||||||||| | |||

end Format 2 definition

||| ||| ||||||||| ||| |||

end Format 3 definition

||| ||| ||||||||||| |||

end Format 4 definition

||| ||| |||||||||| |||

Enter Configuration

ADVANCED FORMATTING

Exit and Save Configuration

Enable Advanced Format

◆ no Advanced Formats enabled

Advanced Format 1

enable

disable

Advanced Format 2

enable

disable

Advanced Format 3

enable

disable

Advanced Format 4

enable

disable

Enter Configuration

ADVANCED FORMATTING

Exit and Save Configuration

No Match Result

clear data - no transmission

transmit data using standard format

This selection determines the action to be taken when codes read do not conform to the advanced format requisites (no match).

- Codes not matching can be ignored, cleared from memory and not transmitted.

- Codes not matching can be transmitted using the Standard formatting (Headers, Code Length, Code ID, Terminators).

ACK/NACK protocol

PSCAN-D-1D-D2 readers

This parameter sets a transmission protocol in which the host responds to the reader after every code transmitted. The host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception
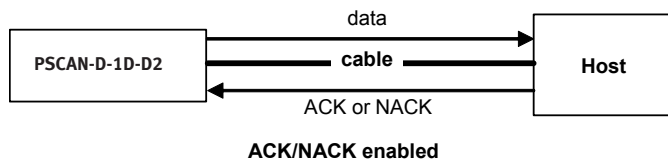
ACK/NACK enabled

If the reader does not receive an ACK or NACK, transmission is ended after the RX Timeout. When ACK/NACK protocol is enabled, FIFO must be disabled manually.

FIFO

PSCAN-D-1D-D2 readers

This parameter determines whether data (barcodes) are buffered on a First In First Out basis allowing faster data collection in certain cases, for example when using slow baud rates and/or hardware handshaking. If the FIFO buffering is enabled, codes are collected and sent out on the serial line in the order of acquisition. About 800 characters can be collected (buffer full), after which the reader signals an error and discards any further codes until the transmission is restored. If the FIFO buffering is disabled, each code must be transmitted before another one can be read.

RX timeout

When the RS-232 interface is selected, the host can be used to configure the device by sending it command strings. This parameter can be used to automatically end data reception from the host after the specified period of time. If no character is received from the host, after the timeout expires, any incomplete string (any string not terminated by ‹CR›) is flushed from the device buffer.

Reading parameters

Trigger signal

This mode determines how the reading phase is controlled when the hardware trigger operating mode is selected:

- **Trigger active level:** the reader goes ON when the trigger is pressed and goes OFF when it is released

- **Trigger active pulse:** the reader goes ON at the first trigger press and goes OFF only at a second press

Trigger click

When enabled, it activates a "click" sound upon each trigger pressure.

Trigger-off timeout

When this timeout is selected, the reader turns OFF automatically after the desired period of time.

Reads per cycle

In general, a reading cycle corresponds to the ON + OFF times of a device.

The resulting effects of this parameter on code reading depend on other related configuration conditions. Here are the definitions of ON and OFF times.

- For readers using the software trigger parameter (FLASH MODE), a reading cycle corresponds to the flash on + flash off times. Code reading takes place during the flash on time.

- For readers using the hardware trigger parameter, a reading cycle corresponds to a trigger press (ON) + one of the following OFF events: trigger release (for trigger active level) a second trigger press (for trigger active pulse) trigger-off timeout

When one read per cycle is selected, the device decodes only one code during the ON period and immediately turns the reader OFF. It is only possible to read another code when the next ON time occurs. In multiple reads per cycle, the ON period is extended so that the device can continue decoding codes until an OFF event occurs. For software trigger mode, the flash on period is immediately reset after each read and therefore extended. If another code is decoded before the reset flash on period expires, it is again reset and the effect is that the device remains ON, decoding codes until the flash on or timeout period expires. The safety time parameter should be used in this case to avoid unwanted multiple reading of the same code.

Safety time

Safety time prevents the device from immediately decoding the same code more than once. Same code consecutive reading can be disabled requiring the reader to be removed from the code (no decoding) for at least 400 ms, or a timeout can be set up to 9.9 seconds before the decoder will accept the same code. Reading is immediate if the code changes. The safety time parameter is not applicable when reading stacked codes or when setting one read per cycle in hardware trigger operating mode, since these settings require voluntary action by the user.

Decoding parameters

Warning

These parameters are intended to enhance the decoding capability of the reader for particular applications. Used incorrectly, they can degrade the reading performance or increase the possibility of a decoding error.

Ink-spread

The ink-spread parameter allows the decoding of codes that are not perfectly printed because the page texture tends to absorb the ink.

Overflow control

The overflow control parameter can be disabled when decoding codes printed on small surfaces that do not allow the use of an overflow space. This command does not affect code families 2/5, Code 128, and Code 93.

Interdigit control

The interdigit control parameter verifies the interdigit spacing for code families Code 39 and Codabar.

Advanced formatting

Match conditions

Selecting an Advanced Formatting and specifying a Match restriction (Code Type, Code Length, Predefined Characters), the code will be transmitted according to the order of the defined formats.

For example, defining 2 formats where:

- Format 1: Match Code type = Code128

- Format 2: Match Code length = 15 and Match with Predefined Characters "DATA" a Code128 "DATA:12345ABCDE" with code length 15 will be formatted following the Format 1.

To send the same code with the Format 2, it is necessary to invert the format order as follows:

- Format 1: Match Code length = 15 and Match with Predefined Characters "DATA"

- Format 2: Match Code type = Code128

Custom default configuration

Read the following code to set the reader user-defined configuration as custom default configuration:

Save User-defined Configuration as Custom Default

Read the following code whenever you need to restore the custom default configuration:

Restore Custom Default Configuration

Code type recognition

This procedure allows the reader to enter a particular state during which it reads and transmits to the host information about the family type of codes unknown to the user (with the exception of MSI, Code 49, and Code 16k code types). It is also possible to read and transmit configuration strings without interpreting them. All codes are read ignoring the check digit. Follow the given procedure:

① Read the following code to enter the code type recognition mode:

☞ code type recognition

② Read existing codes whose family type you need to check.

③ Read the following code to return to the reader's normal functioning:

exit code type recognition mode

Message formatting

The system always provides PSCAN-D (barcode reader) to host data communication using the following message formatting:

> [Header][Barcode reader-Address] [Barcode reader-Addresse_delimiter][Base stationaddr.][Base station addr_delimiter] [Time stamp][Time stamp_delimiter][Code ID][Codelength] **CODE** [Terminator][items in square brackets are optional]

Messages from Host to Reader

The general format to enable the barcode reader for 2 way communication is:

> [Barcode reader_address][Barcode reader_address_ delimiter]‹Message›CR

Note!

- If you enabled the barcode reader address stamping or the Barcode reader address delimiter, you must specify them in every message.

- If you have not enabled the barcode reader address stamping or the barcode reader address Delimiter, you must not specify them.

- Messages cannot start with "$+" because they would be interpreted as a configuration command.

The message field can store plain text and escape sequences.

- Escape sequences are interpreted as commands.

- Plain text is directly printed on the display. If writing beyond the end of line, the display does not wrap automatically. Extra characters are ignored. Control characters are not interpreted.

Cursor Control

ESC[n A   Up n rows, no scroll

ESC[n B   Down n rows, no scroll

ESC[n C   Right n columns

ESC[n D   Left n columns

ESC[G CR

ESC[r;cH   Move to row r, column c, ESC[1;1H is the upper left character position of the display)

ESC D   Down 1 row, with scroll

ESC E   CR and cursor down 1 row with scroll

ESC M   Up 1 row and scroll

Note

- Since ‹CR› is used as the message terminator, you must use ESC [G order ESC E to print a CR.

- The cursor row position is not affected by the currently selected front. The display always has 4 rows, so when writing with the large font, actually two rows are written to the current one and the one below it. You will need two ESC E commands to step from one row to the next when using the large font.

- The cursor column position is affected by the currently selected font. Therefore, column 6 is 36 pixels from the left border only if you last selected the 6x8 font; otherwise, it could be 48 or 72 pixels from the left border.

Font Selection

ESC [0 m   Normal mode

ESC [7 m   Reverse mode

ESC # 4   Large font: subsequent characters are written on the current row and the row below it using the 12x16 font which allows for two of eight characters on the display.

ESC # 5   Normal font: subsequent characters are written using the 6x8 font which allows for four rows of sixteen characters on the display.

ESC # 7   Medium font: subsequent characters are written using 8x8 font which allows for four rows of twelve characters on the display.

LED and Beeper Control

ESC [0 q   Emit short high tone + short delay

ESC [1 q   Emit short low tone + short delay

ESC [2 q   Emit long low tone + short delay

ESC [3 q   Emit good read tone

ESC [4 q   Emit bad tx tone

ESC [5 q   Wait 100 ms

ESC [6 q   Turn on the green LED

ESC [7 q   Turn off the green LED

ESC [8 q   Turn on red LED

ESC [9 q   Turn off red LED

The LED control escape sequences are intended to activate the LEDs for short periods of time and can be used in combination with the beeper. The LED and beeper will be controlled by the system after the entire command sequence is interpreted.

Example:

ESC [6 ESC [3 q ESC [7 q   Turns on the green LED, emits a good read tone, and turns off the green LED.

ESC [6 ESC [5 q ESC [7 q   Turns on the green LED for 100 ms and then turns off the green LED.

Setting RTC

ESC [0 p T T M M J J   Set date to day, month, year.
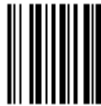
ESC [1 p H H M M   Set time to hours, minutes, seconds are automatically set to 00.

Codes and character sets

Single codes

• To enter numerical values, scan successively the digits 0-9.

• Read alphanumeric values by scanning their hex values, i.e., 'L' (hexadecimal value: 4C): first scan '4' then 'C'.

‖‖‖ 0	‖‖‖ 1	‖‖‖ 2
‖‖‖ 3	‖‖‖ 4	‖‖‖ 5
‖‖‖ 6	‖‖‖ 7	‖‖‖ 8
‖‖‖ 9	‖‖‖ A	‖‖‖ B
‖‖‖ C	‖‖‖ D	‖‖‖ E
‖‖‖ F	‖‖‖ G	‖‖‖ H
‖‖‖ I	‖‖‖ J	‖‖‖ K
‖‖‖ L	‖‖‖ M	‖‖‖ N

Codes and character sets (cont.)

O	P	Q
R	S	T
U	V	W
X	Y	Z

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Code identifier table

2/5 Interleaved

N

2/5 Industrial

P

2/% normal 5 bars

O

2/5 matrix 3 bars

Q

EAN 8

A

EAN 13

B

UPC A

C

UPC E

D

EAN 8 with 2 ADD ON

J

EAN 8 with 5 ADD ON

K

Subject to modifications

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Code identifier table (cont.)

EAN 13 with 2 ADD ON

L

EAN 13 with 5 ADD ON

M

UPC A with 2 ADD ON

F

UPC A with 5 ADD ON

G

UPC E with 2 ADD ON

H

UPC E with 5 ADD ON

I

Code 39

V

Code 39 Full ASCII

W

Codabar

R

ABC Codabar

S

Code 128

T

EAN 128

k

Code 93

U

CIP/39

Y

CIP/HR

e

Code 32

X

Code identifier table (cont.)

ISBT 128

f

MSI

Z

Code 16K

p

Code 11

b

Code 49

q

GS1 Databar Expanded Linear and Stacked

t

GS1 Databar Limited

v

GS1 Databar 14 Linear and Stacked

u

Configuration codes

Enter configuration

$+

Exit and save configuration

$-

Abort current setting

$%

Cancel all current settings (without exit)

$/

Send Firmware Version

$+$!

Restore Default

$+$×

Hex and numeric tables

Decimal	Hexadecimal	Character	Meaning of the most important Control characters
0	00 h	NUL	without effect
1	01 h	SOH	Start of header
2	02 h	STX	Start of text
3	03 h	ETX	End of text
4	04 h	EOT	End of transmission
5	05 h	ENQ	Enquiry
6	06 h	ACK	Acknowledge
7	07 h	BEL	Bell
8	08 h	BS	Back space
9	09 h	HT	Horizontal tabulating
10	0A h	LF	Line feed
11	0B h	VT	Vertical tabulating
12	0C h	FF	Form Feed
13	0D h	CR	Carriage Return
14	0E h	SO	SHIFT out,
15	0F h	SI	SHIFT in
16	10 h	DLE	Data link escape
17	11 h	DC1	XON
18	12 h	DC2	
19	13 h	DC3	XOFF
20	14 h	DC4	
21	15 h	NAK	Negative acknowledge
22	16 h	SYN	Sync character
23	17 h	ETB	End of transmission block
24	18 h	CAN	Cancel
25	19 h	EM	End of Medium
26	1A h	SUB	Substitute
27	1B h	ESC	ESCAPE
28	1C h	FS	FIELD separator
29	1D h	GS	Group separator
30	1E h	RS	Record separator
31	1F h	US	Until separator, Space

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Hex and numeric tables (cont)

Decimal	Hexa-decimal	Character	Decimal	Hexa-decimal	Character	Decimal	Hexa-decimal	Character
32	20 h	SPACE	64	40 h	@	96	60 h	`
33	21 h	!	65	41 h	A	97	61 h	a
34	22 h	"	66	42 h	B	98	62 h	b
35	23 h	#	67	43 h	C	99	63 h	c
36	24 h	$	68	44 h	D	100	64 h	d
37	25 h	%	69	45 h	E	101	65 h	e
38	26 h	&	70	46 h	F	102	66 h	f
39	27 h	'	71	47 h	G	103	67 h	g
40	28 h	(	72	48 h	H	104	68 h	h
41	29 h	)	73	49 h	I	105	69 h	i
42	2A h	*	74	4A h	J	106	6A h	j
43	2B h	+	75	4B h	K	107	6B h	k
44	2C h	,	76	4C h	L	108	6C h	l
45	2D h	-	77	4D h	M	109	6D h	m
46	2E h	.	78	4E h	N	110	6E h	n
47	2F h	/	79	4F h	O	111	6F h	o
48	30 h	0	80	50 h	P	112	70 h	p
49	31 h	1	81	51 h	Q	113	71 h	q
50	32 h	2	82	52 h	R	114	72 h	r
51	33 h	3	83	53 h	S	115	73 h	s
52	34 h	4	84	54 h	T	116	74 h	t
53	35 h	5	85	55 h	U	117	75 h	u
54	36 h	6	86	56 h	V	118	76 h	v
55	37 h	7	87	57 h	W	119	77 h	w
56	38 h	8	88	58 h	X	120	78 h	x
57	39 h	9	89	59 h	Y	121	79 h	y
58	3A h	:	90	5A h	Z	122	7A h	z
59	3B h	;	91	5B h	[	123	7B h	{
60	3C h	<	92	5C h	\	124	7C h	|
61	3D h	=	93	5D h	]	125	7D h	}
62	3E h	>	94	5E h	^	126	7E h	~
63	3F h	?	95	5F h	_	127	7F h	DEL

Subject to modifications

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Maintenance and Repair

Repair

If repair is needed, please contact your local Pepperl+Fuchs office.

Installation cable "Cable PSCAN-D-1D-D2" to barcode reader PSCAN-D-*
Exchange of the cable on barcode reader PSCAN-D-1D-D2

Scope of supply

Removing old cable at the PSCAN-D-1*
Removing old cable

1. Make sure that the barcode reader is disconnected from the mains during installation.
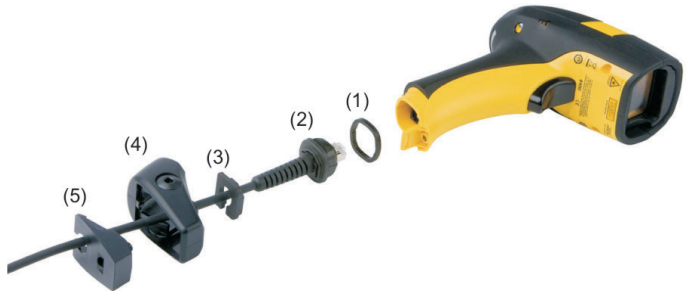

2. Unscrew the screw at the barcode reader.

3. First, slide down the strain relief and then the cover over the yellow "tooth." Slide down the cable spacer.

4. Pull the plug out of the handle and pull down the plastic boot and the rubber gasket

Connecting the new cable

(1) rubber gasket
(2) plastic boot
(3) cable spacer
(4) cover
(5) strain relief

Install the new cable on the barcode reader

1. Make sure that the barcode reader is disconnected from the mains during installation.

2. Slip the cover (4) over the cable.

3. Push the plastic boot (2) into the rubber gasket (1). Take care that the tab on the plastic boot (2) is aligned with the notch in the rubber gasket.

(1) notch
(2) tab

4. Insert the cable into the socket of the plastic boot (2) with the rubber gasket (1). Ensure that the "FRONT" marking on the plastic boot (2) is facing out.

5. Insert the cable with the plastic boot (2) and gasket (1) into the handle. Ensure that the "FRONT" marking on the plastic boot (2) is facing out, with the arrow pointing towards the front of the barcode reader.

6. Insert the cable spacer (3) into the cable wire and slide it towards the handle.
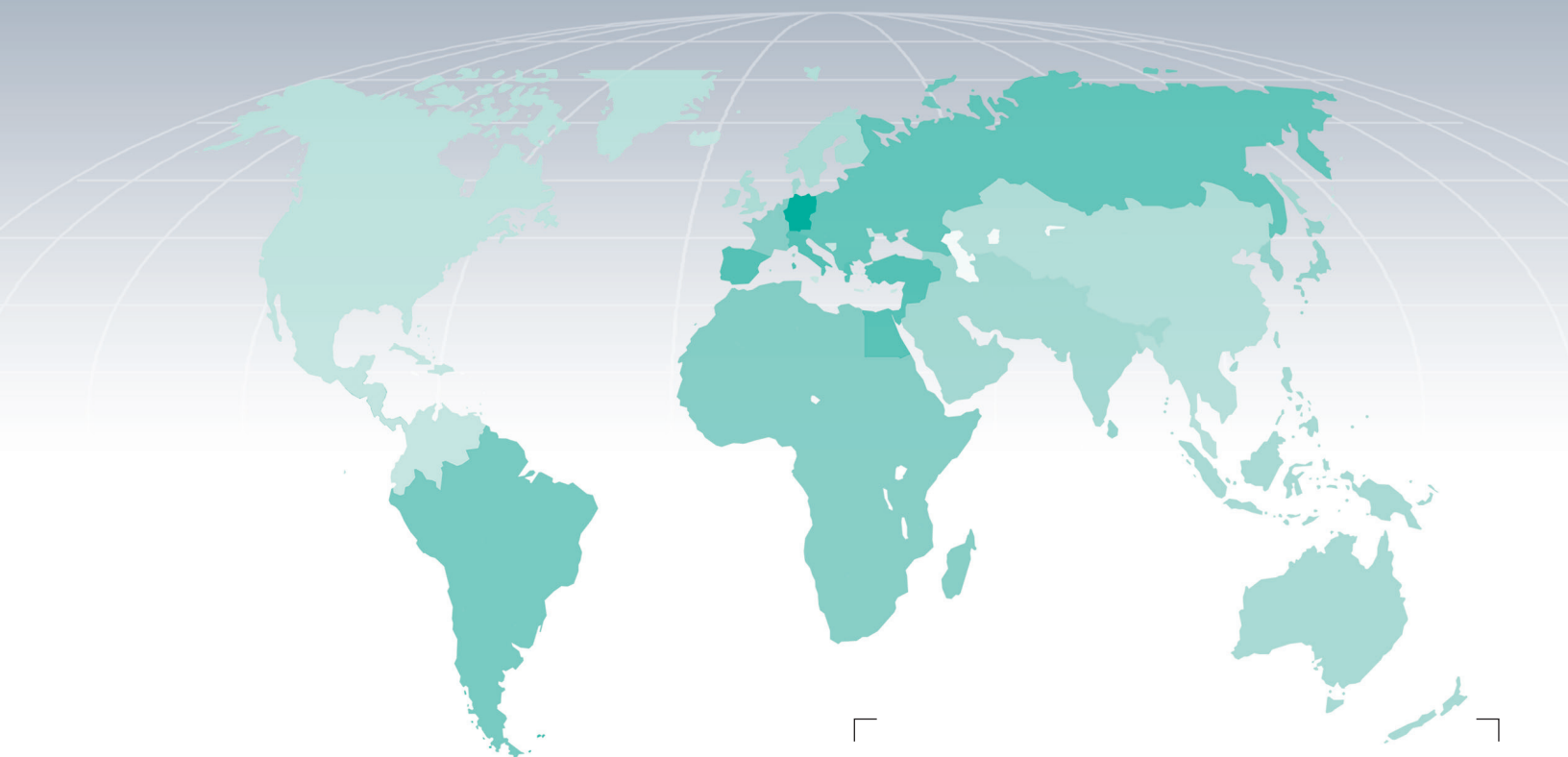

(3) cable spacer

7. Push the cover (4) along the cable toward the reader, and hook it over the yellow "tooth."

8. Insert the strain relief (5) into the cover (4) and tighten the screw to fix the whole assembly to the reader handle.

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