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DLS2000-M

Instruction Manual

DLS2000-M

INSTRUCTION MANUAL





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DLS2000-M

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This manual refers to
software version 6.00
and later

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GENERAL VIEW

DLS2000-M

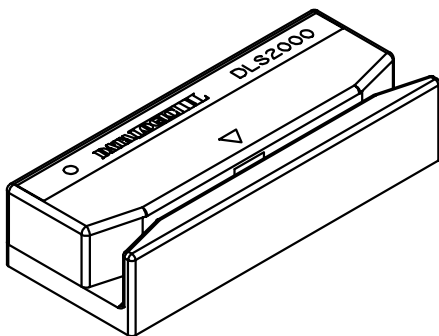


Figure A

HOW TO USE THIS MANUAL

DLS2000-M CONNECTIONS

- To connect DLS2000-M to your system see CHAPTER 2.

DLS2000-M CONFIGURATION

- To configure your DLS2000-M see CHAPTER 3.
 - 1) Read the Restore Default code on the Quick Reference card to reset the DLS2000-M with the factory default values.
 - 2) Read the Interface Selection code on the Quick Reference card for your particular application.

DLS2000-M IS NOW READY TO READ BARCODES.

- To change the default settings:
 - 3) Using one of the configuration methods described in par. 3.4 or 3.5, integrate the appropriate command strings from the group of tables in par. 3.6 for your particular application.

DESCRIPTIONS

- For information on status indicators see CHAPTER 1.
- For details on barcode reading parameters and reference tables see CHAPTER 4.

1 GENERAL FEATURES

1.1 INTRODUCTION

The DLS2000-M is an optical slot reader with built-in decoder and interface.

It is the ideal solution in all applications where information needs to be collected rapidly, easily and reliably.

1.2 DESCRIPTION AND USE

The DLS2000-M can be used in desktop applications or fixed to a wall, panel or other appropriate surface.

Dimensions of the mounting holes are given in the following diagram:

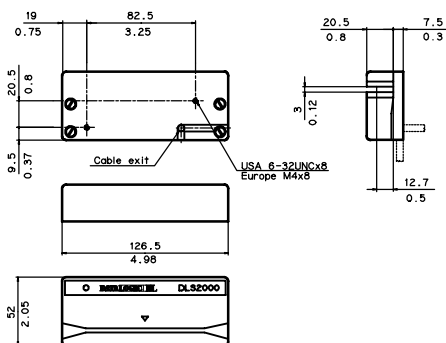


Figure 1 - Overall dimensions

To read barcodes, slide or swipe them through the slot with the barcode facing the arrow on the DLS2000-M body.

1.3 STATUS INDICATORS

DLS2000-M has two indicators, LED and beeper. They signal several operating conditions which are described in the tables below:

POWER UP

Beeper	Meaning
L L L L	Parameters loaded correctly
H H H H long tones	Parameter loading error, reading or writing error in the non volatile memory
H L H L	Hardware error in EEPROM

CONFIGURATION

Beeper	Meaning
H H H H	correct entry or exit from Configuration mode
L	good read of a command
L L L	command read error

DATA ENTRY


Beeper	LED	Meaning
U	ON	correct read of a code in normal mode
UUU		timeout expired - operation not completed
	OFF	ready to read a code
H L long tones		tx buffer full (when FIFO is enabled)

U = user configurable tone

H = high tone

L = low tone

2 CONNECTIONS



Connections should always be made with power OFF!

CAUTION

2.1 RS232 CONNECTIONS

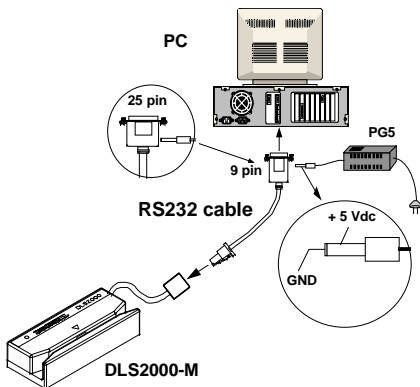


Figure 2 - RS232 connections to PC

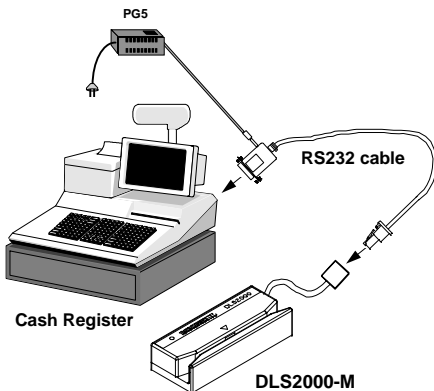


Figure 3 - RS232 connections to cash register

2.2 WEDGE CONNECTIONS

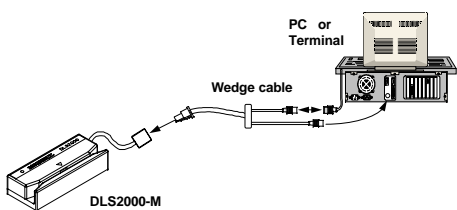


Figure 4 - Wedge connections to PC

3 CONFIGURATION

3.1 CONFIGURATION OVERVIEW

The DLS2000-M default configuration is sufficient for the majority of applications. In this case configuration is performed by reading 2 barcodes from the Quick Reference card provided with your DLS2000-M, Restore Default and the interface selection code for your application (see par. 3.2 and 3.3).

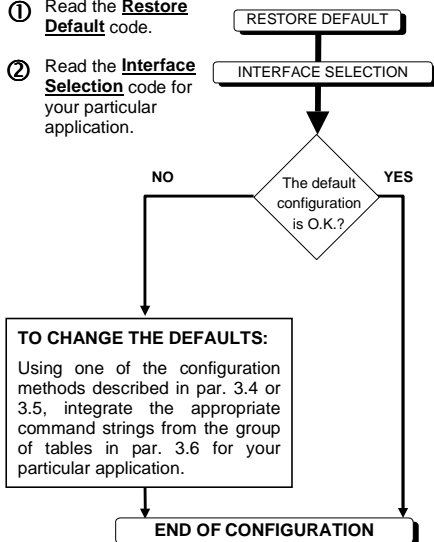
If you wish to change the default values, you can use two different methods:

- All DLS2000-Ms using the RS232 interface can be configured by receiving the appropriate command strings from a host over the serial communications line (see par. 3.4).
- All DLS2000-Ms can be configured by printing a barcode label (or labels) containing the appropriate command strings (see par. 3.5).

DLS2000-M CONFIGURATION

① Read the **Restore Default** code.

② Read the **Interface Selection** code for your particular application.



For detailed information on individual configuration parameters see chapter 4.

3.2 RESTORE DEFAULT

- ① Read this code on the Quick Reference card to restore all default values.

RS232 DEFAULT SETTINGS

9600 baud, no parity, 8 data bits, 1 stop bit, no handshaking, ack/nack disabled, fifo enabled, delay disabled, rx timeout 5 sec.;

DATA FORMAT: code identifier disabled, *no header*, *terminator = CR-LF*

WEDGE DEFAULT SETTINGS

USA keyboard, caps lock off, delays disabled control character emulation = ctrl+shift+key;

DATA FORMAT: code identifier disabled, *no header*, *terminator = ENTER*

READING PARAMETERS

beeper intensity high, tone 2

DECODING PARAMETERS

ink-spread enabled, overflow control enabled, interdigit control enabled

CODE SELECTION

enabled codes

- **EAN 8/EAN 13 / UPC A/UPC E**
without ADD ON, check digit transmission,
no conversions
- **Interleaved 2/5**
check digit control and transmission,
variable length code from 4 to 99 characters
- **Standard Code 39**
no check digit control
variable length code from 1 to 99 characters
- **Code 128**

disabled codes

EAN 128, Code 93, Codabar, pharmaceutical codes

3.3 INTERFACE SELECTION

- ② Read the Interface Selection code on the Quick Reference card for your particular application.

You can change any interface selection by simply reading another interface selection code.

Header and **Terminator** default values depend on the interface selection:

RS232: no header, terminator CR LF
 WEDGE: no header, terminator ENTER

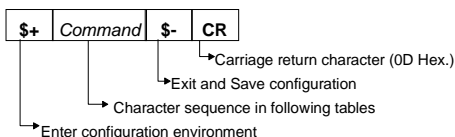
These default values are ALWAYS restored through the reading of RS232 or WEDGE interface selection code.

DLS2000-M IS NOW READY TO READ BARCODES.

3.4 CONFIGURATION STRINGS

This method is valid only for RS232 interface selection and connections.

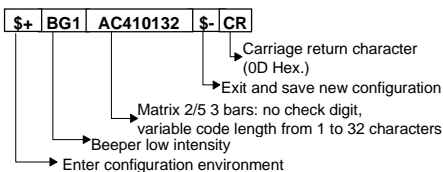
In this case DLS2000-M is configured by receiving command strings (ASCII characters) from the host using the following format:



All command strings are listed in the tables in par. 3.6.

Example:

Multiple command programming sequence:



Each configuration parameter setting overwrites the condition previously active for that parameter.

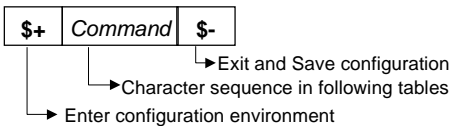
NOTE

The DLS2000-M buffer can contain a maximum of 60 characters. If your configuration string goes over this value, you must split it into separate groups and send each group after a delay of at least 3 seconds to give the reader time to empty the buffer and interpret the commands.

3.5 CONFIGURATION BARCODES

All DLS2000-Ms can be configured by printing the command strings as a barcode label (or labels) and then reading them with the DLS2000-M.

The format of each label is as follows:












The symbology must be Code 128 subset B.


All command strings are listed in the tables in par. 3.6.



3.6 COMMAND STRINGS



ENTER/EXIT CONFIGURATION COMMANDS	
DESCRIPTION	STRING
Enter configuration	\$+
Exit and Save configuration	\$-
Restore factory default configuration	\$*
Transmit the software release	\$!

INTERFACE SELECTION	
DESCRIPTION	STRING
RS232 interface	CP0
WEDGE for IBM AT or PS/2	CP500
WEDGE for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-break keyboard	CP501
WEDGE for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-only keyboard	CP502
WEDGE for IBM XT	CP503
WEDGE for IBM Terminal 3153	CP504
WEDGE for IBM SURE1	CP506

RS232		
DESCRIPTION		STRING
Baud rate	150	CD0
	300	CD1
	600	CD2
	1200	CD3
	2400	CD4
	4800	CD5
	9600	CD6
	19200	CD7
Parity	disabled	CC0
	even	CC1
	odd	CC2
Data bits	7	CA0
	8	CA1
	9	CA2
Stop bits	1	CB0
	2	CB1
Handshaking	disabled	CE0
	RTS/CTS	CE1 
	XON/XOFF	CE2 
	RTS always ON	CE3 
ACK/NACK	disabled	CF0 
	enabled	CF3 
FIFO	disabled	EC0 
	enabled	EC1 
Inter-character Delay		CK00 - CK99 
RX Timeout		CL00 - CL99 

Strings marked with  refer to the explanations in chapter 4.

WEDGE		
DESCRIPTION		STRING
Keyboard	English	FJ4
	French	FJ2
	German	FJ3
	Italian	FJ1
	Swedish	FJ5
	USA	FJ0
	Spanish	FJ6
	Belgian	FJ7
Caps Lock	caps lock ON	FE1
	caps lock OFF	FE0
Inter-character Delay		CK00 - CK99 
Inter-code Delay		FG00 - FG99 
Control Character Emulation	ctrl+shift+key	FO0
	ctrl+key	FO1

DATA FORMAT		
DESCRIPTION		STRING
Code Identifier	disabled	EB0
	DL standard	EB1 
	AIM standard	EB2 
	Custom	EB3
Custom Code Identifier		EHabc
Header	no header	EA00
	one character	EA01x
	two character	EA02xx
	three character	EA03xxx
	four character	EA04xxxx
Terminator	no terminator	EA10
	one character	EA11x
	two character	EA12xx
	three character	EA13xxx
	four character	EA14xxxx

a = ASCII character.

b, c, x = HEX values representing an ASCII character.
(see tables in par 4.3.2).

a = ASCII character corresponding to the DATALOGIC STANDARD Code Identifier (see table in par. 4.3.1).

b = Hex value of the first Custom Code Identifier character from **00** to **7F**;


FF = disable Code Identifier

c = Hex value of the second Custom Code Identifier character from **00** to **7F**;




FF = disable second character of Custom Code Identifier

x = for RS232: from **00** to **7F**


x = for WEDGE: from **00** to **9B**

Strings marked with  refer to the explanations in chapter 4.

READING PARAMETERS		
DESCRIPTION		STRING
Beeper Intensity	off	BG0
	low	BG1
	medium	BG2
	high	BG3
Beeper Tone	tone 1	BH0
	tone 2	BH1
	tone 3	BH2
	tone 4	BH3

DECODING PARAMETERS		
DESCRIPTION		STRING
Ink-spread	disabled	AX0 
	enabled	AX1
Overflow Control	disabled	AW1 
	enabled	AW0
Interdigit Control	disabled	AV0 
	enabled	AV1

CODE SELECTION		
DESCRIPTION		STRING
Disable ALL family codes		AZ0
Disable EAN/UPC family		AA0
EAN/UPC without ADD ON		AA1
EAN/UPC with ADD ON		AA5
EAN/UPC with and without ADD ON		AA8
EAN 8/EAN 13 without ADD ON		AA3
EAN 8/EAN 13 with ADD ON 2 ONLY		AAK
EAN 8/EAN 13 with ADD ON 5 ONLY		AAL
EAN 8/EAN 13 with ADD ON 2 AND 5		AA6
UPC A/UPC E without ADD ON		AA4
UPC A/UPC E with ADD ON 2 ONLY		AAM
UPC A/UPC E with ADD ON 5 ONLY		AAN
UPC A/UPC E with ADD ON 2 AND 5		AA7
EAN 8 check digit transmission	disabled	AAG0
	enabled	AAG1
EAN 13 check digit transmission	disabled	AAH0
	enabled	AAH1
UPC A check digit transmission	disabled	AAI0
	enabled	AAI1
UPC E check digit transmission	disabled	AAJ0
	enabled	AAJ1
UPC E to UPC A conversion		AAA
UPC E to EAN 13 conversion		AAB
UPC A to EAN 13 conversion		AAC
EAN 8 to EAN 13 conversion		AAD
enable ISBN conversion only		AP1
enable ISSN conversion only		AP2
enable ISBN and ISSN conversion		AP3
disable ISBN and ISSN conversion		AP0

Strings marked with  refer to the explanations in chapter 4.

CODE SELECTION (continued)	
DESCRIPTION	STRING
Disable Code 39 family	AB0
Code 39: no check digit control	AB11
Code 39: check digit control and transmission	AB12
Code 39: check digit control without transmission	AB13
Code 39 Full ASCII: no check digit control	AB21
Code 39 Full ASCII: check digit control and transmission	AB22
Code 39 Full ASCII: check digit control without transmission	AB23
CIP/39	AB3
Code 32	AB4
Code 39 family Code Length	AB*xxxx
Disable Code 2/5 family	AC0
Interleaved 2/5: no check digit control	AC11xxxx
Interleaved 2/5: check digit control and transmission	AC12xxxx
Interleaved 2/5: check digit control without transmission	AC13xxxx
Normal 2/5 5 bars: no check digit control	AC21xxxx
Normal 2/5 5 bars: check digit control and transmission	AC22xxxx
Normal 2/5 5 bars: check digit control without transmission	AC23xxxx
Industrial 2/5 (IATA): no check digit control	AC31xxxx
Industrial 2/5 (IATA): check digit control and transmission	AC32xxxx
Industrial 2/5 (IATA): check digit control without transmission	AC33xxxx
Matrix 2/5 3 bars: no check digit control	AC41xxxx
Matrix 2/5 3 bars: check digit control and transmission	AC42xxxx
Matrix 2/5 3 bars: check digit control without transmission	AC43xxxx
CIP/HR	AC5

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

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

Examples:

0132 = variable length from 1 to 32 digits in the code.

1010 = 10 digit code length only.

The maximum code lengths are 99 characters.

CODE SELECTION (continued)	
DESCRIPTION	STRING
Disable Codabar family	AD0
Standard CODABAR: no start/stop character equality control nor transmission	AD111
Standard CODABAR: no start/stop character equality control but transmission	AD112
Standard CODABAR: start/stop character equality control but no transmission	AD121
Standard CODABAR: start/stop character equality control and transmission	AD122
ABC CODABAR: no start/stop character equality control but transmission	AD212
Codabar family Code Length	AD*xxxx
lower case Start/Stop character	ADA0
upper case Start/Stop character	ADA1
Disable Code 128 family	AI0
Code 128	AI11
EAN 128	AI21
define EAN 128 separator character	EPz
disable EAN 128 separator character	Aa0
enable EAN 128 separator character	Aa1
disable add first GS in EAN 128	EQ0
enable add first GS in EAN 128	EQ1
Disable Code 93 family	AK0
Code 93: no check digit control	AK1

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

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

Examples:

0132 = variable length from 1 to 32 digits in the code.

1010 = 10 digit code length only.

The maximum code lengths are 99 characters.

z = for RS232: from **00** to **7F**

z = for WEDGE: from **00** to **9B**

4 REFERENCES

4.1 RS232 PARAMETERS

4.1.1 Handshaking

Hardware handshaking: (RTS/CTS)

The RTS line is activated by the decoder before transmitting a character. Transmission is possible only if the CTS line (controlled by the Host) is active.

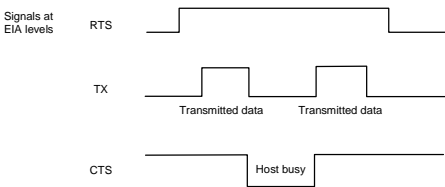


Figure 6 - State diagram for RTS/CTS

Software handshaking: (XON/XOFF)

During transmission, if the Host sends the XOFF character (13 Hex), the decoder interrupts the transmission with a maximum delay of one character and only resumes when the XON character (11 Hex) is received.

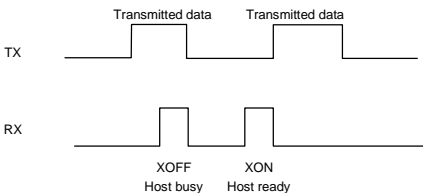


Figure 7 - State diagram for XON/XOFF

4.1.2 ACK/NACK Protocol

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. If DLS2000-M does not receive an ACK or NACK, transmission is ended after the RX Timeout (see par. 4.1.5). Selection of the ACK/NACK protocol automatically disables FIFO buffering see par. 4.1.3.

4.1.3 FIFO

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. Up to 185 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.

Selection of FIFO buffering automatically disables ACK/NACK protocol see par. 4.1.2.

4.1.4 Inter-Character Delay

Delay between characters transmitted to the Host.

00 = Delay disabled
01-99 = Delay from 1 to 99 milliseconds

4.1.5 RX Timeout

When the RS232 interface is selected, the Host can be used to configure the DLS2000-M by sending it command strings (see par. 3.4).

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.

4.2 WEDGE PARAMETERS

4.2.1 Inter-Character Delay

Delay between characters transmitted to the Host.

00 = Delay disabled
01-99 = Delay from 1 to 99 milliseconds

4.2.2 Inter-Code Delay

Delay between codes transmitted to the Host.

- 00 = Delay disabled
 01-99 = Delay from 1 to 99 seconds

4.3 DATA FORMAT

4.3.1 Code Identifier

CODE IDENTIFIER TABLE		
CODE	DL STD	AIM STD
2/5 interleaved	N	]I y
2/5 industrial	P	]X y
2/5 normal 5 bars	O	]S y
2/5 matrix 3 bars	Q	]X y
EAN 8	A	]E 4
EAN 13	B	]E 0
UPC A	C	]X y
UPC E	D	]X y
EAN 8 with 2 ADD ON	J	]E 5
EAN 8 with 5 ADD ON	K	]E 6
EAN 13 with 2 ADD ON	L	]E 1
EAN 13 with 5 ADD ON	M	]E 2
UPC A with 2 ADD ON	F	]X y
UPC A with 5 ADD ON	G	]X y
UPC E with 2 ADD ON	H	]X y
UPC E with 5 ADD ON	I	]X y
Code 39	V	]A y
Code 39 Full ASCII	W	]A y
CODABAR	R	]F y
ABC CODABAR	S	]X y
Code 128	T	]C 0
EAN 128	k	]C 1
Code 93	U	]G y
CIP/39	Y	]X y
CIP/HR	e	]X y
Code 32	X	]X y

Note: 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.).

4.3.2 Header/Terminator Selection

Select the desired Header/Terminator code plus the correct number of character(s) from the HEX table.

Example:

EA0441424344 = Header ABCD

CHARACTER TO HEX CONVERSION TABLE					
char	hex	char	hex	char	hex
NUL	00	+	2B	V	56
SOH	01	,	2C	W	57
STX	02	-	2D	X	58
ETX	03	.	2E	Y	59
EOT	04	/	2F	Z	5A
ENQ	05	0	30	[	5B
ACK	06	1	31	\	5C
BEL	07	2	32	]	5D
BS	08	3	33	^	5E
HT	09	4	34	_	5F
LF	0A	5	35	`	60
VT	0B	6	36	a	61
FF	0C	7	37	b	62
CR	0D	8	38	c	63
SO	0E	9	39	d	64
SI	0F	:	3A	e	65
DLE	10	;	3B	f	66
DC1	11	<	3C	g	67
DC2	12	=	3D	h	68
DC3	13	>	3E	i	69
DC4	14	?	3F	j	6A
NAK	15	@	40	k	6B
SYN	16	A	41	l	6C
ETB	17	B	42	m	6D
CAN	18	C	43	n	6E
EM	19	D	44	o	6F
SUB	1A	E	45	p	70
ESC	1B	F	46	q	71
FS	1C	G	47	r	72
GS	1D	H	48	s	73
RS	1E	I	49	t	74
US	1F	J	4A	u	75
SPACE	20	K	4B	v	76
!	21	L	4C	w	77
"	22	M	4D	x	78
#	23	N	4E	y	79
\$	24	O	4F	z	7A
%	25	P	50	{	7B
&	26	Q	51	|	7C
'	27	R	52	}	7D
(	28	S	53	~	7E
)	29	T	54	DEL	7F
*	2A	U	55		

These parameters are not affected by the restore default code. The header/terminator default values are restored only through the respective interface selection codes.

For the WEDGE interface, the following extended keyboard values can also be configured:

EXTENDED KEYBOARD TO HEX CONVERSION TABLE			
HEX	IBM AT IBM 3153	IBM XT	IBM 31xx IBM 32xx IBM 34xx IBM 37xx
HEX	KEY	KEY	KEY
83	ENTER	ENTER	FIELD EXIT
84	TAB	TAB	TAB
85	F1	F1	F1
86	F2	F2	F2
87	F3	F3	F3
88	F4	F4	F4
89	F5	F5	F5
8A	F6	F6	F6
8B	F7	F7	F7
8C	F8	F8	F8
8D	F9	F9	F9
8E	F10	F10	F10
8F	F11	ESC	F11
90	F12	BACKSPACE	F12
91	HOME	HOME	ENTER
92	END	END	RESET
93	PG UP	PG UP	INSERT
94	PG DOWN	PG DOWN	DELETE
95	↑	↑	FIELD -
96	↓	↓	FIELD +
97	←	←	ENTER (Paddle)
98	→	→	PRINT
99	ESC	ESC	
9A	CTRL (Right)	CTRL (Right)	
9B	Euro	Space	Space

4.4 DECODING PARAMETERS



CAUTION

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.

4.4.1 Ink-Spread

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

4.4.2 Overflow Control

The overflow control parameter can be disabled when decoding codes printed on small surfaces, which don't allow the use of an overflow space.

This command does not effect code families 2/5, Code 128 and Code 93.

4.4.3 Interdigit Control

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

5 TECHNICAL FEATURES

Electrical Features	
Power supply	5 Vdc \pm 10%
Consumption	140 mA max.
Decode depth of field	3 mm
Max. resolution	0.12 mm, 5 mils
PCS	min. 15% (Datalogic Test Chart)
Reading indicators	LED, Beeper
Environmental Features	
Working Temperature	0 °C to + 55 °C
Storage Temperature	-20 °C to + 60 °C
Humidity	90% non condensing
Ambient light	light angle 80° 10,000 lux
Vibration resistance	0.75 mm at 10 to 55 Hz, 2 hours sinewave, sweptime 1 octave / min x,y,z
Shock resistance	30 G - 11 ms 3 shocks on the 6 planes half sine
Protection Class	IP50
Mechanical Features	
Weight (without cable)	about 180 g.
Cable length	60 cm

DATALOGIC S.p.A.,
Via Candini, 2
40012 - Lippo di Calderara
Bologna - Italy



dichiara che
declares that the
déclare que le
bescheinigt, daß das Gerät
declare que el

DLS20XXX-XX, Slot Reader

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:
den nachstehenden 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	92/31/EEC, 93/68/EEC	emendamenti successivi
	and		further amendments
	et		ses successifs amendements
	und		späteren Abänderungen
	y		sucesivas 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 Etats 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 las siguientes normas:

EN 55022, August 1994:	LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT (ITE)
EN 61000-6-2, April 1999:	ELECTROMAGNETIC COMPATIBILITY (EMC). PART 6-2: GENERIC STANDARDS - IMMUNITY FOR INDUSTRIAL ENVIRONMENTS.

Lippo di Calderara, 21/03/2002

Ruggero Cacioppo

Quality Assurance Supervisor