

IS1000 Series

Radio Frequency Bar Code Reader



Configuration Guide

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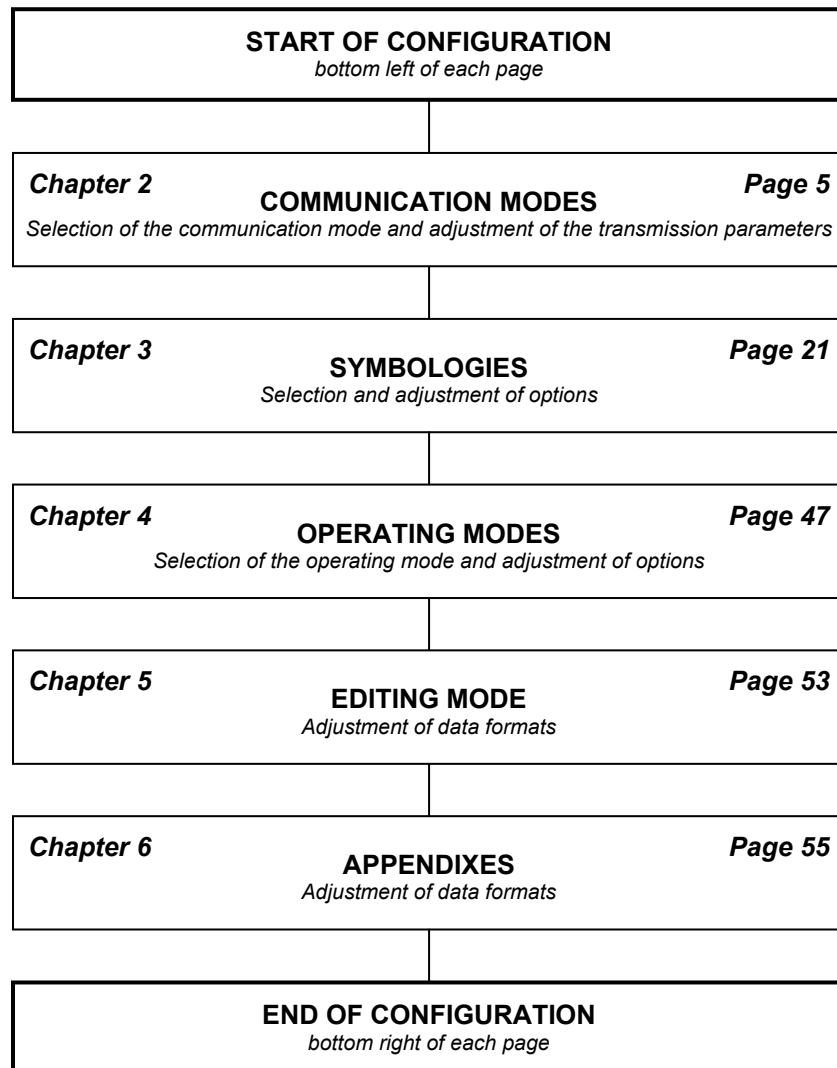
1. INTRODUCTION

This manual contains information about configuration IS1000 laser reader and decoder present in the radio base.

The installation procedures and technical description are described in the IS1000 *Installation and User's Guide*.

The IS1000 *Connection List* contains the connection numbers (or ID) and the cable references to be used for Keyboard-Wedge communication on PCs and terminals, for communication with P.O.S. systems and Notebooks. For other types of connections see chapter 2, *Communication Modes*.

Once the radio base is powered on, each parameter value can be changed simply by scanning, with the laser reader, the codes appearing in this manual with respect to configuration sequence.



 **Note:**

There is no need to adjust all the parameters. Change only the ones concerning your application. Unchanged parameters will keep their previous value.

The parameter values are stored in a non-volatile memory called EEPROM and are saved when the radio base is turned off.

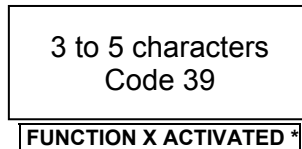
1.1. Default Configuration (factory setting)

When shipped from the factory, each IS1000 is configured with default parameter values as follows:

Default Configuration	
Communication Mode	RS232 mode: - 9600 bps - Even parity - 7 data bits - 1 stop bit - CR/LF end of message characters
Symbology	Code 39, Code 128, EAN 128, UPC/EAN, Interleaved 2/5, Monarch/Codabar
Radio	433 MHz – Channel 3
Operating Mode	- Simple acknowledgment mode - Timer 1 = 200 ms - Timer 2 = 3 s - Timer 3 = 2 s - Number of re-transmissions = 3
Buzzer	High volume

These are the main parameters, please check the sections of this manual which concern your application.

The default value of each parameter appears like this:



The text below the code is framed and ended by the sign * to indicate the default value.

At any time, the default values of all the parameters can be set by scanning this code:



 **Caution:**

The reading of this code will turn all parameters to their default value.

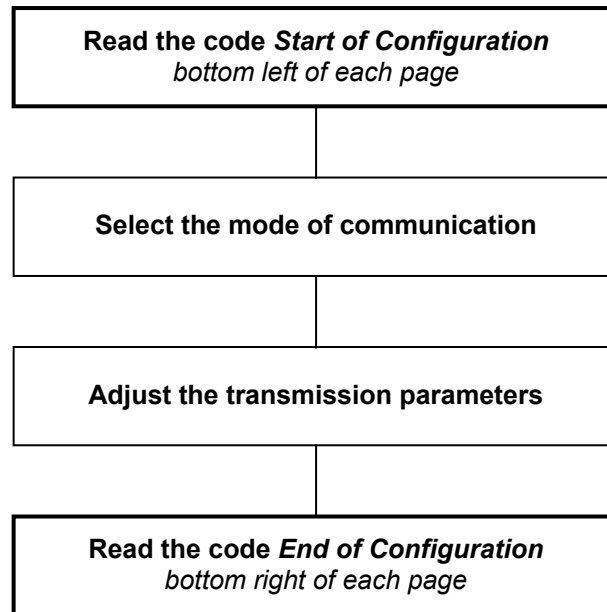
Page intentionally left blank

2. COMMUNICATION MODES

The radio base is equipped with a decoder offering a multi-interface communication port.

The default communication mode is RS232 (9600 baud, 7 data bits, parity even, 1 stop bit, end message: CR LF).

Other communication modes can be selected by using the following sequence:



START OF CONFIGURATION



END OF CONFIGURATION

2.1. RS232

Use the codes on this page through to page 11 to activate and adjust the RS232 parameters.



RS232 MODE ACTIVATED *

2.1.1. Baud Rate



300



600



1200



2400



4800



9600 *



19200



38400



START OF CONFIGURATION



END OF CONFIGURATION

2.1.2. Data Bits



2.1.3. Parity



2.1.4. Stop Bits



START OF CONFIGURATION



END OF CONFIGURATION

2.1.5. End of Message Character

One character can be systematically transmitted with each code to indicate the end of message:



CR/LF *



STX...ETX



HT



SUITE (MINITEL)



NONE



LF



CR



EOT

Other characters or complete fields can be added to the message using the *Preamble / Postamble* function (see appendix 6.3, page 58) or the *Editing Mode* (see chapter 5, page 53).



START OF CONFIGURATION



END OF CONFIGURATION

2.1.6. Time-Out Between Characters

In case that errors are detected using high speed transmissions such as 19200 or 38400 baud and if two stop bits are already set, a time-out can be inserted between each character for a better synchronization:



START OF CONFIGURATION



END OF CONFIGURATION

2.1.7. ACK/NAK Protocol

Once this protocol is activated, the decoder waits for an acknowledgment from the host system:

- ACK (06 hexa) means: message correctly received by the host system.
- NAK (15 hexa) means: message incorrectly received by the host, upon reception of this character the decoder resends the message.



ACK/NAK DISACTIVATED *



ACK/NAK ACTIVATED

2.1.8. XON/XOFF Protocol

Using this protocol, the host system can control the data flow coming from the decoder:

- XON (11 hexa) means: host system ready to receive data.
- XOFF (13 hexa) means: host system busy, the decoder stops the transmission and waits for an XON.



XON/XOFF DISACTIVATED *



XON/XOFF ACTIVATED

2.1.9. RTS/CTS Protocol

This protocol is a hardware "handshake" between the decoder and the host system. Before transmitting data, the decoder rises its RTS signal (pin 4) to +10 volt and waits for a +10 volt signal on its CTS (pin 5) from the host. The rest position of the two pins is -10 volt.



RTS/CTS PROTOCOL DISACTIVATED *



RTS/CTS PROTOCOL ACTIVATED



START OF CONFIGURATION



END OF CONFIGURATION

2.1.10. PC-Term Mode

Some applications use several RS232 terminals connected to a PC host system configured in PC-Term mode. When a character is typed on a keyboard of a terminal, its scan code value is transmitted to the PC instead of its ASCII value. Then, upon reception, the PC sends back the corresponding ASCII character to display on the screen.

Therefore, once this mode is activated, the decoder sends the scan code value of each character read.

To activate the PC-Term mode, read this code and adjust the RS232 parameters using page 6 to 10. It is advised to insert a time-out of 50 ms between each character when baud rate is over 9600 baud (see page 9).



PC-TERM MODE ACTIVATED

Upper/lower case characters and the type of numeric characters can be adjusted using page 14 and 15.

Keyboard layout style can be selected using the *Bar Code Pad* page 12, without reading the code *Keyboard-Wedge Mode Activated*.



START OF CONFIGURATION



END OF CONFIGURATION

2.2. Keyboard-Wedge

In this mode the radio base is connected between the keyboard and the computer (or terminal). Data is emulated by the decoder as if it was typed on the keyboard.

The default communication mode (factory setting) is RS232, use the codes on this page to activate the Keyboard-Wedge mode and to select the ID corresponding to your computer or terminal:



KEYBOARD-WEDGE MODE ACTIVATED

Consult the *IS1000 Connection List* and enter the ID corresponding to your computer or terminal using this *Bar Code Pad*



0



1



2



3



4



5



6



7



8



9



START OF CONFIGURATION



END OF CONFIGURATION

PC Keyboard-Wedge ID:

<i>PC Keyboard Type</i>	<i>ID</i>
ALT Mode	114
Belgian	644
French	1
German	104
Hungarian	437
Italian	123
Spanish	313
Swedish	169
Swiss	148
UK	611
US	11



For other Keyboard-Wedge interfaces, please refer to the IS1000 Connection List to obtain ID and cable reference.



START OF CONFIGURATION



END OF CONFIGURATION

2.2.1. End of Message Character

One of the characters below can be systematically emulated by the decoder as the end of message character:



Other characters, signs, function keys or fields can be added using the *Preamble / Postamble* function (see appendix 6.3, page 58) or the *Editing Mode* (see chapter 5, page 53).

2.2.2. Upper / Lower Case Options

Use one of these codes to inform the decoder of the state of your keyboard:



START OF CONFIGURATION



END OF CONFIGURATION

2.2.3. Types of Numeric Characters

This function allows the emulation of the numeric characters of the numeric pad or those located on top of the keyboard.

Use this function if trouble occurs with upper/lower case keyboard modes.



NUMERICS LOCATED
OVER THE ALPHANUMERIC PAD *



NUMERIC PAD



Note:

If the option Numeric Pad is chosen, the numeric pad of the keyboard must be also turned on (or locked) for correct operation.

2.2.4. Time-Out Between Characters

The insertion of a time-out between each character can sometimes avoid eventual errors due to a fast transmission speed (specially on PS/2 or when DOS and BIOS are very busy).



0 ms *



5 ms



10 ms



20 ms



50 ms



100 ms



START OF CONFIGURATION



END OF CONFIGURATION

2.2.5. "WYSE" Time-Out

Some Keyboard-Wedge connections on some Wyse terminals can drop characters especially when a string of identical characters appears in a code.

Only in this case, use this function to insert a time-out between characters:



ACCESS CODE TIME-OUT

**Enter the desired value
using the *Numeric Pad* page 81**

0 ≤ value ≤ 49



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

2.3. P.O.S. (Point Of Sale) Systems

The main communication modes with P.O.S. systems are:

- RS232
- Keyboard-Wedge
- OCIA
- RS485

To set RS232 communication use pages 6 to 11 to adjust the transmission parameters.

To set a Keyboard-Wedge, OCIA or RS485 communication use page 12 of this manual; scan the code *Keyboard-Wedge Mode Activated* and enter your ID.



Please refer to the IS1000 Connection List to obtain ID and cable reference.



START OF CONFIGURATION



END OF CONFIGURATION

2.4. Wand Emulation

Scan this code to activate the wand emulation mode:



WAND EMULATION MODE ACTIVATED

Then select the symbology to be emulated using the *Bar Code Pad* page 12, without reading the code *Keyboard-Wedge Mode Activated*:

<i>Emulation</i>	<i>ID</i>
Code 39	69
Interleaved 2/5	68
UPC/EAN *	70

* Only 8 or 13 characters messages are accepted for this emulation

Then adjust the following transmission parameters.

2.4.1. Transmission Speed



START OF CONFIGURATION

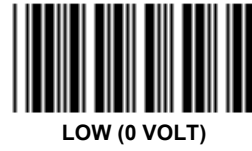
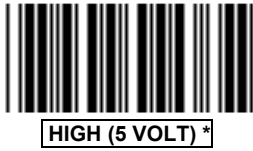


END OF CONFIGURATION

2.4.2. Bar/Space Polarity



2.4.3. Idle State



START OF CONFIGURATION



END OF CONFIGURATION

2.5. Laser Emulation

With this mode, data are transmitted as code 39 data coming from a TTL hand held laser or CCD scanner.

Scan this code to activate this mode:



LASER EMULATION MODE ACTIVATED



For the radio base connector pin-out, refer to the IS1000 Installation and User's Guide.



START OF CONFIGURATION



END OF CONFIGURATION

3. SYMBOLOGIES

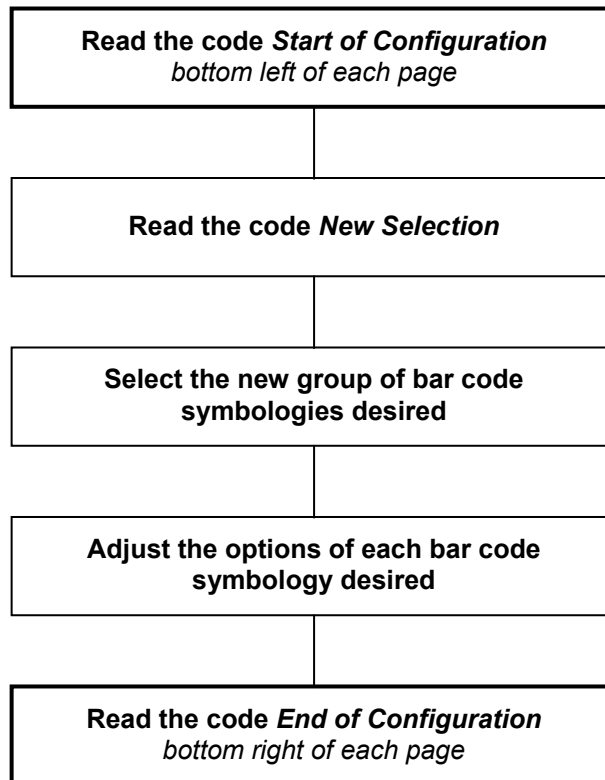
Many bar code symbologies have been developed to suit many data capture applications in different domains (retail, industry, medical, transport...) requiring simple or complete sets of characters (numeric, alphanumeric, full ASCII set...) with various density performances.

Each symbology has options which must be carefully checked and adjusted by the user.

Some samples are printed in appendix 6.12, page 82.

The default configuration of the IS1000 permits the reading of only six bar code symbologies appearing on the next left hand page.

Other symbologies can be selected on the next right hand page by using the following sequence:



To fully optimize the decoding reliability, it is advised to select only the symbology(ies) required for your application.

In addition, a function called *Decoding Selectivity* (see page 45) will perform several data collections and decodings with comparisons before transmission.



START OF CONFIGURATION



END OF CONFIGURATION

3.1. Symbology Selection



NEW SELECTION

This code must be read to initialize any new selection of symbologies



CODE 39 *



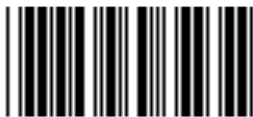
INTERLEAVED 2/5 *



UPC/EAN *



MONARCH/CODABAR *



CODE 128 *



EAN 128 *

These six bar code symbologies are the most commonly used and are active by default. Other symbologies can be selected on the next page.

 **Note:**

- If no symbology is selected after the reading of New Selection code, the above six symbologies will remain activated.
- Only the symbologies selected after the reading of New Selection code will be activated
- If New Selection code is not read before selecting another symbology, this will be added to the six of above.



START OF CONFIGURATION



END OF CONFIGURATION



STANDARD 2/5



MSI



PLESSEY



TELEPEN



CODE 93



MATRIX 2/5



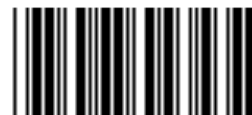
IATA



BC 412 **



3W7



Reserved # 1



Reserved # 2



Reserved # 3

Once your selection is completed, consult the next pages to verify and adjust the options you require for each symbology.

*** Strictly reserved for IBM and authorized companies; require a specific firmware.*



START OF CONFIGURATION



END OF CONFIGURATION

3.2. Code 39

This is the most popular alpha-numeric bar code symbology. It has a set of 43 characters (alphanumeric and a few symbols) and can be used with or without a check digit.

3.2.1. Standard/Full ASCII

The Code 39 *Full ASCII* option allows the transmission of the 128 ASCII characters. Each ASCII character is a combination of two Code 39 characters. It can be very useful specially to transmit control characters (STX, ETX, TAB, EOT...) as preambles or postambles in a message (see appendix 6.3, page 58). The *Code 39 Full ASCII Table* is listed in appendix 6.10, page 70.



STANDARD *



FULL ASCII

3.2.2. Full ASCII Extended

In Keyboard-Wedge mode, function keys like F1 to F12, →, HOME, CLEAR... can be emulated using this function.

The function key to be emulated is represented by two Code 39 characters from the *Code 39 Full ASCII Extended Table* (see appendix 6.8, page 65), which can be part of the symbol or separate from it.



DISACTIVATED *



ACTIVE ON TWO CHARACTERS
PRECEDED BY A DASH
(part of or separate from the symbol)



ACTIVE ON TWO CHARACTERS
(part of or separate from the symbol)



ACTIVE ONLY ON TWO CHARACTERS
SEPARATE FROM THE SYMBOL



Note:

The function key value to be emulated can be set as a preamble or a postamble of message (see appendix 6.3, page 58).



START OF CONFIGURATION



END OF CONFIGURATION

3.2.3. Multiread



The Multiread function permits the temporary storage of one or more codes in the decoder's memory which will then be transmitted in a single string message.

To operate the Multiread function, the desired group of codes to be first stored must have a Multiread Character as the leading character. This character can be chosen in the *Multiread Character Table* (see appendix 6.9, page 67; default is SPACE character) after reading code *Activated*. The transmission will start once a code having no Multiread Character is read.

3.2.4. Modulo 43 Check Character

In the case of high level security applications, a check character can be integrated as the last character in the code and verified before transmission.



See page 27 for the calculation algorithm of Code 39 Modulo 43 Check Character.



START OF CONFIGURATION



END OF CONFIGURATION

3.2.5. Pharmacode or Pharma 32/39

This symbology is used only in Italy. The encoding uses the Code 39 standard but the decoding performs a transformation of the digits using a translation table.

Example:

The Code 39 message: 2 D W W K P will be transformed into 080638517.

To activate this symbology, the code *New Selection* must be read first.



NEW SELECTION *



PHARMACODE ACTIVATED



START/STOP NOT TRANSMITTED *



START/STOP TRANSMITTED



CHECK DIGIT TRANSMITTED *



CHECK DIGIT NOT TRANSMITTED

3.2.6. CIP Code 39

CIP Code is specific to the French pharmaceutical industry. This function allows the reading of the CIP Code 39 only (code with 7 characters), with the possibility of transmitting or not the check digit. To cancel this function, read the code *All Codes 39*.



ACTIVATED WITH
CHECK DIGIT NOT TRANSMITTED



ACTIVATED WITH
CHECK DIGIT TRANSMITTED



ALL CODES 39 *



START OF CONFIGURATION



END OF CONFIGURATION

3.2.7. Start/Stop

This function activates the transmission of the start and stop characters (sign ✱).



NOT TRANSMITTED *



TRANSMITTED

3.2.8. Modulo 43 Algorithm

Code 39 is strongly self checked and most situations do not require a check character. If a specific application requires exceptional data security, a check character can be added as the last character of the code.

Example:

Message: 12345/ABCDE

Sum of values: $1 + 2 + 3 + 4 + 5 + 40 + 10 + 11 + 12 + 13 + 14 = 115$

Divide 115 by 43. The quotient is 2 with the remainder 29. The check character is the character corresponding to the value of the remainder, which is 29 in this example, corresponding to the character T.

The complete message, including check character is: 12345/ABCDET.

Numerical value assignments for computing the optional check character:

Character	Value	Character	Value	Character	Value
0	0	F	15	U	30
1	1	G	16	V	31
2	2	H	17	W	32
3	3	I	18	X	33
4	4	J	19	Y	34
5	5	K	20	Z	35
6	6	L	21	-	36
7	7	M	22	.	37
8	8	N	23	Space	38
9	9	O	24	\$	39
A	10	P	25	/	40
B	11	Q	26	+	41
C	12	R	27	%	42
D	13	S	28		
E	14	T	29		



START OF CONFIGURATION



END OF CONFIGURATION

3.3. Interleaved 2/5

This symbology is only numeric and offers a very high density of characters per inch due to its interleaved encoding system. The decoding is very easy even if the symbols are poorly printed. These advantages make it very popular for industrial applications.

But to avoid missing characters when scanning is incomplete, it has to be used with fixed lengths (see pages 28 or 29) or variable lengths with a check digit (see page 30).

3.3.1. Fixed Length(s) Authorized and Set Upon First Reading(s)

The characters are interleaved (always paired), therefore it is necessary to define whether the number of significant characters is odd or even.



EVEN *



ODD



1 LENGTH FIXED AFTER THE FIRST READ *



2 LENGTHS FIXED AFTER THE FIRST 2 READS



3 LENGTHS FIXED AFTER THE FIRST 3 READS



4 LENGTHS FIXED AFTER THE FIRST 4 READS



In this mode, the code lengths are not saved after power-off.



START OF CONFIGURATION



END OF CONFIGURATION

3.3.2. Fixed Length(s) Authorized and Set Using the Numeric Pad

Select the number of code length(s) desired (1 to 4):



ONE



TWO



THREE



FOUR

Select the N° of the length to be adjusted:



LENGTH N° 1



LENGTH N° 2



LENGTH N° 3



LENGTH N° 4

**Enter the desired number of characters
using the *Numeric Pad* page 81**



VALIDATION

Go back to adjust a next N° of length or read the code *End of Configuration* if no other lengths is desired.



In this mode, the code lengths are saved after power-off.



START OF CONFIGURATION



END OF CONFIGURATION

3.3.3. Variable Lengths Authorized



ACTIVATED



CHECK DIGIT
VERIFIED BUT NOT TRANSMITTED



CHECK DIGIT
VERIFIED AND TRANSMITTED

How to calculate the check digit value:

Example:

Message: 14356

Add the odd positions: $1 + 3 + 6 = 10$

Multiply by 3 = 30

Add the even positions. $30 + 4 + 5 = 39$

The check digit is the complement to the next ten: $CK = 40 - 39 = 1$

The printed message will be: 143561



CIP CHECK DIGIT
VERIFIED BUT NOT TRANSMITTED



CIP CHECK DIGIT
VERIFIED AND TRANSMITTED



CHECK DIGIT NOT VERIFIED *



Caution:

The mode Check Digit Not Verified is not advised, missing characters can occur in case of incomplete scanning of a code.



START OF CONFIGURATION



END OF CONFIGURATION

3.4. UPC/EAN

This symbology is mainly used for retail applications. It has fixed lengths (8 or 12 characters for UPC, 8 or 13 characters for EAN) and uses a check digit as the last character and is only numeric. Two or five supplemental digits called Add-On can be added to the right hand side of the codes.

3.4.1. Types of UPC/EAN Authorized



ALL UPC/EAN CODES *



EAN 13 AUTHORIZED



UPC A AUTHORIZED



EAN 8 AUTHORIZED



UPC E AUTHORIZED



Note:

Several selections can be accumulated.

3.4.2. Transformations



UPC TRANSMITTED AS EAN *



UPC TRANSMITTED AS UPC



UPC E TRANSMITTED AS UPC E *



UPC E TRANSMITTED AS UPC A



START OF CONFIGURATION



END OF CONFIGURATION

3.4.3. Add-On Options

The Add-On is a group of 2 or 5 digits printed on the right hand side of a code which can be transmitted or not depending of the following settings:



ADD-ON NOT TRANSMITTED *



ADD-ON TRANSMITTED

If *Add-On Transmitted* is set, some conditions can be fixed:



ADD-ON MAY NOT BE PRESENT *



ADD-ON MUST BE PRESENT

If *Add-On Must Be Present* is selected, other conditions can be fixed:

On the type of Add-On accepted:



WITH 2 OR 5 CHARACTERS *



WITH 2 CHARACTERS ONLY



WITH 5 CHARACTERS ONLY

For specific applications with EAN 13 on magazines:

Code EAN 13 starting with the 3 digits 378 or 379 will be decoded only if the Add-On is available and correctly decoded.



DISACTIVATED *



ACTIVATED



START OF CONFIGURATION



END OF CONFIGURATION

3.4.4. Leading Prefixes for P.O.S. Systems

Leading characters can be transmitted with each code to inform the P.O.S. system with the type of UPC or EAN read.

The prefixes are: FF for EAN 8, F for EAN 13, A for UPC A, E for UPC E.



PREFIXES NOT TRANSMITTED *



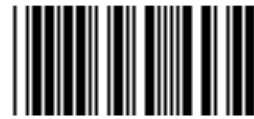
PREFIXES TRANSMITTED

3.4.5. Flag Option

The Flag is the first digit of the code. It can be transmitted or suppressed.



EAN 13 FLAG TRANSMITTED *



EAN 13 FLAG NOT TRANSMITTED



EAN 8 FLAG TRANSMITTED *



EAN 8 FLAG NOT TRANSMITTED



UPC A FLAG TRANSMITTED *



UPC A FLAG NOT TRANSMITTED



UPC E FLAG TRANSMITTED *



UPC E FLAG NOT TRANSMITTED



START OF CONFIGURATION



END OF CONFIGURATION

3.4.6. Check Digit Options



EAN 13 CHECK DIGIT TRANSMITTED *



EAN 13 CHECK DIGIT NOT TRANSMITTED



EAN 8 CHECK DIGIT TRANSMITTED *



EAN 8 CHECK DIGIT NOT TRANSMITTED



UPC A CHECK DIGIT TRANSMITTED *



UPC A CHECK DIGIT NOT TRANSMITTED



UPC E CHECK DIGIT TRANSMITTED *



UPC E CHECK DIGIT NOT TRANSMITTED

3.4.7. Product Code

The product code is represented by the last six digits (without the check digit) can be transmitted alone:



ALL CHARACTERS TRANSMITTED *



PRODUCT CODE ONLY

3.4.8. ISBN Conversion

This function converts UPC/EAN codes appearing on book into ISBN format.

The 3 leading digits and the check digit of UPC/EAN codes are suppressed and the remaining 9 digits are transmitted with the ISBN check digit calculated by the decoder.



UPC/EAN TRANSMITTED AS AN UPC/EAN *



UPC/EAN CONVERTED IN ISBN



START OF CONFIGURATION



END OF CONFIGURATION

3.5. Monarch/Codabar

The Codabar (or Monarch) is a very high reliable bar code which has been designed specially for medical applications such as blood bag identification.

Its character set contains numerics and four symbols.

3.5.1. Start/Stop



NOT TRANSMITTED *



TRANSMITTED



a b c d Small *



ABCD BLOCK

a, b, c, d are the different start/stop characters.

3.5.2. Concatenation



CONCATENATED *



STANDARD

This function permits the capture of two codes with only one scan. Codes must be close to one another and on the same "line".

Once captured, the two codes are assembled and transmitted as one message.



Note:

To operate this function correctly, the first code must end with the "d" stop character and the second code must start with the "d" start character. These two start/stop characters are cleared before transmission.



START OF CONFIGURATION



END OF CONFIGURATION

3.6. Code 128

This symbology offers a great flexibility with its three sets of characters:

- Set A: upper case alphanumeric characters and all ASCII control characters.
- Set B: upper and lower case alphanumeric characters and some symbols.
- Set C: numeric only but which a very high density of characters per inch.

Good quality printed codes are recommended due to the continuous structure (no gaps between characters) and the four types of bar and space widths.

It works with a modulo 103 check character as the last character.



Note:

The UCC/EAN 128 options are described on next page.

3.6.1. Check Character



VERIFIED BUT NOT TRANSMITTED *



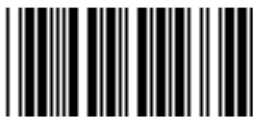
NOT VERIFIED BUT TRANSMITTED



VERIFIED AND TRANSMITTED

3.6.2. FNC2 Function

This function permits the temporary storage of a code in the decoder if this code starts with the FNC2 character. The message buffered will be concatenated and transmitted with next code having no FNC2 character.



FNC2 NOT ACTIVATED *



FNC2 ACTIVATED



START OF CONFIGURATION



END OF CONFIGURATION

3.7. UCC/EAN 128

This symbology is fully compatible with Code 128. The main difference between EAN 128 and conventional Code 128 is that EAN 128 codes always contain a reserved non-data character, function 1 (FNC1), as the first character after the start character. This FNC1 character acts also as a separator of fields in the code.

Example of code UCC/EAN 128 structure:

START	FNC1	ID – DATA 1	FNC1	ID – DATA 2	CK	STOP
--------------	-------------	--------------------	-------------	--------------------	-----------	-------------

START: Start character from set A, B or C

FNC1 : Separator character

ID : Identifier of type of data

CK : Check digit modulo 103

STOP : Stop character

The decoder detects an UCC/EAN 128 code when FNC1 is the leading character.

The transmission of the data string will be performed as follow:

] C1	ID – DATA 1	GS	ID – DATA 2
-------------	--------------------	-----------	--------------------

] C1 : Three characters representing the identifier of the code UCC/EAN 128

GS : ASCII character (1D hexa) acting as a separator



In Keyboard-Wedge mode, the character GS is transmitted as quotes " (22 hexa).

The character FNC1 can be transmitted or not using these codes:



3.8. Standard 2/5

This symbology is numeric only and uses the same encoding system as the code Interleaved 2/5 but only the bars are significant. The problem of reliability is also the same in case of incomplete scanning of a code so it has to be used with fix length(s).

3.8.1. Number of Lengths Authorized



To fix the number of characters per length, read one (or two) bar code label(s) having the desired length(s) after the decoder is turned on.



Note:

The length(s) are not saved after power-off.

3.8.2. Start/Stop Types

Two types of start/stop characters can be used, select the one corresponding to your application:



3.9. MSI

This symbology is mainly used in libraries to trace the loan of books. It is only numeric and due to its very simple encoding system it can be used only with fixed length or with variable lengths when including one or two check digits.

3.9.1. Variable or Fix Lengths



VARIABLE LENGTHS *



ONE FIXED LENGTH SET BY READING
A LABEL AFTER POWER-ON



Note:

The length is not saved after power-off.

3.9.2. Double Check Digit (Modulo 10)



VERIFIED BUT NOT TRANSMITTED *



VERIFIED AND BOTH TRANSMITTED



BOTH VERIFIED BUT ONLY
FIRST ONE TRANSMITTED



NOT VERIFIED

3.9.3. Single Check Digit (Modulo 10)



VERIFIED BUT NOT TRANSMITTED



VERIFIED AND TRANSMITTED



START OF CONFIGURATION



END OF CONFIGURATION

3.10. Plessey

This was the first bar code symbology invented in the UK during the early 70's to control the loan of library books.

The character set is numeric and its encoding system is very simple (thin bar = 0, large bar = 1). It can be only read with two check digits as last characters.



3.11. Telepen

Mainly used in UK, this symbology has two separated sets of characters; one is numeric and the other is alphanumeric. Use the codes below to activate the set desired.



3.12. Code 93

The 128 ASCII characters can be encoded using this symbology which is more dense than Code 39. Two check digits are always encoded as the last characters and are verified by the decoder but not transmitted.

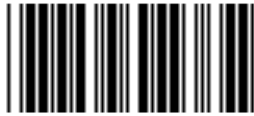
Its Multiread function permits the concatenation of codes in the decoder for those that start with a space character. These will be transmitted upon the reading of a code having no leading space character.



3.13. Matrix 2/5

This is a numeric and a more dense code than the Standard 2/5. Each character is encoded with three bars and two spaces. It is advised to use it with fixed lengths or with a check digit.

3.13.1. Types of Start/Stop



WITH 3 BARS *



START

STOP



WITH 2 BARS



START

STOP

3.13.2. Check Digit



VERIFIED AND TRANSMITTED *



VERIFIED BUT NOT TRANSMITTED



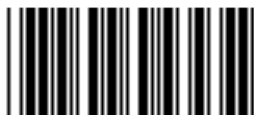
NOT VERIFIED



Caution:

The mode Check Digit Not Verified is not advised, missing characters can occur in case of incomplete scanning of a code.

3.13.3. Fixed or Variable Lengths



VARIABLE *



FIXED

In case that fixed lengths have been set, go to next page to adjust the number of characters per length.



START OF CONFIGURATION



END OF CONFIGURATION

3.13.4. Setting the Authorized Lengths



FIRST LENGTH SELECTED



ACCESS CODE
FIRST LENGTH

Enter the desired number of characters
using the *Numeric Pad* page 81



VALIDATION



SECOND LENGTH SELECTED



ACCESS CODE
SECOND LENGTH

Enter the desired number of characters
using the *Numeric Pad* page 81



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

3.14. IATA

This code is used by the airline and railway companies and are printed at the bottom of each ticket. It is in fact a Standard 2/5 code with 2 bar start/stop characters.

Once activated (see *Symbology Selection*, chapter 3.1), only codes with 15, 17, 19 or 21 characters can be decoded.

3.15. BC 412

This symbology has been developed by IBM and is reserved for IBM and authorized companies only. To decode it the decoder must be equipped with specific firmware available on request, accompanied with an authorization letter from IBM.

It uses a check digit being the second character in the code which is verified and transmitted or not depending of the option selected.



CHECK DIGIT NOT TRANSMITTED *



CHECK DIGIT TRANSMITTED

3.16. 3W7

Mainly used in Italy, this symbology has a set of 28 characters (numeric, letters A to F, a few symbols and ASCII control characters).

A check digit modulo 28 is used as the last character in the code which is always verified but not transmitted.



START OF CONFIGURATION



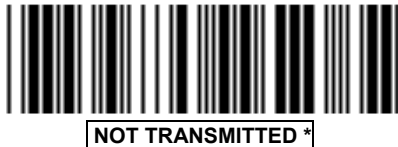
END OF CONFIGURATION

3.17. Leading Identifiers

They are characters added by the decoder to the leading positions of each code which inform the host system of the type of symbology decoded. For example, they can be used when several codes with different symbologies appear on a product or document.

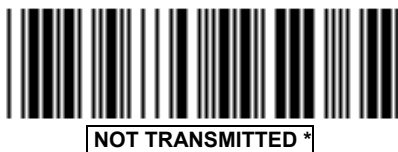
Two types of identifiers can be used:

3.17.1. Identifier with One Character



<i>Symbology</i>	<i>Identifier</i>	<i>Symbology</i>	<i>Identifier</i>
Code 39	A	Telepen	B
Pharmacode	S	Code 93	G
Interleaved 2/5	I	Matrix 2/5	Q
UPC/EAN	E	IATA	T
Monarch/Codabar	F	BC 412	U
Code 128	C	3W7	X
EAN 128	J	Reserved # 1	V
Standard 2/5	R	Reserved # 2	W
MSI	M	Reserved # 3	Y
Plessey	P		

3.17.2. Identifier with Three Characters



The first character is] (5D hexa), the second one identifies the type of symbology read, the third one indicates an option in the symbology. Please consult the AIM standard to obtain the complete list of identifiers.



START OF CONFIGURATION



END OF CONFIGURATION

3.18. Decoding Selectivity

This function can be used to fully optimize the reliability of decoding when poor printed codes are used.

Once activated, the decoder performs three data captures and three decodes then compares them before transmission.



MINIMUM SELECTIVITY *
(one capture, one decode)



MAXIMUM SELECTIVITY
(3 captures, 3 decodes)



START OF CONFIGURATION



END OF CONFIGURATION

Page intentionally left blank



START OF CONFIGURATION

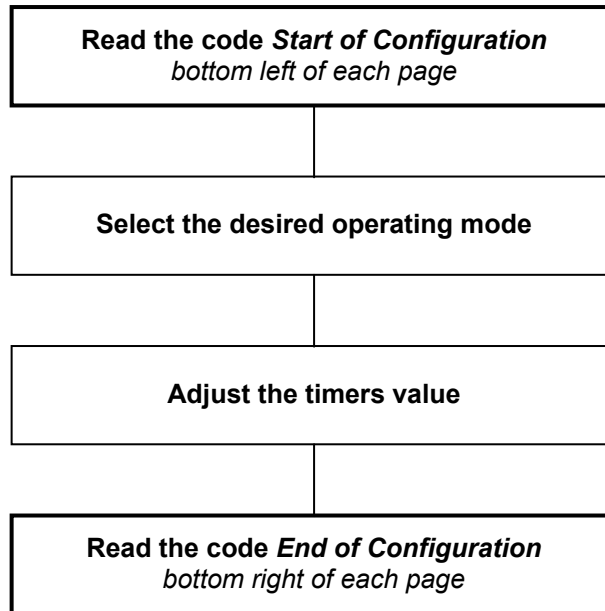


END OF CONFIGURATION

4. OPERATING MODES

The default operating mode of the IS1000 is the "Simple Acknowledgment".

Other operating modes can be selected by using the following sequence:



4.1. Simple Acknowledgment



- Timer T1 = 200 ms (default value). To configure it, see page 51.



START OF CONFIGURATION



END OF CONFIGURATION

4.2. Host System Acknowledgment



HOST SYSTEM ACKNOWLEDGMENT



ACK/NAK PROTOCOL ACTIVATED

- Timer T1 = 200 ms (default value). To configure it, see page 51.
- Timer T2 = 3 s (default value). To configure it, see page 52.
- Timer T3 = 2 s (default value). To configure it, see page 52.

4.3. On File / Not On File



ACTIVATED



DISACTIVATED



ON FILE / NOT ONFILE

- Timer T1 = 200 ms (default value). To configure it, see page 51.
- Timer T2 = 3 s (default value). To configure it, see page 52.
- Timer T3 = 2 s (default value). To configure it, see page 52.



START OF CONFIGURATION



END OF CONFIGURATION

4.3.1. Setting the On File Character

This function can be used to change the On File Character sends by the host.

By default: Character ~ (7E hexa).



ACCESS CODE
ON FILE CHARACTER

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION

4.3.2. Setting the Not On File Character

This function can be used to change the Not On File Character sends by the host.

By default: Character DEL (7F hexa).



ACCESS CODE
NOT ON FILE CHARACTER

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

4.4. Bell



ACTIVATED



DISACTIVATED



BELL

- Timer T1 = 200 ms (default value). To configure it, see page 51.
- Timer T2 = 3 s (default value). To configure it, see page 52.



START OF CONFIGURATION



END OF CONFIGURATION

4.5. Setting the Timers

<i>Operating Mode</i>	<i>Default Value</i>		
	<i>Timer T1</i>	<i>Timer T2</i>	<i>Timer T3</i>
Simple Acknowledgment	200 ms		
Host System Acknowledgment	200 ms	3 s	2 s
On File / Not On File	200 ms	3 s	2 s
Bell	200 ms	3 s	

4.5.1. Timer T1

Default value = 200 ms



ACCESS CODE TIMER T1

**Enter the desired value
using the *Numeric Pad* page 81**

(Step of 10 ms)

$10 \leq \text{value} \leq 254$



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

4.5.2. Timer T2

Default value = 3 s



ACCESS CODE TIMER T2

**Enter the desired value
using the *Numeric Pad* page 81**

(Step of 100 ms)

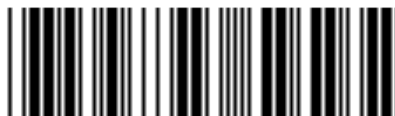
$10 \leq \text{value} \leq 254$



VALIDATION

4.5.3. Timer T3

Default value = 2 s



ACCESS CODE TIMER T3

**Enter the desired value
using the *Numeric Pad* page 81**

(Step of 100 ms)

$10 \leq \text{value} \leq 254$



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

5. EDITING MODE



START OF CONFIGURATION



END OF CONFIGURATION



START OF CONFIGURATION



END OF CONFIGURATION

6. APPENDIXES

6.1. Radio Parameters

6.1.1. Radio Channel

<i>Channel Number</i>	<i>Frequency</i>
1	433.4 MHz
2	433.6 MHz
3	433.8 MHz
4	434.0 MHz
5	434.2 MHz
6	434.4 MHz



CHANNEL 1



CHANNEL 2



CHANNEL 3*



CHANNEL 4



CHANNEL 5



CHANNEL 6



START OF CONFIGURATION



END OF CONFIGURATION

6.1.2. Number of Re-transmissions

Maximum number of bar code re-transmission attempts by the IS1000.



START OF CONFIGURATION



END OF CONFIGURATION

6.2. Adjustment of the Beep Sound

6.2.1. Laser Reader

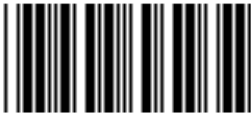


VOLUME HIGH *



VOLUME LOW

6.2.2. Radio Base



VOLUME HIGH *



VOLUME MEDIUM



VOLUME LOW



VOLUME OFF



DURATION LONG (120 ms) *



DURATION MEDIUM (60 ms)



DURATION SHORT (20 ms)



DURATION VERY SHORT (5 ms)



START OF CONFIGURATION



END OF CONFIGURATION

6.3. Preamble / Postamble

One or several characters (22 maximum) can be systematically added to each message as Preamble (leading positions) or as Postamble (ending positions) before transmission to the host system.

These characters can be chosen from the *Code 39 Full ASCII Table* (see appendix 6.10, page 70) when ASCII characters are required or from the *Code 39 Full ASCII Extended Table* (see appendix 6.8, page 65) to emulate function keys in Keyboard-Wedge mode.

6.3.1. Preamble Character



ACCESS CODE PREAMBLE BUFFER

**Enter the Preamble character(s)
using the *Code 39 Full ASCII Table* page 70 or
the *Code 39 Full ASCII Extended Table* page 65**

6.3.2. Postamble Character



ACCESS CODE POSTAMBLE BUFFER

**Enter the Postamble character(s)
using the *Code 39 Full ASCII Table* page 70 or
the *Code 39 Full ASCII Extended Table* page 65**

6.3.3. Clear Buffer

To clear a buffer, read the corresponding access code then read the code *Clear Buffer Pre-selected*.



CLEAR BUFFER PRE-SELECTED



START OF CONFIGURATION



END OF CONFIGURATION

6.4. Conversion of Characters

6.4.1. First Character

A first character can be converted into another defined by the user with the codes on this page (see next page for changing a second one).

Example:

The user wants to convert all Q characters found in an input message into A. Input message Q10Q234 will be changed into output message A10A234.



ACCESS CODE
FIRST CHARACTER TO BE CONVERTED

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION



ACCESS CODE
NEW CHARACTER DESIRED

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION



START OF CONFIGURATION



END OF CONFIGURATION

Read this code to clear a pre-programmed conversion of a first character.



CONVERSION OF FIRST CHARACTER
CLEARED



START OF CONFIGURATION



END OF CONFIGURATION

6.4.2. Second Character



ACCESS CODE
SECOND CHARACTER TO BE CONVERTED

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION



ACCESS CODE
NEW CHARACTER DESIRED

Enter the desired character
using the *Code 39 Full ASCII Table* page 70



VALIDATION

Read this code to clear a pre-programmed conversion of a second character.



CONVERSION OF SECOND CHARACTER
CLEARED



START OF CONFIGURATION



END OF CONFIGURATION

6.5. Rolling Buffer Mode

In this mode, the input data is first stored in the buffer of the decoder (up to 3K characters maximum) and transmitted to the host system at a rhythm fixed by the inter-message time-out selected on this page.

It can be useful when the data transmission speed to the host system is slow (specially in Keyboard-Wedge mode) while a group of bar code labels has to be read very quickly (example: carton on a conveyor...) or while a group of RS232 input messages has to be first collected before transmission to the host system.



NO TIME-OUT *



100 ms



200 ms



500 ms



700 ms



1 SECOND



1.5 SECONDS



2 SECONDS



3 SECONDS



5 SECONDS



7 SECONDS



10 SECONDS



START OF CONFIGURATION



END OF CONFIGURATION

6.6. Transmission of the Full ASCII Character Set

This function releases the transmission of the 96 printable ASCII characters (20 to 7F hexa) to the host system in any communication mode. The purpose of this function is to verify that all characters are correctly emulated by the decoder specially in Keyboard-Wedge mode.



ASCII TABLE TRANSMISSION ACTIVATED



START OF CONFIGURATION



END OF CONFIGURATION

6.7. Displaying the Firmware Level

Once the IS1000 radio base is connected to a host system with communication parameters correctly adjusted, the level of the firmware implemented in the IS1000 laser reader, radio base and its decoder can be displayed.



LASER READER AND RADIO BASE

The message will appear as follow:

Portable=X.XX - - Base=X.XX



RADIO BASE DECODER

The message will appear as follow:

FIRMWARE LEVEL: XXX.XX



START OF CONFIGURATION



END OF CONFIGURATION

6.8. Code 39 Full ASCII Extended Table



•A

FIELD EXIT



•B

FIELD ADVANCE



•C

ENTER



•D

SEND



•E

TAB -



•F

RETURN



•G

RESET, RESTORE



•H

HOME



•I

→



•J

←



•K

↑



•L

↓



•M

CLEAR



•N

F1



•O

F2



•P

F3



•Q

F4



•R

F5



•S

F6



•T

F7



•U

F8



•V

F9



•W

F10



•X

F11



•Y

F12



•Z

RESERVED

6.9. Multiread character Table



SPACE *



0



1



2



3



4



5



6



7



8



9



A



B



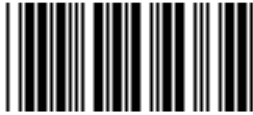
C



D



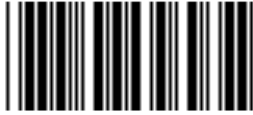
E



F



G



H



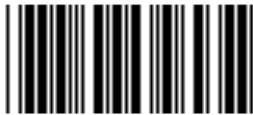
I



J



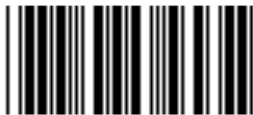
K



L



M



N



O



P



Q



R



S



T



U



V



W



X



Y



Z



-



.



*



\$



/



+



%

6.10. Code 39 Full ASCII Table

Translation and values of the bar codes which appear on the next pages.

ASCII	Code 39	Hexa Value
NUL	%U	00
SOH	\$A	01
STX	\$B	02
ETX	\$C	03
EOT	\$D	04
ENQ	\$E	05
ACK	\$F	06
BEL	\$G	07
BS	\$H	08
HT	\$I	09
LF	\$J	0A
VT	\$K	0B
FF	\$L	0C
CR	\$M	0D
SO	\$N	0E
SI	\$O	0F
DLE	\$P	10
DC1	\$Q	11
DC2	\$R	12
DC3	\$S	13
DC4	\$T	14
NAK	\$U	15
SYN	\$V	16
ETB	\$W	17
CAN	\$X	18
EM	\$Y	19
SUB	\$Z	1A
ESC	%A	1B
FS	%B	1C
GS	%C	1D
RS	%D	1E
US	%E	1F

ASCII	Code 39	Hexa Value
SP	Space	20
!	/A	21
"	/B	22
#	/C	23
\$	/D	24
%	/E	25
&	/F	26
'	/G	27
(/H	28
)	/I	29
*	/J	2A
+	/K	2B
,	/L	2C
-	-	2D
.	.	2E
/	/O	2F
0	0	30
1	1	31
2	2	32
3	3	33
4	4	34
5	5	35
6	6	36
7	7	37
8	8	38
9	9	39
:	/Z	3A
;	%F	3B
<	%G	3C
=	%H	3D
>	%I	3E
?	%J	3F

Translation and values of the bar codes which appear on the next pages.

<i>ASCII</i>	<i>Code 39</i>	<i>Hexa Value</i>
@	%V	40
A	A	41
B	B	42
C	C	43
D	D	44
E	E	45
F	F	46
G	G	47
H	H	48
I	I	49
J	J	4A
K	K	4B
L	L	4C
M	M	4D
N	N	4E
O	O	4F
P	P	50
Q	Q	51
R	R	52
S	S	53
T	T	54
U	U	55
V	V	56
W	W	57
X	X	58
Y	Y	59
Z	Z	5A
[%K	5B
\	%L	5C
]	%M	5D
^	%N	5E
_	%O	5F

<i>ASCII</i>	<i>Code 39</i>	<i>Hexa Value</i>
`	%W	60
a	+A	61
b	+B	62
c	+C	63
d	+D	64
e	+E	65
f	+F	66
g	+G	67
h	+H	68
i	+I	69
j	+J	6A
k	+K	6B
l	+L	6C
m	+M	6D
n	+N	6E
o	+O	6F
p	+P	70
q	+Q	71
r	+R	72
s	+S	73
t	+T	74
u	+U	75
v	+V	76
w	+W	77
x	+X	78
y	+Y	79
z	+Z	7A
{	%P	7B
	%Q	7C
}	%R	7D
~	%S	7E
DEL	%T	7F



NUL



SOH



STX



ETX



EOT



ENQ



ACK



BEL



BS



HT



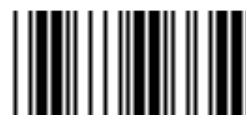
LF



VT



FF



CR



SO



SI



DLE



DC1



DC2



DC3



DC4



NAK



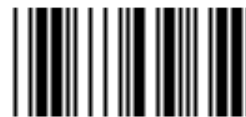
SYN



ETB



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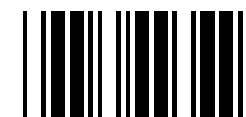
*



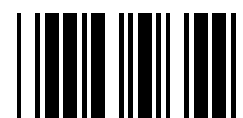
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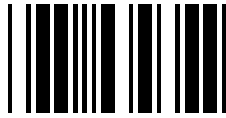
A



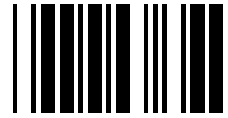
B



C



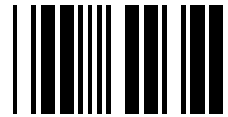
D



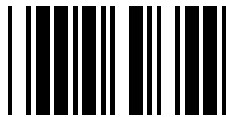
E



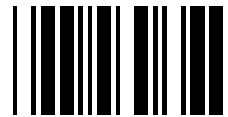
F



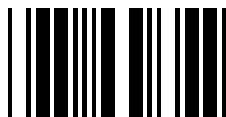
G



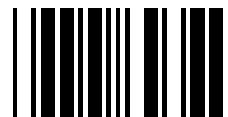
H



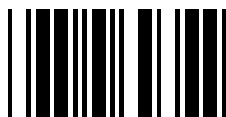
I



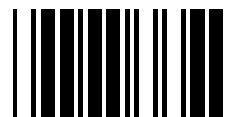
J



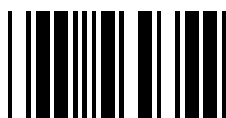
K



L



M



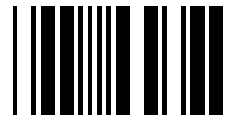
N



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Q



R



S



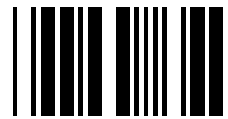
T



U



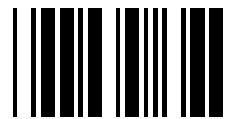
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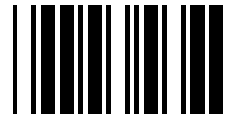
Page intentionally left blank

6.11. Numeric Pad

For entering variable data while configuration.



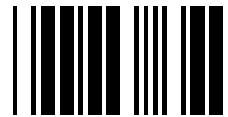
0



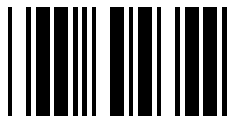
1



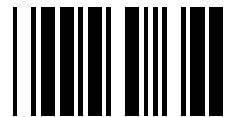
2



3



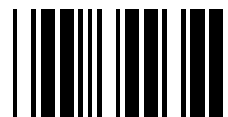
4



5



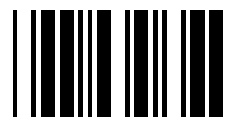
6



7



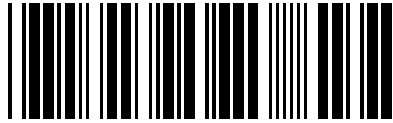
8



9

6.12. Samples of Bar Codes

CODE 39



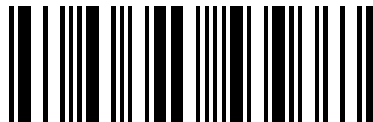
A123G

INTERLEAVED 2/5



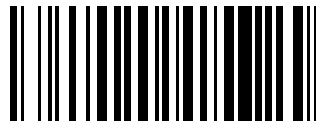
012345

CODABAR



a12345b

CODE 128



A1234

EAN 128



11940731 Lot 127

UPC E



UPC A



UPC A with ADD-ON of 5 characters



EAN 8



EAN 13



EAN 13 with ADD-ON of 5 characters



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