



ES4790i Embedded Image Scanner User Manual



Version: ES4790i_UM_EN_V1.0.4

Contents

Contents	i
Notes about structure and electric circuit design	iii
1 Specifications	4
1-1 Technical specifications	4
1-2 Default setting for each barcode	5
2 Getting started	6
2-1 Parts of scanner	6
2-2 Electrical interface/Pin assignment of cable connector	7
2-3 Typical input/output, LDO external, and DC/DC circuitries	9
2-4 Installation guide	10
2-4-1 Mounting	10
2-5 Notes of timing	11
2-5-1 Timing characteristics	11
2-5-2 Timing waveforms	11
2-6 Operation of Embedded Scanner	12
2-6-1 Request revision	12
2-6-2 Decode by pulling down pin TRIG	12
2-6-3 Decode by commands	13
3 Parameter menus	14
3-1 Introduction	14
3-2 Example: Single-parameter setting by scanning 1D barcodes	15
3-3 RS-232 interface	16
3-4 USB interface	19
3-5 Scan mode & some global settings	22
3-6 Indication	27
3-7 Decode illumination mode and Decode aiming pattern	28
Note 1 : The instruction of calibrating the aimer in vertical centering direction	30
Note 2 : Scan barcode or send command to enter upgrade mode	31
3-8 UPC-A	32
3-9 UPC-E	34
3-10 UPC-E1	36
3-11 EAN-13	38
3-12 EAN-8	40
3-13 Code 39 (Code 32, Trioptic Code 39)	42
3-14 Interleaved 2 of 5	45
3-15 Codabar	47
3-16 Code 128	49
3-17 UCC/EAN 128 (GS1-128)	51
3-18 ISBT 128	53
3-19 Code 93	55
3-20 G1-G4 & C1-C2 & FN1 substitution string setting	56
3-21 G1-G4 string position & Code ID position	60
3-22 String transmission	61
4 Serial Communication Interface (SCI)	64
4-1 Programming command syntax	65
4-1-1 Single-parameter setting	65

4-1-2 Multiple-parameter setting	66
4-1-3 Query command syntax.....	66
4-1-4 Start Decode & Stop Decode.....	67
4-1-5 Return default parameters & firmware revision	67
4-1-6 Get Image.....	68
4-1-7 Responses	68
4-2 Examples of setting and query commands	69
5 Enable & Disable “NR”	71
6 Enable & Disable configuration by scanning barcode.....	72
7 Barcode representing non-printable character.....	73
8 ASCII table.....	74
9 Test symbols.....	75
10 Return default parameters & firmware version.....	76
11 Configuration alphanumeric entry barcode	77

Notes about structure and electric circuit design

1. The embedded scanner must be electrically isolated.
2. Leave sufficient space to accommodate the maximum size of the embedded scanner.

1 Specifications

1-1 Technical specifications

Dimensions (L x W x H)	78 mm x 77.5 mm x 19.6 mm		
Weight	221 g (without cable)		
Case Material	Zinc alloy		
Scan Window Material	Tempered glass		
Indicator Interface	Beeper		
Interface Supported	RS-232 (3.3 V TTL-level), USB Keyboard, USB Virtual COM		
Trigger Mode	Handheld, Auto-detect, Command, Level		
Programming Method	Manual (reading special barcode)		
Firmware Upgrade	Online		
Input Voltage	5.0±0.25 VDC		
Current	Scanning: 250 mA; Standby: 130 mA		
Illumination LED	White LED(5700 K), Red LED		
Aiming LED	525 nm peak wavelength, green LED		
Image Size	1280 x 1024 pixels		
Scanner Field of View	WA: Horizontal: 64° , Vertical: 7° SR: Horizontal: 40° , Vertical: 7°		
Print Contrast	20% minimum reflective difference		
Decoding Capability	UPC-A, UPC-E, UPC-E1, EAN-13, EAN-8, ISBN (Bookland EAN), ISSN, Code 39, Code 39 full ASCII, Code 32, Trioptic Code 39, Interleaved 2 of 5, Codabar (NW7), Code 128, ISBT 128, Code 93, UCC/EAN 128 (GS1-128)		
Minimum Resolution	1D: 3 mil		
Decoding Depth		WA	SR
	3mil Code39 (3 chars)	0 mm – 90 mm	/
	5mil Code128 (12 chars)	0 mm – 110 mm	20 mm – 170 mm
	10mil Code 39 (3 chars)	0 mm – 140 mm	0 mm – 240 mm
	20mil Code 39 (3 chars)	0 mm – 190 mm	0 mm – 290 mm
Temperature	-20°C to 50°C (-4°F to 122°F), operating; -40°C to 70°C (-40°F to 158°F), storage		
Humidity	5% to 95% (non-condensing)		
Mechanical Vibration	IEC60068-2-6 Un-powered scanner withstands a random vibration along each of the X, Y and Z axes for a period of one hour per axis, define as follows: 20 Hz to 80 Hz Ramp up to 0.04 G ² /Hz at the rate of 3 dB/oct 80 Hz to 350 Hz 0.04 G ² /Hz 350 Hz to 2000 Hz Ramp down at the rate of 3 dB/oct		
Mechanical Shock	IEC60068-2-27 Shock pulse: 0.5 ms, Maximal acceleration: 1500 G, Shock direction & time: ± X-axis, ± Y-axis, ± Z-axis, 3 times for each direction, total of 18 times.		
Safety	Photobiological Safety: EN62471:2008 EMC: EN55032 ; EN55035 ESD Protection: contact discharge: ± 4 KV, air discharge: ± 8 KV Sealing: IP52 Drop Resistance: Withstands multiple 1.5 m (5 ft.) drops to concrete RF Immunity: IEC61000-4-3, 10 V/m Artificial Light Immunity: 100,000 lux		

1-2 Default setting for each barcode

Code type	Read enable	Check digit verification	Check digit transmission	Min. code length	Proprietary code ID	AIM code ID
UPC-A	√	√	√	(12) ²	A	JE0
UPC-E	√	√	√	(8) ²	D	JE0
UPC-E1	-	√	√	(8) ²	D	JE0
EAN-13	√	√	√	(13) ²	A	JE0
EAN-8	√	√	√	(8) ²	C	JE4
ISBN (Bookland EAN)	√	√	√	(13) ²	B	JE0
Code 39	√	-	-	1	M	JA0
Interleaved 2 of 5	√	-	-	6	I	JI0
Codabar	√	-	-	4	N	JF0
Code 128	√	√	-	1	K	JC0
UCC/EAN 128	√	√	-	1	K	JC1
ISBT 128	√	√	-	1	K	JC0
Code 93	√	√	-	1	L	JG0

2 Getting started

2-1 Parts of scanner



Figure 2-1 Appearance

2-2 Electrical interface/Pin assignment of cable connector

The embedded scanner has a RJ-45 cable connector. Table 2-1 lists the pin assignments of the embedded scanner.

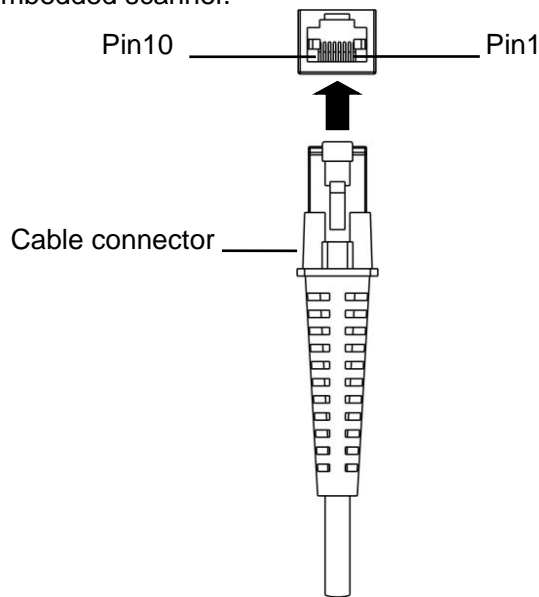


Figure 2-2 Electrical interface/Pin assignment

Table 2-1 Electrical interface/Pin assignment

Pin No.	RS-232		USB		Descriptions
	Pin/Signal Name	Type	Pin/Signal Name	Type	
1	Power (5V)	Power	Power (5V)	Power	Power: +5 VDC
2	NC	-	NC	-	NC: No connection
3	Ground	Power	Ground	Power	Ground: 0V reference
4	3.3V (for interface auto selection)	Input	Ground (for interface auto selection)	Input	RS-232: Logic high level, 3.3V USB: Logic low level, 0V reference
5	TXD	Output	NC	-	RS-232: Serial data transmit output port (Transmitted data)
6	RXD	Input	NC	-	RS-232: Serial data receive input port (Received data)
7	NC	-	NC	-	NC: No connection
8	TRIG	Input	TRIG	Input	Trigger. Logic low level (activity): 0V reference Logic high level: 3.3V
9	CTS	Input	D-	-	RS-232: Handshaking line (Clear-to-send). USB: Negative differential line.
10	RTS	Output	D+	-	RS-232: Handshaking line (Request-to-send). USB: Positive differential line.

Note: Voltage level of all RS-232 Pin-outs (RXD, TXD, CTS and RTS) is 0V for logic low level and 3.3V for logic high level.

The embedded scanner has a TTL-level RS-232 interface to communicate with a host. RTS and CTS are only used for hardware flow control and should be left unconnected or tied to V_{CC} by 100K Ohm resistors when they are not used.

The following diagram demonstrates the interconnection.

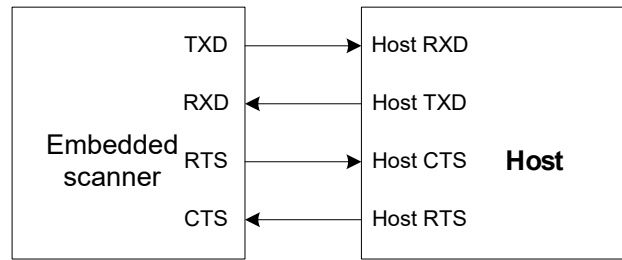


Figure 2-3 Embedded scanner and Host interconnection via RS-232

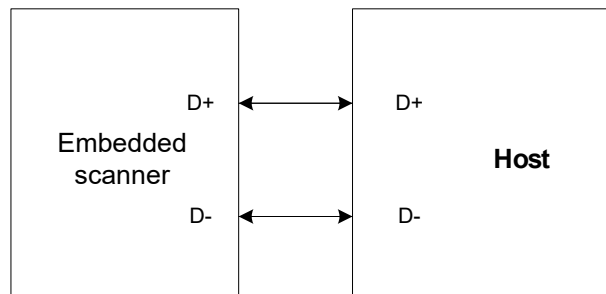
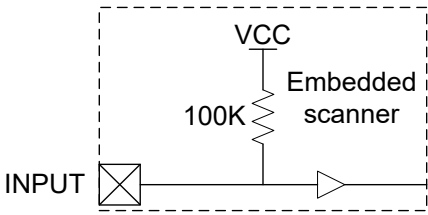
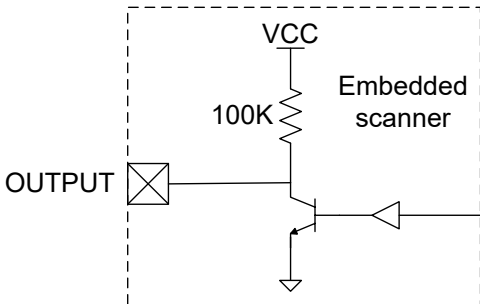
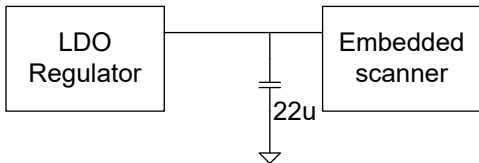
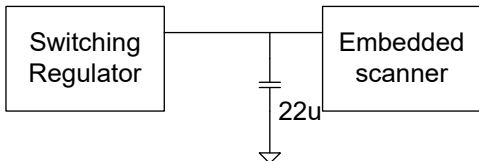


Figure 2-4 Embedded scanner and host interconnection via USB

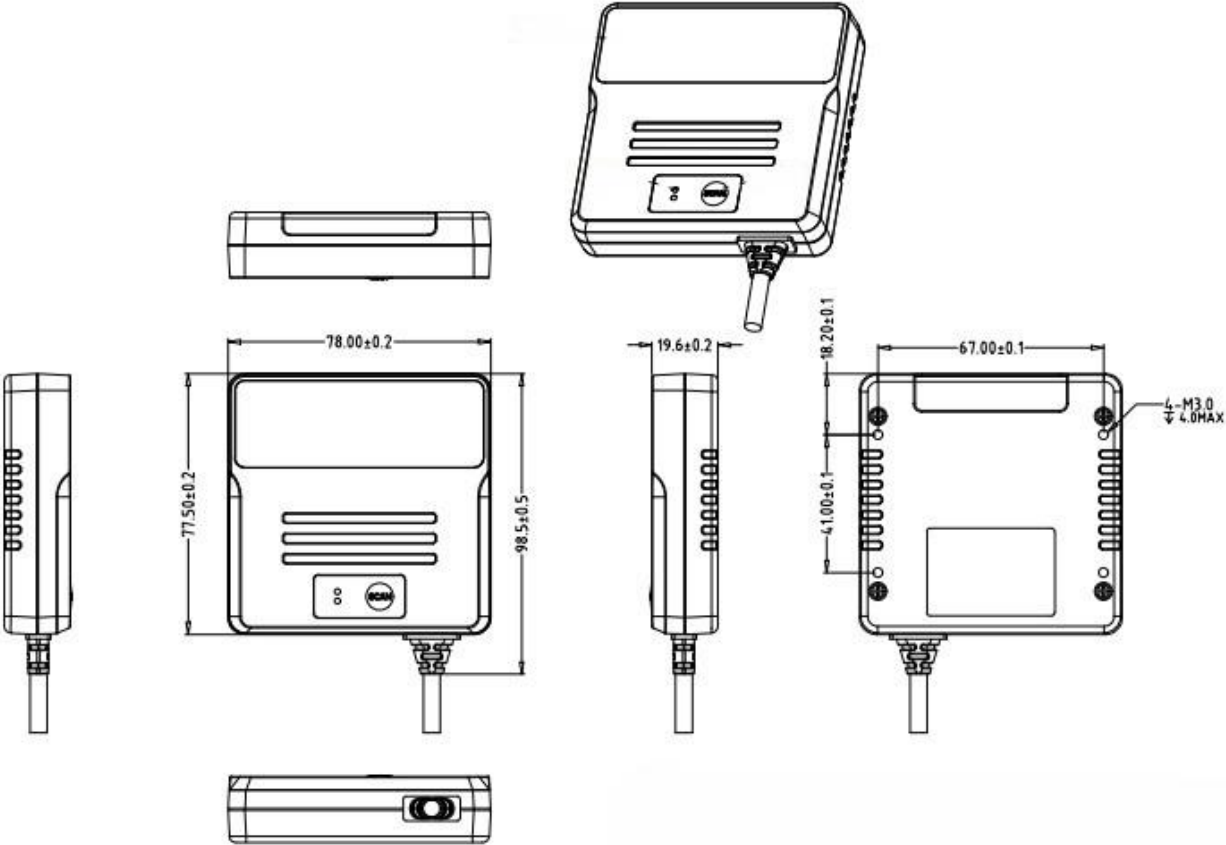
2-3 Typical input/output, LDO external, and DC/DC circuitries

<p>Input: each input IO pin is internally pulled up by a 100K Ohm resistor (VCC=3.3V).</p> <table><tr><td></td><td>Min.</td><td>Max.</td></tr><tr><td>V_{inL}</td><td>-0.3V</td><td>0.7V</td></tr><tr><td>V_{inH}</td><td>2.4V</td><td>3.6V</td></tr></table>		Min.	Max.	V _{inL}	-0.3V	0.7V	V _{inH}	2.4V	3.6V	
	Min.	Max.								
V _{inL}	-0.3V	0.7V								
V _{inH}	2.4V	3.6V								
<p>Output: each output port is an open-drain pad with a 100K Ohm pull-up resistor and the maximum sink current is 100 mA (VCC=3.3V).</p>										
<p>External LDO circuitry: it is recommended to apply low noise LDO (Low Dropout Voltage) regulators.</p>										
<p>External switching regulator circuitry:</p> <table><tr><td></td><td>Min.</td><td>Max.</td></tr><tr><td>Switching Frequency</td><td>1 MHz</td><td>-</td></tr><tr><td>Ripple V_{P-P}</td><td>-</td><td>50 mV</td></tr></table>		Min.	Max.	Switching Frequency	1 MHz	-	Ripple V _{P-P}	-	50 mV	
	Min.	Max.								
Switching Frequency	1 MHz	-								
Ripple V _{P-P}	-	50 mV								

2-4 Installation guide

2-4-1 Mounting

(Units = mm)



2-5 Notes of timing

2-5-1 Timing characteristics

Table 2-2 Timing characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
General characteristics						
t_r	Low to high rise time	$C_L=50\text{pf}$			1.0	us
t_f	High to low fall time	$C_L=50\text{pf}$			1.0	us
Trigger timing						
$t_{\text{trig_l}}$	Trigger low level hold time		20			ms
$t_{\text{trig_h}}$	Trigger high level hold time		20			ms
t_{dbt}	Trigger de-bounce time				1.1	ms
Wake up timing						
t_{idle2fo}	Idle to Operation				1	ms
t_{stb2fo}	Standby to Operation				7	ms

2-5-2 Timing waveforms

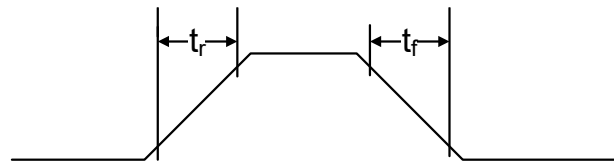


Figure 2-5 General characteristics

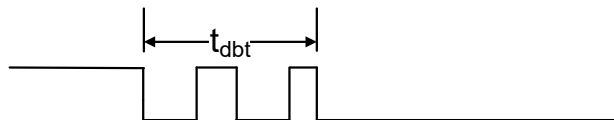


Figure 2-6 Trigger de-bounce timing

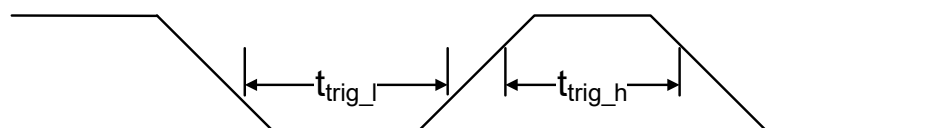


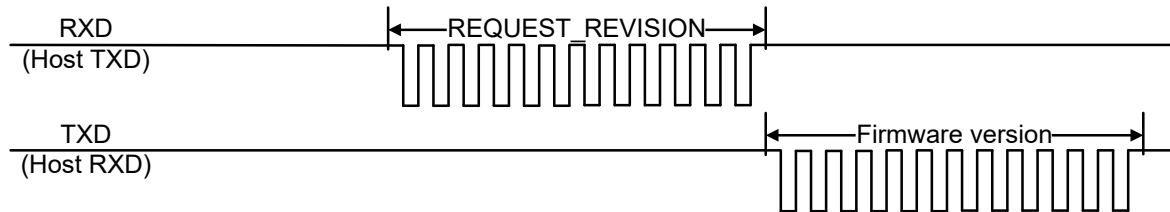
Figure 2-7 Hardware trigger timing

2-6 Operation of Embedded Scanner

The following cases demonstrate how a host operates an embedded scanner quickly and easily.

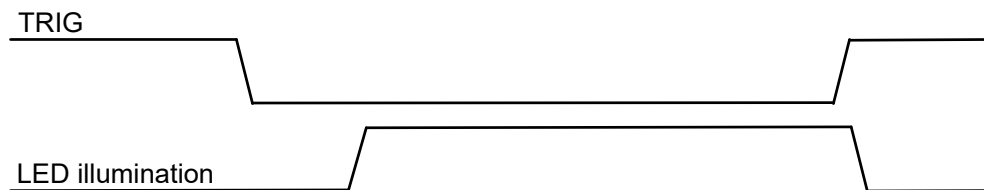
2-6-1 Request revision

- 1) Host sends a Firmware Version list command (0x16, 0x4D, 0x0D, 0x25, 0x25, 0x25, 0x56, 0x45, 0x52, 0x2E).
- 2) After receiving the command, Embedded Scanner responds with firmware version.



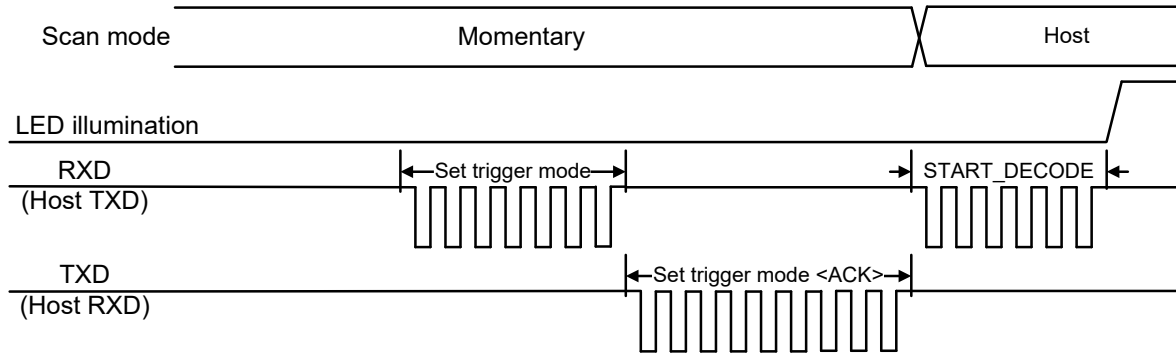
2-6-2 Decode by pulling down pin TRIG

- 1) Host pulls down pin TRIG.
- 2) Then Embedded Scanner turns on LED illumination and starts decode. The LED illumination will be turned off if either Scan standby duration expires or Embedded Scanner succeeds in decoding.



2-6-3 Decode by commands




- 1) Host sends a command (0x16, 0x4D, 0x0D, 0x30, 0x34, 0x30, 0x31, 0x44, 0x30, 0x35, 0x2E) to set Scan mode to Host.
- 2) Then Embedded Scanner responses with the received command and a <ACK> (0x06) character, and then change Scan mode to Host.
- 3) After receiving the <ACK> character, Host sends a START_DECODE command (0x16, 0x54, 0x0D).
- 4) Embedded Scanner turns on LED illumination to decode. The LED illumination will be turned off if either Scan standby duration expires or Embedded Scanner succeeds in decoding. A STOP_DECODE command (0x16, 0x55, 0x0D) can end decode process.



3 Parameter menus

3-1 Introduction

This section describes the programmable parameters, to change the parameter values.

-  Refer to [3-2 Example : Single-parameter setting by scanning 1D barcodes](#), scan the appropriate barcodes included in this section, The new values replace the existing values.
-  To set the new values as custom default settings, scan the Write to Custom Defaults barcode. The factory default settings or custom default settings can be recalled by scanning appropriate barcodes, refer to [10 Return default parameters & firmware version](#).
-  Send parameters through the TTL-level RS-232 or USB virtual COM interface. Instructions of programming and querying the embedded scanner are described in [4-1 Programming command syntax](#).

3-2 Example: Single-parameter setting by scanning 1D barcodes

Important notes:

1. After each successful programming, the embedded scanner will beep twice.
2. Throughout the programming barcode menus, **the factory default settings are indicated with asterisks (*)**.

Two programming modes have been provided as bellows:

❶ Single-scan setting

- Scan the appropriate **Single-scan setting** (e.g. **%0101D00%**) according to the user's demand.

Example: To set **Flow control** to be XON/XOFF.

Steps: Scan the following barcode.



%0301D03%

❷ Multiple-scan setting

- Step 1. Scan the **Option barcode** (e.g. **%0101M%**) according to the user's demand.
- Step 2. To the right of the option barcode, the necessary alphanumeric inputs are listed. Scan two alphanumeric entries from **0** to **9** or **A** to **F**, refer to [11 Configuration alphanumeric entry barcode](#).
- Step 3. Repeat Step 2, if more user parameters input are required.
- Step 4. Scan the **%END%** barcode, listed on the lower left hand corner of each parameter setting part.

Example: To set **Flow control** to be XON/XOFF.

Steps: Scan the following barcodes in order.



%0301M%



0



3



%END%

3-3 RS-232 interface

Flow control:

None - The communication only uses TXD and RXD signals without any hardware or software handshaking protocol.

RTS/CTS – If the embedded scanner wants to send the barcode data to the host, it will assert the RTS signal first, and then waits for the CTS signal from the host to perform normal data communication. If CTS is not asserted in Response delay, the embedded scanner will issue an error indication.























Two-direction flow control - The embedded scanner asserts the RTS signal when it is OK for the host to transmit. The host asserts CTS when it is OK for the device to transmit.
















XON/XOFF – An <XOFF> character turns the embedded scanner's transmission off until the embedded scanner receives an <XON> character.

ACK/NAK – After transmitting data, the embedded scanner expects either an <ACK> character (acknowledge) or <NAK> character response from the host. When a <NAK> character is received, the embedded scanner transmits the same data again and waits for either an <ACK> character or <NAK> character. After three unsuccessful attempts to send data when <NAK> characters are received the embedded scanner issues an error indication and discards the data.

Inter-character delay: This delay is inserted after each data character transmitted.

Response delay: This delay is used for serial communication of the embedded scanner when it waits for a handshaking acknowledgment from the host.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Flow control  %0301M%	None	00*	 %0301D00% *
	RTS/CTS	01	 %0301D01%
	Two-direction flow control	02	 %0301D02%
	XON/XOFF	03	 %0301D03%
	ACK/NAK	04	 %0301D04%
Inter-character delay  %0302M%	0 ms	00*	 %0302D00% *
	5 ms	01	 %0302D01%
	10 ms	02	 %0302D02%
	20 ms	03	 %0302D03%
	40 ms	04	 %0302D04%
	80 ms	05	 %0302D05%
Response delay  %0304M%	00-99 (100 ms)	00-99	
		00*	 %0304D00% *
Baudrate  %0305M%	300	00	 %0305D00%
	600	01	 %0305D01%
	1200	02	 %0305D02%
	2400	03	 %0305D03%
	4800	04	 %0305D04%
	9600	05*	 %0305D05% *

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
	19200	06	 %0305D06%
	38400	07	 %0305D07%
	57600	08	 %0305D08%
	115200	09	 %0305D09%
Parity bit  %0306M%	None	00*	 %0306D00% *
	Odd	01	 %0306D01%
	Even	02	 %0306D02%
Data bit  %0307M%	8 bits	00*	 %0307D00% *
	7 bits	01	 %0307D01%
Stop bit  %0308M%	1 bit	00*	 %0308D00% *
	2 bits	01	 %0308D01%
 %END%			

3-4 USB interface

USB device type:

HID keyboard – By setting, the embedded scanner is used as a USB HID keyboard emulation device.

USB Virtual COM – By setting, the embedded scanner emulates a regular RS-232-based COM port.

If a Microsoft Windows PC is connected to the embedded scanner, a driver is required to install on the connected PC. The driver will use the next available COM Port number. The driver and the installation guide can be found in the associated CD and on the manufacturer's website. A Windows-based software COM_Text is recommended to display the barcode data in text format. COM_Text emulates some kind of serial-key typing.

Simple COM Port Emulation - Please contact the manufacturer for the instruction.

Notes:

1) When change USB Device Type, the embedded scanner automatically restarts.

2) USB Device Type will be changed to USB virtual COM if Scan Mode is set as Host. Besides, the change of USB Device Type from the USB virtual COM to others is forbidden when Scan Mode is Host.

Keyboard layout: The embedded scanner supports different national keyboard layouts.

Inter-character delay: This delay is inserted after each data character transmitted. By selecting, the user can change the output speed of the embedded scanner to match the speed of the host USB communication port.














Numeric key:





















Alphabetic key - The embedded scanner will output code result as alphabetic key.

Numeric key - The embedded scanner will output code result as pressing numeric keypad ('0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '.', '+', '-', '/', '*' only).

Alt+ keypad - The embedded scanner will output code result as pressing Alt+ numeric key (on keypad). Note that the Num Lock control key must be ON. This setting can be specially adapted for use with different national keyboard layout.

USB function code: It can support the output and prohibition of non-printable-characters, as well as the output and prohibition of function codes corresponding to non-printable-characters.

Multiple-scan setting			Single-scan setting
Option bar code	Option	Alpha. entry	
USB device type  %0901M%	HID keyboard	00*	 %0901D00% *
	HID keyboard for Apple Mac	01	 %0901D01%
	USB virtual COM	02	 %0901D02%
	Simple COM Port Emulation	03	 %0901D03%
Keyboard layout  %0902M%	USA	00*	 %0902D00% *
	Turkish F	01	 %0902D01%
	Turkish Q	02	 %0902D02%
	French	03	 %0902D03%
	Italian	04	 %0902D04%
	Spanish	05	 %0902D05%
	Slovak	06	 %0902D06%
	Denmark	07	 %0902D07%
	Japanese	08	 %0902D08%
	German	09	 %0902D09%
	Belgian	10	 %0902D10%
	Russian	11	 %0902D11%
	Czech	12	 %0902D12%
	Thai	13	 %0902D13%
	Hungary	14	 %0902D14%

Multiple-scan setting			Single-scan setting
Option bar code	Option	Alpha. entry	
	Swiss German	15	 %0902D15%
	Portugal	16	 %0902D16%
Inter-character delay  %0903M%	0 ms	00	 %0903D00%
	5 ms	01*	 %0903D01% *
	10 ms	02	 %0903D02%
	20 ms	03	 %0903D03%
	40 ms	04	 %0903D04%
	60 ms	05	 %0903D05%
Numeric key  %0904M%	Alphabetic key	00*	 %0904D00% *
	Numeric keypad	01	 %0904D01%
	Alt + keypad	02	 %0904D02%
	GBK	03	 %0904D03%
	BIG5	04	 %0904D04%
	THAI	05	 %0904D05%
USB function code  %0905M%	Output non-printing characters	00	 %0905D00%
	Output function codes corresponding to non-printable-characters.	01*	 %0905D01% *
	Prohibition output of non-printable-character	03	 %0905D03%
 %END%			

3-5 Scan mode & some global settings

Scan mode:

Good-read off – The trigger pin must be pulled down once to activate scanning. The scanner stops scanning when there is a successful reading or no code is decoded after the Scan standby duration elapsed.

Momentary – Pin TRIG acts as a switch. Pull down pin TRIG to activate scanning and pull up the trigger to stop scanning. The scanner stops scanning when there is a successful reading or no code is decoded after the Scan standby duration elapsed.

Alternate – Pin TRIG acts as a toggle switch. Pull pin TRIG to activate or stop scanning.

Continuous – The embedded scanner always keeps scanning, and it does not matter when pin TRIG is pulled down or Scan standby duration is elapsed.

Host – A START_DECODE command issues the triggering signal. In this mode, the embedded scanner interprets an actual trigger pull as a Good-read off scanning option. There is a practical application in [2-6-4 Decode by commands](#).

Good-read on – The trigger pin must be pulled down once to activate scanning. The scanner stops scanning when no code is decoded after the Scan standby duration elapsed.

Auto-detection- Good-read on – By setting Enable, the scanner will start scanning if any nearby object has been detected. The scanner stops scanning when no code is successful decoded after the Stand-by duration elapsed. Once the scanner stops scanning, the present object must be removed to enable Auto-detection.

Auto-detection- Good-read off – By setting Enable, the scanner will start scanning if any nearby object has been detected. The scanner will stop scanning when there is a successful reading or no code is decoded after the Stand-by duration elapsed. Once the scanner stops scanning, the present object must be removed to enable Auto-detection.

Desktop - The embedded scanner always keeps scanning, and it does not matter when pin TRIG is pulled down or Scan standby duration is elapsed. When the scanner remains motionless and the barcode is moved for decoding, the decoding speed can be improved.

Same barcode delay time for 1D symbol: If a 1D barcode has been scanned and output once successfully, the scanner must output the same barcode data beyond delay time. When this feature is set to be "0xFF", then the delay time is indefinite.

Double confirm: If it is enabled, the scanner will require a several times of same-decoded-data to confirm a valid reading.

Global Max./Min. code length for 1D symbol: These two lengths are defined as the valid range of decoded 1D barcode data length. Make sure that the minimum length setting is no greater than the maximum length setting, or otherwise the labels of the symbol will not be readable. In particular, the same value can be set for both minimum and maximum reading length to force the fixed length barcode decoded.

Notes:

1. Please set the max./min. length for individual barcode in later sections, if special demand is requested.

2. The number of check digits is included in max./min. code length.

3. These two settings have no effect on the symbols with fixed-length, e.g. UPC-A, UPC-E, EAN-13, EAN-8 and China Post.

Global G1-G4 string selection: The scanner offer one or two string group for all symbols. By setting one or two digits to indicate which string group you want to apply. You may refer to [3-20 G1-G4 & C1-C2 & FN1 substitution string setting](#) and [3-21 G1-G4 string position & Code ID position](#).

Example: Group 1 → set 01 or 10. Group 2 and 4 → set 24 or 42.

All valid settings include 00, 01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 30, 31, 32, 33, 34, 35, 36, 40, 41, 42, 43, 44, 45, 46, 50, 51, 52, 53, 54, 55, 56, 60, 61, 62, 63, 64, 65 and 66.

Element amendment: If it is enabled, the scanner can read the barcode comprised with bars and spaces in different scale.

Decoder optimization: If it is enabled, the scanner will optimize the decoder with error correction. This function is not effective for all types of barcode.

Character encoding system: A character encoding system consists of a code that pairs each character from a given repertoire. Common examples include Morse code, the Baudot code, the ASCII and Unicode. If the data received does not display with the proper characters (domestic language, e.g. Chinese), it maybe because the barcode being scanned was created using a character encoding system that is different from the one the host program is expecting. Try alternate options to find the proper one.

Complete data output before next decode attempt: This setting is active only when USB device type

is set as “HID keyboard” or “HID keyboard for Apple Mac”, refer to [3-5 USB interface](#). If it is enabled, the scanner will not start next decode attempt until previous data output is completed.

Sleep mode: If it is enabled, the scanner will go to sleep when no code is successful decoded after the Sleep mode delay elapsed.







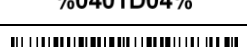
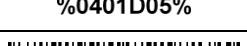
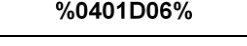
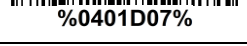




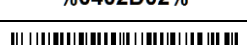
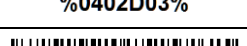
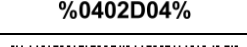
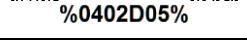
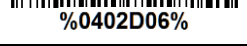
Sleep mode delay: When no code is successful decoded beyond this time, the scanner will go to sleep.
























Mobile decoding speed mode:





























Normal mode offers good scan speed and the longest working ranges (depth of field).







Enhanced mode will give you the highest possible scan speed but slightly less range than Normal mode.

Enhanced mode is best used when you require a very fast scan speed and don't require a long working range.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Scan mode  %0401M%	Good-read off	00	 %0401D00%
	Momentary	01	 %0401D01%
	Alternate continue	02	 %0401D02%
	Continue	03	 %0401D03%
	Time-out off	04	 %0401D04%
	Host	05	 %0401D05%
	Auto-detection- Good-read on	06	 %0401D06%
	Auto-detection- Good-read off	07	 %0401D07%
	Desktop	11*	 %0401D11% *
Standby duration  %0402M%	4 seconds	00*	 %0402D00% *
	8 seconds	01	 %0402D01%
	16 seconds	02	 %0402D02%
	24 seconds	03	 %0402D03%
	30 seconds	04	 %0402D04%
	1 minute	05	 %0402D05%
	1.5 minutes	06	 %0402D06%
	2 minutes	07	 %0402D07%

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
	5 minutes	08	 %0402D08%
	7 minutes	09	 %0402D09%
	10 minutes	10	 %0402D10%
	15 minutes	11	 %0402D11%
	20 minutes	12	 %0402D12%
	30 minutes	13	 %0402D13%
	45 minutes	14	 %0402D14%
	1 hour	15	 %0402D15%
Same barcode delay time for 1D symbol  %0403M%	00-FF ₁₆ (50 ms)	00-FF ₁₆	
		00	 %0403H00%
		08*	 %0403H08% *
Double confirm  %0404M%	00-09 (00: no)	00-09	
		00*	 %0404D00% *
Global max. code length for 1D symbol  %0405M%	01-99	01-99	
		99*	 %0405D99% *
Global min. code length for 1D symbol  %0406M%	01-99	01-99	
		04*	 %0406D04% *
Global G1-G4 string selection  %0407M%	00-66	00-66	
		00*	 %0407D00% *
Element amendment  %0408M%	Disable	00	 %0408D00%
	Enable	01*	 %0408D01% *
Decoder optimization	Disable	00	 %0410D00%

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
 %0410M%	Enable	01*	 %0410D01% *
Character encoding system  %0413M%	ASCII	00*	 %0413D00% *
	UTF-8	01	 %0413D01%
	Windows-1251	02	 %0413D02%
	Simplified Chinese	03	 %0413D03%
	Traditional Chinese	04	 %0413D04%
	Windows-1250	05	 %0413D05%
	KOI8R	06	 %0413D06%
	Japanese	07	 %0413D07%
Complete data output before next decode attempt  %0414M%	Disable	00*	 %0414D00%
	Enable	01	 %0414D01%
Sleep mode  %0416M%	Disable	00	 %0416D00%
	Deep sleep	01	 %0416D01%
	Idle mode	02	 %0416D02%
	Shallow sleep	03*	 %0416D03% *
Sleep mode delay  %0412M%	1 second	00	 %0412D00%
	5 seconds	01	 %0412D01%
	10 seconds	02	 %0412D02%
	30 seconds	03	 %0412D03%
	60 seconds (1 minute)	04	 %0412D04%
	300 seconds (5 minutes)	05*	 %0412D05% *
	600 seconds (10 minutes)	06	 %0412D06%
	1800 seconds (30 minutes)	07	 %0412D07%

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
	3600 seconds (1 hour)	08	 %0412D08%
	10800 seconds (3 hours)	09	 %0412D09%
Mobile decoding speed mode  %0431M%	Normal	00*	 %0431D00% *
	Enhanced	01	 %0431D01%
 %END%			

3-6 Indication

Power on alert: After power-on the embedded scanner will generate an alert signal to indicate a successful self-test.

Beeper indication: After each successful reading, the embedded scanner will beep to indicate a good barcode reading, and its beep tone duration is adjustable.

Volume of beeper: This parameter can be adjusted for different level of the volume of the beeper.

Duration of successful decoding: This parameter can be adjusted for a good reading upon favorite usage.

Tone of beeper: This parameter can be adjusted for a favorite ring tone.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Power on alert  %0501M%	Disable	00	 %0501D00%
	Enable	01*	 %0501D01% *
Beeper indication  %0503M%	Disable	00	 %0503D00%
	Enable	01*	 %0503D01% *
Duration of successful decoding  %0504M%	01-99 (10 ms)	01-99	
		05*	 %0504D05% *
Volume of beeper  %0505M%	Low	00	 %0505D00%
	Middle	01	 %0505D01%
	High	02*	 %0505D02% *
Tone of beeper  %0506M%	Low	00	 %0506D00%
	Middle	01	 %0506D01%
	High	02*	 %0506D02% *
 %END%			

3-7 Decode illumination mode and Decode aiming pattern

Decode illumination mode: Enable illumination causes the embedded scanner to turn on the illumination to aid decoding. Disable illumination to turn off illumination for the embedded scanner during decoding. Better quality images could be obtained with illumination support. The effectiveness of the illumination decreases as the distance to the target increases.




Decode aiming pattern: When this option is enabled, the embedded scanner will project the aiming pattern during the code capture.

Level of decode illumination: This parameter can be adjusted for different level of decode illumination.

Decoding light source: By changing the Settings and adjusting the color of the decoding light source, you can help the scanner to obtain better images, improve decoding performance.

Decoding light source: By changing the Settings and adjusting the color of the decoding light source, you can help the scanner to obtain better images, improve decoding performance.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Decode illumination mode  %9001M%	Always Off	00	 %9001D00%
	Always On	01	 %9001D01%
	On when reading	03*	 %9001D03% *
Decode aiming pattern  %9002M%	Always off	00	 %9002D00%
	Always on	01	 %9002D01%
	On before reading	02	 %9002D02%
	On when reading	03*	 %9002D03% *
Level of decode illumination  %9003M%	Low	01	 %9003D01%
	Middle	02	 %9003D02%
	High	03*	 %9003D03% *
Holding time of aiming light on  %9004M%	00-99 (1s)	00-99	
		01*	 %9004D01% *
Decoding light source	G1 fill light source	00	 %9005D00%


 %9005M%	G2 fill light source	01*	 %9005D01% *
 %END%			

Note 1 : The instruction of calibrating the aimer in vertical centering direction

1. Scan the barcode on this page. The scanner will give three musical short beeps to indicate entering calibration mode.
2. Press the trigger of the scanner while maintaining the distance of about 15cm between the scan window of the scanner and this paper. After a few seconds, the scanner will give three short beeps to indicate a successful calibration, or a long beep to indicate a failed calibration.
3. If the calibration is failed in step 2, please repeat the steps 1-2. If it is not succeed after a multiple times of calibration, please contact your local dealer or the manufacturer for further instruction.



Note 2 : Scan barcode or send command to enter upgrade mode

Scan barcode to enter upgrade mode	 %NMUGD
Send command to enter upgrade mode	Send command 0x16 0x4D 0x0D 0x25 0x4E 0x4D 0x55 0x47 0x44 0x2E by USB virtual COM or RS232 COM.

3-8 UPC-A

Read:

Format

System character	Data digits (10 digits)	Check digit
------------------	-------------------------	-------------

Check digit verification: The check digit is optional.

Check digit trans.: By setting Enable, check digit will be transmitted.

Code ID setting: Code ID is a one-two-character string used to represent the symbol upon a succeeding reading. If you want application to transmit Code ID, you must set **Code ID transmission** to be enabled. Refer to [3-42 String transmission](#).

Insertion group selection: Refer to **Global insertion group selection** of [3-6 Scan mode & some global settings](#).

Supplement digits: The Supplement digits barcode is the supplemental 2 of 5 characters.

Format

System character	Data digits (10 digits)	Check digit	Supplement digits 2 of 5
------------------	-------------------------	-------------	--------------------------

Truncation/Expansion:

Truncate leading zeros - The leading "0" digits of UPC-A data characters can be truncated when the feature is enabled.

Example: Barcode "001234567895",

Output: "1234567895".

Expand to EAN-13 - It extends to 13-digits with a "0" leading digit when the feature is enabled.

Example: Barcode "001234567895",

Output: "0001234567895".

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1101M%	Disable	00	 %1101D00%
	Enable	01*	 %1101D01% *
Check digit verification  %1102M%	Disable	00	 %1102D00%
	Enable	01*	 %1102D01% *
Check digit trans.  %1103M%	Disable	00	 %1103D00%
	Enable	01*	 %1103D01% *
Code ID setting  %1104M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<A>*	 %1104H41% *
Insert group selection  %1105M%	00-66	00-66	
		00*	 %1105D00% *
Supplement digits  %1106M%	None	00*	 %1106D00% *
	2 digits	01	 %1106D01%
	5 digits	02	 %1106D02%
	2 or 5 digits	03	 %1106D03%
Truncation/Expansion  %1107M%	None	00*	 %1107D00% *
	Truncate leading zeros	01	 %1107D01%
	Expand to EAN-13	02	 %1107D02%
 %END%			

3-9 UPC-E

Read:

Format

System character "0"	Data digits (6 digits)	Check digit
----------------------	------------------------	-------------

Check digit verification: The check digit is optional.

Check digit trans.: By setting Enable, check digit will be transmitted.

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Supplement digits:

Format

System character "0"	Data digits (6 digits)	Check digit	Supplement digits 2 of 5
----------------------	------------------------	-------------	--------------------------

Truncation/Expansion:

Truncate leading zeros - The leading "0" digits of UPC-E data characters can be truncated when the feature is enabled.

Example: Barcode "00123457",

Output: "123457".

Expand to EAN-13 - It extends to 13-digits with a "0" leading digit when the feature is enabled.

Example: Barcode "00123457",

Output: "0001234000057".

Expand to UPC-A - It extends to 12-digits when the feature is set to be enabled.

Example: Barcode "00123457",

Output: "001234000057".

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1201M%	Disable	00	 %1201D00%
	Enable	01*	 %1201D01% *
Check digit verification  %1202M%	Disable	00	 %1202D00%
	Enable	01*	 %1202D01% *
Check digit trans.  %1203M%	Disable	00	 %1203D00%
	Enable	01*	 %1203D01% *
Code ID setting  %1204M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<D>*	 %1204H44% *
Insert group selection  %1205M%	00-66	00-66	
		00*	 %1205D00% *
Supplement digits  %1206M%	None	00*	 %1206D00% *
	2 digits	01	 %1206D01%
	5 digits	02	 %1206D02%
	2 or 5 digits	03	 %1206D03%
Truncation/Expansion  %1207M%	None	00*	 %1207D00% *
	Truncate leading zeros	01	 %1207D01%
	Expand to EAN-13	02	 %1207D02%
	Expand to UPC-A	03	 %1207D03%
 %END%			

3-10 UPC-E1

Read:

Format

System character "1"	Data digits (6 digits)	Check digit
----------------------	------------------------	-------------

Check digit verification: The check digit is optional.

Check digit trans.: By setting Enable, check digit will be transmitted.

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Supplement digits:

Format

System character "1"	Data digits (6 digits)	Check digit	Supplement digits 2 of 5
----------------------	------------------------	-------------	--------------------------

Truncation/Expansion:

Expand to EAN -13 - It extends to 13-digits with "0" digits when the feature is enabled.


Example: Barcode "10012341",

Output: "0100120000031".

Expand to UPC-A - It extends to 12-digits when the feature is set to be enabled.

Example: Barcode "10012341",

Output: "100120000031".

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %3401M%	Disable	00*	 %3401D00% *
	Enable	01	 %3401D01%
Check digit verification  %3402M%	Disable	00	 %3402D00%
	Enable	01*	 %3402D01% *
Check digit trans.  %3403M%	Disable	00	 %3403D00%
	Enable	01*	 %3403D01% *
Code ID setting  %3404M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<D>*	 %3404H44% *
Insert group selection  %3405M%	00-66	00-66	
		00*	 %3405D00% *
Supplement digits  %3406M%	None	00*	 %3406D00% *
	2 digits	01	 %3406D01%
	5 digits	02	 %3406D02%
	2 or 5 digits	03	 %3406D03%
Truncation/Expansion  %3407M%	None	00*	 %3407D00% *
	Expand to EAN-13	02	 %3407D02%
	Expand to UPC-A	03	 %3407D03%
 %END%			

3-11 EAN-13

Read:

Format

Data digits (12 digits)	Check digit
-------------------------	-------------

Check digit verification: The check digit is optional.

Check digit trans.: By setting Enable, check digit will be transmitted.

Code ID setting: Refer to [Code ID setting](#) of 3-10 UPC-A.

Insertion group selection: Refer to [Insertion group selection](#) of 3-10 UPC-A.

Supplement digits:

Format

Data digits (12 digits)	Check digit	Supplement digits 2 of 5
-------------------------	-------------	--------------------------

ISBN/ISSN conversion: The ISBN (international Standard Book Number, or Bookland EAN) and ISSN (International Standard Serial Number) are two kinds of barcode for books and magazines. The ISBN is 10 digits with leading “978” and the ISSN is 8 digits with leading “977” of the EAN-13.









Example:

Barcode “9780194315104”, Output: “019431510X”.

Barcode “9771005180004”, Output: “10051805”.

ISBN/ISSN Code ID setting: Refer to [Code ID setting](#) of 3-10 UPC-A.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1301M%	Disable	00	 %1301D00%
	Enable	01*	 %1301D01% *
Check digit verification  %1302M%	Disable	00	 %1302D00%
	Enable	01*	 %1302D01% *
Check digit trans.  %1303M%	Disable	00	 %1303D00%
	Enable	01*	 %1303D01% *
Code ID setting  %1304M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<A>*	 %1304H41% *
Insert group selection  %1305M%	00-66	00-66	
		00*	 %1305D00% *
Supplement digits  %1306M%	None	00*	 %1306D00% *
	2 digits	01	 %1306D01%

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
	5 digits	02	 %1306D02%
	2 or 5 digits	03	 %1306D03%
ISBN/ISSN conversion  %1307M%	Disable	00*	 %1307D00% *
	Enable	01	 %1307D01%
ISBN/ISSN Code ID setting  %1309M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		*	 %1309H42% *
 %END%			

3-12 EAN-8

Read:

Format

Data digits (7 digits)	Check digit
------------------------	-------------

Check digit verification: The check digit is optional.

Check digit trans.: By setting `Enable`, check digit will be transmitted.

Code ID setting: Refer to `Code ID setting` of [3-10 UPC-A](#).

Insertion group selection: Refer to `Insertion group selection` of [3-10 UPC-A](#).

Supplement digits:

Format

Data digits (7 digits)	Check digit	Supplement digits 2 of 5
------------------------	-------------	--------------------------

Truncation/Expansion: Refer to `Truncation/Expansion` of [3-10 UPC-A](#).

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1401M%	Disable	00	 %1401D00%
	Enable	01*	 %1401D01% *
Check digit verification  %1402M%	Disable	00	 %1402D00%
	Enable	01*	 %1402D01% *
Check digit trans.  %1403M%	Disable	00	 %1403D00%
	Enable	01*	 %1403D01% *
Code ID setting  %1404M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<C>*	 %1404H43% *
Insert group selection  %1405M%	00-66	00-66	
		00*	 %1405D00% *
Supplement digits  %1406M%	None	00*	 %1406D00% *
	2 digits	01	 %1406D01%
	5 digits	02	 %1406D02%
	2 or 5 digits	03	 %1406D03%
Truncation/Expansion  %1407M%	None	00*	 %1407D00% *
	Truncate leading zero	01	 %1407D01%
	Expand to EAN-13	02	 %1407D02%
 %END%			

3-13 Code 39 (Code 32, Trioptic Code 39)

Read:

Format

Start character(*)	Data digits (variable)	Check digit (optional)	End character(*)
--------------------	------------------------	------------------------	------------------

Check digit verification: The check digit is optional and made as the sum module 43 of the numerical value of the data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Each symbol has own max./min. code length. If both setting of max./min. code length are "00", the setting of global max./min. code length is effective. The length is defined as to the actual barcode data length to be sent. Label with length exceeds these limits will be rejected. Make sure that the minimum length setting is no greater than the maximum length setting or otherwise all labels of the symbol will be readable. In particular, you can see the same value for both minimum and maximum reading length to force the fixed length barcode decoded.

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Start/End transmission: The start and end characters of Code 39 are "*". You can transmit all data digits including two "*".

"*" as data character: By setting Enable, "*" can be recognized as data character.

Convert Code 39 to Code 32: Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Note that code 39 must be enabled in order for this parameter to function.

Format of Code 32

"A"(optional)	Data digits (8 digits)	Check digit
---------------	------------------------	-------------

Code 32 Prefix "A" transmission: By setting Enable, the prefix character "A" can be added to all Code 32 barcodes.

Trioptic Code 39 read: Trioptic Code 39 is a variant of Code 39 used in the marking of magnetic tapes and computer cartridges. Trioptic Code 39 symbols always contain six characters.

Format

Start character(\$)	Data digits (8 digits)	End character(\$)
-----------------------	------------------------	---------------------

Trioptic Code 39 Start/End transmission: The start and end characters of Trioptic Code 39 are "\$".

All data digits including two "\$" can be transmitted.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1501M%	Disable	00	 %1501D00%
	Enable	01*	 %1501D01% *
Check digit verification  %1502M%	Disable	00	 %1502D00%
	Enable	01*	 %1502D01% *
Check digit trans.  %1503M%	Disable	00	 %1503D00%
	Enable	01*	 %1503D01% *
Max. code length  %1504M%	00-99	00-99	
		99*	 %1504D99% *
Min. code length  %1505M%	00-99	00-99	
		01*	 %1505D01% *
Code ID setting  %1506M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<M>*	 %1506H4D% *
Insert group selection  %1507M%	00-66	00-66	
		00*	 %1507D00% *
Format  %1508M%	Standard	00*	 %1508D00% *
	Full ASCII	01	 %1508D01%
Start/End transmission  %1509M%	Disable	00*	 %1509D00% *
	Enable	01	 %1509D01%
	Disable	00*	 %1510D00% *

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
"4*" as data character  %1510M%	Enable	01	 %1510D01%
Convert Code 39 to Code 32  %1511M%	Disable	00*	 %1511D00% *
	Enable	01	 %1511D01%
Code 32 prefix "A" transmission  %1512M%	Disable	00*	 %1512D00% *
	Enable	01	 %1512D01%
Trioptic Code 39 read  %1513M%	Disable	00*	 %1513D00% *
	Enable	01	 %1513D01%
Trioptic Code 39 Start/End transmission  %1514M%	Disable	00*	 %1514D00% *
	Enable	01	 %1514D01%
 %END%			

3-14 Interleaved 2 of 5

Read:

Format

Data digits (variable)	Check digit (optional)
------------------------	------------------------

Check digit verification: The check digit is made as the sum module 10 of the numerical value of the data digits. There are two optional check digit algorithms: the specified Uniform Symbol Specification (USS) and the Optical Product Code Council (OPCC).

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1601M%	Disable	00	 %1601D00%
	Enable	01*	 %1601D01% *
Check digit verification  %1602M%	Disable	00*	 %1602D00% *
	USS	01	 %1602D01%
	OPCC	02	 %1602D02%
Check digit trans.  %1603M%	Disable	00*	 %1603D00% *
	Enable	01	 %1603D01%
Max. code length  %1604M%	00-99	00-99	
		99*	 %1604D99% *
Min. code length  %1605M%	00-99	00-99	
		06*	 %1605D06% *
Code ID setting  %1606M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<I>*	 %1606H49% *
Insert group selection  %1607M%	00-66	00-66	
		00*	 %1607D00% *
 %END%			

3-15 Codabar

Read:

Format

Start character	Data digits (variable)	Check digit (optional)	End character
-----------------	------------------------	------------------------	---------------

Check digit verification: The check digit is made as the sum module 16 of the numerical value of the data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).




Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).















Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Start/End Type: Codabar has four pairs of Start/End Pattern; you may select one pair to match your application.

Start/End transmission: Refer to [Start/End transmission](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Start/End character equality: By setting Enable, the start and end character of a Codabar barcode must be the same.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %1901M%	Disable	00	 %1901D00%
	Enable	01*	 %1901D01% *
Check digit verification  %1902M%	Disable	00*	 %1902D00% *
	Enable	01	 %1902D01%
Check digit trans.  %1903M%	Disable	00*	 %1903D00% *
	Enable	01	 %1903D01%
Max. code length  %1904M%	00-99	00-99	
		99*	 %1904D99% *
Min. code length  %1905M%	00-99	00-99	
		04*	 %1905D04% *
Code ID setting  %1906M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<N>*	 %1906H4E% *
Insert group selection	00-66	00-66	

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
 %1907M%		00*	 %1907D00%*
Start/End type  %1908M%	ABCD/ABCD	00*	 %1908D00%*
	abcd/abcd	01	 %1908D01%
	ABCD/TN*E	02	 %1908D02%
	abcd/tn*E	03	 %1908D03%
Start/End transmission  %1909M%	Disable	00*	 %1909D00%*
	Enable	01	 %1909D01%
Start/End character equality  %1910M%	Disable	00*	 %1910D00%*
	Enable	01	 %1910D01%
 %END%			

3-16 Code 128

Read:

Format

Data digits (variable)	Check digit (optional)
------------------------	------------------------

Check digit verification: The check digit is made as the sum module 103 of all data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Truncate leading zeros: The leading “0” digits of Code 128 barcode characters can be truncated when the feature is enabled.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %2001M%	Disable	00	 %2001D00%
	Enable	01*	 %2001D01% *
Check digit verification  %2002M%	Disable	00	 %2002D00%
	Enable	01*	 %2002D01% *
Check digit trans.  %2003M%	Disable	00*	 %2003D00% *
	Enable	01	 %2003D01%
Max. code length  %2004M%	00-99	00-99	
		99*	 %2004D99% *
Min. code length  %2005M%	00-99	00-99	
		01*	 %2005D01% *
Code ID setting  %2006M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<K>*	 %2006H4B% *
Insert group selection  %2007M%	00-66	00-66	
		00*	 %2007D00% *
Truncate leading zeros  %2008M%	Disable	00*	 %2008D00% *
	All leading "0"	01	 %2008D01%
	Only the first "0"	02	 %2008D02%
 %END%			

3-17 UCC/EAN 128 (GS1-128)

Read:

Format

Data digits (variable)	Check digit (optional)
------------------------	------------------------

Check digit verification: The check digit is made as the sum module 103 of all data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Truncate leading zeros: Refer to [Truncate leading zeros](#) of [3-21 Code 128](#).

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %2501M%	Disable	00	 %2501D00%
	Enable	01*	 %2501D01% *
Check digit verification  %2502M%	Disable	00	 %2502D00%
	Enable	01*	 %2502D01% *
Check digit trans.  %2503M%	Disable	00*	 %2503D00% *
	Enable	01	 %2503D01%
Max. code length  %2504M%	00-99	00-99	
		99*	 %2504D99% *
Min. code length  %2505M%	00-99	00-99	
		01*	 %2505D01% *
Code ID setting  %2506M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<K>*	 %2506H4B% *
Insert group selection  %2507M%	00-66	00-66	
		00*	 %2507D00% *
Truncate leading zeros  %2508M%	Disable	00*	 %2508D00% *
	All leading "0"	01	 %2508D01%
	Only the first "0"	02	 %2508D02%
 %END%			

3-18 ISBT 128

Read:

Format

"=" or "&"	Data digits (variable)	Check digit (optional)
------------	------------------------	------------------------


Check digit verification: The check digit is made as the sum module 103 of all data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %3301M%	Disable	00	 %3301D00%
	Enable	01*	 %3301D01% *
Check digit verification  %3302M%	Disable	00	 %3302D00%
	Enable	01*	 %3302D01% *
Check digit trans.  %3303M%	Disable	00*	 %3303D00% *
	Enable	01	 %3303D01%
Max. code length  %3304M%	00-99	00-99	
		99*	 %3304D99% *
Min. code length  %3305M%	00-99	00-99	
		01*	 %3305D01% *
Code ID setting  %3306M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<K>*	 %3306H4B% *
Insert group selection  %3307M%	00-66	00-66	
		00*	 %3307D00% *
 %END%			

3-19 Code 93

Read:

Format

Data digits (variable)	2 Check digit (optional)
------------------------	--------------------------













Check digit verification: The check digit is made as the sum module 47 of all data digits.

Check digit trans.: By setting Enable, check digit will be transmitted.

Max./Min. code length: Refer to [Max./Min. code length](#) of [3-15 Code 39 \(Code 32, Trioptic Code 39\)](#).

Code ID setting: Refer to [Code ID setting](#) of [3-10 UPC-A](#).

Insertion group selection: Refer to [Insertion group selection](#) of [3-10 UPC-A](#).

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Read  %2101M%	Disable	00	 %2101D00%
	Enable	01*	 %2101D01% *
Check digit verification  %2102M%	Disable	00	 %2102D00%
	Enable	01*	 %2102D01% *
Check digit trans.  %2103M%	Disable	00*	 %2103D00% *
	Enable	01	 %2103D01%
Max. code length  %2104M%	00-99	00-99	
		99*	 %2104D99% *
Min. code length  %2105M%	00-99	00-99	
		01*	 %2105D01% *
Code ID setting  %2106M%	00-FF ₁₆ (ASCII)	00-FF ₁₆	
		<L>*	 %2106H4C% *
Insert group selection  %2107M%	00-66	00-66	
		00*	 %2107D00% *
 %END%			

3-20 G1-G4 & C1-C2 & FN1 substitution string setting

Format of barcode data transmission:

Prefix	Code name	Preamble	Code ID	Code length	Code data	Code ID	Postamble	Suffix
--------	-----------	----------	---------	-------------	-----------	---------	-----------	--------

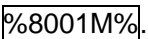



Suffix string setting: The <enter> key is represented indifferent ASCII when it is applied by different OS. For a Windows/DOS OS, <enter> is represented as <CR><LF> (0x0D 0x0A); for an Apple MAC OS, <enter> is represented as <CR> (0x0D); for a Linux/Unix OS, <enter> is represented as <LF> (0x0A).

Prefix/Suffix/Preamble/Postamble string setting:

They are appended to the data automatically when a barcode is decoded.

Example: Add a symbol of “\$” as a prefix for all symbols.

Steps:

- 1) Scan the option barcode of Prefix string setting: .
- 2) Use the [8 ASCII table](#) to find the value of \$ → 24.
- 3) Scan  and .
- 4) Scan  barcode.

Scanning steps: Scan the following barcodes in order.

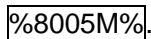







Insert G1/G2/G3/G4 string setting: The embedded scanner offers 4 positions and 4 character strings to insert among a symbol.

Example: Set G1 string to be “AB”.

Original code data	“1 2 3 4 5 6”
Output code data	“1 2 A B 3 4 5 6”

Steps:

- 1) Scan the option barcode of Insert G1 string setting: .
- 2) Use the ASCII table to find the value of A →41, B→42
- 3) Scan ,  and , .
- 4) Scan  barcode.
- 5) Refer to [3-21 G1-G4 string position & Code ID position](#).
- 6) Refer to [3-6 Scan mode & some global settings](#).



Testing barcode:



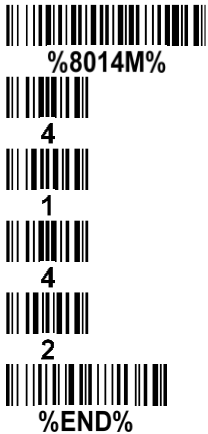
FN1 substitution string setting: The FN1 character (0x1D) in an UCC/EAN128 barcode, or a Code 128 barcode, or a GS1 DataBar barcode can be substituted with a defined string.

Single character C1/C2 replacement: By setting, a defined character in the data string can be replaced by another defined character. The C1 and C2 replacement are applied simultaneously.

Example: Replace all the “A” character in a data string to be “B” character.


















Original code data	“1 2 3 A 5 A”
Output code data	“1 2 3 B 5 B”




Steps: scan the following barcodes in order. The ASCII value for “A” is 41, and the ASCII value for “B” is 42.



Testing barcode:



Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Prefix string setting  %8001M%	0-22 characters	00-FF ₁₆	
	None	00*	 %8001H00% *
Suffix string setting  %8002M%	0-22 characters	00-FF ₁₆	
	<ENTER>	0D0A*	
Preamble string setting  %8003M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8003H00% *
Postamble string setting  %8004M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8004H00% *
Insert G1 string setting  %8005M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8005H00% *
Insert G2 string setting  %8006M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8006H00% *
Insert G3 string setting  %8007M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8007H00% *
Insert G4 string setting  %8008M%	0-22 characters	00-FF ₁₆	
	none	00*	 %8008H00% *
FN1 substitution string setting  %8009M%	0-4 characters	00-FF ₁₆	
	<SP>	20*	 %8009H20% *
Single character C1 replacement	0000-FFFF ₁₆	0000*	

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
 %8014M%		0000-FFFF ₁₆	
Single character C2 replacement  %8015M%	0000-FFFF ₁₆	0000*	
		0000-FFFF ₁₆	
 %END%			


3-21 G1-G4 string position & Code ID position

Format of barcode data transmission:

Prefix	Code name	Preamble	Code ID	Code length	Code data	Code ID	Postamble	Suffix
--------	-----------	----------	---------	-------------	-----------	---------	-----------	--------

Insert G1/G2/G3/G4 string position: The embedded scanner offers 4 positions to insert strings among the symbol. In case of the insertion position is greater than the length of the symbol, the insertion of string is not affected.

Code ID position: It is allowed to select different positions of Code ID placement.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Insert G1 string position  %8101M%	00-99	00-99	
		00*	 %8101D00% *
Insert G2 string position  %8102M%	00-99	00-99	
		00*	 %8102D00% *
Insert G3 string position  %8103M%	00-99	00-99	
		00*	 %8103D00% *
Insert G4 string position  %8104M%	00-99	00-99	
		00*	 %8104D00% *
Code ID position  %8105M%	Before code data	00*	 %8105D00% *
	After code data	01	 %8105D01%
 %END%			

3-22 String transmission

Note: The information in this chapter is closely related to 3-20 G1-G4 & C1-C2 & FN1 substitution string setting.

Format of barcode data transmission:

Prefix	Code name	Preamble	Code ID	Code length	Code data	Code ID	Postamble	Suffix
--------	-----------	----------	---------	-------------	-----------	---------	-----------	--------

Prefix transmission: By setting Enable, prefix will be appended before the data transmitted.

Suffix transmission: By setting Enable, suffix will be appended before the data transmitted.

Code name transmission: By setting Enable, code name will be transmitted before code data.

Preamble transmission: By setting Enable, preamble will be appended before the data transmission.

Postamble transmission: By setting Enable, Postamble will be appended after the data transmission.

Code ID transmission: By setting Enable, Code ID can be transmitted in the format of either Proprietary ID or AIM ID. Refer to [1-3 Default setting for each barcode](#).

Code length transmission: The length of code data string can be transmitted before the code data transmitted when Enable is selected. The length is represented by a number with two digits.

Case conversion: The characters within code data or the whole output string can be set in either upper case or lower case.




FN1 substitution transmission: The embedded scanner supports a FN1 substitution feature. The replacement string of FN1 can be chosen by user (see [3-20 G1-G4 & C1-C2 & FN1 substitution string setting](#)).

All-non-printable-character string transmission with string setting: By setting Enable, all string settings, e.g. Preamble transmission or Insert G1 string setting, are active for an all-non-printable-character string. Here a non-printable character means a character with ASCII value between 0x00 to 0x1F.

Transmit the first N data characters only: The embedded scanner supports to only transmit the first N data characters of a barcode. The number of N can be set as a digit between 1 and 99.

Transmit the last N data characters only: The embedded scanner supports to only transmit the last N data characters of a barcode. The number of N can be set as a digit between 1 and 99.

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
Prefix transmission  %8201M%	Disable	00*	 %8201D00% *
	Enable	01	 %8201D01%
Suffix transmission  %8202M%	Disable	00	 %8202D00%
	Enable	01*	 %8202D01% *
Code name transmission  %8203M%	Disable	00*	 %8203D00% *
	Enable	01	 %8203D01%
Preamble transmission  %8204M%	Disable	00*	 %8204D00% *
	Enable	01	 %8204D01%
Postamble transmission  %8205M%	Disable	00*	 %8205D00% *
	Enable	01	 %8205D01%
Code ID transmission  %8206M%	Disable	00*	 %8206D00% *
	Enable	01	 %8206D01%
Code length transmission  %8207M%	Disable	00*	 %8207D00% *
	Enable	01	 %8207D01%
Case conversion  %8208M%	Disable	00*	 %8208D00% *
	Upper (data only)	01	 %8208D01%
	Lower (data only)	02	 %8208D02%
	Upper (whole string)	03	 %8208D03%
	Lower (whole string)	04	 %8208D04%

Multiple-scan setting			Single-scan setting
Option barcode	Option	Alpha. entry	
FN1 substitution transmission  %8209M%	Disable	00*	 %8209D00% *
	Enable	01	 %8209D01%
All-non-printable-character string transmission with string setting  %8210M%	Disable	00*	 %8210D00% *
	Enable	01	 %8210D01%
Transmit the first N data characters only  %8211M%	01-99	01-99	
	All	99*	 %8211D99% *
Transmit the last N data characters only  %8212M%	01-99	01-99	
	All	99*	 %8212D99% *
 %END%			

4 Serial Communication Interface (SCI)

Note: The SCI programming commands can be used in place of the programming barcodes.

All communication between the embedded scanner and host occurs over the hardware interface lines using the Serial Communication Interface (SCI). The function of the SCI show as below:

- ✚ Maintain a bi-directional communication interface between the embedded scanner and the host.
- ✚ Allow the host to send commands to access the settings of the embedded scanner.
- ✚ Passes decoded data from the embedded scanner to the host.

In this section, the programming and query command syntax is described and examples of using commands to access the embedded scanner are presented.

4-1 Programming command syntax

4-1-1 Single-parameter setting

Format

Prefix	Parameter index	D/H	Value	Storage
--------	-----------------	-----	-------	---------

Prefix: <SYN> M <CR> (ASCII 0x16, 0x4D, 0x0D).

Parameter index: Each parameter has a unique 4-digit index which is similar to the option barcode listed in 6 Parameter Menus, except that there is no leading '%' and ending "M%" in the Parameter index.

D/H: This is used by the embedded scanner to identify the numeral system of Value. 'D' indicates a decimal number while 'H' indicates a hexadecimal number.

Value: This is generally a 2-digit number except for string-setting parameters, e.g. Prefix string setting.

Storage: A single character that specifies the storage area to which the command is applied to. An exclamation point '!' performs the command's operation on the volatile memory. A period '.' performs the command's operation on the device's non-volatile memory. Using '!' only when the setting needs to function through a single power cycle (Parameter value will be lost when power removed or the scanner enters Standby mode).

Example1: Set 0401->03 (decimal). The command is as following.

Prefix	Parameter index	D	Value	.
0x16 0x4D 0x0D	0x30 0x34 0x30 0x31	0x44	0x30 0x33	0x2E

Example2: Set 8002->0D0A (hexadecimal). The command is as following.

Prefix	Parameter index	H	Value	.
0x16 0x4D 0x0D	0x38 0x30 0x30 0x32	0x48	0x30 0x44 0x30 0x41	0x2E

4-1-2 Multiple-parameter setting

Format

Prefix	Parameter index 1	D/H	Value 1	;	• • •	Parameter index N	D/H	Value N	Storage
--------	-------------------	-----	---------	---	-------	-------------------	-----	---------	---------

Prefix: Refer to Prefix of [4-1-1 Single-parameter setting](#).

Parameter index 1 to Parameter index N: Refer to Parameter index of [4-1-1 Single-parameter setting](#).

D/H: Refer to D/H of [4-1-1 Single-parameter setting](#).

Value 1 to Value N: Refer to Value of [4-1-1 Single-parameter setting](#).

Storage: Refer to Storage of [4-1-1 Single-parameter setting](#).

Example: Set 0401->03 (decimal), 8002->0D0A (hexadecimal). The command is as following.

Prefix	Parameter index	D	Value	;	Parameter index	H	Value	.
0x16 0x4D 0x0D	0x30 0x34 0x30 0x31	0x44	0x30 0x33	0x3B	0x38 0x30 0x30 0x32	0x48	0x30 0x44 0x30 0x41	0x2E

4-1-3 Query command syntax

Format

Prefix	Parameter index	^/?/*	.
--------	-----------------	-------	---

Prefix: Refer to Prefix of [4-1-1 Single-parameter setting](#).

Parameter index: Refer to Parameter index of [4-1-1 Single-parameter setting](#).

^/?/*: Several special characters can be used to query the embedded scanner about its settings.

^ (0x5E)	Read the default value for the parameter
? (0x3F)	Read the current value for the setting.
* (0x2A)	Read the range of possible values for the parameter.

4-1-4 Start Decode & Stop Decode

Start Decode

Format

<SYN>	T	<CR>
0x16	0x54	0x0D

Activate the embedded scanner to scan barcodes when Scan Mode is Host.

Stop Decode

Format

<SYN>	U	<CR>
0x16	0x55	0x0D

Deactivate the embedded scanner to scan barcodes when Scan Mode is Host.

4-1-5 Return default parameters & firmware revision

Load Defaults

Format

<SYN>M<CR>	%%%DEF	.
0x16 0x4D 0x0D	0x25 0x25 0x25 0x44 0x45 0x46	0x2E

Set the parameters to the default values.

Write to Custom Defaults

Format

<SYN>M<CR>	%%WCDF	.
0x16 0x4D 0x0D	0x25 0x25 0x57 0x43 0x44 0x46	0x2E

Write the current parameter setting to the custom default settings.

Restore Custom Defaults

Format

<SYN>M<CR>	%%RSDF	.
0x16 0x4D 0x0D	0x25 0x25 0x52 0x53 0x44 0x46	0x2E

Restore custom default settings to current settings. If failed, restore default settings.

Firmware Version List

Format

<SYN>M<CR>	%%%VER	.
0x16 0x4D 0x0D	0x25 0x25 0x25 0x56 0x45 0x52	0x2E

Request the software revision string from the embedded scanner.

4-1-6 Get Image

Original Image Ship

Format

<SYN>M<CR>	%OISHP	.
0x16 0x4D 0x0D	0x25 0x4F 0x49 0x53 0x48 0x50	0x2E

An image is taken whenever the scan operation is done. The last image is always stored in memory. The original image can be “shipped” by using the `%OISHP` command.

Down-sampled Image Ship

Format

<SYN>M<CR>	%DISHP	.
0x16 0x4D 0x0D	0x25 0x44 0x49 0x53 0x48 0x50	0x2E

An image is taken whenever the scan operation is done. The last image is always stored in memory. The down-sampled image can be “shipped” by using the `%DISHP` command.

4-1-7 Responses

The embedded scanner responds to a serial command with one of three responses:

<ACK> (0x06)	A valid command which has been processed.
<ENQ> (0x05)	An invalid index command.
<NAK> (0x15)	A command with a valid parameter index and an invalid value.

4-2 Examples of setting and query commands

The following examples illustrate how a command should be constructed and transmitted to the embedded scanner.

Example 1: Append prefix “1N” to all symbols

Step 1:

- 1) Set Prefix string setting to be “1N”.
- 2) Look up the parameter table in 6 Parameter Menus and the ASCII table in 11 ASCII table. The target parameter index is “8001”.
- 3) Its numeral system is hexadecimal, indicated by ‘H’.
- 4) Using the ASCII table, “1N” is translated into “314E”.
- 5) Put all above parts and then append a prefix and a storage indicator ‘.’, thus, “<SYN>M<CR>8001H314E.” is the command.
- 6) Upon receiving command, embedded scanner response with “8001H314E<ACK>”.

Host: <SYN>M<CR>8001H314E.

<SYN>M<CR>	8001	H	314E	.
0x16 0x4D 0x0D	0x38 0x30 0x30 0x31	0x48	0x33 0x31 0x34 0x45	0x2E

Embedded Scanner: 8001H314E

8001	H	314E	<ACK>
0x38 0x30 0x30 0x31	0x48	0x33 0x31 0x34 0x45	0x06

Step 2:

- 1) Enable Prefix transmission.
- 2) Look up the parameter table in 6 Parameter Menus and the ASCII table in 11 ASCII table. The target parameter index is represented by: “8201”.
- 3) The numeral system is decimal: ‘D’.
- 4) The value is translated as: ‘0’ and ‘1’.
- 5) Put all above parts and then append a storage indicator ‘.’ to construct the command: “<SYN>M<CR>8201D01.”
- 6) Upon receiving command, embedded scanner response with “8201D01<ACK>”.

Host: <SYN>M<CR>8201D01.

<SYN>M<CR>	8201	D	01	.
0x16 0x4D 0x0D	0x38 0x32 0x30 0x31	0x44	0x30 0x31	0x2E

Embedded Scanner: 8201D01<ACK>

8201	D	01	<ACK>
0x38 0x32 0x30 0x31	0x44	0x30 0x31	0x06

Example 2: Query current scan mode

- 1) Look up the parameter table in 6 Parameter Menus and the ASCII table in 11 ASCII table. The target parameter index is "0401".
- 2) The numeral system is decimal, thus, 'D' is used.
- 3) The value field is filled with '?'.
"0401?".
- 4) Put all above parts and then append a storage indicator '.' to construct the command:
"<SYN>M<CR>0401?.".
- 5) Upon receiving command, embedded scanner response with "0401D01<ACK>".

Host: <SYN>M<CR>0401?.

<SYN>M<CR>	0401	?	.
0x16 0x4D 0x0D	0x30 0x34 0x30 0x31	0x3F	0x2E

Embedded Scanner: 0401D01<ACK>

0401	D	01	<ACK>
0x30 0x34 0x30 0x31	0x44	0x30 0x31	0x06

5 Enable & Disable “NR”



%NRON%

Enable “NR”

If it is enabled, while the scanner receives the STOP_DECODE command or fails to decode a barcode within the Stand-by duration time, the scanner will transmit “NR”.



%NROFF

Disable “NR” (Default)

6 Enable & Disable configuration by scanning barcode

Note: The setting of the below two barcodes does affect the operation of scanning the barcodes in 10 Return default parameters & firmware version.



%PSCEN

Enable configuration by scanning barcode (Default)

The default status of the embedded scanner is enabled to scan configuration barcode.



%PSCUN

Disable configuration by scanning barcode

Scan the above barcode to disable scanning configuration barcode, then the embedded scanner will not operate configuration by scanning configuration barcodes, but the data string of configuration barcode will be displayed. If you want to operate configuration by scanning configuration barcodes, please scan “%PSCEN” barcode.

7 Barcode representing non-printable character

Notes to make the following barcode:

1. According to different barcode printing software, the method of printing following barcode is different.
2. If using CODESOFT software, firstly read the information through "Help→Index→Code128→Special input syntax". Also refer to ASCII table. For example, if we wish to make "F1" barcode, select "CODE 128", then select "CODE A" type, and input "{DC1}" as data.



8 ASCII table

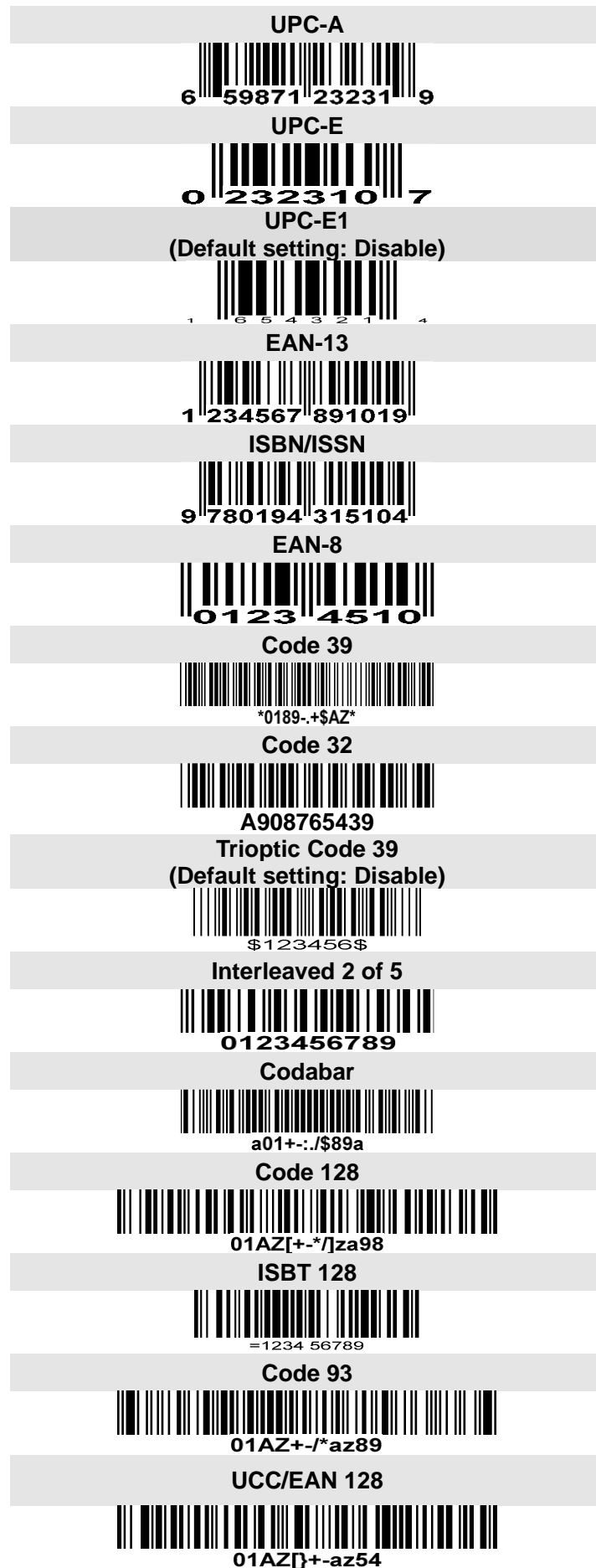
		for keyboard wedge		for RS-232	
H L		0	1	0	1
0		Null		NUL	DLE
1		Up	F1	SOH	DC1
2		Down	F2	STX	DC2
3		Left	F3	ETX	DC3
4		Right	F4	EOT	DC4
5		PgUp	F5	ENQ	NAK
6		PgDn	F6	ACK	SYN
7			F7	BEL	ETB
8		Bs	F8	BS	CAN
9		Tab	F9	HT	EM
A			F10	LF	SUB
B		Home	Esc	VT	ESC
C		End	F11	FF	FS
D		Enter	F12	CR	GS
E		Insert	Ctrl+	SO	RS
F		Delete	Alt+	SI	US

Notes: The 2nd and the 3rd columns above are used for keyboard wedge only.

H L	2	3	4	5	6	7
0	SP	0	@	P	`	p
1	!	1	A	Q	a	q
2	“	2	B	R	b	r
3	#	3	C	S	c	s
4	\$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	‘	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	[	k	{
C	,	<	L	\	l	|
D	-	=	M	]	m	}
E	.	>	N	^	n	~
F	/	?	O	_	o	DEL

Example: ASCII “A” = “41”.

9 Test symbols



10 Return default parameters & firmware version



%%%DEF

Restore Factory Defaults

Scan this barcode to restore the factory default values.
(Except communication mode and scanning mode)



%%%WCDF

Write to Custom Defaults

Store the current scanner settings as custom defaults.



%%%RSDF

Restore Custom Defaults

Restore the scanner's custom default settings. If no custom defaults were set, restore the factory default values.



%%%VER

Firmware Version List

Scan this barcode to display the firmware version.

11 Configuration alphanumeric entry barcode



0



1



2



3



4



5



6



7



8



9



A



B



C



D



E



F

To finish parameter setting, please scan the bar code below.



%END%