

I-500

2D Imaging Barcode Scanner



Programming Guide

Important Notice

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General Handling Precautions

Do not dispose the scanner in fire.
Do not put the scanner directly in the sun or by any heat source.
Do not use or store the scanner in a very humid place.
Do not drop the scanner or allow it to collide violently with other objects.
Do not take the scanner apart without authorization

Guidance for Printing

This manual is in A5 size. Please double check your printer setting before printing it out. When the barcodes are to be printed out for programming, the use of a high-resolution laser printer is strongly suggested for the best scan result.

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Using the Scanner

1. Ensure that the scanner is connected to the host computer correctly.
2. Hold down the trigger button to activate the red aiming line and the white illumination pattern. The illumination pattern is used to illuminate the barcode. The aiming line is used to aim at the barcode and help to find the best reading distance. Keep red aiming line in the center of a bar code.
3. On a successful scan, there'll be a beep sound, illumination & aiming pattern will turn off. The scanner then transmits barcode message to the host computer.

NOTE: After scanning the same barcode a few times, it will be able to find a certain scanning distance range with higher successful reading rate. This range is the optimum reading distance.

Settings and Programming

Scan selected barcodes in this manual to perform setup and programming of the handheld imaging barcode scanner. Decoding options and interface protocols can be tailored to a specific application.

Setup parameters are stored in non-volatile memory in the scanner and are retained even when power is off. Setup parameters change only when you reset them. You may need to hide adjacent code patches with your hand when scanning.

Enabling and Disabling Programming Operation

Programming operation can be enabled or disabled by scanning the following barcodes. Factory default is to have programming enabled.



Enable programming



Disable programming

User Preferences

Show Version

Scan this barcode to display firmware version.



Read device firmware version

System Settings

Scan this barcode to return all parameters to the factory default values.



Factory default settings

User Default Settings

In addition to the factory settings, users can also save their frequently used configuration as the user default settings. By scanning the "Save current settings as user default" barcode, the current configuration information of the device can be saved as the user default settings information. If there is user default setting information in the scanner, the new configuration information will replace the original user default setting information after the operation.

By scanning "Restore user default settings", the reader module can be restored to user default settings last saved.

Scan barcodes below to set or delete customer's factory default.



Save current settings as user default



Restore user default settings

Scan Mode

Scan a barcodes below to set the scanner to different modes.

Trigger Mode: In this mode, the scanner starts scanning after pressing the trigger, and stops scanning after successfully reading the code or releasing the trigger.

Presentation Mode: Also called auto trigger mode. The scanner is inactive but will automatically detect barcodes presented in the scan zone and become active. After successful scan and data is sent or no barcode is scanned within a preset time, the scanner will go back to monitoring state. Scanning can also be started by pressing the trigger.

Continuous Scan Mode: Scans periodically non-stop at preset intervals. User can press the trigger to pause the scanning and press the trigger again to resume scanning.



Trigger Mode (default)



Presentation Mode



Continue Scan Mode

Scan Timeout

In the Presentation Mode and Continuous Scan Mode, scan the following barcodes to select the timeout for unsuccessful scans. At timeout, the scanner will stop scanning, and depending on mode selection, scan again when new barcode is presented or wait until next scanning interval.



1000ms



3000ms



*5000ms



Infinite

Scan Interval

In Presentation mode and Continuous Scan mode, scan the following barcodes to select the interval between two adjacent scan operations (regardless of whether the reading is successful or not).



No delay



500ms



*1000ms



1500ms



2000ms

Same Code Delay Time Mode

For Presentaion mode and Continuous Scan mode, to avoid reading the same barcode multiple times in succession, same code delay can be enabled such that scanning of same barcode is only accepted after a selected delay time.



* Same code scan delay enabled



Same code scan delay disabled

Same Code Delay Time Selection

(effective only when Same Code Scan Delay is enabled)



500ms



700ms



1000ms



3000ms



5000ms



Unlimited

Interface Switch

The 2D Imager supports interfaces USB HID keyboard and USB virtual COM. To switch the interface, simply configure the proper interface by following interface selection.



* USB Keyboard



USB Virtual COM Port
(Driver installation required)

Access Period of USB Keyboard

The period that the PC accesses the USB keyboard for data can be selected by scanning the following barcodes.



1ms



3ms



5ms



*10ms

Speed of USB HID Keyboard Data



High speed



Normal speed

Good Read Beep Setting

Scan a barcode below to enable/disable the beep signal after a good decode.



*Enable beep



Disable beep

Good Read Beep Frequency

Scan a barcode below to select the beep tone of the beep signal after a good decode.



Low



*Medium



High

Good Read Beep Length

Scan a barcode below to select the duration of the beep signal after a good decode.



30ms



*60ms



90ms



120ms

Aiming Pattern

Aiming pattern works as an aiming system to aid in barcode reading. Use the following settings to enable or disable this function. This function is for supporting models only.



*Auto



Always On



Always Off



Flashing

Illumination

Set Illumination to aid in barcode reading. Use the following settings to configure this function.



*Auto



Always On



Always Off

Country Code

Scan the following settings to change the keyboard country code.



*USA



Czech



France



Germany



Hungary



Italy



Spain



Turkey



Portugal



Sweden



Netherlands



Norway



Brazil



Russia

Readable Barcode Symbolologies

This section provides the programming barcodes for enabling and disabling readable symbologies. If the default values suit requirements, programming is not necessary.

If all symbologies are disabled, only settings barcodes are readable. Barcode symbologies can then be enabled individually.

All Symbologies



Enable All



Disable All



Default

EAN/UPC



* Enable EAN/UPC



Disable EAN/UPC



Enable EAN/UPC 2/5-digit
supplemental code



*Disable EAN/UPC 2/5-digit
supplemental code



Enable UPC-E to
EAN13 conversion



*Disable UPC-E to
EAN13 conversion



Enable UPC-E to
UPC-A conversion



*Disable UPC-E to
UPC-A conversion



Enable UPC-E leading 0 digit



*Disable UPC-E leading 0 digit



Enable EAN to
ISBN conversion



*Disable EAN to
ISBN conversion



Enable EAN GS1 Prefix



*Disable EAN GS1 Prefix

Code 128



* Enable Code 128



Disable Code 128

Code 39



* Enable Code 39



Disable Code 39



Enable [*]
Character Output



* Disable [*]
Character Output

Code 93



* Enable Code 93



Disable Code 93

Code 32



Enable Code 32



* Disable Code 32

Code 11



* Enable Code 11



Disable Code 11

Codabar



* Enable Codabar



Disable Codabar



* Enable Output of
Start & Stop Symbols



Disable Output of
Start & Stop Symbols

Interleaved 2 of 5



* Enable Interleaved 2 of 5



Disable Interleaved 2 of 5

Matrix 2 of 5



* Enable Matrix 2 of 5



Disable Matrix 2 of 5

Industrial 2 of 5



* Enable Industrial 2 of 5



Disable Industrial 2 of 5

PDF417



* Enable PDF417



Disable PDF417

Micro PDF417



* Enable Micro PDF



Disable Micro PDF

Data Matrix



* Enable Data Matrix



Disable Data Matrix

QR Code



* Enable QR Code



Disable QR Code

GS1-DataBar



* Enable GS1-DataBar



Disable GS1-DataBar

Aztec



* Enable Aztec



Disable Aztec

Codablock F



* Enable Codablock F



Disable Codablock F

Data Editing

In applications, it may be required to edit the data output to facilitate data differentiation and processing. Data editing includes:

- Add data prefix
- Add data suffix
- Add barcode identifiers (Code ID)
- Extract data segment from decoded information
- Read Fail message when data decoding failed
- Add data terminator

Default output format of processed data is as follows:

[Prefix] [CodeID] [Data] [Suffix] [Terminator]

Prefix

Prefix is a character string output from scanner before sending out decoded barcode information. It can be added by scanning the "Enable Prefix" setting code.



Enable Prefix Output



* Disable Prefix Output



Modify Prefix



Save Settings

The prefix string can be modified by following steps:

1. Look up the hexadecimal codes of the prefix characters in the ASCII code character table in Appendix A. Up to 15 characters is allowed in the Prefix string.
2. Confirm whether programming of scanner is enabled. If not, scan the "Enable Programming" setup barcode on page 2.
3. Scan "Modify Prefix" barcode.
4. Scan the data setting barcodes in Appendix B for the hexadecimal data codes of the Prefix (2 hexadecimal digits per character).
5. Scan the "Save Settings" barcode.

Example, set Prefix string to "DATA"

1. From the ASCII code character table, the hexadecimal values of the string "DATA" is "44", "41", "54", "41".
2. Confirm that programming of scanner is enabled.
3. Scan "Modify Prefix" barcode.
4. Scan the 8 data setting barcodes in Appendix B, "4", "4", "4", "1", "5", "4", "4", "1".
5. Scan the "Save Settings" barcode.

Suffix

Suffix is a character string output from scanner after sending out decoded barcode information. It can be added by scanning the "Enable Suffix" setting code.



Enable Suffix Output



* Disable Suffix Output



Modify Suffix



Save Settings

The Suffix string can be modified by following steps:

1. Look up the hexadecimal codes of the prefix characters in the ASCII code character table in Appendix A. Up to 15 characters is allowed in the Prefix string.
2. Confirm whether programming of scanner is enabled. If not, scan the "Enable Programming" setup barcode on page 2.
3. Scan "Modify Suffix" barcode.
4. Scan the data setting barcodes in Appendix B for the hexadecimal data codes of the Prefix (2 hexadecimal digits per character).
5. Scan the "Save Settings" barcode.

Example, set Suffix string to "END"

1. From the ASCII code character table, the hexadecimal values of the string "END" is "45", "4E", "44".
2. Confirm that programming of scanner is enabled.
3. Scan "Modify Suffix" barcode.
4. Scan the 8 data setting barcodes in Appendix B, "4", "5", "4", "E", "4", "4".
5. Scan the "Save Settings" barcode.

Code Identifiers

Adding code identifiers to the output stream allow applications to identify the symbologies of barcodes read. The single character code identifier Code ID corresponding to each barcode type can be modified according to application requirements.



Enable Code ID Output



* Disable Code ID Output



Restore all Code ID to default



Save Settings

Default values of Code ID

Barcode type	Code ID character
EAN-13	d
EAN-8	d
UPC-A	d
UPC-E0	d
UPC-E1	d
Code 128	j
Code 39	b
Code 93	i
Code 32	C
Code 11	H
Codabar	a
Interleaved 2 of 5	e
Industrial 2 of 5	D
Matrix 2 of 5	v
MSI-Plessey	m
GS1 Databar (RSS-14)	R
GS1 Databar Limited (RSS)	R
GS1 Databar Expanded (RSS)	R
QR Code	Q
Data Matrix	u
PDF 417	r
Aztec	A
Micro PDF417	P
CodaBlock F	F

The Code ID character of a specific barcode type can be modified by following steps:

1. Look up the hexadecimal code of the required Code ID character for the barcode type in the ASCII code character table in Appendix A.
2. Confirm whether programming of scanner is enabled. If not, scan the "Enable Programming" setup barcode on page 2.
3. Scan the "Code ID" barcode for the barcode type.
4. Scan the data setting barcodes in Appendix B for the 2 hexadecimal codes of the Code ID character.
5. Scan the "Save Settings" barcode.

Example, set Code ID of CODE 128 to "A"

1. From the ASCII code character table, the hexadecimal value of the character "A" is "41".
2. Confirm that programming of scanner is enabled.
3. Scan "CODE 128 Code ID" barcode.
4. Scan the 2 data setting barcodes "4" and "1" in Appendix B.
5. Scan the "Save Settings" barcode.



EAN 13 Code ID



EAN 8 Code ID



UPCA Code ID



UPCE0 Code ID



UPCE1 Code ID



CODE 128 Code ID



CODE 39 Code ID



CODE 93 Code ID



Codabar Code ID



Interleaved 2 of 5 Code ID



Industrial 2 of 5 Code ID



Matrix 2 of 5 Code ID



CODE 11 Code ID



MSI Code ID

GS1 Databar
RSS Code IDGS1 Databar
Limited RSS Code IDGS1 Databar
Expanded RSS Code ID

QR CODE Code ID



Data Matrix Code ID



PDF417 Code ID

Data Terminator Character

Scan the following settings to select terminator character to be added to end of data output.



None



*CR



Tab



CR & LF

Data segment extraction

If the application requires only a part of decoded information, this function can be used to extract and output a portion of data.

The decoded data is divided into three sections:

[Start] [Center] [End]

The character string lengths of the Start and End data sections can be set up by scanning the setting barcodes. The user can then choose the required data sections by scanning the following setting barcodes.



Transmit entire data



Transmit Start section only



Transmit End section only



Transmit Center section only

To modify length of Start section and End Section, scan the “Modify length of Start section” or “Modify length of End section” setting barcodes and then scan the data setting codes to modify the length of the segment. The maximum lengths of the Start and End segments are 255 characters.

The length of section is represented by a 2 hexadecimal characters that corresponds to the hexadecimal value conversion of the decimal length value (Table in Appendix A can be used to look up the data conversion).



Modify length of Start section



Modify length of End section



Abort Setting



Save Settings

Examples:

For decoded data "1234567890123ABC", output the first thirteen bytes "1234567890123"

1. From the conversion table, hexadecimal value of decimal data "13" (required length) is "0D".
2. Confirm that programming of scanner is enabled.
3. Scan "Modify length of Start section" barcode.
4. Scan the 2 data setting barcodes "0" and "D" in Appendix B.
5. Scan the "Save Settings" barcode.
6. Scan the "Transmit Start section only" barcode.

For decoded data "1234567890123ABC", output the last 3 bytes "ABC"

1. From the conversion table, hexadecimal value of decimal data "3" (required length) is "03".
2. Confirm that programming of scanner is enabled.
3. Scan "Modify length of End section" barcode.
4. Scan the 2 data setting barcodes "0" and "3" in Appendix B.
5. Scan the "Save Settings" barcode.
6. Scan the "Transmit End section only" barcode.

For decoded data "1234567890123ABC", output the middle 4 bytes "6789"

1. Length of Start section is 5 and length of End section is 7. From the conversion table, hexadecimal value of decimal data "5" and "7" are "05" and "07".
2. Confirm that programming of scanner is enabled.
3. Scan "Modify length of Start section" barcode.
4. Scan the 2 data setting barcodes "0" and "5" in Appendix B.
5. Scan the "Save Settings" barcode.
6. Scan "Modify length of End section" barcode.
7. Scan the 2 data setting barcodes "0" and "7" in Appendix B.
8. Scan the "Save Settings" barcode.
9. Scan the "Transmit Center section only" barcode.

Read Fail Message

Read Fail message refers to the data string to be transmitted to host application when the reading of barcode is unsuccessful. This allows the application program to detect the information and react accordingly.



Send Read Fail message



Do not send Read Fail message



Modify Read Fail Message



Save Settings

The Read Fail message can be modified by following steps:

1. Look up the hexadecimal code of the required Read Fail message in the ASCII code character table in Appendix A.
2. Confirm whether programming of scanner is enabled. If not, scan the "Enable Programming" setup barcode on page 2.
3. Scan the "Modify Read Fail Message" barcode.
4. Scan the data setting barcodes in Appendix B for the hexadecimal data codes of the character in the message (2 hexadecimal digits per character).
5. Scan the "Save Settings" barcode.

Example: Modify Read Fail message to "FAIL"

1. From the ASCII code character table, the hexadecimal values of the 4-character message "FAIL" is "46", "41", "49", "4C".
2. Confirm that programming of scanner is enabled.
3. Scan the "Modify Read Fail Message" barcode.
4. Scan the data setting barcodes "4", "6", "4", "1", "4", "9", "4", "C" in order.
5. Scan the "Save Settings" barcode.

Appendix

Appendix A: ASCII Code Table

Decimal	Character	Hexadecimal
0	NUL	00
1	SOH	01
2	STX	02
3	ETX	03
4	EOT	04
5	ENQ	05
6	ACK	06
7	BEL	07
8	BS	08
9	HT	09
10	LF	0A
11	VT	0B
12	FF	0C
13	CR	0D
14	SO	0E
15	SI	0F
16	DLE	10
17	DC1	11
18	DC2	12
19	DC3	13
20	DC4	14
21	NAK	15
22	SYN	16
23	ETB	17
24	CAN	18
25	EM	19
26	SUB	1A
27	ESC	1B
28	FS	1C
29	GS	1D
30	RS	1E
31	US	1F
32	SP	20
33	!	21

Decimal	Character	Hexadecimal
34	"	22
35	#	23
36	\$	24
37	%	25
38	&	26
39	`	27
40	(	28
41	)	29
42	*	2A
43	+	2B
44	,	2C
45	-	2D
46	.	2E
47	/	2F
48	0	30
49	1	31
50	2	32
51	3	33
52	4	34
53	5	35
54	6	36
55	7	37
56	8	38
57	9	39
58	:	3A
59	;	3B
60	<	3C
61	=	3D
62	>	3E
63	?	3F
64	@	40
65	A	41
66	B	42
67	C	43
68	D	44
69	E	45
70	F	46
71	G	47
72	H	48

Decimal	Character	Hexadecimal
73	I	49
74	J	4A
75	K	4B
76	L	4C
77	M	4D
78	N	4E
79	O	4F
80	P	50
81	Q	51
82	R	52
83	S	53
84	T	54
85	U	55
86	V	56
87	W	57
88	X	58
89	Y	59
90	Z	5A
91	[	5B
92	\	5C
93	]	5D
94	^	5E
95	_	5F
96	'	60
97	a	61
98	b	62
99	c	63
100	d	64
101	e	65
102	f	66
103	g	67
104	h	68
105	i	69
106	j	6A
107	k	6B
108	l	6C
109	m	6D
110	n	6E
111	o	6F

Decimal	Character	Hexadecimal
112	p	70
113	q	71
114	r	72
115	s	73
116	t	74
117	u	75
118	v	76
119	w	77
120	x	78
121	y	79
122	z	7A
123	{	7B
124		7C
125	}	7D
126	~	7E
127	DEL	7F

Appendix B: Data Codes

0



1



2



3



4



5



6



7



8



9



A



B



C



D



E



F

Appendix C: Data Code Editing

After reading the data code, scan "Save Settings" code to save the settings. If there is a mistake while reading the data code, you can cancel the readings with the barcodes below.

Examples:

For data code string "AB12", after scanning "A", "B", "1", "2" in data code entry:

1. If the "Erase last data" is scanned, data "2" will be erased, leaving string entry "AB1". Next scan of data codes will append new data to end of "AB1".
2. If "Cancel String" is scanned, the whole string "AB12" will be erased, leaving empty string. Next scan of data codes will start as new string.
3. If "Abort Setting" is scanned, the data code setting operation will be aborted.



Save Settings



Erase Last Data



Cancel String



Abort Setting