



**Model 200 / 250 / 260  
Programming Guide**

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## **Serial Programming Specifications**

### ***Serial Command Structure***

"Start Character"<Command 1>...<Command n>"End Character"

The command structure consists of:

- Start character
- Command/s
- End character

### ***Start Character***

Every serial programming starts with an SOH character (ASCII value 01). The SOH character is needed only once for each set of commands, for example if you need to send two consecutive commands, it would require one SOH character followed by the two commands and the End character.

### ***Commands***

Each command data is bounded in <> characters. For example, the factory default command is

<FACDEF=1>

### ***End Character***

At the end of each set of command\s, the end character EOT (ASCII value 04) is required.

### ***Scanner Responds***

After each successful command\s, the scanner will respond with an ACK character. If the command is incomplete or out of rang, then the scanner responds with a NAK character.

Example:

This is a command for setting the Factory defaults :

"SOH"<FACDEF=1>"EOT"

In Visual Basic:

Dim Command As String

Command = Chr\$(1) & "<FACDEF=1>" & Chr\$(4)

And the scanner response is:

ACK

Changes will be effective after scanner ACK response.

## Factory Setup

**Description:** To restore all factory settings, this command will overwrite all existing setting with the factory default settings.

**Scanner Response:** ACK if the factory restore is completed successfully / NAK

Description	Field	Values allowed
Factory Default	Default	FACDEF=1

Table 1.1

## Scanner Settings

**Description:** To request current setting parameters (SETPAR), scanner model number (FINGER) or request a respond to a ping command (TXPING).

**Scanner Response:** (SETPAR) ACK followed by a complete list of settings, (each field is sent separately with its start and stop character) and followed by \r\n after the last field/ NAK  
 (FINGER) ACK followed by a model name and \r\n / NAK  
 (TXPING) ACK / NAK

Description	Field	Values allowed
Current Settings		SETPAR:
Send Scanner Model		FINGER:
Sending a Ping		TXPING:

Table 1.2

## Scanner Revisions

**Description:** To request an Application 1, 2 or Hardware revision number.

**Scanner Response:** (APP1RV) ACK "N.NN.NN\r\n" / NAK  
 (APP2RV) ACK "N.NN.NN\r\n" / NAK  
 (HARDRV) ACK "N.NN.NN\r\n" / NAK  
 (SERIAL) ACK "NNNNNNNNNN\r\n" / NAK  
 N is an ASCII '0' – '9', All responses have a fixed length

Description	Field	Values allowed
Send Revision Number	Application 1	APP1RV:
	Application 2	APP2RV:
	Hardware	HARDRV:

Table 1.3

## Serial Number Read & Setup

**Description:** The maximum length is 30 characters and no control character is allowed for a serial number.

**Example:** 'SOH'<SERIAL:>'EOT'

**Scanner Response:** ACK "XXXXXXXXXX...\r\n" / NAK  
X is a printable ASCII, with variable length

**Description:** When this option is enabled the data will be sent before the decoded data. The default is a 'disable'.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Serial Number Read		SERIAL:
Add to stream	Enable	SERIEN=1
	Disable *	SERIEN=0

Table 1.4

## Web Setup

**Description:** To request a web address stored in the scanner.

**Scanner Response:** ACK "www. ...\r\n" / NAK  
Response is a variable length

Description	Field	Values allowed
Web Site Information	WWW	WEBSIT:

Table 1.5

\* Marks indicate the factory default setting

## Serial Port Setup

**Description:** To setup serial port parameters, changes will be effective after scanner ACK response.

**Host Requirement:** The Character Delay range is between 0 ms – 50 ms

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
RS232 Data Bits	8 *	RSBITS=8
	7	RSBITS=7
RS232 Parity	None *	RSPRTY=NONE
	Odd	RSPRTY=ODD
	Even	RSPRTY=EVEN
RS232 Stop Bits	1 *	RSSTOP=1
	2	RSSTOP=2
RS232 Hardware Flow Control	Enable	RSCTSE=1
	Disable *	RSCTSE=0
RS232 Baud Rate	1200	RSBAUD=1200
	2400	RSBAUD=2400
	4800	RSBAUD=4800
	9600 *	RSBAUD=9600
	19200	RSBAUD=19200
	38400	RSBAUD=38400
	57600	RSBAUD=57600
115200	RSBAUD=115200	
RS232 Character Delay	0 ms *	RSDELY=000

Table 2.1

## Registration Key Read & Write

**Description:** To setup Registration Key, changes will be effective after scanner ACK response. Control characters are not permitted. The maximum length is 30 characters\*. When the REGIEN option is enabled, the data will be added between serial number and decoded data.

Example: 'SOH'<REGKEY:>'EOT'

**Scanner Response:** ACK "XXXXXXXXXX...\r\n" / NAK  
X is a printable ASCII, with variable length

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Reg. Key Read		REGKEY:
Add to stream	Enable	REGIEN=1
	Disable *	REGIEN=0
Reg. Key Write		REGKEY=

Table 2.2

\* Do not use write function on every scanner reads, the maximum write is 10,000 times.

## Speaker Setup

**Description:** To setup speaker volume, power-up beeps and parameter beeps (beeps after changing the scanner setup via serial port). Changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Speaker Volume	Off	SPVOLU=OFF
	Low	SPVOLU=LOW
	Medium *	SPVOLU=MEDIUM
	High	SPVOLU=HIGH
Power-Up Beeps	Enable *	SPPOWB=1
	Disable	SPPOWB=0
Parameter Beeps	Enable *	SPPARA=1
	Disable	SPPARA=0

Table 2.3

## Prefix / Suffix Setup

**Description:** To setup prefix and suffix parameters, changes will be effective after scanner ACK response.

**Host Requirement:** To setup prefix and suffix with a control characters use the following table:

```
[NUL] [SOH] [STX] [ETX] [EOT]
[ENQ] [ACK] [BEL] [BS] [HT]
[LF] [VT] [FF] [CR] [SO]
[SI] [DLE] [DC1] [DC2] [DC3]
[DC4] [NAK] [SYN] [ETB] [CAN]
[EM] [SUB] [ESC] [FS] [GS]
[RS] [US] [DEL]
```

**Example:** setting suffix with AbC, Carriage Return and Line Feed is  
 "SOH"<SUFFIX=AbC[CR][LF]>" EOT"

Then, the suffix value is added to the end of every good read, the control characters are sent in ASCII characters.

**Code Identifier:** If the code identifier is enabled, then the standard AIM ID is added to the prefix. The AIM ID values are the following:

```
Code39           ]A
Code128          ]C
PDF417           ]L
Magnetic         ]M
```

The Code identifier is added to the end of the prefix value.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Prefix	Set	PREFIX=
Add Code Identifier	Enable	PRECID=1
	Disable *	PRECID=0
Suffix	Set	SUFFIX=
Add CR to Suffix	Enable	SUFFCR=1
	Disable *	SUFFCR=0

Table 2.4

### Code39 Setup

**Description:** To setup Code39 parameters, changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Code 39	Enable	CD39EN=1
	Disable *	CD39EN=0
Code 39 Start/Stop Char	Send	CD39SS=1
	Hide *	CD39SS=0

Table 2.5

### Code128 Setup

**Description:** To setup Code128 parameters, changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Code 128	Enable	CD128E=1
	Disable *	CD128E=0

Table 2.6

### PDF417 Setup

**Description:** To setup PDF417 parameters, changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
PDF417	Enable *	PDF417=1
	Disable	PDF417=0

Table 2.7

## Power Saving

**Description:** Power saving mode sets the power consumption to minimum, when it is idle or isn't reading a card. Changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Power Saving Mode	Enable	POWSET=1
	Disable *	POWSET=0

Table 2.8

### Power Saving Time Line:

<p>If Power Saving Mode enabled, the Model 200/250/260 goes to minimum power consumption after 15 seconds. In this mode, the green LED is blinking every 2 seconds. The scanner wakes-up by either inserting a barcode or swiping a magnetic card.</p>					
<b>Power</b>	80mA @5.0V	428mA @5.0V	125mA @5.0V	41mA @5.0V	<b>21mA @5.0V</b>
<b>Time (Sec.)</b>	3.0	0.1 – 2.0	0.5 ~ 7.0	15	~
<b>Remark</b>	Initialization	Capture the Image	Decoding Time	Timer Reset for Comm.	Wake-up by Magnetic, 2D Card

## Magnetic Track Setup

**Description:** To setup each magnetic stripe track parameters, changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Magnetic Track 1, 2, 3	Enable *	MAG1EN=1
	Disable	MAG1EN=0
	Enable *	MAG2EN=1
	Disable	MAG2EN=0
	Enable *	MAG3EN=1
	Disable	MAG3EN=0

Table 2.9

## LRC (Longitudinal Redundancy Check Character) Setup

**Description:** To setup track data with LRC (Check Character) to the host after decoding. Changes will be effective after scanner ACK response. This command affects all enabled tracks.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
LRC Character	Enable	MAGLRC=1
	Disable *	MAGLRC=0

Table 2.10

## Magnetic Raw Data Setup

**Description:** To setup raw data output to the host. Each 8-bit raw data is encoded into two ASCII characters.

```
Example:      0000 0110 1011 0000
              -----
              "0"  "6"  "B"  "0"
              4 leading zeros + data + 4 trailing zeros
              Hex representation: "06B0"
```

\*\* The number of leading and trailing zeros may vary from time to time, depending on the characteristic of the F2F chip.

Changes will be effective after scanner ACK response. This command affects all enabled tracks.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
Raw Data Output	Enable	MAGRAW=1
	Disable *	MAGRAW=0

Table 2.11

## NO-READ Message Setup

**Description:** To setup No-Read parameters, changes will be effective after scanner ACK response.

The scanning results of a no read card are the following:

**Magnetic Stripe (M250/260):** If there is a problem in reading a recorded information on a track, the reader reports error using the ASCII string “NR” (HEX 45 & 52) for each track.

If there is no recorded information on a track, the reader reports an error using the ASCII string “ND” (HEX 45 & 44) for each track.

Any enabled prefixes or suffixes are appended around this message.

**Linear Barcode:** If there is a problem in reading a 1D (code39 or Code 128) on the card, The reader reports an error using the ASCII string “NR0” (HEX 45 & 52 & 30). Any enabled prefixes or suffixes are appended around this message. The reader does not send the Code ID even in case that the option is enabled.

**PDF417 Barcode:** If there is a problem in reading a PDF417 on the card, the reader reports an error using the ASCII string “NR” (HEX 45 & 52) followed by a character indicating a type of error. The error types are:

- “0” : Not found a PDF417 symbol
- “1” : Too many damaged code-words
- “2” : Too many Misread code-words
- “3” : Codeword translation to ASCII error

Any enabled prefixes or suffixes are appended around this message. The reader does not send the Code ID even in case that the option is enabled.

**Scanner Response:** ACK / NAK

Description	Field	Values allowed
No-Read Message	Enable	NOREAD=1
	Disable *	NOREAD=0

Table 2.12

## Scanner upgrade

**Description:** To transfer and upgrade scanner software. Changes will be effective after scanner ACK response.

**Scanner Response:** ACK / NAK

*Example 1:*

Host: (ASCII value 01 'SOH')<A1CODE=Z>(ASCII value 04 'EOT')

Scanner: ACK

Host: switch to Zmodem protocol

Scanner: switch to Zmodem protocol

(After the file is being transferred)

Host: switch back to normal setting

Scanner: switch back to normal setting

*Example 2:*

Host: (ASCII value 01 'SOH')<A1CODE=G>(ASCII value 04 'EOT')

Scanner: ACK

### **Start Download**

Host: (ASCII value 02 'STX')  
(CMDID)(DATALEN)(DATA)(CRC32)  
(ASCII value 03 'ETX')

Scanner: ACK

### **Goto Start\_Download until is done**

Notes:

CMDID: ASCII value 31 '1' = First block;

ASCII value 32 '2' = Mid block;

ASCII value 33 '3' = Last block; (1 Byte)

DATALEN: Length of Data Block (2 Bytes, LSB - MSB)

DATA: Data Block (Variable Length)

CRC32: Calculated CRC which includes CMDID, DATALEN and DATA (4 Bytes)

Description	Field	Values allowed
Application Code Upgrade	Zmodem	A1CODE=Z
Second App. Code Upgrade	Zmodem	A2CODE=Z
Application Code Upgrade	VISA 1	A1CODE=V
Second App. Code Upgrade	VISA 1	A2CODE=V
Application Code Upgrade	Generic	A1CODE=G
Second App. Code Upgrade	Generic	A2CODE=G

Table 2.13

## Appendix A

DEC	HEX	ASCII	DEC	HEX	ASCII	DEC	HEX	ASCII	DEC	HEX	ASCII
0	00	[NUL]	32	20	[space]	64	40	@	96	60	`
1	01	[SOH]	33	21	!	65	41	A	97	61	a
2	02	[STX]	34	22	"	66	42	B	98	62	b
3	03	[ETX]	35	23	#	67	43	C	99	63	c
4	04	[EOT]	36	24	\$	68	44	D	100	64	d
5	05	[ENQ]	37	25	%	69	45	E	101	65	e
6	06	[ACK]	38	26	&	70	46	F	102	66	f
7	07	[BEL]	39	27	'	71	47	G	103	67	g
8	08	[BS]	40	28	(	72	48	H	104	68	h
9	09	[HT]	41	29	)	73	49	I	105	69	i
10	0A	[LF]	42	2A	*	74	4A	J	106	6A	j
11	0B	[VT]	43	2B	+	75	4B	K	107	6B	k
12	0C	[FF]	44	2C	,	76	4C	L	108	6C	l
13	0D	[CR]	45	2D	-	77	4D	M	109	6D	m
14	0E	[SO]	46	2E	.	78	4E	N	110	6E	n
15	0F	[SI]	47	2F	/	79	4F	O	111	6F	o
16	10	[DLE]	48	30	0	80	50	P	112	70	p
17	11	[DC1]	49	31	1	81	51	Q	113	71	q
18	12	[DC2]	50	32	2	82	52	R	114	72	r
19	13	[DC3]	51	33	3	83	53	S	115	73	s
20	14	[DC4]	52	34	4	84	54	T	116	74	t
21	15	[NAK]	53	35	5	85	55	U	117	75	u
22	16	[SYN]	54	36	6	86	56	V	118	76	v
23	17	[ETB]	55	37	7	87	57	W	119	77	w
24	18	[CAN]	56	38	8	88	58	X	120	78	x
25	19	[EM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUB]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESC]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FS]	60	3C	<	92	5C	\	124	7C	
29	1D	[GS]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RS]	62	3E	>	94	5E	^	126	7E	~
31	1F	[US]	63	3F	?	95	5F	_	127	7F	[DEL]

Table A.1

## **Appendix B**

### **Model 200/250 Serial Port Pin outs (RJ-45)**

<b>Pin Number</b>	<b>Description</b>
1	Reserved
2	VCC (7 - 20 VDC)
3	Reserved
4	Reserved
5	Ground
6	TxD (Transmit Data)
7	RxD (Receive Data)
8	RTS (Request To Send)
9	CTS (Clear To Send)
10	Reserved

*Table B.1*

### **Model 260 PIN-OUT: RJ45 & Kiosk Connector (10 Pin)**

<b>N0</b>	<b>FUNCTION</b>	<b>Direction</b>	<b>REMARK</b>
1	VUBS	IN	POWER from USB +5V
2	VCC	IN	15V DC (use E-Seek's AC-DC Adapter)
3	D-	IN/OUT	USB DEVICE
4	D+	IN/OUT	USB DEVICE
5	GND	--	
6	TXD	OUT	RXD on host
7	RXD	IN	TXD on host
8	RTS	OUT	CTS on host
9	CTS	IN	RTS on host
10	NC	--	

*Table B.2*