Users Manual

QuickBarII™
Single-Chip
Bar Code Decoder

REV E
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QuickBarII Single-Chip Decoder

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Section 1. Introduction

DESCRIPTION

The QuickBarII product is a single chip, high-speed bar code decoder. The chip is far smaller than traditional decoder chip sets (10mm*10mm for TQFP-44). With a minimum of additional components, you can build a **high speed** and **feature rich** bar code decoding subsystem. This high-speed chip has a minimum instruction time of 0.125 μsecond when operating with an 8 MHz crystal. Comparable 8051 type microcontroller have a 1.5 μsecond minimum instruction time. The QuickBarII Chip uses "On the fly" parallel processing to offer a very quick and robust decode. It supports scan speed of up to 100 scans per second.

FEATURES

- Single chip
- High performance
- Low power
- Supports Wand, Slot Reader, CCD and Laser bar code scanning devices
- Available bar code symbologies: Code 39, Code 128, Interleaved 2 of 5, Industrial 2 of 5, Codabar, UPC-A, UPC-E, EAN-13, EAN-8, UPC/EAN 2 & 5 digit AddOn, Code 11, Code 93, MSI/Plessey, Code 4, Code 5 and BC412.
- In-System Reprogrammable Downloadable Flash Memory
- Keyboard and Serial interface to the Host
- Host configurable using serial commands or Barcode Setting
- High current LED output drives LED directly
- High current oscillated Beeper output drives beeper directly
- Low cost

PIN CONFIGURATIONS

TQFP-44

Pin configuration diagram for TQFP-44 package.

Left side pins (top to bottom):
- 1 INSTR-IN
- 2 P DATA
- 3 SCK/CTS
- 4 RESET
- 5 VCC
- 6 GND
- 7 XTAL2
- 8 XTAL1
- 9 RXD
- 10 DREADY/TXD
- 11 WAKE

Top side pins (44 to 34):
- 44 REF
- 43 TRIG
- 42 PENA
- 41 SOS
- 40 GND
- 39 VCC
- 38
- 37
- 36 CONT
- 35 READ_OK
- 34

Bottom side pins (12 to 21):
- 12 P_CLK
- 13 BEEP
- 14 CLK_OUT
- 15 DATA
- 16
- 17 VCC
- 18 GND
- 19
- 20
- 21

Right side pins (33 to 22):
- 33
- 32
- 31 DATA_OUT
- 30
- 29
- 28 GND
- 27 VCC
- 26
- 25
- 23
- 22
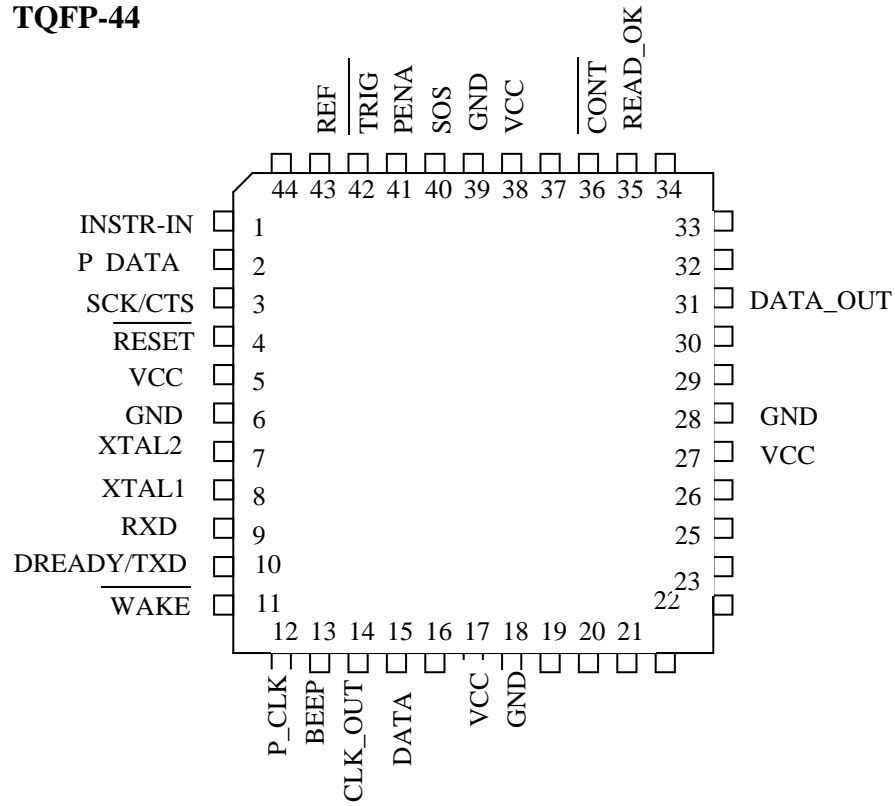
PIN DESCRIPRITIONS

VCC
Supply voltage

GND
Ground

$\overline{\text{RESET}}$
Reset input. A low on this pin for two machine cycles (0.25 μsecond with an 8 MHz crystal) while the oscillator is running resets the QuickBarII. This pin is also used for Serial Memory Programming. See Appendix D. for Serial Memory Programming details.

XTAL1
Input to the inverting oscillator amplifier and input to the internal clock operation circuit.

XTAL2
Output from the inverting oscillator amplifier

DATA
Bar code data. From any bar code scanning device

SOS
Start Of Scan. From Laser or CCD scanners

$\overline{\text{TRIG}}$
Trigger switch. It's active Low. From Laser or CCD scanners

PENA
Power Enable. From QuickBarII to Laser or CCD scanners

READ-OK
Good Read signal to drive a LED. From QuickBarII

BEEP
2700 HZ Beep signal. From QuickBarII

CLOCK_OUT
QuickBarII "Keyboard Clock" output signal. From QuickBarII (Keyboard Version Only)

DATA_OUT
QuickBarII "Keyboard Data" output signal. From QuickBarII (Keyboard Version Only)

P_CLK
PC "Keyboard clock" output signal. To QuickBarII (Keyboard Version Only)

P_DATA
PC "keyboard Data" output signal. To QuickBarII

DREADY
QuickBarII "Data Ready" signal, used to control key board wedge. (Keyboard Version Only)

TXD
Serial data transmit. From QuickBarII (Serial version only)

RXD
Serial data receive. To QuickBarII (Serial version only)

CTS
Clear to send. To QuickBarII (Serial version only)

REF
A reference voltage used internally by QuickBarII

SCK
Serial Memory Programming Serial Clock. See Appendix D. for details

INSTR-IN
Serial Memory Programming Input. See Appendix D. for details

DA-OUT (share pin with P_DATA)
Serial Memory Programming Output. See Appendix D. for details

$\overline{\text{WAKE}}$

Wake up signal from the host to QuickBarII. Maintaining **WAKE** at Low level for more than 30ms wakes up the QuickBarII. See Appendix E. for details.

$\overline{\text{CONT}}$

Continuous Mode control input. Continuous Mode for RS232 version only. In KB version, Pull the pin to HIGH.

RESET SOURCES

The QuickBarII has two sources of reset:
- Power-On Reset. The QuickBarII is reset when a supply voltage is applied to the VCC and GND pins.
- External Reset. The QuickBarII is reset when a low level is present on the RESET pin for more than two XTAL cycles.

Power-On Reset
A Power-On Reset (POR) circuit ensures that the QuickBarII is not started until Vcc has reached a safe level. An internal timer prevents the QuickBarII from starting until after about 19ms after Vcc has reached 2 volts.

As the pin is pulled high by an on-chip resistor, the pin can be left unconnected if no external reset is required. Connecting to Vcc will have the same effect.

External Reset
An external reset is generated by a low level on the RESET pin. The RESET pin must be held low for at least two crystal clock cycles. When reaches the Reset Threshold Voltage (Vcc/2) on its positive edge, the delay timer starts the QuickBarII after about 16ms.

IMPORTANT!
Note on Brown-Out protection circuit
Unstable power supply may cause QuickBarII to malfunction. The non-volatile EEPROM memory in QuickBarII may be altered when this happens. An external reset IC such as the Dallas Semiconductor DS1811 or similar circuit is required to monitor the Vcc and reset the QuickBarII for Brown-Out protection.

CRYSTAL OSCILLATOR

XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator, as shown in Figure 1. Either a quartz crystal or a ceramic resonator may be used. To drive the device from an external clock source, XTAL2 should be left unconnected while XTAL1 is driven as shown in Figure2.
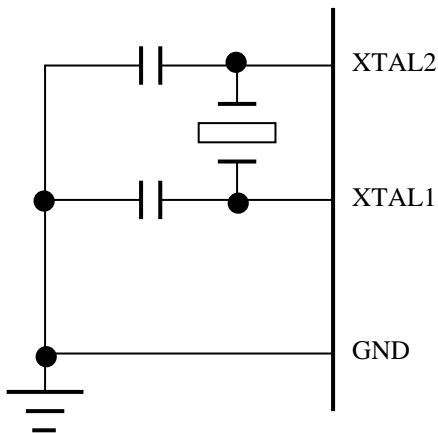
Figure1. Oscillator Connections
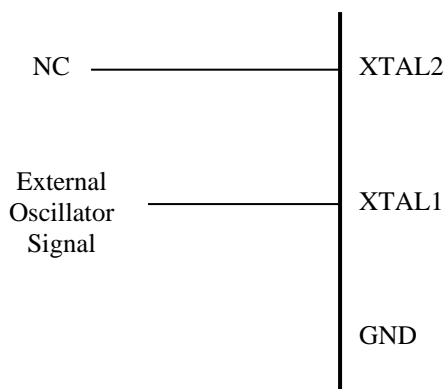
Figure2. External Clock Drive Configuration

Section2. Hardware Interfaces

The QuickBarII supports all barcode scanning devices (Wand, Slot Reader, CCD and Laser). See Appendix E. for timing waveforms of typical bar code scanners.

The Interface Signal of the QuickBarII is CLK_OUT, DATA_OUT, P_CLK, P_DATA and DREADY. With these signals the QuickBarII provides the most convenient way to build an AT/XT compatible Keyboard Wedge Interface. Recommended schematics is available per request. Following is a brief description for the schematics.

The "Wedge" interface is in between the PC and Keyboard. It contains two pair of bi-direction signals: the K_CLK and K_DATA signals are connected to Keyboard, the P_CLK and P_DATA signal are connected to PC.
In the normal state, the QuickBarII turns on the analog switch 4066 by setting DREADY to HIGH and releases the Keyboard bus by setting DATA_OUT and CLK_OUT to HIGH. In the case, the K_CLK and K_DATA are directly connected to the P_CLK and P_DATA, and the Keyboard can send data to PC and listens the response from PC. The Keyboard and PC can communicate in the way same as without wedge in between.
When the QuickBarII needs send data to PC, it turns off the 4066 to break the connection between PC and Keyboard by setting DREADY to LOW, and then sends CLK and DATA signal from CLK_OUT and DATA_OUT to P_CLK and P_DATA through the OC gate 74HC03. The QuickBarII also "listens" to the response from the PC through P_CLK and P_DATA when it is sending data to PC.

The READ-OK pin can drive a LED directly with up to 20ma current. READ-OK is Low when power is first on. Scanning a bar code label turns it to High. It goes Low and Stays Low after QuickBarII successfully decodes the bar code label.

The BEEP pin can source/sink up to 20ma at 5V. When QuickBarII successfully decodes a barcode label, the BEEP signal oscillates at about 2700 Hz for a period of 50ms.

The WAKE pin wakes up the QuickBarII from Power Down Mode. Connecting WAKE to TRIG makes TRIG signal to wake up QuickBarII. Connecting WAKE to GND disables the Power Down Mode. See Appendix F. for details.

The CONT signal is used for Continue Mode which is not supported by the Keyboard wedge.
The CONT pin has to be pull up to HIGH in the Keyboard Wedge .

An 8 MHZ crystal or an external 8 MHZ clock signal can be used with QuickBarII. Refer to CRYSTAL OSCILLATOR in Section 1 for details.

The SCK, DA_OUT, and INSTR_IN signal are used for the optional in-system Serial Memory Programming.

Section3. Configuration Descriptions

The appropriate configuration for the user's application must be programmed into the QuickBarII. These configuration settings control the serial interface parameters, general settings and the barcode symbologies to be read along with the appropriate reading restrictions. The settings can be transmitted to the QuickBarII by sending "SetUp Commands" from the host processor via the serial interface. The configuration settings are maintained in non-volatile memory inside the QuickBarII and are not affected by cycling power.

DEFAULT SETTINGS

QuickBarII is shipped from the factory with the default settings shown in Table 1 below. These settings are shown in ***Bold Italics*** in the feature descriptions and the SetUp Command listings. The QuickBarII can be reset to the default by sending the "Reset All Default" command to it.

Table1, Default Settings

SETTING	DEFAULT
GENERAL	
Code ID	Off
Trigger Mode	Trigger
Beep Duration	Long
STX Sending	Off
ETX Sending	Off
Prefix Sending	Off
Suffix Sending	On
UPC-A Label ID	a
UPC-E Label ID	b
EAN-8 Label ID	c
EAN-13 Label ID	d
Code39 Label ID	e
I2of5 Label ID	f
S2of5 Label ID	g
Code128 Label ID	h
MSI Label ID	i
Codabar Label ID	j
Code11 Label ID	k
Code93 Label ID	l
BC412 Label ID	m
Code4 Label ID	n
Code5 Label ID	o
Prefix Setting	Null
Suffix Setting	\CR
UPC-A	Enabled
Send Number System Digit	Yes

Send Check Digit	Yes
Read Two Digit Addendum	No
Read Five Digit Addendum	No
Addendum Required	Yes
Add Separator Space	Yes
Send UPC-A as EAN-13	No
Scan Verification Times	2
UPC-E	Enabled
Send Number System Digit	Yes
Send Check Digit	Yes
Read Two Digit Addendum	No
Read Five Digit Addendum	No
Addendum Required	Yes
Add Separator Space	Yes
UPC-E Expansion	No
Scan Verification Times	2
EAN-13	Enabled
Send Induced Country Code Digit	Yes
Send Check Digit	Yes
Read Two Digit Addendum	No
Read Five Digit Addendum	No
Addendum Required	Yes
Add Separator Space	Yes
Scan Verification Times	2
EAN-8	Enabled
Send Induced Country Code Digit	Yes
Send Check Digit	Yes
Read Two Digit Addendum	No
Read Five Digit Addendum	No
Addendum Required	Yes
Add Separator Space	Yes
Scan Verification Times	2
Code 39	Enabled
Full ASCII Mode	On
Verify Check Digit	No
Send Check Digit	No
Send Start/Stop Characters	No
Scan Verification Times	1
Min Length	1
Max Length	60
Interleaved 2 of 5	Enabled
Fixed Length	Off
Verify Check Digit	No
Send Check Digit	No
Scan Verification Times	2

Min Length	4
Max Length	60
Industrial 2 of 5	Enabled
Fixed Length	Off
Verify Check Digit	No
Send Check Digit	No
Scan Verification Times	2
Min Length	1
Max Length	60
Code 128	Enabled
Scan Verification Times	1
Min Length	1
Max Length	60
Codabar	Enabled
Verify Check Digit	No
Send Check Digit	No
Send Start/Stop	Yes
Scan Verification Times	1
Min Length	2
Max Length	60
MSI/Plessey	Enabled
Send Check Digit(s)	No
Single Mod 10 Check Digit	No
Mod10-Mod10 or Mod10-Mod 11	Mod10-Mod10
Scan Verification Times	1
Min Length	1
Max Length	60
Code 11	Enabled
Check Digit(s)	2
Send Check Digit(s)	No
Scan Verification Times	1
Min Length	1
Max Length	60
Code 93	Enabled
Scan Verification Times	1
Min Length	1
Max Length	60
Code 4	Enabled
Scan Verification Times	1
Code 5	Enabled
Scan Verification Times	1
BC 412	Enabled
Send Check Digit	Yes
Scan Verification Times	1
Min Length	1

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Max Length	60
Serial Interface Parameters	
Baud Rate	9600
Parity	None
Data Bit	8
Stop Bit	1
Handshaking	Software
Xon Character	DC1
XOff Character	DC3

RECEIVE CURRENT SETTINGS

The current configuration settings can be retrieved from the QuickBarII by sending the "Receiving Command" from the host.

FEATURE DESCRIPTIONS

Data Output Format

Decoded label will be output in following format.:
[STX][Prefix][Label ID] Label [suffix][ETX]

Data within [ ] means optional.
STX is a special code, its ASCII code is 02.
ETX is another special code, its ASCII code is 03.

General Selections

This group of configuration settings defines the basic operating parameters of the decoded scanner.

Code ID: On or *Off* - Each bar code symbology is assigned a CODE ID character. This character is added to the beginning of the scanned data and it is configurable. The host can use this character to ensure that the data received came from the appropriate type of symbol.

Trigger Mode: *Trigger* or Trigger-Less**.** This option applies to Laser or CCD scanners only. In Trigger Mode, the decoder waits for the TRIG signal to go from High to Low to enable the scanning. In Trigger-Less Mode, the scanner is always scanning, and the decoder will only send decoded data to the host if a new barcode label is seen.

Beep Duration: *Long* or Short. The Long beep lasts about 50ms and the Short beep lasts about 30ms.

STX Sending: On or *Off*. It is a special code before the scanned data indicates the start of data.

ETX Sending: On or *Off*. It is a special code after the scanned data indicates the end of data.

Prefix Sending: On or *Off*. This indicates whether or not sending prefix before scanned data.

Suffix Sending: *On* or Off. This indicates whether or not sending suffix after scanned data.

Label ID setting

This group of configuration settings defines label ID for each symbology, it is a one character code ID.

Prefix setting

This configuration setting defines a string for prefix, the string is up to 12 characters.

Suffix setting

This configuration setting defines a string for suffix, the string is up to 12 characters.

UPC-A

Enable/Disable: It is a fixed format symbology and there are no variations allowed. If disabled, the data from the symbology will be disregarded.

Send Number System Digit: *Yes* or No - The first encoded digit in the UPC-A symbol is the number system digit. If enabled, the first digit of the transmitted data stream is the number system digit followed by the manufacturer's number. If disabled, then the first five digits transmitted are the manufacturer's number.

Send Check Digit, *Yes* or No - The check digit is mandatory in the UPC symbology. If enabled, the decoder will send the decoded check digit as the last character in the data stream transmitted. If not, in the check character will be suppressed before transmission.

Read Two Digit Addendum: Yes or *No* - If enabled, the decoder will decode the two digit secondary symbol when it scanned with the primary symbol and add the data to the end of the transmission. If not, any secondary symbols will be ignored.

Read Five Digit Addendum: Yes or *No* - This option operates in the same manner as the Read Two Digit Addendum option except it enables the reading of a five digit secondary symbol.

Addendum Required: *Yes* or No - If a two or five digit addendum is enabled, then enabling this option will require an addendum be present before a "Good Read" is registered. If this option is set to No, then symbols with and without the addendum will be accepted.

Add Separator Space: *Yes* or No - This option is used with the Two Digit and Five Digit Addendum options. If enabled, an ASCII space character is inserted between the data decoded from the primary UPC symbol and the addendum symbol.

Send UPC-A as EAN-13: Yes or *No* - The EAN-13 symbology contains an additional character encoded in the symbol. In applications that may be reading both symbologies, it is sometimes desirable to send the UPC-A symbol in the EAN-13 format. This allows the application to receive the data scanned from both symbologies in the same format.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

UPC-E

Enable/Disable: It is a fixed format symbology and there are no variations allowed. If disabled, the data from the symbology will be disregarded.

Send Number System Digit: *Yes* or No - The first encoded digit in the UPC-E symbol is the number system digit. If enabled, the first digit of the transmitted data stream is the number system digit followed by the manufacturer's number. If disabled, then the first five digits transmitted are the manufacturer's number.

Send Check Digit, *Yes* or No - The check digit is mandatory in the UPC symbology. If enabled, the decoder will send the decoded check digit as the last character in the data stream transmitted. If not, in the check character will be suppressed before transmission.

Read Two Digit Addendum: Yes or *No* - If enabled, the decoder will decode the two digit secondary symbol when it scanned with the primary symbol and add the data to the end of the transmission. If not, any secondary symbols will be ignored.

Read Five Digit Addendum: Yes or *No* - This option operates in the same manner as the Read Two Digit Addendum option except it enables the reading of a five digit secondary symbol.

Addendum Required: *Yes* or No - If a two or five digit addendum is enabled, then enabling this option will require an addendum be present before a "Good Read" is registered. If this option is set to No, then symbols with and without the addendum will be accepted.

Add Separator Space: *Yes* or No - This option is used with the Two Digit and Five Digit Addendum options. If enabled, an ASCII space character is inserted between the data decoded from the primary UPC symbol and the addendum symbol.

UPC-E Expansion: Yes or *No* - The UPC-E symbology uses a special algorithm to suppress zeros in the encoded data. The suppressed information can be restored by either the decoder or the host system. If enabled, the decoder will restore the data to its original format. If the host system is set up to do the expansion, then this option should not be used.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

EAN-8

Enable/Disable - EAN-8 is a fixed format symbology and there are no variations allowed. If disabled, the data from the symbology will be disregarded.

Send Induced Country Code Character: *Yes* or No - The EAN symbology adds an additional digit to the beginning of the data to give a two digit Country Code. If enabled, the induced character is added as the first character transmitted. If disabled, then the induced character is not transmitted.

Send Check Digit: *Yes* or No - The EAN check digit is mandatory. If enabled, the decoder will send the decoded check digit as the last character transmitted. If not, the check character will be suppressed before transmission.

Read Two Digit Addendum: Yes or *No* - If enabled, the decoder will decode the two digit secondary symbol when it scanned with the primary symbol and add it to the end of the transmission. If not, any secondary symbols will be ignored.

Read Five Digit Addendum: Yes or *No* - This option operates in the same manner as the Read Two Digit Addendum option except it enables the reading of a five digit secondary symbol.

Addendum Required: *Yes* or No - If enabled, the two or five digit addendum, will be required before a "Good Read" is registered. If this option is set to No, then symbols with and without the addendum will be accepted.

Add Separator Space: *Yes* or No - This option is used in conjunction with the Two Digit and Five Digit Addendum options. If enabled, an ASCII space character is inserted between the data decoded from the primary EAN symbol and the addendum symbol.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

EAN-13

Enable/Disable - EAN-13 is a fixed format symbology and there are no variations allowed. If disabled, the data from the symbology will be disregarded.

Send Induced Country Code Character: *Yes* or No - The EAN symbology adds an additional digit to the beginning of the data to give a two digit Country Code. If enabled, the induced character is added as the first character transmitted. If disabled, then the induced character is not transmitted.

Send Check Digit: *Yes* or No - The EAN check digit is mandatory. If enabled, the decoder will send the decoded check digit as the last character transmitted. If not, the check character will be suppressed before transmission.

Read Two Digit Addendum: Yes or *No* - If enabled, the decoder will decode the two digit secondary symbol when it scanned with the primary symbol and add it to the end of the transmission. If not, any secondary symbols will be ignored.

Read Five Digit Addendum: Yes or *No* - This option operates in the same manner as the Read Two Digit Addendum option except it enables the reading of a five digit secondary symbol.

Addendum Required: *Yes* or No - If enabled, the two or five digit addendum, will be required before a "Good Read" is registered. If this option is set to No, then symbols with and without the addendum will be accepted.

Add Separator Space: *Yes* or No - This option is used in conjunction with the Two Digit and Five Digit Addendum options. If enabled, an ASCII space character is inserted between the data decoded from the primary EAN symbol and the addendum symbol.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Code 39

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Full ASCII: *On* or Off - The standard Code 39 symbology supports only 43 characters. The number of characters encoded can be expanded by using character pairs to identify the full ASCII 128 character set. When this selection is turned On, the decoder will search for these character pairs and transmit only the Full ASCII single character equivalent to the host. If Full ASCII is enabled and used to read a standard Code 39 symbol, any combination of the defined character pairs will be reported to the host as the single character equivalent. If disabled and a Full ASCII Code 39 symbol is scanned, the decoder will report each of the characters in the Full ASCII pair as individual characters. The decoder has no way of telling if the symbol is encoded in standard Code 39 or Full ASCII Code 39.

Verify Check Digit: Yes or *No* - If enabled, the decoder tests for a check digit, it takes the last character in the decoded data stream as a check digit. It then calculates the correct check digit for the remaining data and compares it to the last data character. If it is the same, the data is accepted, if not, the data is rejected. If the check digit option is not enabled, the decoder will assume the last data character read from the symbol is part of the data stream and will not make a comparison test.

Send Check Digit: Yes or *No* - If the Verify Check Digit option is set to Yes, the decoder can either send the check digit as part of the data or strip it from the data stream before transmission.

Send Start/Stop Characters: Yes or *No* - A unique character is used as the first and last character in a Code 39 symbol. It is printed as an asterisk (*). Some applications require that these characters be transmitted with the data while others specify that they must not be sent.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Interleaved 2 of 5

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Fixed Length: On or *Off* - Interleaved 2 of 5 symbols are commonly printed in a fixed format containing a fixed number of characters. If this option is turned ON, the first Interleaved 2 of 5 symbol scanned after power up will set the length of any other symbols scanned afterwards. If the succeeding scans do not match the length of the first scan, the scan is rejected by the decoder. Power must be recycled before an Interleaved 2 of 5 symbol of a different length will be accepted.

Verify Check Digit: Yes or *No* - If enabled, the decoder tests for a check digit, it takes the last character in the decoded data stream as a check digit. It then calculates the correct check digit for the remaining data and compares it to the last data character. If it is the same, the data is accepted, if not, the data is rejected. If the check digit option is not enabled, the decoder will assume the last data character read from the symbol is part of the data stream and will not make a comparison test.

Send Check Digit: Yes or *No* - If the Verify Check Digit option is set to Yes, the decoder can either send the check digit as part of the data or strip it before transmission.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *4*, 1 to 60 - Sets the minimum number of data characters that will be accepted for this symbology. The Interleaved 2 of 5 symbology must encode numbers in pairs, if the minimum length is set to an odd number, the decoder will automatically use the next higher number for this setting. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. The Interleaved 2 of 5 symbology must encode numbers in pairs, if the maximum length is set to an odd number, the decoder will automatically use the next lower number for this setting. If the maximum length is set lower than the minimum length, all readings will be rejected.

Industrial 2 of 5

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Fixed Length: On or *Off* - Industrial 2 of 5 symbols are commonly printed in a fixed format containing a fixed number of characters. If enabled, the first Industrial 2 of 5 symbol scanned after power up will set the length of any other symbols scanned afterwards. If the succeeding scans do not match the length of the first scan, the scan is rejected by the decoder. Power must be recycled before an Industrial 2 of 5 symbol of a different length will be accepted.

Verify Check Digit: Yes or *No* - If enabled the decoder tests for a check digit, it takes the last character in the decoded data stream as a check digit. It then calculates the correct check digit for the remaining data and compares it to the last data character. If it is the same the data is accepted, if not, data is rejected. If the check digit option is not enabled, the decoder will assume the last data character read from the symbol is part of the data stream and will not make a comparison test.

Send Check Digit: Yes or *No* - If the Verify Check Digit option is set to Yes, the decoder can either send the check digit as part of the data or strip it before transmission to the host.

Scan Verification Times: 1 to 16 (*2*) - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Code 128

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

The **Check Digit** is mandatory for this symbology.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Codabar

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Verify Check Digit: Yes or *No* - If enabled, the decoder tests for a check digit, it takes the last character in the decoded data stream as a check digit. It then calculates the correct check digit for the remaining data and compares it to the last data character. If it is the same, the data is accepted, if not, the data is rejected. If the check digit option is not enabled, the decoder will assume the last data character read from the symbol is part of the data stream and will not make a comparison test.

Send Check Digit: Yes or *No* - If the Verify Check Digit option is set to Yes, the decoder can either send the check digit as part of the data or strip it from the data stream before transmission.

Send Start/Stop Characters: Yes or *No* - The Codabar symbology use the A, B, C and D characters as Start and Stop characters, giving 16 unique Start/Stop character combinations. Some applications require that these characters be transmitted with the data while others specify that they must not be sent.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *2*, 1 to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

MSI/Plessey

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Send Check Digit(s): Yes or *No* - The MSI/Plessey symbology requires a check digit and can optionally have two check digits. The decoder can either send the check digit(s) as part of the data or strip it before transmission to the host.

Single Mod 10 Check Digit: Yes or *No* - If enabled, the decoder will take the last data character decoded and use it for comparison against the internally calculated modulo 10 check digit. If they are the same, the decoder accepts the data as valid and transmits it to the host. If they do not match, then the scan is rejected.

Mod10-Mod10 or Mod10-Mod 11: *Mod10-Mod10* or Mod10-Mod11 - For increased data integrity, the MSI/Plessey symbology can be printed with two check digits. The first check digit is always modulo 10 and the second can be either modulo 10 or modulo 11. The decoder takes the last two data characters decoded and use them for comparison against the internally calculated check digits using the remaining data. If they are the same, the decoder accepts the data and transmits it to the host. If they do not match, then the scan is rejected.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length, *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length, 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Code 11

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Two Check Digits: *Yes* or No - This symbology can be printed with two modulo 11 check digits. If enabled, the decoder will take the last two data characters decoded and use them for comparison against the internally calculated check digits using the remaining data. If the same, the decoder accepts the data and transmits it to the host, if not, the scan is rejected.

Send Check Digit(s): Yes or *No* - This symbology requires a check digit and can optionally have dual check digits. The decoder can either send the check digit(s) as part of the data or strip it from the data stream before transmission to the host. The default is NO.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for a particular symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Code 93

Enable/Disable: If enabled, the symbology will be read subject to the reading restrictions specified by this set of options. If disabled, the data from the symbology will be disregarded.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

BC412

Enable/Disable: The BC412 is a proprietary symbology using primarily in PCB assembly operations. If disabled, the data from the symbology will be disregarded.

Send Check Digit: *Yes* or No – BC412 requires a check digit, the decoder can either send the check digit as part of the data or strip it from the data stream before transmission.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Min Length: *1* to 60 - Sets the minimum number of data characters that will be accepted for this symbology. If the minimum length is set higher than the maximum length, all readings will be rejected.

Max Length: 1 to *60* - Sets the maximum number of data characters that will be accepted for this symbology. If the maximum length is set lower than the minimum length, all readings will be rejected.

Code 4

Enable/Disable: The Code 4 is a proprietary symbology using primarily in libraries. If disabled, the data from the symbology will be disregarded.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Code 5

Enable/Disable: The Code 5 is a proprietary symbology using primarily in libraries. If disabled, the data from the symbology will be disregarded.

Scan Verification Times: *1* to 16 - This option applies to CCD and Laser scanners only. The decoder scans and decodes the same bar code the programmed number of times and compares the information. This is done with a single activation of the trigger. If the data matches, it is outputted to the host.

Serial Interface Parameters

This group of settings specifies the parameters used for serial communications with the host.

Baud Rate: 2400, 4800, *9600*, 19200 or 38400 bps - The data rate for receiving and transmitting serial data is specified by this setting.

Parity: Even, Odd, Mark, Space, or *None* - Serial communications can define a parity check bit to be added to each character as it is transmitted. This check bit can be true for an odd number of "1" bits or an even number of "1" bits in the data character. The user may also choose to always define the parity bit as always a Mark (true) or a Space (false). Selecting None results in no parity bit.

Data Bits: 7 or *8* - The number of data bits used to define the character. Seven data bits can define 128 individual characters, eight bits results in 256 definable characters.

Note: The decoder must use a total of 10 or 11 bits to define a character frame, you cannot select "7" data bits with the "None" parity option. If you do, the decoder will format the character frame as 8 data bits with no parity.

Handshaking: *X-On/X-Off*, RTS/CTS - Some type of "handshaking" or "flow control" must be used between any two communicating SERIAL devices to prevent data from being transmitted before the receiving device can accept. The handshake signals interrupt the flow of data until the receiving device is ready.

Stop Bit: *One* or Two bits - The stop bit defines the number of bits used to end the data frame. Some older equipment require extra time after receiving a character to process it requiring two stop bits.

X-On Character: DC1, DC2, or any one ASCII Character - The normal selections are DC1 or DC2. If another character is specified, make sure it will not occur in the normal data transmission.

X-Off Character: DC3, DC4 or any one ASCII Character - The normal selections are DC3 or DC4. If another character is specified, make sure it will not occur in the normal data transmission.

Section4. SetUp Commands

GENERAL RULES

Serial Parameters

For sending SetUp Commands from the host to the QuickBarII, the serial communication parameter is always **9600, None, 8, 1.** This simplifies the serial communication, makes all 8 data bits available for SetUp Commands and allows full flexibility in selecting the data communication parameters from the QuickBarII to the host.

Setup Commands

There are two groups of Setup Commands, the Sending Commands change the configuration settings and the Receiving Command retrieves all current settings.

A simple ACK/NAK protocol with a one byte checksum is used in sending SetUp Commands to the QuickBarII.

SETUP COMMAND STRUCTURE

<STX><GroupID>[<FuncID><Len><FuncData>…]<ETX><CheckSum>

Where:
<STX> = 02h, <ETX> = 03h.
<GroupID> is a string identifies the SetUp Command group. For Sending Commands that change the configuration settings, the <GroupID> is "S". For Receiving Command that retrieve the current QuickBarII settings, the <GroupID> is "R".
<FuncID> is a one byte Function ID identifies the particular setting(s) affected.
<Len> is a one byte length count for the following data block <FuncData>.
<FuncData> is the data block for the function.
One Sending Command can have many function blocks.
The Receiving Command has no function block.
The overall Exclusive-OR sum (from <STX> to <CheckSum>) should be zero.

PROTOCOL

Sending Command

The host sends a Sending Command to the QuickBarII chip and waits for an acknowledgement. If QuickBarII receives the command correctly, it returns an ACK (06h) to the host. If there is an error, it returns a NAK (15h).

Host		**QuickBarII**
1.	——— Sending Command ———▶	
2.	◀——— ACK if OK ———————	
	or	
	◀------- NAK if Error ------------------	
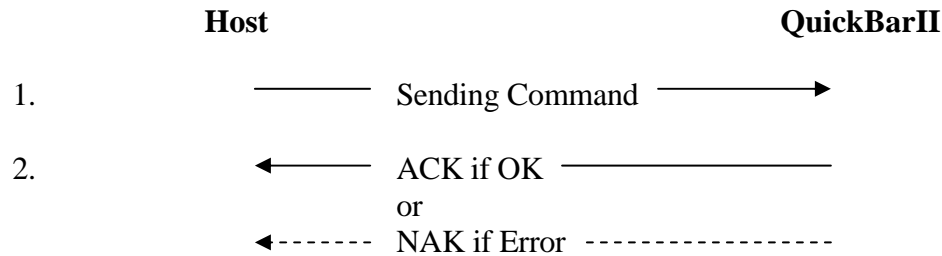
Maximum delay for QuickBarII to response to the command is 5ms. Typical delay is 0.1ms.

Receiving Command

The host sends the Receiving Command to the QuickBarII chip and waits for configuration setting data. If QuickBarII receives the command correctly, it returns an ACK (06h) and the configuration setting data back to the host. If there is an error, it returns a NAK (15h).
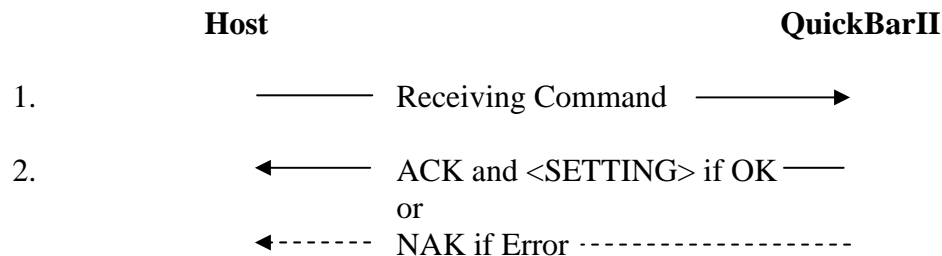
Host		**QuickBarII**
1.	——— Receiving Command ———▶	
2.	◀——— ACK and <SETTING> if OK ———	
	or	
	◀------- NAK if Error ------------------	

Maximum delay for QuickBarII to response to the command is 5ms. Typical delay is 0.1ms.

SENDING COMMAND LIST

All QuickBarII SetUp Sending Commands are listed in the following format:

<STX><S><FuncID><Len><FuncData><ETX><CheckSum>

 "S" is the GroupID for Sending Commands.
<FuncID> is a one byte Function ID identifies the particular setting(s) affected.
<Len> is a one byte length count for the following data block <FuncData>.
<FuncData> is the data block for the function.

Even though one command can have many function blocks, the following list contains only one function block for simplicity.

General Settings

<STX><S><13h><01h><General Settings><ETX><CheckSum>

General Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code ID	On	*Off*
	1	Trigger Mode	Trigger-Less	*Trigger*
	2	Beep duration	*Long*	Short
	3	STX Sending	On	*Off*
	4	ETX Sending	On	*Off*
	5	Prefix Sending	On	*Off*
	6	Suffix Sending	*On*	Off
	7	Reserved		

Restore to Default

<STX><S><16h><ETX><CheckSum>
This command does not have any <FuncData>. It restores all settings to the default value.

Set UPC-A Label ID

<STX><S><20h><01h><Code ID><ETX><CheckSum>
This command set UPC-A label ID as <Code ID>.

Set UPC-E Label ID

<STX><S><21h><01h><Code ID><ETX><CheckSum>
This command set UPE-E label ID as <Code ID>.

Set EAN-8 Label ID

<STX><S><22h><01h><Code ID><ETX><CheckSum>
This command set EAN-8 label ID as <Code ID>.

Set EAN-13 Label ID

<STX><S><23h><01h><Code ID><ETX><CheckSum>
This command set EAN-13 label ID as <Code ID>.

Set Code39 Label ID

<STX><S><24h><01h><Code ID><ETX><CheckSum>
This command set Code39 label ID as <Code ID>.

Set I2of5 Label ID

<STX><S><25h><01h><Code ID><ETX><CheckSum>
This command set I2of5 label ID as <Code ID>.

Set S2of5 Label ID

<STX><S><26h><01h><Code ID><ETX><CheckSum>
This command set S2of5 label ID as <Code ID>.

Set Code128 Label ID

<STX><S><27h><01h><Code ID><ETX><CheckSum>
This command set Code128 label ID as <Code ID>.

Set MSI Label ID

<STX><S><28h><01h><Code ID><ETX><CheckSum>
This command set MSI label ID as <Code ID>.

Set Codabar Label ID

<STX><S><29h><01h><Code ID><ETX><CheckSum>
This command set Codabar label ID as <Code ID>.

Set Code11 Label ID

<STX><S><2Ah><01h><Code ID><ETX><CheckSum>
This command set Code11 label ID as <Code ID>.

Set Code93 Label ID

<STX><S><2Bh><01h><Code ID><ETX><CheckSum>
This command set Code93 label ID as <Code ID>.

Set BC412 Label ID

<STX><S><2Ch><01h><Code ID><ETX><CheckSum>

This command set BC412 label ID as <Code ID>.

Set Code4 Label ID

<STX><S><2Dh><01h><Code ID><ETX><CheckSum>
This command set Code4 label ID as <Code ID>.

Set Code5 Label ID

<STX><S><2Eh><01h><Code ID><ETX><CheckSum>
This command set Code5 label ID as <Code ID>.

Set Prefix

<STX><S><30h><Length of FunID><Length of String><Prefix String><ETX><CheckSum>
This command set prefix string.
<Length of FunID> is length of prefix string + 1(length byte).

Set Suffix

<STX><S><31h><Length of FunID><Length of String><Suffix String><ETX><CheckSum>
This command set suffix string.
<Length of FunID> is length of suffix string + 1(length byte).

UPC-A Settings
<STX><S><61h><2><UPC-A Settings><ETX><CheckSum>

UPC-A Settings

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	UPC-A reading	**Enabled**	Disabled
	1	Send Number System Digit	**Yes**	No
	2	Send Check Digit	**Yes**	No
	3	Read Two Digit Addendum	Yes	**No**
	4	Read Five Digit Addendum	Yes	**No**
	5	Addendum Required	**Yes**	No
	6	Add Separator Space	**Yes**	No
	7	Send UPC-A as EAN-13	Yes	**No**
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

UPC-E Settings
<STX><S><62h><2><UPC-E Settings><ETX><CheckSum>

UPC-E Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	UPC-E reading	*Enabled*	Disabled
	1	Send Number System Digit	*Yes*	No
	2	Send Check Digit	*Yes*	No
	3	Read Two Digit Addendum	Yes	*No*
	4	Read Five Digit Addendum	Yes	*No*
	5	Addendum Required	*Yes*	No
	6	Add Separator Space	*Yes*	No
	7	UPC-E Expansion	Yes	*No*
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

EAN-13 Settings
<STX><S><64h><2><EAN-13 Settings><ETX><CheckSum>

EAN-13 Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	EAN-13 reading	*Enabled*	Disabled
	1	Send Induced Country Code	*Yes*	No
	2	Send Check Digit	*Yes*	No
	3	Read Two Digit Addendum	Yes	*No*
	4	Read Five Digit Addendum	Yes	*No*
	5	Addendum Required	*Yes*	No
	6	Add Separator Space	*Yes*	No
	7	Reserved		
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

EAN-8 Settings
<STX><S><63h><2><EAN-8 Settings><ETX><CheckSum>

EAN-8 Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	EAN-8 reading	*Enabled*	Disabled
	1	Send Induced Country Code	*Yes*	No
	2	Send Check Digit	*Yes*	No
	3	Read Two Digit Addendum	Yes	*No*
	4	Read Five Digit Addendum	Yes	*No*
	5	Addendum Required	*Yes*	No
	6	Add Separator Space	*Yes*	No
	7	Reserved		
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

Code 39 Settings

<STX><S><51h><4><Code 39 Settings><ETX><CheckSum>

Code 39 Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code 39 reading	*Enabled*	Disabled
	1	Full ASCII Mode	*On*	No
	2	Verify Check Digit	Yes	*No*
	3	Send Check Digit	Yes	*No*
	4	Send Start/Stop Characters	Yes	*No*
	5 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Interleaved 2 of 5 Settings

<STX><S><52h><4>< Interleaved 2 of 5 Settings><ETX><CheckSum>

Interleaved 2 of 5 Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Interleaved 2 of 5 reading	*Enabled*	Disabled
	1	Fixed Length	On	*Off*
	2	Verify Check Digit	Yes	*No*
	3	Send Check Digit	Yes	*No*
	4 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 2 to 60.

Industrial 2 of 5 Settings

<STX><S><53h><4>< Industrial 2 of 5 Settings><ETX><CheckSum>

Industrial 2 of 5 Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Industrial 2 of 5 reading	*Enabled*	Disabled
	1	Fixed Length	On	*Off*
	2	Verify Check Digit	Yes	*No*
	3	Send Check Digit	Yes	*No*
	4 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Code 128 Settings

<STX><S><54h><4>< Code 128 Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
Code 128 Settings				
1	0	Code 128 reading	*Enabled*	Disabled
	1 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Codabar Settings

<STX><S><55h><4>< Codabar Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
Codabar Settings				
1	0	Codabar reading	*Enabled*	Disabled
	1	Verify Check Digit	Yes	*No*
	2	Send Check Digit	Yes	*No*
	3	Send Start/Stop	Yes	*No*
	4 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

MSI/Plessey Settings

<STX><S><57h><4>< MSI/Plessey Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
MSI/Plessey Settings				
1	0	MSI/Plessey reading	*Enabled*	Disabled
	1	Send Check Digit	Yes	*No*
	2	Single Mod 10 Check Digit	Yes	*No*
	3	Mod10-Mod10 or Mod10-Mod11	*Mod10-Mod10*	Mod10-Mod11
	4 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Code 11 Settings

<STX><S><56h><4>< Code 11 Settings><ETX><CheckSum>

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Code 11 Settings

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code 11 reading	*Enabled*	Disabled
	1	One or Two Check Digit(s)	One	*Two*
	2	Send Check Digit(s)	Yes	*No*
	3 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Code 93 Settings

<STX><S><58h><4>< Code 93 Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code 93 reading	*Enabled*	Disabled
	1 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.
Min Length and Max Length are numbers from 1 to 60.

Code 4 Settings

<STX><S><5Ah><2>< Code 4 Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code 4 reading	*Enabled*	Disabled
	1 - 7	Reserved		
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

Code 5 Settings

<STX><S><5Bh><2>< Code 5 Settings><ETX><CheckSum>

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Code 5 reading	*Enabled*	Disabled
	1 - 7	Reserved		
2	0 – 7	Scan Verification Times		

Scan Verification Times is a number from 1 to 16.

BC 412 Settings

<STX><S><59h><4>< BC 412 Settings><ETX><CheckSum>

BC 412 Settings

BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	BC 412 reading	*Enabled*	Disabled
	1	Send Check Digit	*Yes*	No
	2 - 7	Reserved		
2	0 – 7	Scan Verification Times		
3	0 – 7	Min Length		
4	0 – 7	Max Length		

Scan Verification Times is a number from 1 to 16.

Baud Rate Setting
<STX><S><41h><1>< Baud Rate Setting><ETX><CheckSum>

Baud Rate Setting		
BYTE	ASCII VALUE	BAUD RATE
1	3	2400
	4	4800
	5	*9600*
	6	19200
	7	38400

Parity Setting
<STX><S><42h><1>< Parity Setting><ETX><CheckSum>

Parity Setting		
BYTE	ASCII VALUE	PARITY
1	0	*None*
	1	Even
	2	Odd
	3	Mark
	4	Space

Data Bit, Stop Bit and Handshaking Settings
<STX><S><43h><1>< Data Bit and Stop Bit Settings><ETX><CheckSum>

Data Bit and Stop Bit Settings				
BYTE	BIT	SETTING	BIT SET TO 1	BIT SET TO 0
1	0	Stop Bit	2	*1*
	1	Data Bit	*8*	7
	2	Handshaking	*Xon/Xoff*	RTS/CTS

Xon Character Setting
<STX><S><44h><1>< Xon Character><ETX><CheckSum>
<Xon Character> is the ASCII code for the desired Xon Character. Default is DC1.

Xoff Character Setting
<STX><S><45h><1>< Xoff Character><ETX><CheckSum>
<Xoff Character> is the ASCII code for the desired Xoff Character. Default is DC3.

RECEIVING COMMAND

The Receiving Command has the following format:
<STX><R><ETX><CheckSum>
Or:
<02h><52h><03h><53h>

The QuickBarII receives the Receiving Command and verifies the CheckSum. If the CheckSum is correct, QuickBarII sends back an <ACK> along with the current setting data block <SETTING>. If the CheckSum is incorrect, QuickBarII sends a <NAK>.

<SETTING> format

The current setting data block <SETTING> is a collection of many Function-Setting blocks <FuncSETBLOCK> as follows:
<STX><Version Number><FuncSETBLOCK1>…< FuncSETBLOCKn><ETX><CheckSum>

<Version Number> consists of two bytes, indicates major and minor version number.

Each Function-Setting block <FuncSETBLOCK> has the following format:
<FuncID><Len><FuncData>
Where:
<FuncID> is a one byte Function ID identifies the setting(s) for the function.
<Len> is a one byte length count for the following function-setting block <FuncData>.
<FuncData> is the current setting for this function. It has the same format as in the Sending Command for this function. See SENDING COMMAND LIST for details.

<FuncSETBLOCK> are in the order of their function ID <FuncID>. On the following page, is the Function List.

FuncID	Len	Description	Setting(s)
13h	1	General	Code ID, Trigger Mode, Beep Duration, STX sending, ETX sending, Prefix sending, Suffix sending
20h	1	UPC-A Label ID	
21h	1	UPC-E Label ID	
22h	1	EAN-8 Label ID	
23h	1	EAN-13 Label ID	
24h	1	Code39 Label ID	
25h	1	I2of5 Label ID	
26h	1	S2of5 Label ID	
27h	1	Code128 Label ID	
28h	1	MSI Label ID	
29h	1	Codabar Label ID	
2Ah	1	Code11 Label ID	
2Bh	1	Code93 Label ID	
2Ch	1	BC412 Label ID	
2Dh	1	Code4 Label ID	
2Eh	1	Code5 Label ID	
30h	1~12	Prefix	\null if not available
31h	1~12	Suffix	\null if not available, CR as default
41h	1	Baud Rate	2400,4800,9600,19200, 38400
42h	1	Parity	None, Even, Odd, Mark, Space
43h	1	Data Bit, Stop Bit and Handshaking	Stop Bit, Data Bit, Handshaking
44h	1	Xon Character	The Xon Character
45h	1	Xoff Character	The Xoff Character
51h	4	Code 39	Enable Full Check SendChk SendSS, Scan-Verification, MaxLen, MinLen
52h	4	I 2 of 5	Enable FixedLen Check SendChk, Scan-Verification, MaxLen MinLen
53h	4	S 2 of 5	Enable FixedLen Check SendChk, Scan-Verification, MaxLen, MinLen
54h	4	Code 128	Enable, Scan-Verification, MaxLen, MinLen
55h	4	Codabar	Enable Check SendChk SendSS, Scan-Verification, MaxLen, MinLen
56h	4	Code 11	Enable CheckMode SendChk, Scan-Verification, MaxLen, MinLen
57h	4	MSI	Enable SendChk CheckMode, Scan-Verification, MaxLen, MinLen
58h	4	Code 93	Enable, Scan-Verification, MaxLen, MinLen
59h	2	BC412	Enable SendChk,

			Scan-Verification
5Ah	2	Code4	Enable, Scan-Verification
5Bh	2	Code5	Enable, Scan-Verification
61h	2	UPCA	Enable SendNSD SendChk AddOn2 AddOn5 AddMust AddSep UPC-A-To-EAN-13, Scan-Verification
62h	2	UPCE	Enable SendNSD SendChk AddOn2 AddOn5 AddMust AddSep UPC-E-Expansion, Scan-Verification
63h	2	EAN8	Enable SendICC SendChk AddOn2 AddOn5 AddMust AddSep, Scan-Verification
64h	2	EAN13	Enable SendICC SendChk AddOn2 AddOn5 AddMust AddSep, Scan-Verification

Section5. Bar Code Setting Menus

There are four types of setting labels and all setting labels are Code39.

Most of them are one step setting labels. One can program the settings by just scan corresponding bar code.

The second one is XOn and XOff setting label. One should scan the XOn/XOff setting first, and then scan the setting value from code39 full ASCII bar code table.

The third one is length or scan times setting label. One should scan the setting label first, and then scan the setting value from QuickBar Number Setting table.

The fourth one is Prefix and Suffix setting label. One should scan the Prefix/Suffix setting first, and then scan the character in string one by one from code39 full ASCII bar code table until scan a null code or up to 12 character.

A success (or partial success) setting will beep twice, a wrong setting will beep four times. A success decoding (not setting) will only beep once.

General Setting

All Default:	/E01600/D		
Enable Code ID:	/E11308/D	**Disable Code ID:**	**/E11300/D**
Trigger-Less Mode:	/E11309/D	**Trigger:**	**/E11301/D**
Long Beep:	**/E1130A/D**	Short Beep:	/E11302/D
STX On:	/E1130B/D	**STX Off:**	**/E11303/D**
ETX On:	/E1130C/D	**ETX Off:**	**/E11304/D**
Prefix On:	/E1130D/D	**Prefix Off:**	**/E11305/D**
Suffix On:	**/E1130E/D**	Suffix Off:	/E11306/D

Communication Setting

2 Stop Bit:	/E14308/D	**1 Stop Bit:**	**/E14300/D**
8 Data Bit:	**/E14309/D**	7 Data Bit:	/E14301/D
Xon/Xoff:	**/E1430A/D**	RTS/CTS:	/E14302/D

Baud Rate/Parity Setting

Baud Rate Setting:	/E24100/D	Parity Setting:	/E24200/D
2400 bits/sec:	/E33300/D	**Parity None:**	**/E33000/D**
4800 bits/sec:	/E33400/D	Parity Even:	/E33100/D
9600 bits/sec:	**/E33500/D**	Parity Odd:	/E33200/D
19200 bits/sec:	/E33600/D	Parity Mark:	/E33300/D
38400 bits/sec:	/E33700/D	Parity Space:	/E33400/D

Xon/Xoff Setting

Set XOn:	/E24400/D	Set XOff:	/E24500/D

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Prefix/Suffix Setting
Prefix Setting: /E23000/D   Suffix Setting: /E23100/D

BC412 Setting
BC412 Enable: **/E15908/D**   BC412 Disable: /E15900/D
Send Check Digit: **/E15909/D**   Not Send Check Digit: /E15901/D
Set BC412 Scan Verification Times: /E25910/D
Set BC412 Minimum Length: /E25920/D
Set BC412 Maximum Length: /E25930/D

Code11 Setting
Code11 Enable: **/E15608/D**   Code11 Disable: /E15600/D
One Check Digit: /E15609/D   **Two Check Digit:**   **/E15601/D**
Send Check Digit: /E1560A/D   **Not Send Check Digit:**   **/E15602/D**
Set Code11 Scan Verification Times: /E25610/D
Set Code11 Minimum Length: /E25620/D
Set Code11 Maximum Length: /E25630/D

Code128 Setting
Code128 Enable: **/E15408/D**   Code128 Disable: /E15400/D
Set Code128 Scan Verification Times: /E25410/D
Set Code128 Minimum Length: /E25420/D
Set Code128 Maximum Length: /E25430/D

Code39 Setting
Code39 Enable: **/E15108/D**   Code39 Disable: /E15100/D
Full ASCII Mode: **/E15109/D**   Not Full ASCII Mode: /E15101/D
Verify Check Digit On: /E1510A/D   **No Verify Check Digit:**   **/E15102/D**
Send Check Digit: /E1510B/D   **Not Send Check Digit:**   **/E15103/D**
Send Start/Stop Character: /E1510C/D   **Not Send Start/Stop Character:**   **/E15104/D**
Set Code39 Scan Verification Times: /E25110/D
Set Code39 Minimum Length: /E25120/D
Set Code39 Maximum Length: /E25130/D

Code4 Setting
Code4 Enable: **/E15A08/D**   Code4 Disable: /E15A00/D
Set Code4 Scan Verification Times: /E25A10/D

Code5 Setting
Code5 Enable: **/E15B08/D**   Code5 Disable: /E15B00/D
Set Code5 Scan Verification Times: /E25B10/D

Code93 Setting
Code93 Enable: **/E15808/D**   Code93 Disable: /E15800/D
Set Code93 Scan Verification Times: /E25810/D
Set Code93 Minimum Length: /E25820/D
Set Code93 Maximum Length: /E25830/D

Codabar Setting
Codabar Enable:	**/E15508/D**	Codabar Disable:	/E15500/D
Verify Check Digit On:	/E15509/D	**No Verify Check Digit:**	**/E15501/D**
Send Check Digit:	/E1550A/D	**Not Send Check Digit:**	**/E15502/D**
Send Start/Stop Character:	/E1550B/D	**Not Send Start/Stop Character:**	**/E15503/D**

Set Codabar Scan Verification Times: /E25510/D
Set Codabar Minimum Length: /E25520/D
Set Codabar Maximum Length: /E25530/D

EAN13 Setting
EAN13 Enable:	**/E16408/D**	EAN13 Disable:	/E16400/D
Send Induced Country Code:	**/E16409/D**	Not Send Induced Country Code:	/E16401/D
Send Check Digit:	**/E1640A/D**	Not Send Check Digit:	/E16402/D
Read Two Digit Addendum:	/E1640B/D	**Not Read Two Digit Addendum:**	**/E16403/D**
Read Five Digit Addendum:	/E1640C/D	**Not Read Five Digit Addendum:**	**/E16404/D**
Addendum Required:	**/E1640D/D**	Addendum Not Required:	/E16405/D
Add Separator Space:	**/E1640E/D**	Not Add Separator Space:	/E16406/D

Set EAN13 Scan Verification Times: /E26410/D

EAN8 Setting
EAN8 Enable:	**/E16308/D**	EAN8 Disable:	/E16300/D
Send Induced Country Code:	**/E16309/D**	Not Send Induced Country Code:	/E16301/D
Send Check Digit:	**/E1630A/D**	Not Send Check Digit:	/E16302/D
Read Two Digit Addendum:	/E1630B/D	**Not Read Two Digit Addendum:**	**/E16303/D**
Read Five Digit Addendum:	/E1630C/D	**Not Read Five Digit Addendum:**	**/E16304/D**
Addendum Required:	**/E1630D/D**	Addendum Not Required:	/E16305/D
Add Separator Space:	**/E1630E/D**	Not Add Separator Space:	/E16306/D

Set EAN8 Scan Verification Times: /E26310/D

I2of5 Setting
I2of5 Enable:	**/E15208/D**	I2of5 Disable:	/E15200/D
Fixed Length On:	/E15209/D	**Fixed Length Off:**	**/E15201/D**
Verify Check Digit On:	/E1520A/D	**No Verify Check Digit:**	**/E15202/D**
Send Check Digit:	/E1520B/D	**Not Send Check Digit:**	**/E15203/D**

Set I2of5 Scan Verification Times: /E25210/D
Set I2of5 Minimum Length: /E25220/D
Set I2of5 Maximum Length: /E25230/D

MSI Setting
MSI Enable:	**/E15708/D**	MSI Disable:	/E15700/D
Send Check Digit:	/E15709/D	**Not Send Check Digit:**	**/E15701/D**
Single Mod 10 Check Digit:	/E1570A/D	**Two Check Digit:**	**/E15702/D**
Mod10-Mod10:	**/E1570B/D**	Mod10-Mod11:	/E15703/D

Set MSI Scan Verification Times: /E25710/D
Set MSI Minimum Length: /E25720/D
Set MSI Maximum Length: /E25730/D

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S2of5 Setting

S2of5 Enable:	**/E15308/D**	S2of5 Disable:	/E15300/D
Fixed Length On:	/E15309/D	**Fixed Length Off:**	**/E15301/D**
Verify Check Digit On:	/E1530A/D	**No Verify Check Digit:**	**/E15302/D**
Send Check Digit:	/E1530B/D	**Not Send Check Digit:**	**/E15303/D**

Set S2of5 Scan Verification Times: /E25310/D
Set S2of5 Minimum Length: /E25320/D
Set S2of5 Maximum Length: /E25330/D

UPC-A Setting

UPC-A Enable:	**/E16108/D**	UPC-A Disable:	/E16100/D
Send Number System Digit:	**/E16109/D**	Not Send Number System Digit:	/E16101/D
Send Check Digital:	**/E1610A/D**	Not Send Check Digital:	/E16102/D
Read Two Digit Addendum:	/E1610B/D	**Not Read Two Digit Addendum:**	**/E16103/D**
Read Five Digit Addendum:	/E1610C/D	**Not Read Five Digit Addendum:**	**/E16104/D**
Addendum Required:	**/E1610D/D**	Addendum Not Required:	/E16105/D
Add Separator Space:	**/E1610E/D**	Not Add Separator Space:	/E16106/D
Send UPC-A as EAN-13:	/E1610F/D	**Not Send UPC-A as EAN-13:**	**/E16107/D**

Set UPC-A Scan Verification Times: /E26110/D

UPC-E Setting

UPC-E Enable:	**/E16208/D**	UPC-E Disable:	/E16200/D
Send Number System Digit:	**/E16209/D**	Not Send Number System Digit:	/E16201/D
Send Check Digit:	**/E1620A/D**	Not Send Check Digit:	/E16202/D
Read Two Digit Addendum:	/E1620B/D	**Not Read Two Digit Addendum:**	**/E16203/D**
Read Five Digit Addendum:	/E1620C/D	**Not Read Five Digit Addendum:**	**/E16204/D**
Addendum Required:	**/E1620D/D**	Addendum Not Required:	/E16205/D
Add Separator Space:	**/E1620E/D**	Not Add Separator Space:	/E16206/D
UPC-E Expansion:	/E1620F/D	**No UPC-E Expansion:**	**/E16207/D**

Set UPC-E Scan Verification Times: /E26210/D

Code39 FULL ASCII Bar Code Table

NUL:	%U	BS:	$H	DLE:	$P	CAN:	$X
SOH:	$A	HT:	$I	DC1:	$Q	EM:	$Y
STX:	$B	LF:	$J	DC2:	$R	SUB:	$Z
ETX:	$C	VT:	$K	DC3:	$S	ESC:	%A
EOT:	$D	FF:	$L	DC4:	$T	FS:	%B
ENQ:	$E	CR:	$M	NAK:	$U	GS:	%C
ACK:	$F	SO:	$N	SYN:	$V	RS:	%D
BEL:	$G	SI:	$O	ETB:	$W	US:	%E

SP:		(:	/H	0:	0	8:	8
!:	/A	):	/I	1:	1	9:	9
":	/B	*:	/J	2:	2	::	/Z
#:	/C	+:	/K	3:	3	;:	%F

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$:	/D	,:	/L	4:	4	<:	%G
%:	/E	-:	-	5:	5	=:	%H
&:	/F	.:	.	6:	6	>:	%I
':	/G	/:	/O	7:	7	?:	%J

@:	%V	H:	H	P:	P	X:	X
A:	A	I:	I	Q:	Q	Y:	Y
B:	B	J:	J	R:	R	Z:	Z
C:	C	K:	K	S:	S	[:	%K
D:	D	L:	L	T:	T	\:	%L
E:	E	M:	M	U:	U	]:	%M
F:	F	N:	N	V:	V	^:	%N
G:	G	O:	O	W:	W	_:	%O

`:	%W	h:	+H	p:	+P	x:	+X
a:	+A	i:	+I	q:	+Q	y:	+Y
b:	+B	j:	+J	r:	+R	z:	+Z
c:	+C	k:	+K	s:	+S	{:	%P
d:	+D	l:	+L	t:	+T	|:	%Q
e:	+E	m:	+M	u:	+U	}:	%R
f:	+F	n:	+N	v:	+V	~:	%S
g:	+G	o:	+O	w:	+W	DEL:	%T

Qbar Number Setting

1:	/E30100/D	2:	/E30200/D	3:	/E30300/D	4:	/E30400/D
5:	/E30500/D	6:	/E30600/D	7:	/E30700/D	8:	/E30800/D
9:	/E30900/D	10:	/E30A00/D	11:	/E30B00/D	12:	/E30C00/D
13:	/E30D00/D	14:	/E30E00/D	15:	/E30F00/D	16:	/E31000/D
17:	/E31100/D	18:	/E31200/D	19:	/E31300/D	20:	/E31400/D
21:	/E31500/D	22:	/E31600/D	23:	/E31700/D	24:	/E31800/D
25:	/E31900/D	26:	/E31A00/D	27:	/E31B00/D	28:	/E31C00/D
29:	/E31D00/D	30:	/E31E00/D	31:	/E31F00/D	32:	/E32000/D
33:	/E32100/D	34:	/E32200/D	35:	/E32300/D	36:	/E32400/D
37:	/E32500/D	38:	/E32600/D	39:	/E32700/D	40:	/E32800/D
41:	/E32900/D	42:	/E32A00/D	43:	/E32B00/D	44:	/E32C00/D
45:	/E32D00/D	46:	/E32E00/D	47:	/E32F00/D	48:	/E33000/D
49:	/E31D00/D	50:	/E31E00/D	51:	/E31F00/D	52:	/E32000/D
53:	/E32100/D	54:	/E32200/D	55:	/E32300/D	56:	/E32400/D
57:	/E32500/D	58:	/E32600/D	59:	/E32700/D	60:	/E32800/D

Appendix A. Absolute Maximum Ratings

Absolute Maximum Ratings*	
Operating Temperature	-55°C to +125°C
Storage Temperature	-65°C to +150°C
Voltage on any Pin except RESET with respect to Ground	-1.0V to VCC+0.5V
Maximum Operating Voltage	6.6V
I/O Pin Maximum Current	40.0 mA
Maximum Current VCC and GND	200.0 mA

*NOTICE:

Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating. Functional operation of the device at these or other conditions beyond those indicated in the DC Characteristics (Appendix B.) section is not implied. Expose to absolute maximum rating conditions for extended periods may affect device reliability.
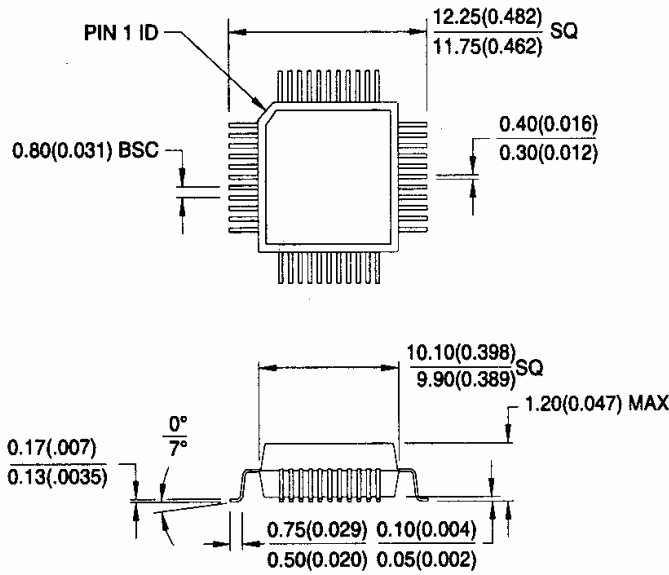
Appendix B. DC Characteristics

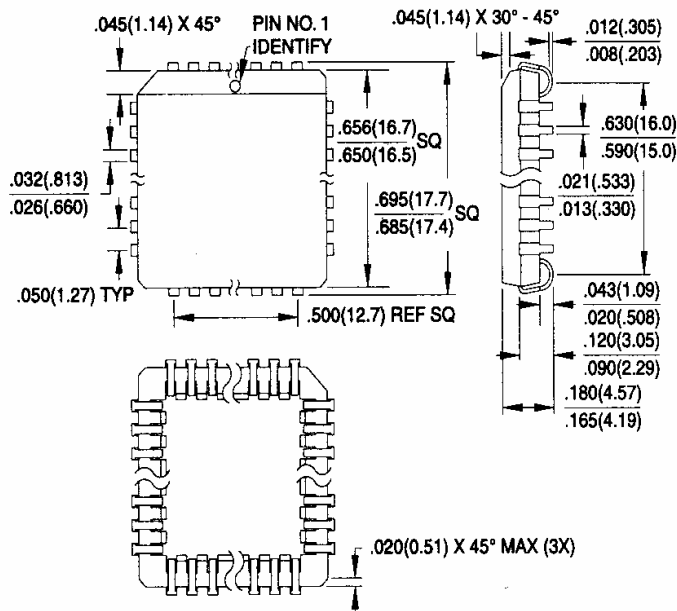T_A = -40°C to 85°C, V_{CC} = 4.5V to 6.0V (unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Units
V_{IL}	Input Low Voltage		-0.5		0.3 Vcc	V
V_{IH}	Input High Voltage	(Except XTAL1, RESET)	0.2 Vcc + 0.9		Vcc + 0.5	V
V_{IH1}	Input High Voltage	(XTAL1, RESET)	0.7 Vcc		Vcc + 0.5	V
V_{OL}	Output Low Voltage	I_{OL} = 20 mA, Vcc = 5V			0.5	V
V_{OH}	Output High Voltage	I_{HI} = 3 mA, Vcc = 5V	4.2			V
I_{OH}	Output Source Current	Vcc = 5V			3	mA
I_{OL}	Output Sink Current	Vcc = 5V			20	mA
$R_{I/O}$	I/O Pin Pull-Up Resistor		35		120	kΩ
I_{CC}	Power Supply Current	Active, 5V, 8MHz		12		mA
I_{CC}	Power Down Mode	Vcc = 3V WDT disable		<1		mA

44A, 44 Lead, Thin (1.0 mm)
Plastic Gull Wing Quad Flat Package (TQFP)
Dimensions in Millimeters and (Inches)

PIN 1 ID

12.25(0.482) SQ
11.75(0.462)

0.80(0.031) BSC

0.40(0.016)
0.30(0.012)

10.10(0.398) SQ
9.90(0.389)

1.20(0.047) MAX

0°
7°

0.17(.007)
0.13(.0035)

0.75(0.029) 0.10(0.004)
0.50(0.020) 0.05(0.002)

44J, 44 Lead, Plastic J-Leaded Chip Carrier (PLCC)
Dimensions in Inches and (Millimeters)
JEDEC STANDARD MS-018 AC

.045(1.14) X 45°

PIN NO. 1
IDENTIFY

.045(1.14) X 30° - 45°

.012(.305)
.008(.203)

.656(16.7) SQ
.650(16.5)

.630(16.0)
.590(15.0)

.032(.813)
.026(.660)

.695(17.7) SQ
.685(17.4)

.021(.533)
.013(.330)

.050(1.27) TYP

.043(1.09)
.020(.508)

.500(12.7) REF SQ

.120(3.05)
.090(2.29)

.180(4.57)
.165(4.19)

.020(0.51) X 45° MAX (3X)

Appendix C. Dimensional Data (TQFP-44)

Appendix D. Bar Code Scanner Characteristics

The QuickBarII chip supports all common bar code scanners such as Pen Wands, Slot Readers, CCDs and Lasers. Following are the typical characteristics for these scanners. Data and description provided here are for informational purpose only. Individual scanner may have different characteristics, contact the scanner manufacturer for specifications.
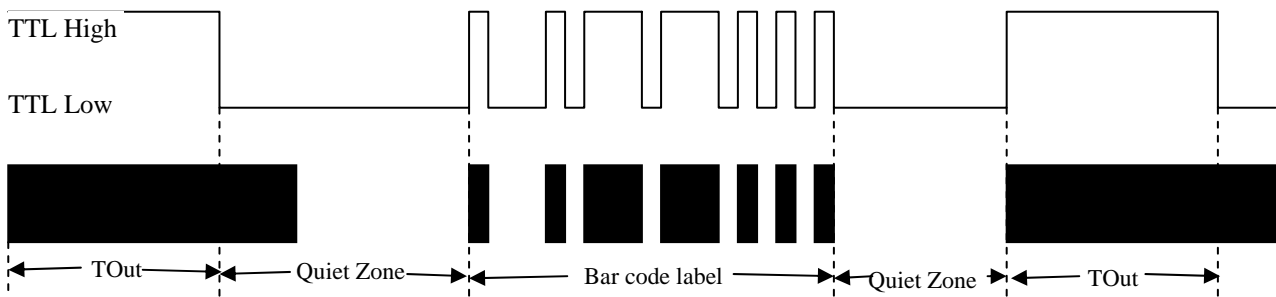
Wand and Slot Reader

Pen Wands and Slot Readers have very similar characteristics. There are two common types of Wands/Slot Readers.

Wands/Slot Readers type 1 digital output waveform
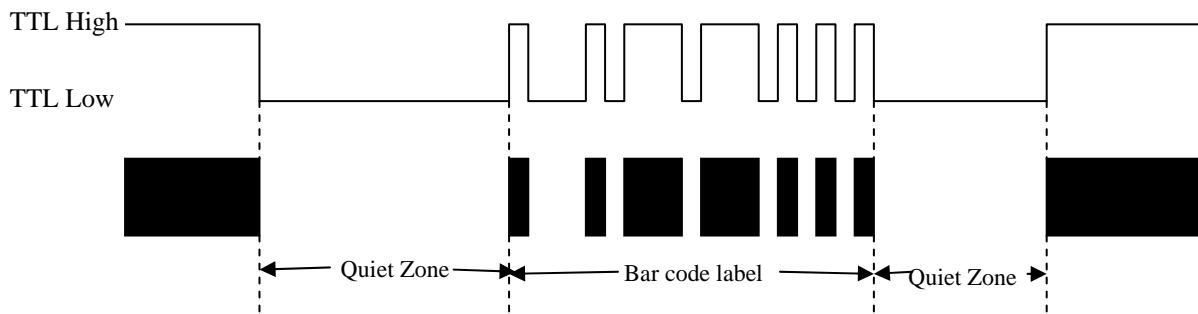
TTL High

TTL Low

Quiet Zone   Bar code label   Quiet Zone

Type 1 Wands/Slot Readers outputs High (TTL level) when it sees black. It outputs Low when it sees white.

Wands/Slot Readers type 2 digital output waveform

TTL High

TTL Low

TOut   Quiet Zone   Bar code label   Quiet Zone   TOut

Many Hewlett Packard Wands/Slot Readers are Type 2. As with Type 1 Wands/Slot Readers, Type 2 Wands/Slot Readers outputs High (TTL level) when it sees black. It outputs Low when it sees white.
However, Type 2 Wands/Slot Readers only maintains TTL High level for a maximum of TOut period of time. TOut is typically 60ms to 100ms.

Note on Wands/Slot Readers:

Some Wands/Slot Readers output a High when the object is White and Low when it's Black.

CCD and Laser Scanner

CCD and Laser Scanners scan the bar code label repeatedly. The Scan Rate ranges from 30 scans/second for a Handheld Laser Scanner to 1,000 scans/second for a high performance industrial Laser Scanner. The vast majority of the scanners, are low speed scanners with scan rate less than 60 scans/second.

Typical CCD/Laser Scanner I/O signals:

TRIGGER – Output signal from the scanner. It is High when the scanner is powered off. Pressing trigger makes it Low.

POWER-ENABLE – Input signal from the decoder to the scanner. It is Low when the scanner is off. A High level turns on the scanner and the scanner starts to scan.

SOS – Start Of Scan. Output signal from the scanner. It is High when the scanner is off. It's polarity changes when the scanner changes the scan direction.

DATA – Output bar code data signal from the scanner. A typical scanner outputs High on White and Low on Black.

READ-OK – Input signal from the decoder to the scanner. A typical scanner has a READ-OK LED indicator that is connected to this signal. The decoder sets the READ-OK to High after a successful decoding.

Typical CCD/Laser Scanner timing waveform:
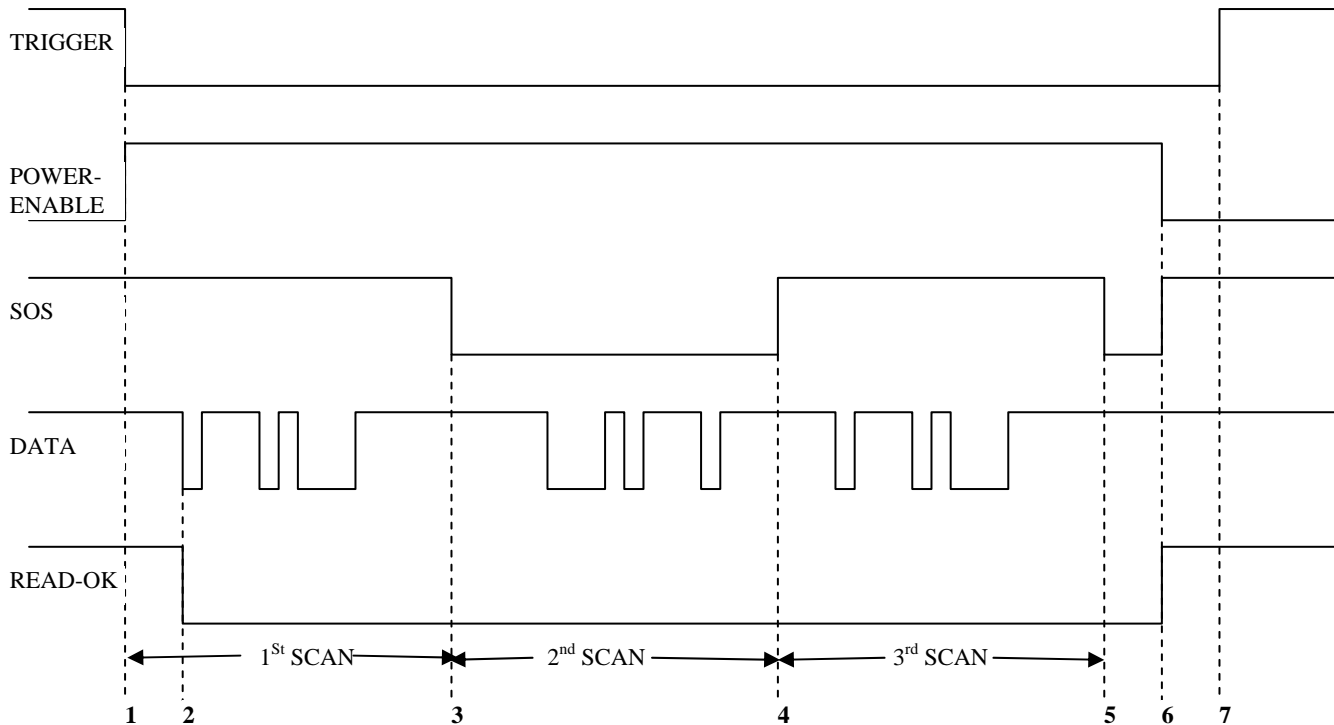
QuickBarII Single-Chip Decoder

Typical CCD/Laser Scanner working sequence:

1. The Trigger is pressed on the scanner. The decoder sets POWER-ENABLE line to High to turn on the scanner. Scanner starts to scan.
2. The scanner "sees" the first black bar and the decoder clears the READ-OK line.
3. The scanner finishes the 1st scan, changes its scan direction and the SOS signal polarity changes to Low.
4. The scanner finishes the 2nd scan, changes its scan direction and the SOS signal polarity changes to High.
5. The scanner finishes the 3rd scan, changes its scan direction and the SOS signal polarity changes Low.
6. The decoder successfully decodes a bar code label. It sets the READ-OK to High, clears the POWER-ENABLE to turn off the scanner. And the SOS signal goes back to High.
7. READ-OK LED illuminated (or hears a beep from the decoder), trigger is released. TRIGGER signal goes back to Low.

Notes:
- Some scanners do not follow the above description of the SOS signal. QuickBarII is compatible with these scanners.
- Some CCD scanners do not output DATA when SOS is Low. DATA is always High when SOS is Low.
- Different decoders handle the READ-OK signal differently. Some (such as the QuickBarII) keep it High after a successful read, while some others clear it to Low after certain period of time (typically a few seconds).

Appendix E. Power Down Mode

QuickBarII supports the Power Down Mode. Power supply current in Power Down Mode is less than 1 mA. Following is the description of the Power Down Mode.

Enter Power Down Mode

QuickBarII automatically enters into the Power Down Mode when there is no data from a CCD/Laser scanner for about 50 ms. If the scanner is a Wand/Slot Reader type, QuickBarII waits for about 400 ms.

Wake up from Power Down Mode

Holding the WAKE pin Low for at least 30ms wakes up the QuickBarII. When using a CCD/Laser scanner, the WAKE pin can be connected to the TRIG (Trigger) pin to provide an easy way to wake up the QuickBarII. See Appendix E. for details on the trigger signal.

Disable Power Down Mode

It is sometimes desirable not to use the Power Down Mode for maximum performance. Connecting the WAKE pin to GND disables the Power Down Mode.

Special consideration when using SetUp Commands

If Power Down Mode is not disabled, QuickBarII is in the Power Down Mode most of the time. Before sending a SetUp Command, the host needs to wake up the QuickBarII by holding the WAKE pin Low for at least 30 ms. The host can then communicate with the QuickBarII. WAKE pin must be held Low during the whole SetUp procedure.

Special consideration when using Trigger-Less Mode

If Power Down Mode is not disabled, setting the Trigger-Less Mode may cause the QuickBarII to enter the Power Down Mode and the scanner will then be turned off. We recommend to disable the Power Down Mode when using Trigger-Less Mode.

Appendix F. Ordering Information

Several package options are available for the QuickBarII chip. Following is a list of the part numbers and brief descriptions.

Part number	Package	Description
IDT1440-1	TQFP-44	Keyboard Version
IDT1440-2	TQFP-44	RS232 Version