MICROVISION

Flic® Laser Bar Code Scanner Developer's Guide

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Trademarks

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1 Getting Started

The Flic Family of scanners provides simple, affordable and versatile bar code scanning. The device comes in two options, Tethered/Batch and Cordless. The Tethered/Batch scanner will be referred to as Flic Basic.

The **Flic Basic Scanner** and the **Flic Cordless Scanner** are flexible products that support both new and existing applications. The Flic scanner's flexibility makes it ideal for a wide range of data collection applications. For portable applications such as asset tracking, the Flic scanner can store a minimum of 500 UPC bar codes in memory. The saved bar codes can be easily downloaded for processing. For tethered uses such as library, the Flic can be attached to a host for immediate data entry. If you require a little of both, Flic can operate tethered and then be removed and used in store-and-forward mode for applications like healthcare, where it might be easier to bring the scanner to the patient rather than the patient to the scanner.

The **Flic Cordless Scanner** lets you roam while you scan bar codes. Using the cordless scanner's wireless features, you can scan bar codes in real time in a 30-50ft (10-15m) Bluetooth radio range. Outside of this range, the cordless scanner saves the bar codes in its memory. When you move back into Bluetooth radio range, the scanner automatically reconnects and the saved bar codes are downloaded. With the built in 500 UPC bar code memory and auto-reconnect features of Flicware Cordless, the Flic Cordless Scanner gives you a virtually unlimited wireless bar code scanning range.

The Flic scanner supports four operating modes, tethered, hardware handshake, batch and cordless:

- **Tethered:** When the Flic scanner is attached to a computer or other host by a cable, it is tethered. In this mode, when the user presses the button, the scanner immediately transmits the decoded bar code to the host. Both the Flic Basic and Flic Cordless support tethered operation.
- **Hardware Handshake**: The Flic **Basic** scanner can configured to use CTS Hardware Handshake via a command or control barcode. A special cable is required for this mode. In CTS Hardware Handshake mode the controls when the Flic downloads bar codes. Once a Flic is in CTS Hardware Handshake mode it will not accept commands via the serial cable until Hardware Handshake mode is disabled.
- **Batch**: When the scanner is not connected to a host either by a cable or through Bluetooth, it operates in batch mode. In this mode, when the user presses the button, the scanner stores the decoded bar code. Then when the user connects the scanner to the host, the scanner immediately begins downloading the stored bar codes. Both the Flic Basic and Flic Cordless support batch operation.
- **Cordless**: When you are using a Flic **Cordless** Scanner, and it is connected to a host device via Bluetooth, the scanner immediately transmits the decoded bar code to the host just like a tethered scanner.

The Flic scanner supports four data transmission formats:

- **Compatible**: The compatible data format allows the Flic scanner to work with legacy systems, bar codes are transmitted in a industry standard format. Therefore, you do not need to change your existing applications.
- **Compatible with ACK**: The ACK data transmission formats adds an element of data integrity to a system by requiring the host application to 'acknowledge' reception of each bar code.
- **Compatible with Serialization**: Serialization adds a further element of data integrity by requiring a host application to 'acknowledge' each received bar code with the data serialization number appended to each bar code. In this manner a host application can ensure that not only did it

receive all bar codes, but that it did not receive any bar codes multiple times. Cordless Flic always uses this protocol.

- XML: The XML data transmission format gives access to the enhanced features of the scanner, such as timestamp, device and user IDs. It supports PC- and web-based applications.

1.1 Manual Conventions

In this manual the scanners are listed as follows:

- Basic refers to a Flic Scanner that is not Bluetooth enabled.
- Cordless refers to a Flic Cordless Scanner that is Bluetooth enabled.
- Scanner or Flic Scanner refers to both the Basic Scanner and the Cordless Scanner.
- ASCII control characters are enclosed in angle brackets: e.g. <CR > represents an ASCII carriage return.
- Bar codes received from the Flic Scanner are referred to as 'data'.
- The Cable connecting a Flic Scanner to a host device is interchangeably referred to as a 'serial cable', 'RS232 cable', or just 'cable'.
- The Flic Basic Scanner is Firmware Versions (FWV) 1.8, 1.9, 1.10, … The Flic Cordless Scanner is FWV 2.0, 2.1, 2.2, …

1.2 Developer Options

Microvision provides three ways for you, a developer, to interact with the Flic scanner:

1. The Flicware™ Family of Software
    - Flicware: The basic version of the application, Flicware, turns any Windows® program into a bar code application in only minutes. Flicware is used with a tethered/batch scanner. You can download Flicware for free from the www.flicscanner.com website, or you can order the software on a CD.
    - Flicware for Pocket PC provides the same functionality as Flicware but on the Pocket PC platform. This software comes bundled with interface cables for Pocket PC devices.
    - Flicware Pro: The upgrade version, Flicware Pro, provides enhancements such as transaction processing, application recognition and sound prompting. It allows you to customize the interface. Flicware Pro is used with either the tethered/batch scanner, or the Flic Cordless Scanner when combined with Flicware Cordless. Flicware Pro can be purchased from the website, or from your local reseller.
    - Flicware Cordless for PC and Flicware Cordless for Pocket PC work with the Flic Cordless Scanner and a Bluetooth enabled host device to quickly turn your Windows® applications, or your Pocket PC based PDA applications into bar code programs. Flicware Cordless incorporates the functionality of Flicware. You can download Flicware Cordless for PC for free or purchase Flicware Cordless for Pocket PC from the website.
2. A web browser plug-in. Microvision provides a browser plug-in that handles the setup and communication with the Flic scanner. The plug-in passes XML formatted data to the web page. The plug-in and the documentation are available from customer support. Contact customer support at customer_service@microvision.com.
3. The device interface defined in this developer guide supports full, customized programming.

4. Microvision is currently developing a Flic SDK including programming examples. We expect to have our first platform complete in early Q1'04. Please contact technical support for more information.

2 The Flic Scanner's Device Features

2.1 Visual and Audio Scan Status Indicators

The Flic scanner has a green LED and a piezo beeper to provide visual and audible indicators of the status of a scan. The combination of the two indicates various device conditions as shown in the table below. By default, both the LED and beeper are enabled. Either the LED or the beeper can be turned on or off by using the bar codes listed in "0 Device Option Control Bar Codes" in the Appendices on page 46, or by setting the appropriate control bits through the command interface.

Table 1: LED and Beeper Signals

	Green LED	Beeper
Good Scan	On for 200 msec	Single beep, higher pitch and shorter than the Invalid Command beep
Device Memory Full	Blinks 3 times	Beeps three times
Downloading	Blinks 2 times per second while the data is downloading	None
Download Complete	On for 300 msec	Three beeps that descend in pitch
Invalid Command	None	Single beep, lower pitch and longer than the Good Scan beep
System Error	None	Beeps five times. This cannot be disabled
Cordless Scanner only		
Discoverable Mode (FWV 2.0)	Blinks twice every two seconds	None
Radio Connected (FWV 2.0)	Blinks once every two seconds	None

2.2 Bar Code Data Storage

In batch mode, the Flic scanner stores the bar code information in its internal non-volatile memory. The Flic can store a minimum of 500 UPC bar codes. Since Code 39 and Code 128 have variable length data, the minimum number will vary for these bar codes. You can mix bar code styles without penalty.

When the scanner's memory is full, the scanner's LED will blink three times, and the beeper will sound three times. This is the Device Full alert. Once full, the scanner cannot perform any additional scans. If the user tries to scan by pushing the button, the Flic scanner will repeat the Device Full alert without activating the laser. In order to enable further scans, you must clear the bar code memory. For information on clearing the memory, see "3.5.7 "D" the Download Bar Code Data Command" on page 18, and "3.5.8 "C" the Clear Bar Code Data Command" on page 19.

2.3 Standby Power Save Mode

Flic Basic Scanner

The Flic Basic scanner operates from 3 AAA batteries that will supply over 1100,000 continuous scans or 100 scans/day for 12 months (24,000 scans). In order to conserve power the scanner enters standby mode

after two seconds of no activity. When scanning, the device wakes up when you press the scan button. When communicating with a host, the host must follow the wake-up sequence described in "3.5.1 Wake Command" on page 16.

Flic Cordless Scanner

The Flic Cordless Scanner also operates from 3 AAA batteries that will supply over 76,000 continuous scans or 100 scans / day for 8 months (16,000 scans). In order to conserve power the Cordless scanner enters standby mode after a programmable Tconnect time of no activity and drops the Bluetooth connection. The default Tconnect time is 60 seconds. When scanning, the device wakes up and the Bluetooth radio enters Discovery mode, looking for the host to reconnect. When using Flicware Cordless software, the host detects the scanner in discovery mode and quickly re-connects and the data is transferred.

2.4 Flic Command Code Interface

To communicate with the scanner and modify its functionality, the Flic scanner provides a Command Code Interface. This consists of a number of short commands that allow for querying the scanner, downloading stored data, changing parameters, and clearing bar code data. The Flic Command Code Interface works with a Basic Scanner when tethered or a Bluetooth connected Cordless Scanner.

2.5 Flic Identification

The following information can be retrieved from the scanner:

Device ID	Each device has a unique ID number. This number is set at the factory, and it cannot be changed. You can use this feature to associate a particular scanner with a specific application or user.
Firmware Version	Allows the end-user or application to determine what version of firmware is in the scanner to determine what features are available. This will also indicate whether it is a Tethered/Batch or Cordless scanner.
Bluetooth Firmware Version	For Cordless scanners, the version of the Bluetooth firmware is also provided.

2.6 Flic Configurable Features

The following information can be configured for each Flic scanner.

Table 2: Flic Scanner Features

Flic Feature	Description
User ID	You can use this data field to store custom information. This field is targeted to be used as a user ID but can be used to store any information. For example, you can use it to store the employee number, application data, or the installation date. For more information, see "5.6 Writing a Number to the User ID Field" on page 36, and "5.7 Writing an 8-Character String to the User ID Field" on page 37.
Time Reference	Use this data field to store an initial time reference value. The timestamp associated with each scan is the amount of time from the last scan. Your application can use the value of this field to calculate the actual time by adding it and the amount of time from the last scan. For more information, see "3.5.6 "I" the Initialize Time Reference Setting Command" on page 18, and "5.8 Recovering the Time From a Timestamp" on page 37. If you do not need to calculate time values, you can use this field to store other information. **Note:** The information in this field is stored in RAM. It is not retained if the scanner loses power, or if you return the scanner 's configuration to the default values.
Data Formatting	The Flic scanner provides flexible data output formatting. Choices include XML vs Compatible format, adding a Symbology ID to the data (either AIM or NCR standards), changing preamble and post amble formats, and varying data output like UPC Expansions and combining add-on codes. For more information, see the bar codes in "Appendix F" on page 46, and the "4.6 Device Configuration Data" on page 29, or the "Data Format Options Control Bar Codes" on page 48.
Symbology Controls	Supported bar code symbologies can be enabled or disabled. Other bar code symbology features like checksum checking and stripping are also configurable. For more information, see the bar codes in "Appendix F" on page 46, or the "Symbology Selection Control Bar Codes" on page 49.
Flic Operation Controls	The Flic scanner provides for operational controls like delay between bar codes, Baud Rate selection, timestamp, and LED and Beep enable and disable. For more information, see the bar codes in "Appendix F" on page 46, or the "Device Option Control Bar Codes" on page 46.

Timestamp	This feature provides the amount of time elapsed since the last scan. You can choose whether to store the relative timestamp with each successful bar code, or with each button push. For more information, see "4.6 Device Configuration Data" on page 29 or "3.5.6 "I" the Initialize Time Reference Setting Command" on page 18, or "5.8 Recovering the Time From a Timestamp" on page 37. You can use the timestamp to track time and attendance or for any application where the scanning time is important information. **Note:** This information is not retained if the scanner loses power, or if you return the scanner to its default configuration.
Flic Data Verification	To insure proper data transfer, the Flic scanner offers two forms of data verification. An Acknowledge protocol requires the host 'ACK' each bar code before it is deleted from memory. Serialization of each bar code insures that if a bar code is retransmitted, the host can detect this and handle the data properly to avoid duplicate bar codes. For more information, see "4.6 Device Configuration Data" on page 29 or "4.5 Data Verification" on page 28.

2.7 Flic Cordless Features

The Flic Cordless scanner provides all of the same features as the basic Flic scanner with the addition of the wireless interface. The best way to use the Flic Cordless scanner is with the Flicware Cordless software. Flicware Cordless software manages:

- Easy first time connection of a host to a scanner
- Auto-reconnection of a host to a scanner whenever the connection is broken.
- Data Security by using the Serialization data transmission format.
- Keyboard emulation to port data directly into a host application.
- VCOM support on PC platforms for use with applications that may already be using a Flic Basic scanner.

When not using Flicware Cordless software, a custom application must support the Serialization data transmission format, thus insure that no data is lost or duplicated in the transfer over the Bluetooth radio link. For more information, see "4.6 Device Configuration Data" on page 29 or "4.5 Data Verification" on page 28, or "4.3.3 Compatible with Serialization Data Transmission Format" on page 25.

3 Communicating with the Flic Scanner

All communications between the Flic scanner and host are done via RS-232 serial interface, or the Bluetooth connection.

3.1 Communications Speed

By default, the Flic scanner communicates at 4800 baud. The scanner also supports 9600 baud. You can change the baud rate by using the control bar codes in "Device Option Control Bar Codes" on page 46. Using the bar codes is the only way to change the baud rate. The Return to Factory Settings Command (`F`) does not alter the baud rate. For more information, see "3.5.11 "F" the Return to Factory Settings Command" on page 21.

3.2 Configuring the Flic Scanner

The Flic scanner can be configured using one of two methods: you can use the device control bar codes displayed in "Appendix F" on page 46, or you can use the command code interface described in this guide:

- Enable or disable scanner features
- Retrieve the scanner's configuration information
- Set the baud rate for communications (only available via a control bar code).
- Set the delay between bar codes in milliseconds
- Select a symbology
- Set symbology options
- Restore the default settings
- Set an initial time value (only available programmatically)
- Test the scanner's functionality
- Download the bar code data
- Clear the bar code data from memory
- Restore the default settings

For examples that show how to programmatically set the scanner's configuration, see "5.1 Changing the Scanner's Configuration" on page 35.

3.3 Programming Conventions

All command codes and XML codes transmitted to and from the Flic scanner are case insensitive.

All data transmitted to and from the Flic scanner is sent using ASCII characters. Numeric data values are formatted in hexadecimal. The data is sent using two characters per byte, with each character giving the value of a nibble.

3.4 Sending Commands to the Flic Scanner

The host initiates all communications to the Flic scanner by sending a command packet. The command packet consists of:

1. Single-character command code. The commands are listed in "Table 3: Command Codes" below. The commands are case-insensitive.
2. Data, if applicable. There is no space between the command code and the data.
3. Terminating carriage return, <CR> or <ETX>. The Flic scanner ignores the line-feed character <LF> if it is sent.

The scanner responds within one second. The scanner sends the data when it recognizes commands that return data. Commands that do not return data, receive an <ACK> character response. Commands that are not recognized receive a <NAK> response. These commands should be retransmitted. When you receive no response, this indicates that the device is not connected, or that it is asleep.

3.4.1 Standby Mode (BASIC FLIC SCANNER ONLY)

The Basic Flic scanner automatically returns to standby mode after two seconds of inactivity. This prevents the Basic Flic Scanner from waking and staying alert for prolonged periods, and helps to insure a long battery life. Before you can communicate with the Basic Flic Scanner you must wake the scanner by:

- Following the wake up communication sequence described below in "3.5.1 Wake Command" on page 16 when you are using the command interface to interact with the Basic Flic Scanner.

3.4.2 Standby Mode [FLIC CORDLESS SCANNER ONLY]

The Flic Cordless Scanner will time out and enter standby mode while waiting for a device (PC or PPC) to pair with it, while waiting for a device to connect to it after it has been paired, while it is inactive (no communication from the device, and no button presses) after connecting with a device. These time outs are based on internal configurable timers described in 3.5.10 "BT" the Bluetooth Timers Command (FLIC CORDLESS SCANNER ONLY).

3.5 Command Codes

The command codes are not case sensitive. The codes are described in detail below the table.

Table 3: Command Codes

Name	Command Code	Data Transmitted with Command	Data received from Flic Scanner	Description
Wake	Any single character	None	None	Send any single character over the interface to wake the unit. Microvision recommends that you send the <SOH> character, or Ctrl+A in HyperTerminal. The scanner does not perform any action in response other than waking up. It will not send an <ACK> or <NAK> code. For more information, see "3.5.1 Wake Command" below.
Who	W	None	Who response data	Returns the configuration information. For more information, see "3.5.3 "W" the Who Command" on page 16.
Signal	T	0 or 1 bytes	<ACK>	Blink LED and/or beep piezo. For more information, see "3.5.4 "T" the Signal Command" on page 17.
Set device configuration	S	Varies	<ACK>	Sets the device format and configuration. The format and configuration is stored in non-volatile memory. For more information, see "3.5.5 "S" the Set Device Configuration Command" on page 17.
Initialize time reference setting	I	12 bytes	<ACK>	Set the time reference value or use this field for any other custom data storage. For more information, see "3.5.6 "I" the Initialize Time Reference Setting Command" on page 18.
Download bar code data	D	None	Bar code data or <ACK>	Request stored bar code data. For more information, see "3.5.7 "D" the Download Bar Code Data Command" on page 18.
Clear bar code data	C	None	<ACK>	Clears entire device bar code data buffer. For more information, see "3.5.8 "C" the Clear Bar Code Data Command" on page 19.
Pairing mode	BM	0 or 1 bytes	<ACK> or 1 byte of pairing mode	Reads or sets the Bluetooth pairing mode. For more information, see "3.5.9 "BM" the Pairing Mode Command" on page 19.
Bluetooth timers	BT	0 or 4 bytes	<ACK> or: xxxx xxxx xxxx xxxx	Reads or sets the Bluetooth timer values. For more information, see "3.5.10 "BT" the Bluetooth Timers Command" on page 20, and "5.9 Reading the Bluetooth Timer Values" on page 38.
Return to factory settings	F	1 byte (1 or 2)	<ACK>	Return device setup to factory default settings. For more information, see "3.5.11 "F" the Return to Factory Settings Command" on page 21.
Set ITF Minimum length	MI	0 or 1 byte	xx or <ACK>	Sets or returns the length of the minimum ITF bar code that will be successfully scanned.
Set ITF Maximum length	MX	0 or 1 byte	xx or <ACK>	Sets or returns the length of the maximum ITF bar code that will be successfully scanned. Note that this is a false sense of security as it will not provide any increase in data integrity, and should always be set the same as the minimum.

3.5.1 Wake Command (BASIC FLIC SCANNER ONLY)

The Basic Flic scanner enters standby mode when it is inactive for two seconds. Microvision has implemented the wake sequence outlined below so that the scanner knows when it needs to pay attention to the messages it receives.

The scanner wakes up when it receives any single character. To keep the scanner awake, and to communicate with the scanner:

1. Send any character. Microvision recommends that you send the <SOH> character, or Ctrl+A in HyperTerminal.
2. Wait at least 0.75 second, but less than 2.0 seconds.
3. Send a Who command by transmitting the W<CR> characters.
4. Receive the Who response.

If the scanner does not receive a W within the required time window, the device returns to standby mode. If scanner receives a different character before it receives the W, you must wait at least 0.75 seconds before sending the W. Once the W has been received, the scanner is awake, and you can use the full command set in "Table 3: Command Codes," above.

3.5.2 Flic Cordless Scanner wake [FLIC CORDLESS SCANNER ONLY]

The Flic Cordless Scanner is awake as long as it has Bluetooth radio connection. When The Flic Cordless Scanner is awake you can use the full command set in "Table 3: Command Codes," above. To Wake up the Flic Cordless Scanner, press the button. Then the scanner is awake, and you can use the full command set in "Table 3: Command Codes," above.

3.5.3 "W" the Who Command

The Who command serves two purposes:

1. It confirms to the scanner that the host is communicating and thus it should stay awake.
2. It returns the complete configuration information.

The format for the command is:

W<CR>

The Flic Basic Scanner provides the configuration information in the following format:

```
Microvision® Flic® Bar Code Scanner, ID: 00003664, FW: 1.8.0<CR><LF>
<SOH>WA123B456C789D012690000000000036640105010800<CR><LF>
```

The Flic Cordless Scanner provides the configuration information in the following format:

```
Microvision® Flic® Bar Code Scanner, ID: 00003664, FW: 2.1.0, BT: 1.0M<CR><LF>
<SOH>WA123B456C789D012690000000000036640105020100<CR><LF>
```

The data returned in the above example breaks down as follows:

- User ID: A123B456C789D012
- Configuration Setup: 69000000
- Device ID: 00003664
- Hardware version: 0105

- Firmware version: 010800

3.5.4 "T" the Signal Command

You can force the scanner to flash the LED and/or emit a tone. The command is:

```
T[n]<CR>
```

where n is one of the values listed in the table below.

Table 4: T Command Codes Options

n Value	LED	Piezo
(not given)	Current device setting	Current device setting
0	Current device setting	Current device setting
1	Off	Single Good Beep
2	On for 200 msec	Off
3	On for 200 msec	Single Good Beep
4 (FW Version 1.10, 2.2)	Off	Single Bad Beep

The device responds with an <ACK> when the test is complete.

3.5.5 "S" the Set Device Configuration Command

You can use this command to configure the scanner. The configuration options are listed in "4.6 Device Configuration Data" on page 29. The configuration data that is transmitted to the Flic scanner is automatically stored in internal non-volatile memory. The memory location for the data is given in Table 13: Device Configuration Data on page 29.

The format of the Set command is:

```
SAAD...D<CR>
```

where:

S The Set command.

AA The address of first byte to set. This value must be between 00 to 0B. It must be two hexadecimal characters long, with a leading 0 if required.

D…D The data. This must be an even number of characters. The data is sent as two ASCII characters per byte. The available values to set are 00 to FF.

The number of bytes you pass is variable. For example, to set the User ID to A123B456C789D012, the command would be

```
S00A123B456C789D012<CR>
```

Note: You do not have to set the value of the entire field. The device will respond with an <ACK> on a successful write, or a <NAK> when there is an error in the command.

Warning: When switching time stamp modes, any stored time stamp information in the device's memory can be associated with the incorrect bar code data. Therefore, you should download all data before changing the configuration.

The examples in "5 Examples" on page 35 provide additional information on using this command.

3.5.6 "I" the Initialize Time Reference Setting Command

The Flic scanner stores the time reference value in RAM. This value is reset to zero when the scanner loses power. When the scanner loses power, its internal clock stops, and the scanner cannot insure that any information concerning time is accurate.

You can use the value of this field to determine whether the timestamp data is valid. When you know that you have set a value in this field, and the information transmitted by the scanner tells you that this value is zero, then you know that the Time Reference has been lost, and the timer function was interrupted.

The command is:

```
IYYMMDDHHMMSS<CR>
```

where

I	The Initialize Time Reference command.
YYMMDDHHMMSS	The date and time. The 12 digits represent 6 bytes of data. All 12 digits must be sent or the command will be ignored. The host has flexibility on the format of the data, but it is recommended that the format be YYMMDDHHMMSS, with the leading YY being implied as the year. For example, March 12, 2002, 8:37:14 pm is set as: `I020312203714<CR>`

The device responds with an `<ACK>` when the time setting operation is complete. The device sends a `<NAK>` when the command is incorrect.

This value will be echoed back in an XML download as the `IT` attribute.

3.5.7 "D" the Download Bar Code Data Command

The Download Bar Code Data command tells the scanner to start downloading the decoded bar codes it has saved in memory. You can use this command to retrieve the data when you are operating in batch mode. When the scanner is tethered, the data is always transmitted after a valid scan.

The format for the command is:

```
D[<CR>|<ETX>]
```

The device responds with the data, when the scanner does not have any bar code data stored, the scanner sends an `<ACK>`.

Table 5: How Data is Downloaded and Deleted from Memory in Batch Mode

Mode	Automatic Data Download Bit	Description
Compatible	Enabled	Data is automatically downloaded when the cable is plugged into the scanner. The data is deleted from the scanner's memory after it is all downloaded. **Warning:** If the host software is not active, the data will be lost. You can enable the ACK/NAK handshaking to prevent this. For more information, see "Table 9: Flic Operation Modes and Data Transmission Formats" on page 24.

Mode	Automatic Data Download Bit	Description
	Disabled	Data is downloaded when you send the Download Bar Code Data command. The data is deleted from the scanner's memory after it is all downloaded.
ACK, Serialization, Hardware Handshake	Enabled	Data is automatically downloaded when the cable is plugged into the scanner. The host confirms each bar code upon receipt. The data is deleted from the scanner's memory after it is all downloaded.
	Disabled	Data is downloaded when you send the Download Bar Code Data command. The host confirms each bar code upon receipt. The data is deleted from the scanner's memory after it is all downloaded.
XML	Enabled	Data is automatically downloaded when the cable is plugged into the scanner. The data remains in the device's bar code memory until you use the Clear command.
	Disabled	Data is downloaded when you use the Download Bar Code Data command. The data remains in the device's bar code memory until you use the Clear command.

3.5.8 "C" the Clear Bar Code Data Command

The C command clears any bar code and timestamp data stored in the scanner's memory. The format of this command is:

```
C<CR>
```

The device will respond with an <ACK> when the clear operation is complete.

3.5.9 "BM" the Pairing Mode Command (FLIC CORDLESS SCANNER ONLY)

The Flic has two different pairing modes that indicate whether the Flic is paired with only one host or whether it can pair with multiple hosts. The pairing mode must be set over the Bluetooth interface as there are not any configuration bits.

The command format is:

```
BM[n][<CR>|<ETX>]
```

where n is one of the values shown in the table below.

Table 6: Pairing Mode Options

n Value	Action	Description	Scanner's Response
	Read the pairing mode		The device will respond with a single ASCII character followed by a <CR>.
1	Set normal pairing mode	This allows a new host to pair with the Flic Cordless scanner when the PIN code is entered correctly. This is	The device will respond with an <ACK> after performing this operation.

		the Bluetooth default value.	
2	Set strong pairing mode	With this setting, the Flic Cordless scanner will communicate only with the current host. Strong pairing uses the Bluetooth device address and the PIN code to pair the scanner.	The device will respond with an <ACK> after performing this operation.

3.5.10 "BT" the Bluetooth Timers Command (FLIC CORDLESS SCANNER ONLY)

The Flic uses the Tlisten, Tconnect, Tlimit, Tsleep timers to control Bluetooth operations. They are defined as follows:

- **Tlisten**. The amount of time that an unpaired Flic will remain in discoverable mode before shutting down.
- **Tconnect**. The amount of time that a Flic will remain connected to a Bluetooth host without any communications activity, i.e. bar code transfer or configuration command, before shutting down.
- **Tlimit**. The amount of time that a previously-paired Flic will remain in discoverable mode before shutting down.
- **Tsleep**. The interval at which the Flic Cordless will attempt to connect to a host and to transmit stored bar codes.

The command format is:

```
BT[nxxxx][<CR>|<ETX>]
```

where nxxxx is one of the values shown in the table below. The xxxx following 'n' is four hexadecimal numbers representing a 16-bit data value, with each bit representing one second, the maximum size of xxxx is 3FFF.

Table 7: Bluetooth Timer Settings Options

n Value	Action	default	Max	Min	Scanner's Response
	Read the values of all the timers.				The device will respond with a single line of data that contains the Tlisten, Tconnect, Tlimit, and Tsleep timer values separated by spaces, and in the order listed. The returned values are in hexadecimal, and represent the number of seconds. For more information, see "5.9 Reading the Bluetooth Timer Values" on page 38.
L*xxxx*	Set the Tlisten timer value.	012C 3 minutes	3FFF ~ 4.5 hours	003c 1 minute	The device will respond with an <ACK> after performing this operation.
C*xxxx*	Set the Tconnect timer value.	003C 1 minute	0000 Infinite	000F 15 seconds	The device will respond with an <ACK> after performing this operation.
M*xxxx*	Set the Tlimit timer value	003C 1 minute	3FFF ~4.5 hours	000A 10 seconds	The device will respond with an <ACK> after performing this operation.
S*xxxx*	Set the Tsleep timer value.	0E10 1 hour	0000 Infinite	003c 1 minute	The device will respond with an <ACK> after performing this operation.

3.5.11 "F" the Return to Factory Settings Command

You can use this command to return a scanner to the default factory configuration, to set NCR default values, or to reset the cordless scanner to the default configuration. The default values are outlined in "Appendix D" on page 44, and in "4.6.1 Device Configuration Bytes and Bits" on page 31. The User ID and Time Reference values are reset to 0s.

The command format is:

```
F[n]<CR>
```

where `n` is one of the values shown in the table below.

Table 8: Default Settings Options

n Value	Description
1	Reset the scanner's configuration to the factory default values.
2	Reset the scanner's configuration to the NCR default values.

The device will respond with an `<ACK>` after performing this operation.

Note: Unlike using the bar codes to reset the default values, these commands do not change the baud rate. This is so that you do not lose communication with the scanner when you are programmatically interacting with it. The Return to Factory Default Settings bar code set the baud rate to 4800. The Return to NCR Default Settings and the bar code set the baud rate to 9600.

3.5.12 'MI' ITF Minimum Decode length (BASIC FLIC SCANNER ONLY)

The MI command returns or sets the ITF minimum decode length. The default is 0 (no minimum).

Command	Response	Scanners Response
MI	##<CR>	Returns the current ITF minimum decoding length in hexadecimal as ##.
MI##	<ACK>	Sets the ITF minimum decoding length.

If the minimum equals the maximum (and is not zero), only ITF barcodes of the specified length will be decoded.

If the minimum is less than the maximum, ITF bar codes with lengths between (inclusive) the minimum and maximum will be decoded.

If the minimum is greater than the maximum, no ITF bar codes will be decoded.

NOTE: ITF bar codes always have an even number of digits.

3.5.13 'MX' ITF Maximum Decode length (BASIC FLIC SCANNER ONLY)

The MX command returns or sets the ITF maximum decode length. The default is 0 (no maximum).

Command	Response	Scanners Response
MX	##<CR>	Returns the current ITF maximum decoding length in hexadecimal as ##.
MX##	<ACK>	Sets the ITF maximum decoding length.

If the maximum is zero, the maximum is the Flic ITF maximum of 30 digits. If the maximum equals the minimum (and is not zero), only ITF barcodes of the specified length will be decoded.

If the maximum is greater than the minimum, ITF bar codes with lengths between (inclusive) the minimum and maximum will be decoded.

If the maximum is less than the minimum, no ITF bar codes will be decoded.

4 Configuration Details

4.1 Operation Modes

The Flic scanner can be configured to operate in one of four different operating modes:

4.1.1 Tethered Mode

In **tethered** mode data is send in real time to the host system. The scanner runs in tethered mode when the cable is plugged into the scanner. When tethered, the scanner operates like a traditional scanner and transmits the scanned data immediately after the scan. Both the Flic Basic and Cordless scanners can operate as a tethered scanner, the Flic Cordless scanner can operate as a tethered scanner using a Flic serial cable, or without wires as a cordless scanner.

4.1.2 Hardware Handshake Mode

Hardware Handshake mode is only supported in the Flic Basic Scanner. In Hardware Handshake the host system controls the flow of data from the Flic. Hardware Handshake mode requires a special cable. In Hardware Handshake mode the Flic sends a bar code when the host signals the Flic via a hardware line.

The Hardware Handshake signal can be configured to be either active high or active low.

If the Hardware Handshake signal is active after a bar code has been successfully scanned, and no bar codes are currently stored, the new bar code will be downloaded immediately. Otherwise, the new bar code will be stored.

To start a download of stored bar codes, the Hardware Handshake signal must be held active until the download begins, which could take as long as 250 milliseconds. Once a download begins, it will continue regardless of the state of the Hardware Handshake signal.

If Hardware Handshake remains active for more than 100 (+/-10) milliseconds after the completion of a bar code download, another bar code will be downloaded. That is, at 90 milliseconds, the second bar code will never be downloaded but at 110 milliseconds, the second bar code will always be downloaded.

4.1.3 Batch Mode

Batch Mode is a store-and-forward method of operating the Flic Scanner. The scanner operates in batch mode when the cable is not plugged into the tethered/batch scanner, or when the cordless scanner does not have a connection. In batch mode, the data is stored in memory until the memory is full. The stored data can then be automatically transmitted to the host when the device reconnects, or it can be stored until the host sends a request for the data.

4.1.4 Cordless Mode

In Cordless mode the Flic Cordless scanner uses Bluetooth as a cable replacement. The Bluetooth enabled Cordless scanner runs in Bluetooth mode when you have configured the device, configured an external Bluetooth host device, the scanner is in radio range of the host device, and the scanner has a Bluetooth connection to the host device. In Bluetooth mode, the scanner acts as though it is tethered.

4.2 Interoperability between operating modes and data transmission formats

The following table shows how the data transmission formats and operation modes interact.

Table 9: Flic Operation Modes and Data Transmission Formats

Mode / Format	Tethered	Batch	Hardware Handshake	Cordless
Compatible (default)	Scanner sends data immediately after the scan. Scanner deletes data after sending. **Warning:** If the host software is not active, the data will be lost.	Scanner sends data when the cable is plugged in. All of the records are sequentially transmitted and then deleted from memory. **Warning:** If the host software is not active, the data will be lost.	Scanner sends data immediately after the scan IF the hardware handshake line indicates send. The host must change the hardware handshake line upon receipt of the data to control when the next data will be sent.	N/A
ACK	Scanner sends data immediately after the scan. Host sends <ACK>. Scanner deletes data after receiving <ACK>. If the scanner receives a <NAK>, it retransmits the data up to two times. If the scanner does not receive an <ACK>, the scanner stores the data in non-volatile memory. On each successful scan, the first data record stored in memory is sent.	Scanner sends the first data record saved in memory when the cable is plugged into the host device. Host sends <ACK>. Scanner sends the next record, if one exists. If the scanner receives a <NAK>, it retransmits the data up to two times. If the scanner does not receive an <ACK> it aborts the download process. After the last data is <ACK>ed the scanner deletes all the data in memory.	N/A	N/A
Serialization	Scanner sends data with 4-digit serialization number appended immediately after the scanned data. Host responds with the same serialization number, <xxxx><ACK>. Scanner deletes data after receiving <xxxx><ACK>. If the scanner receives a <NAK>, it retransmits the data up to two times. If the scanner does not receive an <xxxx><ACK>, the scanner stores the data in non-volatile memory. On each successful scan, the first data record stored in memory is sent. This record may not correspond to the most recent data scanned.	Scanner sends the first data record saved in memory with a 4-digit serialization number appended when the cable is plugged into the host device. Host responds with <xxxx><ACK>. Scanner sends the next record, if one exists. If the scanner receives a <NAK>, it retransmits the data up to two times. If the scanner does not receive an <xxxx><ACK>, it aborts the download process. After the last data is <xxxx><ACK>ed the scanner deletes all the data in memory.	N/A	Scanner sends the first data record saved in memory with a 4-digit serialization number appended when a Bluetooth connection occurs. Host sends <xxxx><ACK>. Scanner sends the next record, if one exists. If the scanner receives a <NAK>, it retransmits the data up to two times. If the scanner does not receive an <xxxx><ACK>, it saves the data in non-volatile memory, and it aborts the download process
XML	Scanner stores data in memory and sends the data immediately. Data remains in memory until a Clear command is received, or until the Clear barcode is scanned. Data will be retransmitted with the next scan or Download command.	Scanner stores data in memory and sends the data when the cable is plugged into the host device, as long as the disable Auto-download bit is not set. Data remains in memory until a Clear command is received, or until the Clear barcode is scanned. Data will be retransmitted with the next scan or Download command, or cable plug in.	N/A	Scanner sends data when a Bluetooth connection occurs, as long as the disable BT-Auto-download bit is not set. The data remains in memory until a Clear command is received, or until the Clear barcode is scanned. Data will be retransmitted with the next scan or Download command, or Bluetooth reconnection.

4.3 Data Transmission Formats

The Flic outputs data in one of four configurable data transmission formats:

4.3.1 Compatible Data Transmission Format

In the Compatible format, a transmitted bar code can have one of the following formats:

```
[<STX>][symbol code]data<CR>[<LF>]
[<STX>][symbol code]data<ETX>
```

The fields enclosed in brackets [ ] are configured by the format options set by the device's configuration. For more information, see "4.6 Device Configuration" on page 29.

The following examples show how bar codes are downloaded in the default and NCR default formats in compatible mode.

The first example shows how a typical UPC bar code is downloaded in the default format:

```
<STX>768268017788<CR><LF>
```

Downloading the same bar code in the NCR default format gives:

```
A768268017788<CR>
```

The next example shows how a typical Code 39 bar code is downloaded in the default format:

```
<STX>QM30840RCR-A<CR><LF>
```

Downloading the same bar code in the NCR format yields:

```
aQM30840RCR-A<CR>
```

And finally, downloading the same bar code with AIM symbology identifiers, you get:

```
<STX>]A0QM30840RCR-A<CR><LF>
```

4.3.2 Compatible with ACK Data Transmission Format

The Compatible with ACK data transmission uses the same form for bar code data:

```
[<STX>][symbol code]data<CR>[<LF>]
[<STX>][symbol code]data<ETX>
```

However, the Host is required to acknowledge each received bar code with an <ACK> response within 1 second. If the Scanner does not receive the <ACK> within the time limit, it does not transmit any more bar codes, and does not delete the bar code from nonvolatile memory.

If the Scanner receives a <NAK> within 1 second of transmitting a bar code it retransmits that bar code. After 2 <NAK>s on the same bar code the Scanner aborts the operation and does not delete the bar code from nonvolatile memory.

4.3.3 Compatible with Serialization Data Transmission Format

The Compatible with Serialization data transmission uses a similar form for bar code data:

```
[<STX>][symbol code]data<4-digit serialization number><CR>[<LF>]
[<STX>][symbol code]data<4-digit serialization number><<ETX>
```

And the Host is required to acknowledge each received bar code with the <4-digit serialization number><ACK> within 1 second. If the Scanner does not receive the <xxxx><ACK> within the time limit, it does not transmit any more bar codes, and does not delete the bar code from nonvolatile memory.

If the Scanner receives a <NAK> within 1 second of transmitting a bar code it retransmits that bar code. After 2 <NAK>s on the same bar code the Scanner aborts the operation and does not delete the bar code from nonvolatile memory.

4.3.4 XML Data Transmission Format

4.3.4.1 XML Tags and Attributes

The XML data format uses the tags and attributes listed in the table below. You should ignore any XML information in your output that is not included in this table.

Table 10: XML Tags and Attributes

Tag	Attribute	Definition
Upload		
Device		Defines the attributes for a particular scanner.
	Type	Type of device downloading data. The only valid value within the `device` tag is `Flic`.

Tag	Attribute	Definition
	Id	Factory programmed identification number.
	Hwv	Hardware version.
	Fwv	Firmware version.
	Ud	User-programmed data.
	It	Time reference or user-programmed data.
tag		
	Type	Type of record. The valid values within this tag are: `bc` –Bar code `t` – Timestamp. A `t` record is used to give a time stamp that is not associated with a bar code. In time stamp mode two, this would indicate a button press without a successful scan. The final `t` record gives the time between the last record and the download by the Flic scanner. This record will only appear if the timestamp feature has been enabled.
	Dt	Delta time in seconds from previous scan or button press, depending on the mode. This record will only appear if the timestamp feature has been enabled.
	Ct	AIM code type. For UPC-A/UPC-E codes that do not have a formal AIM code, the scanner sends an `E`. For more information, see "Appendix E AIM Symbol Codes" on page 45.
	Bc	Bar code data. Certain characters that appear in some types of bar codes cannot be directly transmitted as ASCII data since these characters are used to define the XML structure or are not printable. For these characters the following substitutions are made based on quote-printable encoding protocol.
chk		The checksum is the modulo 256 sum of the characters in the transmission. In the example below the checksum calculation starts with and includes, the `v` in the first line. It ends with the colon (:) character after the `chk` in the final line.

4.3.4.2 XML Format Features

The XML download does not use the ACK or Serialization modes.

After downloading the bar code data, you must explicitly delete the data from the scanner's memory by sending a Clear command, C. This feature provides additional data security. For more information on the Clear command, see "3.5.8 "C" the Clear Bar Code Data Command" on page 19.

The XML mode downloads bar codes using the format shown in the following example:

```
Flic v: 1.2.1<CR><LF>
<?xml version="1.0" encoding="us-ascii" standalone="yes"?><CR><LF>
<upload><CR><LF>
<!-- Microvision Flic Bar code Scanner --><CR><LF>
<device type="Flic" id="00003664" hwv="1.1" fwv="1.2.1" ud=
"0123456789ABCDEF " it= "000000000000 "><CR><LF>
<tag type="bc" dt="15" ct="E" bc="043000103050" /><CR><LF>
<tag type="bc" dt="00" ct="E" bc="063202123252" /><CR><LF>
<tag type="t" dt="4A" /><CR><LF>
<tag type="bc" dt="01" ct="E" bc="083404143454" /><CR><LF>
<tag type="t" dt="01C7" /><CR><LF>
</device><CR><LF>
</upload><CR><LF>
chk: 89! <CR><LF>
```

4.4 Bar code Data Display Format Options

4.4.1 Line Termination Characters

The Flic has three options for line termination, <CR>, <ETX>, and <CR><LF>. The line termination characters are selected by configuring byte 08, bit. 6, and byte 09, bit 1. The following table shows how the various options are selected.

Table 11: Line Termination Characters

Byte 08, Bit 6	Byte 09, Bit 1	Line Termination Character
0	0	<CR>
1	0	<CR><LF>
X	1	<ETX>

4.4.2 Supplemental Bar Code Format

The format of supplemental bar codes depends on three parameter settings: AIM Code, NCR Identifier and Combined Bar Codes. Since AIM Codes take precedence over Combined Bar Codes and NCR Identifiers require supplemental data to be combined with the main bar code, there are five distinct cases.

1. AIM Codes off, NCR Identifiers off, and Combined Bar Codes off. This is the simplest case. The main bar code is transmitted first with the active post-amble characters (<CR>, <CR><LF>, or <ETX>), followed by the supplemental bar code and the post-amble characters. For example, 9781576104903+53999 (EAN-13 + 5) is transmitted as:

   ```
   9781576104903<CR><LF>
   53999<CR><LF>
   ```

2. AIM Codes on, NCR Identifiers off/on, and Combined Bar Codes off. The AIM codes for the main bar code remain the same. There are separate and distinct AIM codes for the supplemental bar code. The main bar code is transmitted first with the post-amble characters, followed by the supplemental bar code and the post-amble characters. For example, 9781576104903+53999 is transmitted as:

   ```
   ]E09781576104903<CR><LF>
   ]E253999<CR><LF>
   ```

3. AIM Codes off, NCR Identifiers on, and Combined Bar Codes off/on. NCR identifiers, by definition, require that supplemental data be combined with the main bar code. Thus, the combined bar code option has no effect. For example, 9781576104903+53999 is transmitted as:

   ```
   F978157610490353999<CR>
   ```

4. AIM Codes off, NCR Identifiers off, and Combined Bar Codes on. This case is very similar to the case above. The supplemental data is merely appended to the end of the main bar code. For example, 9781576104903+53999 is transmitted as:

   ```
   978157610490353999<CR><LF>
   ```

5. AIM Codes on, NCR Identifiers off/on, and Combined Bar Codes on. This is the most complex case, since each symbology is handled differently. The AIM code for combined bar codes is different. For example, 9781576104903+53999 is transmitted as:

   ```
   ]E3978157610490353999<CR><LF>
   ```

The AIM specification for combined bar codes states that 13 digits must be used for EAN-13, UPC-A and UPC-E data. Thus, UPC-E data will always be expanded to the full UPC-A form, and a zero will precede the UPC-A data. For example, the UPC-A 000123456784+45322 and the UPC-E 3424607+89 is transmitted as:

```
]E300001234567844 5322<CR><LF>
]E3003400000246789<CR><LF>
```

The combined bar code AIM modifier does not apply to EAN-8 data. Instead, the same modifier is used regardless of whether a supplemental bar code is present. For example, the EAN8 + 2-digit add-on symbol data of 12345670+12 is transmitted as:

```
]E41234567012<CR><LF>
```

The XML mode also provides some variations based on the selected options. If the supplemental data is transmitted on a separate line (combined bar code and NCR Identifier options disabled), the time stamp field is not output since it always will be zero. Also, if the combined bar code and AIM codes options are selected, UPC-A and UPC-E bar code data is expanded to 13 digits before the supplemental bar code is written.

4.5 Data Verification

The Basic Flic Scanner, by default, does not verify data integrity. The Cordless Flic Scanner always uses data serialization to ensure data integrity. The Data integrity is defined as correct transmission of the bar code to the host. Data is transmitted by the Flic whenever the scanner reconnects. The scanner reconnects when

the cable is plugged in the scanner, or the cordless scanner moves back into radio range of the host device and Flicware Cordless is set to automatically reconnect.

For the Basic Flic there are two options for increased security:

1. **Using an acknowledgment handshake** (<ACK>). When enabled, the host must send an acknowledge character (ASCII 06) to the scanner after receiving the bar code. Only after the scanner receives the acknowledgment will it delete the stored bar code. To enable the acknowledgment protocol, use the ACK/NAK Protocol bar codes displayed in "Device Option Control Bar Codes" on page 46, or set the value of byte 08, bit 7 to 1.
2. **Sending serial numbers with the data** (FWV 1.9, 2.0). The scanner assigns a sixteen-bit hexadecimal serial number to each bar code. The serial number is sent as four hexadecimal characters after each bar code. The serial number is incremented for each scan. After the host receives the bar code, it must send an acknowledge character to the scanner to delete the bar code.

Table 12: Data Verification Options

Byte 0B, Bit 0	Byte 08, Bit 7	Data Verification
0	0	none
0	1	<ACK> handshake
1	X	Serial numbers, <ACK>

You can use the data serial numbers to provide additional safety when you lose a connection between transmission of the bar code by the scanner and receipt of the <ACK>. You can lose the connection when the scanner cable is accidentally disconnected, or when a cordless scanner moves out of Bluetooth radio range. When the scanner reconnects, it resends the same bar code since it did not receive the <ACK>. When you do not have data serial numbers enabled, your application can treat this retransmission as a new bar code, since your application does not know that it has already received the data. When you enable data serial numbers, you can program your application to remember the serial numbers that it has received, and ignore the bar code that was retransmitted.

To enable the data serial numbers, use the Data Serial Numbers bar codes displayed in "Device Option Control Bar Codes" on page 46, or set the values of the bytes and bits listed in the table above.

Note: setting these data serialization levels has no affect on Bluetooth.

4.6 Device Configuration Data

This section describes the device configuration bits. The table below shows the data that the scanner stores, and the memory locations of the data. Since all data values in the scanner are formatted in hexadecimal, the start and stop memory addresses listed below are in hexadecimal. The data is stored as two characters per byte, with each character giving the value of a nibble.

Table 13: Device Configuration Data

Description	Size	Start Memory Address (ASCII)	Stop Memory Address (ASCII)	Read/Write Access

User ID Data	8 bytes	0	7	R/W
Device Configuration Setup	4 bytes	8	B	R/W
Device ID	4 bytes	C	F	R
Hardware Version	2 bytes	10	11	R
Firmware Version	3 bytes	12	14	R

For information on the User ID Data, see "5.6 Writing a Number to the User ID Field" on page 36, and "5.7 Writing an 8-Character String to the User ID Field" on page 37. The section below gives more information on the Device Configuration Setup. The Device ID, Hardware Version and Firmware Version fields are factory defined.

For information about the features added in each firmware upgrade, see "Firmware Version History" on page 43.

4.6.1 Device Configuration Bytes and Bits

The tables in this section define the bits of each byte in the Device Configuration Setup memory.

Table 14: Configuration of First Byte (Address 08)

Bit	Description	Values
0	**Beep**. Enable or disable the beeper.	0 – Off 1 – On*#
2 and 1	**Timestamp**. Enable or disable setting timestamps for each decoded bar code or for any button press even without a decoded bar code. The timestamp is a relative time difference calculated from the last scan or button press, depending on the mode. The timestamp only can be accessed in XML mode. The time stamp data is transmitted as the `DT` (delta time) attribute. The timestamp value is a maximum of 4-bytes, with each count representing one second. Leading zero bytes will not be transmitted. The host is also responsible for setting the initial time reference value using the `I` command. For more information, see "3.5.6 "I" the Initialize Time Reference Setting Command" on page 18, and "5.8 Recovering the Time From a Timestamp" on page 37. **Warning:** When switching time stamp modes, stored time stamp information can become associated with the wrong bar code. Therefore, you should download all data before changing the configuration.	00 – Off*# 01 – On, timestamp decoded bar codes only 10 – On, timestamp any button press 11 – Off. This is saved in memory as 00
3	**LED**. Enable or disable the LED indicator.	0 – Off 1 – On*#
4	**STX**. Enable or disable sending the `<STX>` prefix character in Compatible format.	0 – Off# 1 – On*
5	**AIM Code**. Enable or disable transmission of AIM Code in both Compatible and XML formats. See the AIM code definitions in "Appendix E AIM Symbol Codes" on page 45. This field works in combination with the Enable Combined Bar Codes, and the NCR Symbol Identifiers settings. For more information, see "4.4.2 Supplemental Bar Code" on page 27.	0 – Off*# 1 – On
6	**Linefeed**. Enable or disable sending the linefeed character, `<LF>`, after each carriage return, `<CR>`, in both Compatible and XML formats. This field works in combination with the ETX setting (byte 09, bit 1). For more information, see "4.4.1 Line Termination Characters" on page 27.	0 – Off# 1 – On*
7	**Acknowledgment Protocol.** Enable or disable the ACK/NAK protocol in Compatible format. This does not affect XML format. This field works in combination with the Data Serial Numbers setting (byte 0B, bit 0).	0 – Off*# 1 – On

* Factory Default Setting
# NCR Factory Default Setting

Table 15: Configuration of Second Byte (Address 09)

<table>
<tr><th>Bit</th><th>Description</th><th>Values</th></tr>
<tr><td>0</td><td>Download Format. Set the data transmission format for scanner.</td><td>0 – Compatible*#
1 – XML</td></tr>
<tr><td>1</td><td>ETX. Enable or disable replacing the <CR> or <CR><LF> line termination characters with the <ETX> character. This field works in combination with the Linefeed setting (byte 08, bit 6). For more information, see "4.4.1 Line Termination Characters" on page 27.</td><td>0 – Off*#
1 – On</td></tr>
<tr><td>2</td><td>Automatic Data Download over RS-232. Enable or disable automatically downloading the bar code data when the scanner detects the cable being plugged in.
When automatic data download is disabled, the host must issue a D command to tell the scanner to send the data. For more information, see "3.5.7 "D" the Download Bar Code Data Command" on page 18.</td><td>0 – Enable automatic data download*#
1 – Disable automatic data download</td></tr>
<tr><td>3</td><td>NCR Symbol Identifiers. Enable or disable using NCR symbol identifiers. The identifier is a one or two character string that precedes each bar code. When you enable this bit, you must disable AIM codes because the AIM codes have higher precedence.
When enabled, the transmitted bar code will be prefixed with a letter that identifies the bar code's symbology:
<table>
<tr><td>Code</td><td>A</td><td>E</td><td>F</td><td>FF</td><td>a</td><td>f</td></tr>
<tr><td>Symbology</td><td>UPC-A</td><td>UPC-E</td><td>EAN-13</td><td>EAN-8</td><td>Code 39</td><td>Code 128</td></tr>
</table>
This field works in combination with the AIM Code, and the Enable Combined Bar Codes settings. For more information, see "4.4.2 Supplemental Bar Code" on page 27.</td><td>0 – Off*
1 – On#</td></tr>
<tr><td>4</td><td>Expand UPC-E Codes (FWV 1.8). Enable or disable expanding UPC-E codes to the equivalent UPC-A code.</td><td>0 – Do not expand*#
1 – Expand</td></tr>
<tr><td>5</td><td>Hardware Handshake Active. Enable or disable host control of data download via hardware handshake line. (FWV 1.9, NOT 2.x)</td><td>0 – Disable*#
1 – Enable</td></tr>
<tr><td>6</td><td>Code 39 Strip Check Character. Enable or disable stripping the checksum character from the data. When enabled, the scanner will force checksum verification regardless of the setting of the Code 39 Checksum bit.
ITF Strip Check Character (V1.10, NOT 2.x). Same as for Code 39.</td><td>0 – Enable*#
1 – Disable</td></tr>
<tr><td>7</td><td>Verify Code 39 Check Character. Enable or disable verifying the checksum character before storing the data.
Verify ITF Check Character (FWV 1.10, NOT 2.x). Same as for Code 39.</td><td>0 – Enable*#
1 – Disable</td></tr>
</table>

* Factory Default Setting
\# NCR Factory Default Setting

The bits defined in Table 7 are used to disable individual bar code symbology identifiers or to configure supplemental data. All of the disable bits are set to 0 by default, meaning the code is not disabled, that is, it is enabled. When these bits are set to 1, the corresponding symbology is disabled.

Table 16: Configuration of Third Byte (Address 0A)

Bit	Description	Values
0	**Decode Code 39**	0 – Enable*# 1 – Disable
1	**Decode Code 128**	0 – Enable*# 1 – Disable
2	**Decode UPC-E**	0 – Enable*# 1 – Disable
3	**Decode EAN-8**	0 – Enable*# 1 – Disable
4	**Decode UPC-A/EAN-13**	0 – Enable*# 1 – Disable
5	**Enable Combined Bar Codes.** This field works in combination with the AIM Code, and the NCR Symbol Identifier settings. For more information, see "4.4.2 Supplemental Bar Code" on page 27.	0 – Off*# 1 – On
7 and 6	**Require and Disable Supplemental Bar Codes.** Bit 6 defines the Require Supplemental setting, and bit 7 defines the Disable Supplemental setting. These bits define how supplemental fields are scanned.	00 – Auto-Detect supplemental bar codes* 01 – Require supplemental bar codes for UPC-A, UPC-E and EAN-13. Bar codes without supplements are not scanned. 10 – Ignore supplemental bar codes. Only decode the base bar code.# 11 – Ignore supplemental bar codes. Only decode the base bar code.

* Factory Default Setting
# NCR Factory Default Setting

Table 17: Configuration of Fourth Byte (Address 0B)

Bit	Description	Values
0	Data Serialization (FWV 2.0, FWV 1.9). This bit enables the Serialization Data Transmission Format for the Basic Flic. Data Serialization is always enabled for the Flic Cordless Scanner. See section 4.5, Data Verification for details.	0 – None*# 1 – Serialization
1	Reserved	0
2	**Convert UPC-A Bar Codes to EAN-13 Format** (FWV 1.8, 2.0)	0 – Off*# 1 – On
3	**Decode ITF** (FWV 1.10, NOT 2.x)	0 – Enabled*# 1 – Disabled
5 and 4	**Data Transmission Delay**. This applies only to the Compatible mode. In batch mode the scanner saves the bar codes in memory. When the cable is plugged in, these codes can be automatically transferred to the host. Some systems cannot handle receiving the bar codes one right after another. For these systems you can set the amount of time to wait between transmissions. During the delay, the scanner is unable to communicate. FWV 1.6 and later use the values listed to the right. FWV 1.5. Bit 5 is reserved. Bit 4 has the following values: 0 – No delay 1 – 25ms	00 – No delay* 01 - 500ms 10 – 1100ms# 11 – 1600ms
6	**Automatic Bar Code Download for Cordless Connections.** (FWV 2.0)	0 – Off 1 – On*#
7	Hardware Handshake Active Level. This bit sets the download data signal level when the Flic is in Hardware Handshake Mode (see the Second Configuration Byte, bit 5.) (FWV 1.9, NOT 2.x)	0 – Active High*# 1 – Active Low

* Factory Default Setting
# NCR Factory Default Setting

5 Examples

5.1 Changing the Scanner's Configuration

To change the scanner's configuration, first you need to convert the values for all the bits in the byte that you want to set to hexadecimal.

For example, you want to set the timestamp to stamp decoded bar codes only. Looking at the tables in section "4.6.1 Device Configuration Bytes and Bits," starting on page 31, you see that the timestamp bits are located at address 08, bits 2 and 1. The enable timestamps for decoded bar codes only value is 01. Looking down the rest of Table 14, you determine that you want to use the factory default values for the rest of the bits. Therefore, you are using the following values:

Bit	7	6	5	4	3	2	1	0
Value	0	1	0	1	1	0	1	1

Filling in the values gives:

Decimal	0	64	0	16	8	0	2	1

Adding these together gives a decimal value of 91, which converts to 5B in hexadecimal.

To set the value of the byte, you call the Set command as follows:

```
S085B<CR>
```

Remember that the start address (08) must be two characters long, and the data (5B) must be an even number of characters.

5.2 Changing the Download Data Format to XML

Microvision has not provided bar codes for changing the download format. Therefore, if you want to change the format, you must do it via the command interface.

The download data format bit is located at address 09, bit 0.

To change the data format to XML, and to use the factory default values, set the bits as follows:

Bit	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	1

This converts to 0x01, and the command is:

```
S0901<CR>
```

5.3 Changing Multiple Consecutive Bytes

You can set multiple consecutive bytes using one set command. For example, we want to combine the two previous examples, and set both the download data format to XML, and the timestamp at the same time. This involves setting both bytes 08 and 09. Byte 08 is the first of the consecutive addresses. From above, the new values for byte 08 is 0x5B, and for byte 09 is 0x01. Combining these gives the following command:

```
S085B01<CR>
```

This command will set the values of both bytes.

5.4 Disabling Automatic Data Download

To disable automatic data download, you need to write a 1 to the 2nd bit of address 0x09 Using the factory defaults for the rest of the bits, this translates to 0x04. Therefore send:

```
S0904<CR>
```

5.5 Setting NCR Default Values

Use this command to set the scanner to the NCR default values. The command for this is:

```
F2<CR>
```

This setting turns on the NCR Symbol Identifiers. The NCR default values are listed in "4.6.1 Device Configuration Bytes and Bits" on page 31. The User ID and Time Reference values are reset to 0s.

Note: Unlike using the bar codes to reset the default values, The `F` commands do not change the baud rate. This is so that you do not lose communication with the scanner when you are programmatically interacting with it. The Return to Factory Default Settings and the Return to Flic Cordless Default Settings bar codes set the baud rate to 4800. The Return to NCR Default Settings and the Return to NCR Cordless Default Settings bar codes set the baud rate to 9600.

5.6 Writing a Number to the User ID Field

Before you write a user ID, you should clear the field. To do this, you can set the value of the field to zeros, or you can use the `F` command to reset the device to the factory default settings. For more information, see "3.5.11 "F" the Return to Factory Settings Command" on page 21.

User ID numbers must be less than 18,446,744,073,709,551,615 or FFFFFFFFFFFFFFFFH in hexadecimal. Microvision recommends that your user ID numbers always have the same number of digits. Therefore, you should add preceding 0s if necessary.

There are two methods of writing a user ID number:

1. If your number is 16 digits or less, use the `S` command to write the number, starting at address 00.
2. If your number is between 17 and 20 digits long, convert the value to hexadecimal and use the `S` command to write the hexadecimal number.

For example, you want to store an 8-digit employee number: 68429235. Using the first method, you would send the following commands:

```
S0000000000000000<CR>
S0068429235<CR>
```

This command will write the number 68429235 starting at address 0. Using the `W` command to retrieve the data yields:

```
Microvision® Flic® Bar Code Scanner, ID: 4C454406, FW: 1.5.0
<SOH>W68429235000000005900000004C454406062B010500
```

Note: The user ID number has zeros added to give the full 16 digits. These zeros are the values that already existed in memory for the bytes that you did not set. You can add the leading zeros to the User ID to right align the number in the field. In this case, the command will look as follows:

```
S0000000000000000<CR>
S0000000068429235<CR>
```

Using the second method with the same number, 68429235, you would convert 68429235 to the hexadecimal value 041425B3 and write:

```
S000000000000000000<CR>
S00041425B3<CR>
```

Using the W command to retrieve the data yields:

```
Microvision® Flic® Bar Code Scanner, ID: 4C454406, FW: 1.5.0
<SOH>W041425B300000000590000004C454406062B010500
```

The retrieved value, 041425B3, can then be converted to the decimal value 68429235.

5.7 Writing an 8-Character String to the User ID Field

The 8-byte User ID field can be used to store an 8-character string. This example shows how to store and retrieve JSMITH.

1. Convert each character to its hexadecimal ASCII equivalent by using the chart shown in "Appendix G
2. ASCII Chart"on page 52. From the chart, J = 4A; S = 53; M = 4D; I = 49; T = 54; H = 48.
3. Write:

```
S000000000000000000<CR>
S004A534D4954480000<CR>
```

4. Read back data using the W command:

```
Microvision® Flic® Bar Code Scanner, ID: 4C454406, FW: 1.5.0
<SOH>W4A534D4954480000590000004C454406062B010500
```

5. Take the 16 characters after the W in the second line and convert them back to ASCII. 4A = J; 53 = S; 4D = M; 49 = I; 54 = T; 48 = H; 00 = NUL.

5.8 Recovering the Time From a Timestamp

You have a reference time value of March 12, 2002 8:35:14 AM. Given the following section of an XML download:

```
<device type="Flic" id="00003664" hwv="1.1" fwv="1.0.01" ud=
"0123456789ABCDEF " it= "020312083514 "><CR><LF>
<tag type="bc" dt="15" ct="E" bc="043000103050" /><CR><LF>
<tag type="bc" dt="1FC" ct="E" bc="063202123252" /><CR><LF>
<tag type="t" dt="4A" /><CR><LF>
```

The first scan has a dt (delta time) count of 0x15 or 21 seconds. Call this dt1 and the time for this scan T1. Therefore,

T1 = Time Reference + dt1 = 020312082535 = March 12, 2002 8:35:35 AM

The second scan has a dt count of 0x1FC or 508 seconds. Call this dt2 and the time for this scan T2. Therefore,

T2 = Time Reference + dt1 + dt2 = Time Reference + 8 min 45 sec = 020312084359 = March 12, 2002 8:43:59 AM

The next tag is time only tag.

T3 = Time Reference + dt1 + dt2 +dt3

The last time tag in any XML data record gives the delta time from the last scan to the time the data is downloaded. This final delta time can be used to calculate what the current time should be. The resulting value can be synchronized with the host to verify accuracy.

5.9 Reading the Bluetooth Timer Values

You can read the values of the four Bluetooth timers by sending the following command:

```
BT<CR>
```

If your timers are set to the default values, the scanner will respond with the following:

```
012C 003C 003C 0E10<CR>
```

This corresponds to:

- Tlisten value of 0x012C or 300 seconds.
- Tconnect value of 0x003C or 60 seconds.
- Tlimit value of 0x003C or 60 seconds.
- Tsleep value of 0x0E10 or 3600 seconds

Appendix A

Cable Pin Out

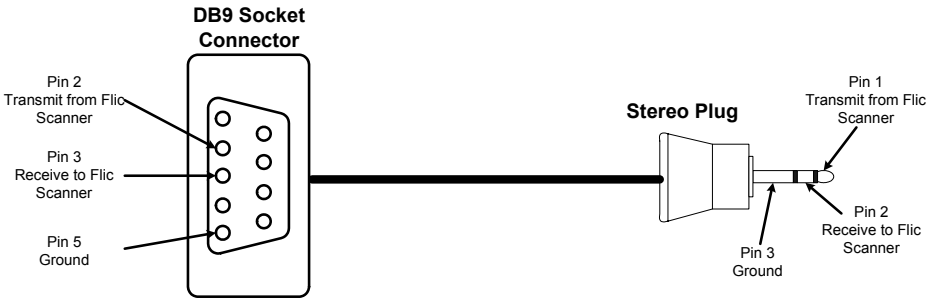


Figure 1: Cable Pin Out

RS232 Cable COM Port Settings

The following settings are used when connecting a scanner via an RS232 cable:

Baud Rate:	4800 or 9600, depending on scanner's configuration
Data Bits:	8
Parity:	None
Stop bits:	2
Flow Control:	None
Duplex:	Half duplex

See Appendix H for Bluetooth COM port settings.

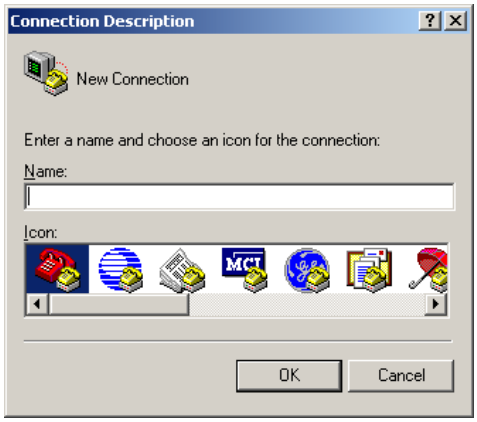
Appendix B

Using HyperTerminal to Connect to a Flic Scanner.

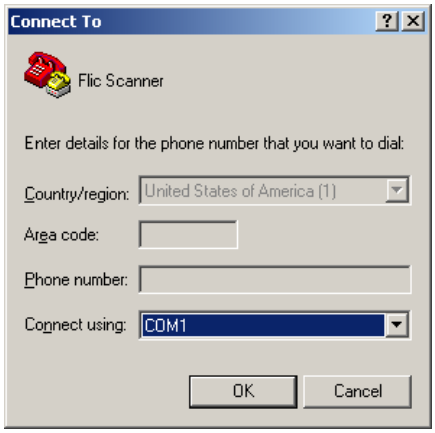
When you start HyperTerminal, you must configure its settings to communicate with the Flic scanner.

To setup HyperTerminal:

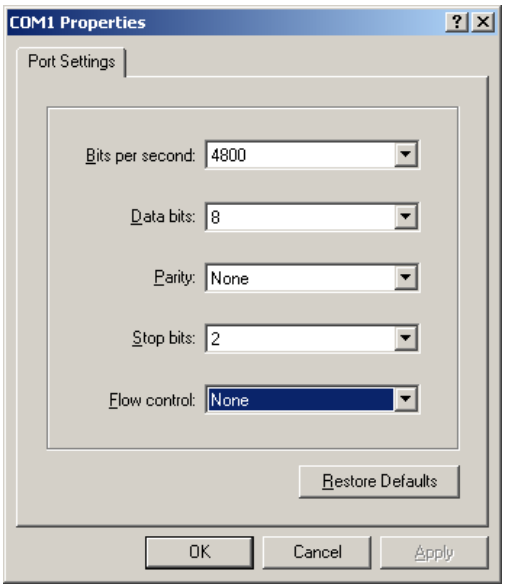
1. Connect the scanner to the host, if it is not already connected.
   - If you are connecting the scanner using the Flic Serial Cable, plug the cable into the host, and into the scanner.
   - If you are connecting a Flic Cordless scanner using Bluetooth:
     a. Start the Flicware Cordless application by selecting **Start** > **Programs** > **Flicware Cordless** > **Flicware Cordless**.
     b. Change the plug-in for the scanner to **BMVCom**.
     c. Note the COM port number displayed on the VCOM Terminal window.
2. Open HyperTerminal by selecting: **Start** > **Programs** > **Accessories** > **Communications** > **HyperTerminal**. HyperTerminal opens a Connection Description dialog box.



3. Enter a name for the connection, and select an icon. Click **OK**. HyperTerminal displays the Connect To dialog box.



4. In the drop-down menu for the Connect using field, select the serial port where you attached the scanner, or the COM port number displayed on the VCOM Terminal window. Click **OK**. HyperTerminal displays the [Port] Properties dialog box.



5. Set the port settings as defined in section "RS232 Cable COM Port Settings".
6. Click **OK**.

Appendix C

Determining the Version of Firmware Installed on Your Scanner

With each firmware release Microvision has implemented new features to enhance the Flic scanner. To see what features were implemented in what release version, see "0 Firmware Version History" below.

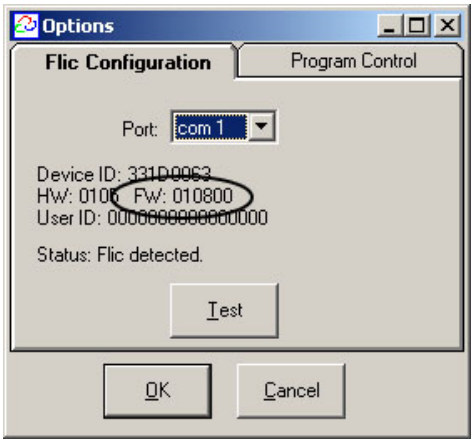
Note: In this guide, features that have been implemented after firmware version 1.5.0 are denoted by a FWV code, followed by the implementation version number.

This section tells you one way of determining what version of the firmware is installed on your scanner. You can also use the Who command to find this information. The Who command is documented in "3.5.3 "W" the Who Command" on page 16.

Note: The scanner's firmware cannot be upgraded. If you need to use the functionality that is implemented in a later version, please contact Microvision.

To determine the firmware version installed on your tethered/batch scanner:

1. Start the Flicware application by selecting **Start** > **Programs** > **Microvision** > **Flicware**.
2. From the Tools menu, select **Options…**
3. On the Options dialog box, if the port to which you connected the scanner is different than the port that is displayed, select the appropriate port from the **Port:** drop down menu.
4. Click **Test**.
5. The application detects the Flic scanner and displays the following information:

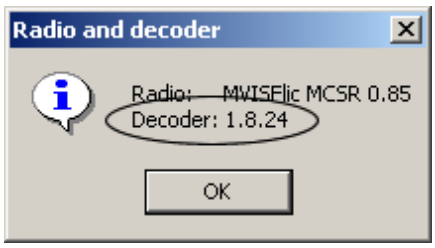


6. Look for the number in the FW field. This is the firmware version number.

To determine the firmware version installed on your cordless scanner:

1. Start the Flicware Cordless application by selecting **Start** > **Programs** > **Flicware Cordless** > **Flicware Cordless**.
2. Press the button on the cordless scanner to place it in discoverable mode.
3. Wait until the Status changes to Connected.
4. Click the name of the scanner to select it, and click **Settings**.

5. On the Settings window, click **Radio/Decoder Version**.



6. Look for the information in the Decoder field. This is the firmware version number.

Firmware Version History

In this guide, features that have been implemented after firmware version 1.5 are denoted by a FWV code, followed by the implementation version number. The version changes are summarized below.

Changes in Version 1.10 (BASIC FLIC SCANNER ONLY)

- Implemented ITF symbology. Removed aggressive scanning (return the Flic to specification).

Changes in Version 2.1 (FLIC CORDLESS SCANNER ONLY)

All 2.x version of the Flic firmware are Flic Cordless.

- Initial Release of Flic Cordless Scanner, replacing the cable with a Bluetooth link.

Changes in Version 1.9 (BASIC FLIC SCANNER ONLY)

After 1.8, all 1.x versions of the Flic firmware are Basic Flic.

- Hardware Handshake host control of downloading bar codes added.

Changes in Version 1.8

- Implemented expansion of UPC-A bar codes to EAN-13 format. If both the expand UPC-E codes (byte 09, bit 4) and the convert UPC-A codes (byte 0B, bit 2) are enabled, then the scanner will expand all UPC-E codes to the EAN-13 format.
- Implemented standard vs. aggressive scanning selectability via control bar code. Standard scanning meets all UPC scanning specifications. Aggressive scanning ignores the UPC/EAN-13 requirement for the amount of blank space (quiet zone) that should surround a bar code.

Changes in Version 1.7

- Changed the NCR symbology identifiers for Code 39 and Code 128.
- Implemented combined bar code feature for supplemental bar codes. For more information, see "4.4.2 Supplemental Bar Code" on page 27.
- Implemented selectable baud rates, 4800 and 9600.

Changes in Version 1.6

- Changed the inter-bar code delay to have four selectable settings: no delay, 500ms, 1.1s and 1.6s.
- Added support for supplemental bar codes with EAN-8.
- Changed how the scanner appends supplemental bar codes to the base bar code when using NCR identifiers.

Appendix D

Microvision and NCR Default Values

Setting	Microvision Default Value	NCR Default Value
Acknowledgment protocol	Off	Off
AIM code	Off	Off
Automatic data download	Enabled	Enabled
Baud rate	4800	9600
Beep	On	On
Code 128 symbology	Enabled	Enabled
Code 39 checksum	Off	Off
Code 39 strip check character	Off	Off
Code 39 symbology	Enabled	Enabled
Combined bar codes	Off	Off
Convert UPC-A bar codes to EAN-13 format (FWV 1.8, 2.0)	Off	Off
Delay between bar code transmissions (FWV 1.6)	No delay	1100ms
Standard vs. aggressive scanning (FWV 1.8, 2.0)	Standard	Standard
Download format	Compatible	Compatible
EAN-8 symbology	Enabled	Enabled
ETX enable	Off	Off
Expand UPC-E codes	Do not expand	Do not expand
LED	On	On
Linefeed	On	Off
NCR symbol identifiers	Off	On
STX	On	Off
Supplemental bar codes	Auto-detect	Ignore
Timestamp	Off	Off
UPC-A/EAN-13 symbology	Enabled	Enabled
UPC-E symbology	Enabled	Enabled
Hardware Handshake	Off	Off
Hardware Handshake Active	High	High
ITF checksum (same as Code 39) (FWV 1.10, NOT 2.x)	Off	Off
ITF strip check character (same as Code 39) (FWV 1.10, NOT 2.x)	Off	Off
ITF symbology (FWV 1.10, NOT 2.x)	Enabled	Enabled

Appendix E

AIM Symbol Codes

The AIM symbol code is a three character string in the format]cm, where

-] ASCII 5D hex
- c AIM code
- m AIM code modifier.

Table 18: AIM Code

Code	Definition
A	Code 39
C	Code 128
E	EAN/UPC

AIM Code Modifiers

UPC-A and UPC-E symbols do not have an AIM symbol code unless they are combined with supplemental data.

Table 19: Code 39 Modifiers

Code	Definition
0	No check character
1	Reader has performed check
3	Reader has performed check and stripped check character

Table 20: Code 128 Modifiers

Code	Definition
0	Standard
1	FC1 in first symbol character position
2	FC2 in second symbol character position

Table 21: UPC/EAN Modifiers

Code	Definition
0	Standard 13-digit EAN
1	Two-digit supplemental data only
2	Five-digit supplemental data only
3	Combined Bar Code Data
4	EAN-8

Appendix F

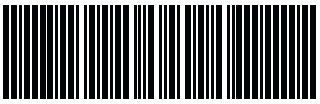
Bar Codes

To use these bar codes to configure your Flic scanner, print the appropriate page. Then use your scanner to read the appropriate bar code.

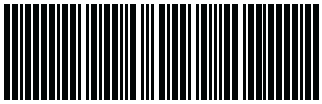
Device Option Control Bar Codes

Return to Factory Default Settings

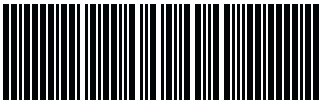
Return to NCR Default Settings



4800 Baud* (FWV 1.7)



9600 Baud# (FWV 1.7)



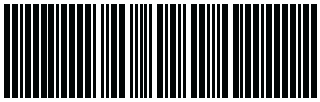
ACK/NAK Protocol

Enable

Disable*#

Auto Download Data for Bluetooth Connection

Enable*#

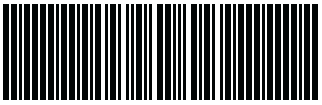


Disable

Auto Download Data for RS-232 Connection

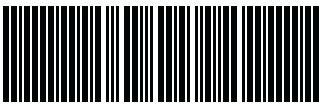
Enable*#

Disable

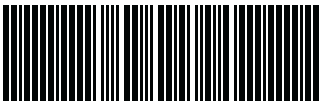


Beep Control

Enable*#



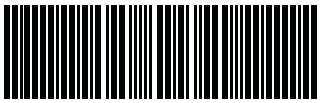
Disable



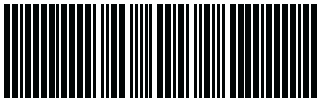
* Factory Default Setting
# NCR Factory Default Setting

Data Serial Numbers

Enable



Disable*#



Delay Between Bar Codes

None*

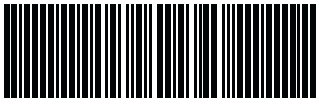
500ms

1100ms#

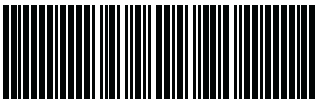
1600ms

Download Format

XML



Compatible*#



LED Control

Enable*#

Disable

Hardware Handshake

Enable

Disable*#

Hardware Handshake Level

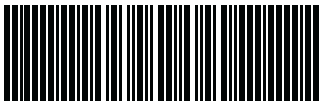
High*#

Low

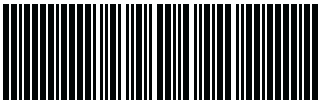
Data Format Options Control Bar Codes

ETX Suffix Character

Enable

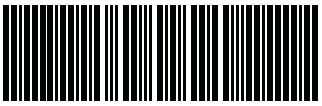


Disable*#

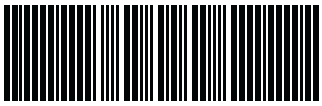


Line Feed Suffix Character

Enable*

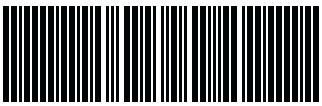


Disable#



STX Prefix Character

Enable*



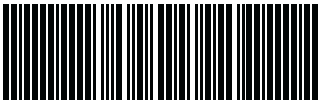
Disable#

* Factory Default Setting
# NCR Factory Default Setting

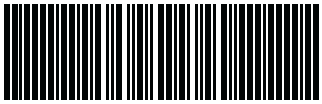
Symbology Selection Control Bar Codes

Code 39

Enable*#

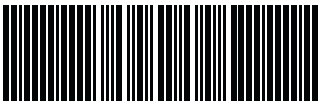


Disable

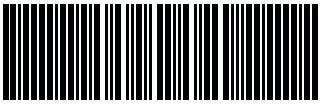


Code 128

Enable*#

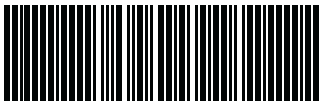


Disable

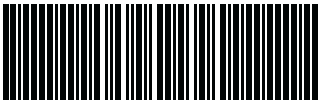


EAN-8

Enable*#

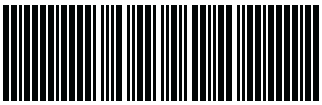


Disable

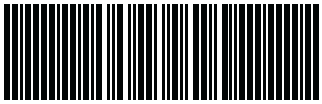


UPC-A/EAN-13

Enable*#

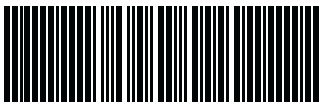


Disable

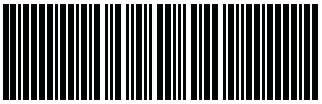


UPC-E

Enable*#

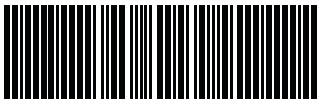


Disable



ITF (FWV 1.10) *#

Enable

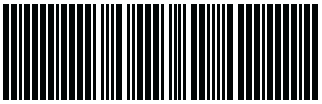


Disable

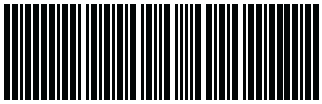
* Factory Default Setting
# NCR Factory Default Setting

Supplemental Bar Codes

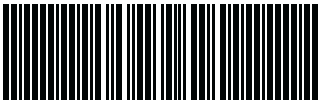
Auto-Detect Supplemental Codes*



Require Supplemental codes

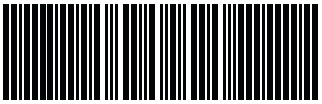


Disable Supplemental Codes#



AIM Symbol Identifiers

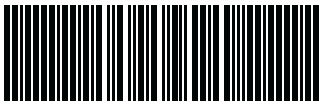
Enable



Disable*#

Combine Bar Codes (FWV 1.7)

Enable

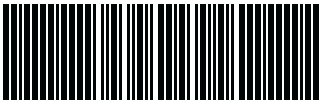


Disable*

NCR Symbol Identifiers

Enable#

Disable*



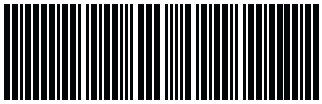
* Factory Default Setting
# NCR Factory Default Setting

Symbology Options Control Bar Codes

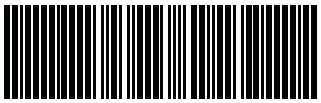
Code 39 Options

Code39 Check and Strip Checksum Enable

Code39 Checksum Enable



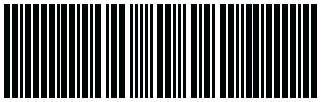
Code39 Checksum Disable*#



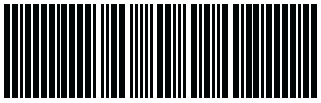
(Disables both Code 39 Checksum options)

UPC/EAN Options

Convert UPC-A codes to EAN-13 codes (FWV 1.8)

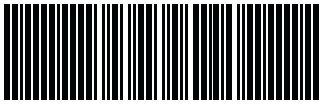


Do Not Convert UPC-A codes*# (FWV 1.8)



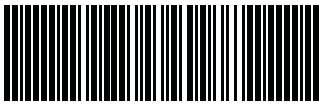
Expand UPC-E codes to UPC-A codes

Do Not Expand UPC-E codes*#



Command Control Bar Codes

Clear Device Bar Code Memory



* Factory Default Setting
# NCR Factory Default Setting

Appendix G

ASCII Chart

Use this ASCII chart to convert characters to hexadecimal, and hexadecimal values to characters. For example, the ampersand (&) is represented as 0x26, or as &#038 in ASCII.

The hexadecimal values can appear in the bar code data. Additionally, you can use the hexadecimal number to write a name to the User ID field.

Note: Non-printable characters are provided for reference in the first and second rows, and in the 7F character.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DEL

Appendix H

Bluetooth Pairing and Connecting

Caveat, the various flavors of Flicware Cordless take care of Bluetooth pairing, connecting and auto-reconnecting, the following has not been verified on all flavors of all window Bluetooth machines:

1) Pairing:

(Using Windows explorer, Bluetooth neighborhood, Bluetooth icon, entering pairing number…)

2) Connecting:

(Using Windows explorer, Bluetooth neighborhood, connect to SPP, connecting to COM port).

Bluetooth SPP COM Port Settings

The following settings are used when connecting to a Flic Cordless Scanner via a Bluetooth SPP COM port:

Baud Rate:	115200
Data Bits:	8
Parity:	None
Stop bits:	1
Flow Control:	None
Duplex:	Half duplex