

**Table A-1 MC75A Technical Specifications (Continued)**

Item	Description
<b>Wireless WAN Data and Voice Communications</b>	
Wireless Wide Area Network (WWAN) radios	<b>MC75A6:</b> GSM: HSDPA (850, 900, 1800, 1900 and 2100 MHz) <b>MC75A8:</b> CDMA: EVDO Rev A (800 and 1900 MHz)
GPS	Integrated Assisted-GPS (A-GPS), autonomous GPS
<b>Wireless LAN Data and Voice Communications</b>	
Wireless Local Area Network (WLAN) radio	Tri-mode IEEE <sup>®</sup> 802.11a/b/g
Data Rates Supported	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Operating Channels	Chan 8-169 (5040 – 5845 MHz) Chan 1-13 (2412-2472 MHz) Chan 14 (2484 MHz) Japan only Actual operating frequencies depend on regulatory rules and certification agency
Security	WPA2, WPA, WEP (40 or 128 bit), TKIP, TLS, TTLS (MS-CHAP), TTLS (MS-CHAP v2), TTLS (CHAP), TTLS-MD5, TTLS-PAP, PEAP-TLS, PEAP (MS-CHAP v2), AES, LEAP
Spreading Technique	Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM)
Antenna	Internal for WLAN and Bluetooth
Voice Communication	Integrated Voice-over-IP ready (P2P, PBX, PTT), Wi-Fi™-certified, IEEE 802.11a/b/g direct sequence wireless LAN
<b>Wireless PAN Data and Voice Communications</b>	
Bluetooth	Class II, v 2.1 with EDR; on-board chip antenna.
<b>Data Capture Specifications</b>	
Options	2D imager, 1D linear, color camera
<b>Linear 1D Scanner (SE950) Specifications</b>	
Optical Resolution	0.005 in. minimum element width
Roll	+/- 30° from vertical
Pitch Angle	+/- 65° from normal
Skew Tolerance	+/- 60° from normal
Ambient Light	Sunlight: 8,000 ft. candles (86,112 Lux) Artificial Light: 450 ft. candles (4,844 Lux)
Shock	2,000 +/- 5% G

Note 1: Total output power can be either USB or serial or a combination of both that cannot exceed 200 mA.

**Table A-1** MC75A Technical Specifications (Continued)

Item	Description
Scan Rate	50 (+/- 6) scans/sec (bidirectional)
Scan Angle	46.5° (typical)
Laser Power	1.0 mW nominal
<b>2D Imager Engine (SE4500) Specifications</b>	
Field of View	Horizontal - 40° Vertical - 25°
Optical Resolution	752X 480 V pixels (gray scale)
Roll	360°
Pitch Angle	+/- 60° from normal
Skew Tolerance	+/- 60° from normal
Ambient Light	9,000 ft. candles (96,900 Lux)
Shock	2,000 +/- 5% G
Focal Distance from Front of Engine	Near: 5 inches Far: 9 inches
Aiming Element (VLD)	655 nm +/- 10 nm
Illumination Element (LED)	625 nm +/- 5 nm
<b>Camera Specifications</b>	
Resolution	2 Mega pixel with auto focus and flash

Note 1: Total output power can be either USB or serial or a combination of both that cannot exceed 200 mA.

**Table A-2** Data Capture Options

Item	Description																											
Laser Decode Capability	<table border="0"> <tr> <td>Code 39</td> <td>Code 128</td> <td>Code 93</td> </tr> <tr> <td>Codabar</td> <td>Code 11</td> <td>Discrete 2 of 5</td> </tr> <tr> <td>Interleaved 2 of 5</td> <td>EAN-8</td> <td>EAN-13</td> </tr> <tr> <td>MSI</td> <td>UPCA</td> <td>UPCE</td> </tr> <tr> <td>UPC/EAN supplementals</td> <td>Coupon Code</td> <td>Trioptic 39</td> </tr> <tr> <td>Webcode</td> <td>Chinese 2 of 5</td> <td>GS1 DataBar</td> </tr> <tr> <td>GS1 DataBar Truncated</td> <td>GS1 DataBar Limited</td> <td>GS1 DataBar Stacked</td> </tr> <tr> <td>GS1 DataBar Expanded</td> <td>GS1 DataBar Expanded Stacked</td> <td></td> </tr> <tr> <td>GS1 DataBar Stacked Omni</td> <td></td> <td></td> </tr> </table>	Code 39	Code 128	Code 93	Codabar	Code 11	Discrete 2 of 5	Interleaved 2 of 5	EAN-8	EAN-13	MSI	UPCA	UPCE	UPC/EAN supplementals	Coupon Code	Trioptic 39	Webcode	Chinese 2 of 5	GS1 DataBar	GS1 DataBar Truncated	GS1 DataBar Limited	GS1 DataBar Stacked	GS1 DataBar Expanded	GS1 DataBar Expanded Stacked		GS1 DataBar Stacked Omni		
Code 39	Code 128	Code 93																										
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GS1 DataBar Expanded	GS1 DataBar Expanded Stacked																											
GS1 DataBar Stacked Omni																												

**Table A-2** Data Capture Options (Continued)

Item	Description		
Imaging Decode Capability	Code 39 Codabar Discrete 2 of 5 EAN-13 UPC/EAN supplementals Webcode Composite C Macro PDF-417 Data Matrix US Planet Canadian 4-state Chinese 2 of 5 microQR GS1 DataBar Limited GS1 DataBar Expanded Stacked	Code 128 Code 11 MSI UPCA Coupon Code TLC39 Micro PDF-417 (Macro) Micro PDF-417 Maxi Code UK 4-state Japanese 4-state USPS 4-state (US4CB) GS1 DataBar GS1 DataBar Stacked GS1 DataBar Stacked Omni	Code 93 Interleaved 2 of 5 EAN-8 UPCE Trioptic 39 Composite AB PDF-417 QR Code US Postnet* Australian 4-state Dutch Kix Aztec GS1 DataBar Truncated GS1 DataBar Expanded
Camera Decode Capability	Code 39 Codabar Discrete 2 of 5 EAN-13 UPC/EAN supplementals Webcode Composite C Macro PDF-417 Data Matrix US Planet Canadian 4-state GS1 DataBar GS1 DataBar Stacked Expanded Stacked	Code 128 Code 11 MSI UPCA Coupon Code TLC39 Micro PDF-417 (Macro) Micro PDF-417 Maxi Code UK 4-state Japanese 4-state GS1 DataBar Truncated GS1 DataBar Expanded GS1 DataBar Stacked Omni	Code 93 Interleaved 2 of 5 EAN-8 UPCE Trioptic 39 Composite AB PDF-417 QR Code US Postnet* Australian 4-state Dutch Kix GS1 DataBar Limited GS1 DataBar

## MC75A Accessory Specifications

### Single Slot USB/Serial Cradle

**Table A-3** *Single Slot USB/Serial Cradle Technical Specifications*

Feature	Description
Dimensions	Length: 14.54 cm (5.72 in.) Width: 11.05 cm (4.35 in.) Height: 9.10 cm (3.58 in.)
Weight	196 g (6.9 oz)
Input Power	12 VDC
Power Consumption	30 watts
Interface	USB, Serial
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

### Four Slot Ethernet Cradle

**Table A-4** *Four Slot Ethernet Cradle Technical Specifications*

Feature	Description
Dimensions	Length: 46.80 cm (18.42 in.) Width: 10.90 cm (4.29 in.) Height: 13.70 cm (5.39 in.)
Weight	1079 g (2.38 lb)
Input Power	12 VDC
Power Consumption	100 watts
Interface	Ethernet
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)

**Table A-4** *Four Slot Ethernet Cradle Technical Specifications (Continued)*

Feature	Description
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

## Four Slot Charge Only Cradle

**Table A-5** *Four Slot Charge Only Cradle Technical Specifications*

Feature	Description
Dimensions	Length: 46.80 cm (18.42 in.) Width: 10.90 cm (4.29 in.) Height: 13.70 cm (5.39 in.)
Weight	1079 g (2.38 lb)
Input Power	12 VDC
Power Consumption	100 watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

## Four Slot Battery Charger

**Table A-6** *Four Slot Battery Charger Technical Specifications*

Feature	Description
Dimensions	Length: 21.0 cm (8.27 in.) Width: 15.50 cm (6.10 in.) Height: 3.47 cm (1.37 in.)
Weight	386 g (13.6 oz)
Input Power	12 VDC

**Table A-6** Four Slot Battery Charger Technical Specifications (Continued)

Feature	Description
Power Consumption	30 watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

## Magnetic Stripe Reader

**Table A-7** Magnetic Stripe Reader (MSR) Technical Specifications

Feature	Description
Dimensions	Length: 7.87 cm (3.1 in.) Width: 8.38 cm (3.3 in.) Height: 3.56 cm (1.4 in.)
Weight	48 g (1.7 oz)
Interface	Serial with baud rate up to 19,200
Format	ANSI, ISO, AAMVA, CA DMV, user-configurable generic format
Swipe Speed	5 to 50 in. (127 to 1270 mm) /sec, bi-directional
Decoders	Generic, Raw Data
Mode	Buffered, unbuffered
Track Reading Capabilities	Tracks 1 and 3: 210 bpi Track 2: 75 and 210 bpi, autodetect
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	5% to 95% non-condensing
Drop	1.22 m (4 ft.) drops to concrete
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

# Appendix B Keypads

## Introduction

The MC75A offers five types of keypad configurations: Numeric, DSD, QWERTY, AZERTY and QWERTZ.

### Numeric Keypad Configuration

The numeric keypad contains application keys, scroll keys, and function keys. The keypad is color-coded to indicate the alternate function key (blue) values. Note that an application can change keypad functions so the MC75A's keypad may not function exactly as described. See [Table B-1](#) for key and button descriptions and [Table B-2](#) on page B-4 for the keypad's special functions.

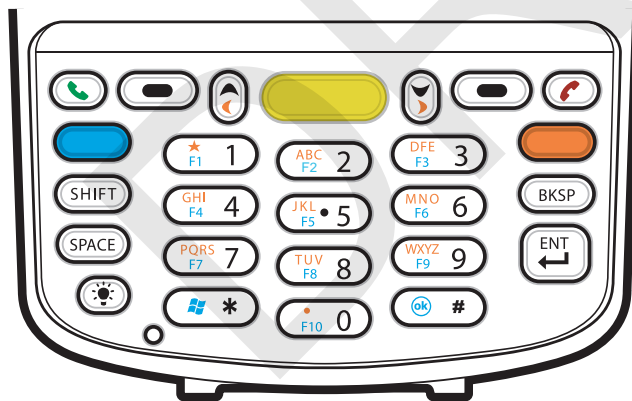






















Figure B-1 MC75A Numeric Keypad

**Table B-1** MC75A Numeric Keypad Descriptions

Key	Description
Blue Key (left) 	Use this key to launch applications or access items (shown on the keypad in blue). Press the Blue key once to activate this mode, followed by another key.  A single press displays the following icon at the bottom of the screen, until a second key is pressed: 
Orange Key 	Use this key to access the secondary layer of characters and actions (shown on the keypad in orange). Press the Orange key once to lock the keypad into Alpha state. A single press displays the following icon at the bottom of the screen:   Press the Orange key a second time to return to the normal state. Press the Orange key, then the Shift key to add a temporary shift (that applies only to the next key pressed) to the orange lock state. This displays the following icon at the bottom of the screen: 
Talk/End  	Talk (Green Phone): press to display the phone keypad window or to dial a phone number (from the phone keypad window). End (Red Phone): press when the phone keypad window displays to stop dialing or end a call.
Scan (yellow) 	Activates the scanner/imager in a scan enabled application.
Scroll Up and Down 	Moves up one item. Moves left one item when pressed with the Orange key.
Scroll Left and Right 	Moves down one item. Moves right one item when pressed with the Orange key.
Soft Keys 	Accesses the command or menu above it on the screen.
Star 	Produces an asterisk in default state. Press and release the blue key, then press the Star key to open the <i>Start</i> menu.



**Table B-1** MC75A Numeric Keypad Descriptions (Continued)

Key	Description
Alphanumeric 	<p>In default state, produces the numeric value on the key.</p> <p>In Alpha state, produces the lower case alphabetic characters on the key. Each key press produces the next alphabetic character in sequence. For example, press and release the Orange key and then press the '4' key once to produce the letter 'g'; press and release the Orange key and then press the '4' key three times to produce the letter 'i'.</p> <p>Press the SHIFT key in Alpha state to produce the upper case alphabetic characters on the key. For example, press and release the Orange key, press and release the SHIFT key, and then press the '4' key once to produce the letter 'G'; press and release the Orange key, press and release the SHIFT key and then press the '4' key three times to produce the letter 'I'.</p>
SPACE 	Produces a space.
BACKSPACE 	Produces a backspace.
SHIFT 	<p>Press and release the SHIFT key to activate the keypad alternate SHIFT functions.</p> <p>A single press displays the following icon at the bottom of the screen, until a second key is pressed: </p> <p>Press the Orange key, then the Shift key to add a temporary shift (that applies only to the next key pressed) to the orange lock state. This displays the following icon at the bottom of the screen: </p>
ENT (Enter) 	Executes a selected item or function.
Pound 	<p>Produces a pound/number sign.</p> <p>Press and release the blue key, then press the Pound key to produce an OK.</p>

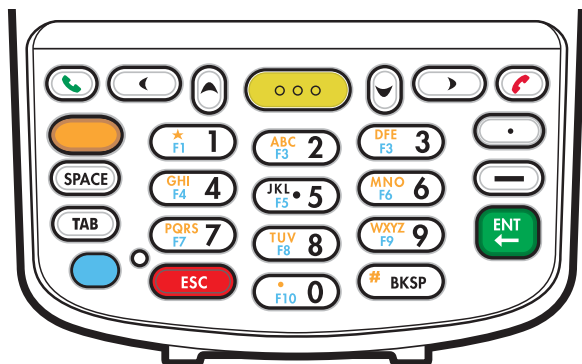
**Table B-2** Numeric Keypad Input Modes

Key	Numeric Mode			Orange Key (Alpha Lowercase Mode)				Orange + Shift Keys (Alpha Uppercase Mode)			
		Blue+ Key	SHIFT + Key	1st Press	2nd Press	3rd Press	4th Press	1st Press	2nd Press	3rd Press	4th Press
1	1	F1	!	*	*	*	*	*	*	*	*
2	2	F2	@	a	b	c		A	B	C	
3	3	F3	#	d	e	f		D	E	F	
4	4	F4	\$	g	h	i		G	H	I	
5	5	F5	%	j	k	l		J	K	L	
6	6	F6	^	m	n	o		M	N	O	
7	7	F7	&	p	q	r	s	P	Q	R	S
8	8	F8	*	t	u	v		T	U	V	
9	9	F9	(	w	x	y	z	W	X	Y	Z
0	0	F10	)	.				>			
Up	Up	Up	Hilight Up	Left				Left			
Down	Down	Down	Hilight Down	Right				Right			
Enter	Action	Action	Action	Action				Action			

Note: An application can change the key functions. The keypad may not function exactly as described.








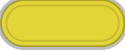
## DSD Keypad Configuration

The DSD keypad contains application keys, scroll keys, and function keys. The keypad is color-coded to indicate the alternate function key (blue) values. Note that an application can change keypad functions so the MC75A's keypad may not function exactly as described. See [Table B-3](#) for key and button descriptions and [Table B-4 on page B-7](#) for the keypad's special functions.














**Figure B-2** MC75A DSD Keypad

**Table B-3** MC75A DSD Keypad Descriptions

Key	Description
Blue Key (left) 	Use this key to launch applications or access items (shown on the keypad in blue). Press the Blue key once to activate this mode, followed by another key.  A single press displays the following icon at the bottom of the screen, until a second key is pressed: 
Orange Key 	Use this key to access the secondary layer of characters and actions (shown on the keypad in orange). Press the Orange key once to lock the keypad into Alpha state. A single press displays the following icon at the bottom of the screen:   Press the Orange key a second time to return to the normal state. Press the Orange key, then the Shift key to add a temporary shift (that applies only to the next key pressed) to the orange lock state. This displays the following icon at the bottom of the screen: 
Talk/End  	Talk (Green Phone): press to display the phone keypad window or to dial a phone number (from the phone keypad window). End (Red Phone): press when the phone keypad window displays to stop dialing or end a call.
Scan (yellow) 	Activates the scanner/imager in a scan enabled application.

**Table B-3** MC75A DSD Keypad Descriptions (Continued)

Key	Description
Scroll Up 	Moves up one item.
Scroll Left 	Moves left one item.
Scroll Down 	Moves down one item.
Scroll Right 	Moves right one item.
Alphanumeric 	<p>In default state, produces the numeric value on the key.</p> <p>In Alpha state, produces the lower case alphabetic characters on the key. Each key press produces the next alphabetic character in sequence. For example, press and release the Orange key and then press the '4' key once to produce the letter 'g'; press and release the Orange key and then press the '4' key three times to produce the letter 'i'.</p> <p>Press the SHIFT key in Alpha state to produce the upper case alphabetic characters on the key. For example, press and release the Orange key, press and release the SHIFT key, and then press the '4' key once to produce the letter 'G'; press and release the Orange key, press and release the SHIFT key and then press the '4' key three times to produce the letter 'I'.</p>
SPACE 	Produces a space.
BACKSPACE 	Produces a backspace.
ESC 	Cancels an operation or action.
ENT (Enter) 	Executes a selected item or function.
Period 	Produces a period character.
Dash 	Produces a dash character.

**Table B-4** DSD Keypad Input Modes

Key	Numeric Mode			Orange Key (Alpha Lowercase Mode)				Orange + Shift Keys (Alpha Uppercase Mode)			
		Blue+ Key	SHIFT + Key	1st Press	2nd Press	3rd Press	4th Press	1st Press	2nd Press	3rd Press	4th Press
1	1	F1	!	*	*	*	*	*	*	*	*
2	2	F2	@	a	b	c		A	B	C	
3	3	F3	#	d	e	f		D	E	F	
4	4	F4	\$	g	h	i		G	H	I	
5	5	F5	%	j	k	l		J	K	L	
6	6	F6	^	m	n	o		M	N	O	
7	7	F7	&	p	q	r	s	P	Q	R	S
8	8	F8	*	t	u	v		T	U	V	
9	9	F9	(	w	x	y	z	W	X	Y	Z
0	0	F10	)	.				>			
.	.	.	.								
-	-	-	-								
Up	Up	Up	Hilight Up								
Down	Down	Down	Hilight Down								
Left	Left	Left	Hilight Left								
Right	Right	Right	Hilight Right								
Enter	Action	Action	Action	Action				Action			
ESC	ESC	ESC	ESC	ESC				ESC			

Note: An application can change the key functions. The keypad may not function exactly as described.

## Alpha-numeric Keypad Configurations

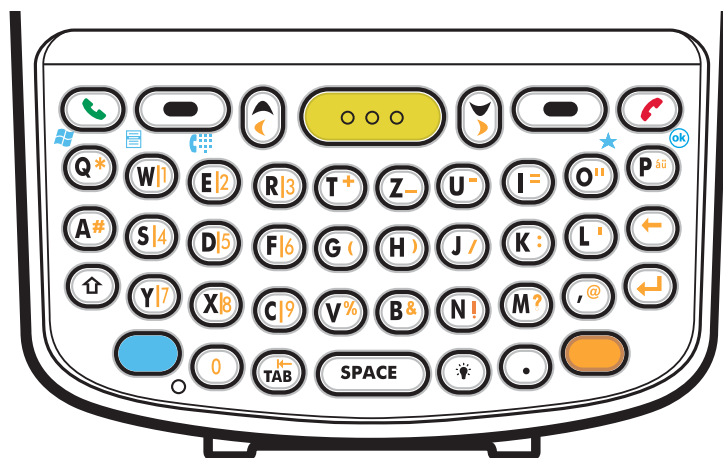
The three types of alpha-numeric keypads produce the 26-character alphabet (A-Z, both lowercase and uppercase), numbers (0-9), and assorted characters. The keypad is color-coded to indicate which modifier key to press to produce a particular character or action. The keypad default is alphabetic, producing lowercase letters. See [Table B-5](#) for key and button descriptions and [Table B-6 on page B-11](#) for the keypad's special functions.



Figure B-3 QWERTY Keypad Configuration











Figure B-4 AZERTY Keypad Configuration

















**Figure B-5** QWERTZ Keypad Configuration

**Table B-5** Alpha-numeric Keypad Descriptions




Key	Action
<p>Blue Key</p> 	<p>Launches applications (shown on the keypad in blue).            Press the Blue key once to activate this mode temporarily, followed by another key. This displays the following icon at the bottom of the screen, until a second key is pressed: </p> <p>Press the Blue key twice to lock this mode. This displays the following icon at the bottom of the screen: </p> <p>Press the Blue key a third time to unlock.</p> <p>Press and hold the Blue key while selecting a sequence of keys to activate this mode temporarily. This displays the following icon at the bottom of the screen as long as the key is pressed: </p>
<p>Orange Key</p> 	<p>Accesses the secondary layer of characters and actions (shown on the keypad in orange).            Press the Orange key once to activate this mode temporarily, followed by another key. This displays the following icon at the bottom of the screen, until a second key is pressed: </p> <p>Press the Orange key twice to lock this mode. This displays the following icon at the bottom of the screen: </p> <p>Press the Orange key a third time to unlock.</p> <p>Press and hold the Orange key while selecting a sequence of keys to activate this mode temporarily. This displays the following icon at the bottom of the screen as long as the key is pressed: </p>

**Table B-5** Alpha-numeric Keypad Descriptions (Continued)

Key	Action
Talk/End  	Talk (Green Phone): press to display the phone keypad window or to dial a phone number (from the phone keypad window). End (Red Phone): press when the phone keypad window displays to stop dialing or end a call.
Scroll Up and Left 	Moves up one item. Moves left one item when pressed with the Orange key.
Scroll Down and Right 	Moves down one item. Moves right one item when pressed with the Orange key.
Soft Keys 	Accesses the command or menu above it on the screen.
Shift 	Changes the state of the alpha characters from lowercase to uppercase. <ul style="list-style-type: none"> <li>• Press the Shift key to activate this mode temporarily, followed by another key. This displays the following icon at the bottom of the screen, until a second key is pressed: </li> <li>• Press the Shift key twice to lock this mode. This displays the following icon at the bottom of the screen: </li> <li>• Press the Shift key a third time to unlock.</li> </ul>
Backlight 	Turns the display backlight on and off.
Backspace 	Produces a backspace.
Enter 	Executes a selected item or function.
Star  	Use this key in conjunction with the Blue key to produces an asterisk.
OK 	Use this key in conjunction with the Blue key as an OK or close button. This function is user programmable.



**Table B-5** Alpha-numeric Keypad Descriptions (Continued)

Key	Action
Start Menu 	Use this key in conjunction with the Blue key to instantly display the <i>Start</i> menu from any application without tapping the screen. This function is user programmable.
Menu 	Use this key in conjunction with the Blue key to instantly display the context menu from any application without tapping the screen. This function is user programmable.
Phonepad 	Use this key in conjunction with the Blue key to display the Phonepad application without tapping the screen. This function is user programmable.

**Table B-6** QWERTY Keypad Input Modes

Key	Normal	Shift + Key	Orange + Key	Blue + Key
Q	q	Q	*	Start Menu
W	w	W	1	Menu
E	e	E	2	Phone
R	r	R	3	
T	t	T	+	
Y	y	Y	_	
U	u	U	-	
I	i	I	=	
O	o	O	"	*
P	p	P	áü	OK
A	a	A	#	
S	s	S	4	
D	d	D	5	
F	f	F	6	
G	g	G	(	
H	h	H	)	
J	j	J	/	
K	k	K	:	

Note: An application can change the key functions. The keypad may not function exactly as described.

**Table B-6** QWERTY Keypad Input Modes (Continued)

Key	Normal	Shift + Key	Orange + Key	Blue + Key
L	l	L	'	
Backspace	Backspace			
Shift	Shift			
Z	z	Z	7	
X	x	X	8	
C	c	C	9	
V	v	V	%	
B	b	B	&	
N	n	N	!	
M	m	M	?	
,	,	<	@	
ENTER	Enter			
0	0	0	0	0
TAB	Tab	Tab	Back tab	Tab
SPACE	Space	Space	Space	Space
Backlight	Backlight	Backlight	Backlight	Backlight
Star	*	*	*	*
.	.	>	.	.

Note: An application can change the key functions. The keypad may not function exactly as described.

**Table B-7** AZERTY Keypad Input Modes

Key	Normal	Shift + Key	Orange + Key	Blue + Key
A	a	A	*	Start Menu
Z	z	Z	1	Menu
E	e	E	2	Phone
R	r	R	3	
T	t	T	+	
Y	y	Y	-	
U	u	U	-	

Note: An application can change the key functions. The keypad may not function exactly as described.

**Table B-7** AZERTY Keypad Input Modes (Continued)

Key	Normal	Shift + Key	Orange + Key	Blue + Key
I	i	I	=	
O	o	O	“	*
P	p	P	áü	OK
Q	q	Q	#	
S	s	S	4	
D	d	D	5	
F	f	F	6	
G	g	G	(	
H	h	H	)	
J	j	J	/	
K	k	K	:	
L	l	L	‘	
M	m	M	?	
Shift	Shift			
W	w	W	7	
X	x	X	8	
C	c	C	9	
V	v	V	%	
B	b	B	&	
N	n	N	!	
,	,	<	@	
Backspace	backspace			
Enter	Enter			
0	0	0	0	0
TAB	Tab	Tab	Back tab	Tab
SPACE	Space	Space	Space	Space
Backlight	Backlight	Backlight	Backlight	Backlight
.	.	>	.	.

Note: An application can change the key functions. The keypad may not function exactly as described.

**Table B-8** QWERTZ Keypad Input Modes

Key	Normal	Shift + Key	Orange + Key	Blue + Key
Q	q	Q	*	Start Menu
W	w	W	1	Menu
E	e	E	2	Phone
R	r	R	3	
T	t	T	+	
Z	z	Z	-	
U	u	U	-	
I	i	I	=	
O	o	O	"	*
P	p	P	áü	OK
A	a	A	#	
S	s	S	4	
D	d	D	5	
F	f	F	6	
G	g	G	(	
H	h	H	)	
J	j	J	/	
K	k	K	:	
L	l	L	'	
Backspace	Backspace			
Shift	Shift			
Y	y	Y	7	
X	x	X	8	
C	c	C	9	
V	v	V	%	
B	b	B	&	
N	n	N	!	
M	m	M	?	

Note: An application can change the key functions. The keypad may not function exactly as described.

**Table B-8** QWERTZ Keypad Input Modes (Continued)

Key	Normal	Shift + Key	Orange + Key	Blue + Key
,	,	<	@	
ENTER	Enter			
0	0	0	0	0
TAB	Tab	Tab	Back tab	Tab
SPACE	Space	Space	Space	Space
Backlight	Backlight	Backlight	Backlight	Backlight
.	.	>	.	.

Note: An application can change the key functions. The keypad may not function exactly as described.

### Special Character Key



**NOTE** Special characters are only available on the alpha-numeric keypad configurations.

To add special characters using the MC75A **áü** key, type the related character first, then press the Orange twice followed by the **áü (P)** key. Continue pressing the **áü** key until the special character displays. To modify an existing character, move the cursor to the right of the character then press the Orange key twice and then press the **áü** key until the special character replaces the original character. [Table B-9](#) lists the special characters you can generate.

**Table B-9** Special Characters

Key	Special Characters	Key	Special Characters
a	à á â ã ä å æ	A	À Á Â Ã Ä Å Æ
c	ç ć ċ ©	C	Ç Ć Ć ©
d	ð	D	Ð
e	è é ê ë ð	E	È É Ê Ë Ì
i	ì í î ï	I	Ì Í Î Ï
l	ł	L	L Ł
n	ñ	N	Ñ
o	ò ó ô õ ö ø œ	O	Ò Ó Ô Õ Ö Ø Æ
p	þ ƒ	P	þ ƒ
r	®	R	®
s	ş š ß	S	Ş Š ß
t	ţ	T	Ţ
u	ù ú û ü	U	Ù Ú Û Ü

**Table B-9** Special Characters (Continued)

Key	Special Characters	Key	Special Characters
y	ý	Y	Ý
z	ž ž	Z	Ž Ž
\$	€ £ ¥	/	\
“	' « ' »	(	[ { < «
)	] } > »	+	± & - _
!	¡ ? ¿	.	¡ ; ;
*	#	@	~ %
%	^	,	; ; ;
#	*	&	- _ + ±
_	+ ± & -	'	« » "
?	¿ ! ¡	:	; ; ;
-	_ + ± &		

# Appendix C Voice Quality Manager

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## Introduction

The Voice Quality Manager (VQM) is a software package that resides on the MC75A. VQM enables a set of features for Voice over WiFi (VoWiFi) calls, and a sub-set of those features for cellular line (GSM or CDMA) calls. The VQM user interface is designed to be intuitive and easy to use, so complex tasks such as enabling the Acoustic Echo Canceller (AEC) while a call is in progress are done with very little or no user intervention.

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## Features

The VQM software:

- Improves the voice transmission quality without using additional battery power.
- Turns on the AEC for VoWiFi calls automatically, without user intervention.
- Prioritizes the outgoing audio IP packets.
- Provides user-selectable audio modes (speakerphone and handset) with a single tap of the VQM icon. A VQM icon in the title bar of the device indicates the audio mode currently in use.
- NDIS 5.1 compliant.

---

## Enabling VQM

To enable VQM:

1. Tap **Start > Programs > File Explorer**.
2. Navigate to the **Windows** folder.
3. Locate the file **VQMAudioNotify**.
4. Tap the filename to enable VQM.

## Audio Modes








The MC75A can be in any one of the seven different audio modes. The mode is visually indicated by the VQM icon on the title bar.



**Figure C-1** VQM Icon in Title Bar

The VQM icon indicates that the device is in speakerphone mode without Acoustic Echo Cancellation (indicated by the gray VQM icon). The audio modes and their corresponding VQM title bar icons are:

**Table C-1** VQM Icons

Icon	Description
	Speakerphone with Acoustic Echo Cancellation.
	Speakerphone without Acoustic Echo Cancellation.
	Handset with Acoustic Echo Cancellation (device is in handset mode only while on a call).
	Headset while on a call (Acoustic Echo Cancellation is not enabled for wired or Bluetooth headsets).
	Headset while not on a call.
	Bluetooth headset while on a call (Acoustic Echo Cancellation is not enabled for wired or Bluetooth headsets). White icon.
	Bluetooth headset while not on a call. Gray icon.

## Changing Audio Modes

Depending upon the audio mode being used, the mode can be changed by tapping the VQM icon in the title bar. The audio mode can only be changed while the user is on a call.



The table below lists the current audio mode and the subsequent audio mode after tapping the VQM icon.

**Table C-2** *Changing Audio Modes*

Audio Mode before Tapping VQM Icon	Audio Mode after Tapping VQM Icon
Speakerphone	Handset
Handset	Speakerphone
Wired headset	Wired headset
Bluetooth headset	Speakerphone

If the audio mode is set to speakerphone and the user taps the VQM icon, the audio mode changes to handset.

If the user is using a Bluetooth headset, tapping the VQM icon un-pairs the Bluetooth headset from the device causing the audio to be routed to the default mode. In VQM 2.5, there is no way to go back to the Bluetooth headset using the VQM icon if it is un-paired. The only way to reconnect the Bluetooth headset to the device is by using the BTEplorer application.

If the user taps the VQM icon when a wired headset is connected to the mobile device, the audio mode does not change. The audio continues to get routed to the wired headset.

If the user taps the VQM icon while not on a call there is not change to the audio mode.

Tap and hold the VQM icon in the title bar to display a notification dialog box that contains:

- AEC: The Acoustic Echo Canceller status
- DSCP Marked Packets: The number of outbound voice packets that have been recognized and marked as high priority by VQM.
- VQM Version: The VQM version number.



**Figure C-2** *VQM Audio Control Dialog Box*

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## Voice Packet Prioritization

IP soft phones transmit voice packets in the same manner as any other application that sends data over the network. On a network with different types of traffic, voice packets are given the same priority as any other traffic, and therefore may be subject to delays.

WiFi Multi-media (WMM) is a solution to this problem. WMM is a specification that supports prioritizing traffic, and “higher-priority” packets can be given preferential treatment.

To make use of WMM, the devices that generate traffic must mark their packets as high or normal priority in a field in the IP packet called Differentiated Services Code-Point (DSCP). The wireless infrastructure, which must be configured to support WMM, gives a higher priority to packets that have been marked as high priority through DSCP marking by the devices that generate traffic.

VQM detects if there is an ongoing Voice over WiFi (VoWiFi) call, and if so, marks outgoing voice packets (Only outgoing voice packets can be marked. The incoming voice packets have already been through the network, so it makes no sense to mark them.) as high-priority using DSCP. This enables WMM-compatible wireless infrastructure to treat the voice packets preferentially. This results in fewer delays for voice packets, which in turn improves the call quality.

## Acoustic Echo Cancellation

Acoustic Echo occurs during a voice call when the audio from the earpiece enters the microphone of the same device. This results in the person at the other end hearing back a delayed version of his/her own voice (“Echo”). Needless to say, “Echo” is not desirable, and needs to be suppressed. This is the functionality performed by the Acoustic Echo Canceller (AEC). There are two approaches to suppressing the Echo:

- Turn the Acoustic Echo Canceller (AEC) on permanently. This approach is not very efficient because the device consumes more power when the AEC is on.
- Turn the Acoustic Echo Canceller (AEC) on only when there is an ongoing call.

VQM follows the second of the two approaches mentioned above.

VQM automatically turns on the Acoustic Echo Canceller (AEC) when the mobile device is in a VoWiFi call. When the call is terminated, VQM turns the AEC off. Note that the AEC is turned on for speakerphone and handset modes and does not get turned on for wired headset and Bluetooth headset modes. The AEC is not required for wired headset because the audio volume is quite low (because of the proximity of the earpiece to the ear), and therefore it is very unlikely for the audio from the earpiece to go in to the mouthpiece. Bluetooth headsets typically have an Echo Canceller built in. Turning the AEC on only while on a call saves battery power, compared to leaving the AEC turned on permanently.

The AEC is not turned on for Cellular calls because the WWAN phone application has a built-in echo canceller.

## Limitations

- There is no VPN support in VQM.
- Only the Avaya softphone is supported.

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## Disabling VQM

To disable VQM perform a warm boot.

# Glossary

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## A

**API.** An interface by means of which one software component communicates with or controls another. Usually used to refer to services provided by one software component to another, usually via software interrupts or function calls

**Aperture.** The opening in an optical system defined by a lens or baffle that establishes the field of view.

**Application Programming Interface.** See **API**.

**ANSI Terminal.** A display terminal that follows commands in the ANSI standard terminal language. For example, it uses escape sequences to control the cursor, clear the screen and set colors. Communications programs support the ANSI terminal mode and often default to this terminal emulation for dial-up connections to online services.

**ASCII.** American Standard Code for Information Interchange. A 7 bit-plus-parity code representing 128 letters, numerals, punctuation marks and control characters. It is a standard data transmission code in the U.S.

**Autodiscrimination.** The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content is decoded.

---

## B

**Bar.** The dark element in a printed bar code symbol.

**Bar Code.** A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a bar code symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format. See **Symbology**.

**Bar Code Density.** The number of characters represented per unit of measurement (e.g., characters per inch).

**Bar Height.** The dimension of a bar measured perpendicular to the bar width.

**Bar Width.** Thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.

**BIOS.** Basic Input Output System. A collection of ROM-based code with a standard API used to interface with standard PC hardware.

**Bit.** Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**Bits per Second (bps).** Bits transmitted or received.

**BOOTP.** A protocol for remote booting of diskless devices. Assigns an IP address to a machine and may specify a boot file. The client sends a bootp request as a broadcast to the bootp server port (67) and the bootp server responds using the bootp client port (68). The bootp server must have a table of all devices, associated MAC addresses and IP addresses.

boot or boot-up

The process a computer goes through when it starts. During boot-up, the computer can run self-diagnostic tests and configure hardware and software.

**bps.** See **Bits Per Second**.

**Byte.** On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.

---

## C

**CDMA. Code Division Multiple Access (CDMA)** is a form of multiplexing and a method of multiple access that does not divide up the channel by time (as in TDMA), or frequency (as in FDMA), but instead encodes data with a special code associated with each channel and uses the constructive interference properties of the special codes to perform the multiplexing.

**CDRH.** Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

**CDRH Class 1.** This is the lowest power CDRH laser classification. This class is considered intrinsically safe, even if all laser output were directed into the eye's pupil. There are no special operating procedures for this class.

**CDRH Class 2.** No additional software mechanisms are needed to conform to this limit. Laser operation in this class poses no danger for unintentional direct human exposure.

**Character.** A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.

**Character Set.** Those characters available for encoding in a particular bar code symbology.

**Check Digit.** A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.

**Codabar.** A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (“-”, “\$”, “:”, “/”, “,” and “+”).

**Code 128.** A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.

**Code 3 of 9 (Code 39).** A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9 and 7 special characters (“-”, “:”, “/”, “+”, “%”, “\$” and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.

**Code 93.** An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.

**Code Length.** Number of data characters in a bar code between the start and stop characters, not including those characters.

**Cold Boot.** A cold boot restarts the mobile computer and erases all user stored records and entries.

**COM port.** Communication port; ports are identified by number, e.g., COM1, COM2.

**Continuous Code.** A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.

**Cradle.** A cradle is used for charging the terminal battery and for communicating with a host computer, and provides a storage place for the terminal when not in use.

---

## D

**Data Communications Equipment (DCE).** A device (such as a modem) which is designed to attach directly to a DTE (Data Terminal Equipment) device.

**DCE.** See **Data Communications Equipment**.

**DCP.** See **Device Configuration Package**.

**Dead Zone.** An area within a scanner's field of view, in which specular reflection may prevent a successful decode.

**Decode.** To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

**Decode Algorithm.** A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

**Decryption.** Decryption is the decoding and unscrambling of received encrypted data. Also see, **Encryption** and **Key**.

**Depth of Field.** The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.

**Device Configuration Package.** The Symbol Device Configuration Package provides the Product Reference Guide (PRG), flash partitions, Terminal Configuration Manager (TCM) and the associated TCM scripts. With this package hex images that represent flash partitions can be created and downloaded to the mobile computer.

**Discrete Code.** A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.

**Discrete 2 of 5.** A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.

**DRAM.** Dynamic random access memory.

**DTE.** See **Data Terminal Equipment**.

---

## E

**EAN.** European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

**Element.** Generic term for a bar or space.

**Encoded Area.** Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.

**ENQ (RS-232).** ENQ software handshaking is also supported for the data sent to the host.

**ESD.** Electro-Static Discharge

**EvDO, 1xEV-DO.** A wireless radio broadband data standard adopted by many CDMA mobile phone service providers. It is standardized by 3GPP2, as part of the CDMA2000 family of standards.

---

## F

**File Transfer Protocol (FTP).** A TCP/IP application protocol governing file transfer via network or telephone lines. See **TCP/IP**.

**Flash Disk.** An additional megabyte of non-volatile memory for storing application and configuration files.

**Flash Memory.** Flash memory is nonvolatile, semi-permanent storage that can be electronically erased in the circuit and reprogrammed. Series 9000 mobile computers use Flash memory to store the operating system (ROM-DOS), the terminal emulators, and the Citrix ICA Client for DOS.

**FTP.** See **File Transfer Protocol**.

---

## H

**Hard Reset.** See **Cold Boot**.

**Hz.** Hertz; A unit of frequency equal to one cycle per second.

**Host Computer.** A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs and network control.

**High-Speed Downlink Packet Access (HSDPA).** A 3G (third generation) mobile telephony communications protocol in the High-Speed Packet Access (HSPA) family, which allows networks based on Universal Mobile Telecommunications System (UMTS) to have higher data transfer speeds and capacity.

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## I

**IDE.** Intelligent drive electronics. Refers to the solid-state hard drive type.

**IEC.** International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

**IEC (825) Class 1.** This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.

**IEEE Address.** See **MAC Address.**

**Input/Output Ports.** I/O ports are primarily dedicated to passing information into or out of the terminal's memory. Series 9000 mobile computers include Serial and USB ports.

**Interleaved 2 of 5.** A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/STOP characters may be encoded.

**Intercharacter Gap.** The space between two adjacent bar code characters in a discrete code.

**Interleaved Bar Code.** A bar code in which characters are paired together, using bars to represent the first character and the intervening spaces to represent the second.

**Internet Protocol Address.** See **IP.**

**IOCTL.** Input/Output Control.

**I/O Ports.** interface The connection between two devices, defined by common physical characteristics, signal characteristics, and signal meanings. Types of interfaces include RS-232 and PCMCIA.

**IP.** Internet Protocol. The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts "packets" from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a "datagram" to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.

**IP Address.** (Internet Protocol address) The address of a computer attached to an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a IP network. Client workstations have

either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

**IPX/SPX.** Internet Package Exchange/Sequential Packet Exchange. A communications protocol for Novell. IPX is Novell's Layer 3 protocol, similar to XNS and IP, and used in NetWare networks. SPX is Novell's version of the Xerox SPP protocol.

**IS-95.** Interim Standard 95. The EIA/TIA standard that governs the operation of CDMA cellular service. Versions include IS-95A and IS-95B. See CDMA.

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## K

**Key.** A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, **Encryption** and **Decrypting**.

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## L

**LASER.** Light Amplification by Stimulated Emission of Radiation. The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

**Laser Diode.** A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.

**laser scanner.** A type of bar code reader that uses a beam of laser light.

**LCD.** See **Liquid Crystal Display**.

**LED Indicator.** A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.

**Light Emitting Diode.** See **LED**.

**Liquid Crystal Display (LCD).** A display that uses liquid crystal sealed between two glass plates. The crystals are excited by precise electrical charges, causing them to reflect light outside according to their bias. They use little electricity and react relatively quickly. They require external light to reflect their information to the user.

---

## M

**MC.** Mobile Computer.

**MDN.** Mobile Directory Number. The directory listing telephone number that is dialed (generally using POTS) to reach a mobile unit. The MDN is usually associated with a MIN in a cellular telephone -- in the US and Canada, the MDN and MIN are the same value for voice cellular users. International roaming considerations often result in the MDN being different from the MIN.



**MIL.** 1 mil = 1 thousandth of an inch.

**MIN.** Mobile Identification Number. The unique account number associated with a cellular device. It is broadcast by the cellular device when accessing the cellular system.

**Misread (Misdecode).** A condition which occurs when the data output of a reader or interface controller does not agree with the data encoded within a bar code symbol.

**Mobile Computer.** In this text, *mobile computer* refers to the MC75A. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

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## N

**Nominal.** The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

**Nominal Size.** Standard size for a bar code symbol. Most UPC/EAN codes are used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).

**NVM.** Non-Volatile Memory.

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## O

**ODI.** See **Open Data-Link Interface**.

**Open Data-Link Interface (ODI).** Novell's driver specification for an interface between network hardware and higher-level protocols. It supports multiple protocols on a single NIC (Network Interface Controller). It is capable of understanding and translating any network information or request sent by any other ODI-compatible protocol into something a NetWare client can understand and process.

**Open System Authentication.** Open System authentication is a null authentication algorithm.

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## P

**PAN .** Personal area network. Using Bluetooth wireless technology, PANs enable devices to communicate wirelessly. Generally, a wireless PAN consists of a dynamic group of less than 255 devices that communicate within about a 33-foot range. Only devices within this limited area typically participate in the network.

Parameter

A variable that can have different values assigned to it.

**PC Card.** A plug-in expansion card for laptop computers and other devices, also called a PCMCIA card. PC Cards are 85.6mm long x 54 mm wide, and have a 68 pin connector. There are several different kinds:

Type I; 3.3 mm high; use - RAM or Flash RAM

Type II; 5 mm high; use - modems, LAN adaptors

Type III; 10.5 high; use - Hard Disks

**PCMCIA.** Personal Computer Memory Card Interface Association. See **PC Card**.

**Percent Decode.** The average probability that a single scan of a bar code would result in a successful decode. In a well-designed bar code scanning system, that probability should approach near 100%.

**PING.** (Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

**Print Contrast Signal (PCS).** Measurement of the contrast (brightness difference) between the bars and spaces of a symbol. A minimum PCS value is needed for a bar code symbol to be scannable.  $PCS = (RL - RD) / RL$ , where RL is the reflectance factor of the background and RD the reflectance factor of the dark bars.

**Programming Mode.** The state in which a scanner is configured for parameter values. See **Scanning Mode**.

---

## Q

**Quiet Zone.** A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.

**QWERTY.** A standard keyboard commonly used on North American and some European PC keyboards. "QWERTY" refers to the arrangement of keys on the left side of the third row of keys.

---

## R

**RAM.** Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

**Reflectance.** Amount of light returned from an illuminated surface.

**Resolution.** The narrowest element dimension which is distinguished by a particular reading device or printed with a particular device or method.

**RF.** Radio Frequency.

**ROM.** Read-Only Memory. Data stored in ROM cannot be changed or removed.

**Router.** A device that connects networks and supports the required protocols for packet filtering. Routers are typically used to extend the range of cabling and to organize the topology of a network into subnets. See **Subnet**.

**RS-232.** An Electronic Industries Association (EIA) standard that defines the connector, connector pins, and signals used to transfer data serially from one device to another.

---

## S

**Scan Area.** Area intended to contain a symbol.

**Scanner.** An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are: 1) Light source (laser or photoelectric cell) - illuminates a bar code;; 2) Photodetector - registers the difference in reflected light (more light reflected from spaces); 3) Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

**Scanning Mode.** The scanner is energized, programmed and ready to read a bar code.

**Scanning Sequence.** A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

**SDK.** Software Development Kit

**Self-Checking Code.** A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.

**Shared Key.** Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.

**SHIP.** Symbol Host Interface Program.

**SID.** System Identification code. An identifier issued by the FCC for each market. It is also broadcast by the cellular carriers to allow cellular devices to distinguish between the home and roaming service.

**SMDK.** Symbol Mobility Developer's Kit.

**Soft Reset.** See **Warm Boot**.

**Space.** The lighter element of a bar code formed by the background between bars.

**Specular Reflection.** The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.

**Start/Stop Character.** A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.

**STEP.** Symbol Terminal Enabler Program.

**Subnet.** A subset of nodes on a network that are serviced by the same router. See **Router**.

**Subnet Mask.** A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.

**Substrate.** A foundation material on which a substance or image is placed.

**SVTP.** Symbol Virtual Terminal Program.

**Symbol.** A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters and check characters.

**Symbol Aspect Ratio.** The ratio of symbol height to symbol width.

**Symbol Height.** The distance between the outside edges of the quiet zones of the first row and the last row.

**Symbol Length.** Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character.

**Symbology.** The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39, PDF417, etc.).

---

## T

**TCP/IP.** (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications. TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted. IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.

**Telnet.** A terminal emulation protocol commonly used on the Internet and TCP/IP-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program.

**Terminal.** See **Mobile Computer**.

**Terminal Emulation.** A "terminal emulation" emulates a character-based mainframe session on a remote non-mainframe terminal, including all display features, commands and function keys. The VC5000 Series supports Terminal Emulations in 3270, 5250 and VT220.

**Terminate and Stay Resident (TSR).** A program under DOS that ends its foreground execution to remain resident in memory to service hardware/software interrupts, providing background operation. It remains in memory and may provide services on behalf of other DOS programs.

**TFTP.** (Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading firmware, downloading software and remote booting of diskless devices.

**Tolerance.** Allowable deviation from the nominal bar or space width.

**Transmission Control Protocol/Internet Protocol.** See **TCP/IP**.

**Trivial File Transfer Protocol.** See **TFTP**.

**TSR.** See **Terminate and Stay Resident**.

---

## U

**UDP.** User Datagram Protocol. A protocol within the IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

**UPC.** Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which is any of four widths. The standard symbology for retail food packages in the United States.

---

## V

**Visible Laser Diode (VLD).** A solid state device which produces visible laser light.

---

## W

**Warm Boot.** A warm boot restarts the mobile computer by closing all running programs. All data that is not saved to flash memory is lost.

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