CipherLab
User Guide

MIRROR VT/5250 Terminal Emulation

For 9 Series Mobile Computers:
9300 / 9600

DOC Version 1.22

CIPHERLAB

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RELEASE NOTES

Version	Date	Notes
1.22	Aug. 03,2011	▸ Add Login & Password limitation ▸ Add Full Screen check box item when Auto Connect is enabled ▸ Add TaskBar On Full Screen check box item in Settings configuration.
1.21	Apr. 08, 2011	Mirror VT/5250 Terminal Emulation User Guide split into separate files for 9300/9600 and 9400/9500 ▸ Modified: Features — Add new feature "Full Screen" and update screenshots ▸ Modified: 1.2 Toolbar — Add "Full Screen" icon ▸ Modified: 3.1.1 Host Settings & Others (5250) — Add font size "10x20" ▸ Modified: 3.1.2 Telnet (VT) — Add font size "10x20" ▸ New: 3.4 Scrollbar Setting
1.20	Nov. 30, 2010	▸ Modified: 2.1.2 Using VT Keypad — Add "F13" ~ "F20" function keys ▸ Modified: 3.3.1 Key Mapping (5250) — Add "F10" ~ "F20" function keys ▸ Modified: 3.3.2 Key Mapping (VT) — Add "F10" ~ "F20" function keys ▸ Modified: Appendix I~V — Add more GS1 DataBar symbologies
1.19	Aug. 26, 2010	▸ Modified: 3.1.1 Host Settings & Others (5250) — Add "Auto Connect" ▸ Modified: 3.1.2 Telnet (VT) — Add "Auto Connect"
1.18	July 12, 2010	▸ Modified: 3.1.1 Host Settings & Others (5250) — Add "Device Name" ▸ Modified: Appendix V — Add "Intercharacter Gap Size" for 4407 and move the setting under Codabar and Code 39, and add "ISBT Concatenation" and "ISBT Concatenation Redundancy" for 4507
1.17	Mar. 23, 2010	▸ Modified: 3.3 Function Key Mapping — Screenshots updated

1.16	Mar. 19, 2010	▸ Modified: 1.1.1 File Menu — TN5250 configuration filename changed to *.netn ▸ Modified: 3.2.2 RFID Reader — UI updated ▸ Modified: 3.2.3 Advanced Barcode Settings — Add "Check Code Length" for TN5250 ▸ Modified: 3.3.1 Key Mapping (5250) — Add "Send" and "End" function keys for 9600 ▸ Modified: 3.3.2 Key Mapping (VT) — Add "Send" and "End" function keys for 9600 ▸ Modified: Appendix I, II — Support ISBT 128 and UPC-E1 for CCD/Laser ▸ Modified: Appendix II — Add "Redundancy Level" and "GTIN for EAN-13" settings for CCD/Laser ▸ Modified: Appendix III — GS1 DataBar (RSS) default setting ▸ Modified: Appendix V — Move "Inter-Character Gap" setting under Codabar and Code 39
1.15	Jan. 04, 2010	▸ Modified: Appendix III — Redundancy Level default setting ▸ Modified: Appendix III — Add "Replace Field Separator" setting for GS1-128 and "UPC/EAN Security Level" for SE955 ▸ Modified: Appendix II~IV — "Read Redundancy" changed to "Redundancy Level"
1.14	Dec. 21, 2009	▸ Modified: Appendix I — ID_MOD_MP_RFID table updated
1.13	Dec. 11, 2009	▸ Update screenshots
1.12	Oct. 21, 2009	▸ Support 9300 and 9600 ▸ Modified: Appendix III — Add "Timeout between Same Barcode" for SE955 ▸ Modified: Appendix V — Add "Intercharacter Gap Size" for 4507
1.11	Mar. 03, 2009	▸ Modified: 9500PPC removed ▸ New: 3.1.2 Macro Frame ▸ Modified: Appendix II — support "Field Separator" setting for EAN-128 with CCD/Laser scan engine ▸ Modified: Appendixes I~III — GS1-128 (EAN-128), GS1 DataBar Omnidirectional (RSS-14), GS1 DataBar Limited (RSS Limited), GS1 DataBar Expanded (RSS Expanded)
1.10	July 21, 2008	New Word template applied ▸ New: support 9400 ▸ Modified: Chapter 3 Configuring MIRROR Terminal Emulation
1.00	Oct. 02, 2007	Initial release

CONTENTS

INTRODUCTION

Seeing the need to combine wireless connectivity and telnet terminal emulation, MIRROR 5250/VT Emulator, is designed to provide telnet terminal emulation on CipherLab 9300/9600 Series Mobile Computers, which are capable of 802.11b/g or Bluetooth PAN networking.

The software consists of CipherNet_TN for 5250 emulation and CipherNet_VT for VT100/220 emulation, each is a telnet client that allows the user to connect to a host computer of the same emulation type and make use of the applications running on it. Thus, the mobile computer works as an input device to a host computer that supports either VT100/VT220 or 5250 emulation. The data collected or input will be sent back to the host computer. On the other hand, the mobile computer works as an output device as well because it can display data coming in from the host.

This manual serves to provide comprehensive understanding of MIRROR 5250/VT Emulator, and helps start a telnet session running host applications. We recommend that you read the document thoroughly before use and keep it at hand for quick reference.

Thank you for choosing CipherLab products!

FEATURES

- CipherNet_TN supports 5250 terminal emulation
- CipherNet_VT supports VT100, VT102, VT220, and ANSI terminal emulation
- Can maximize in full screen in one click
- Can automatically insert data into an input field in the host application via reading barcodes or RFID tags
- Easy cloning by saving user settings to a configuration file
- Supports auto sign on, cursor tracking, etc.
- Supports key mapping
- Supports control for barcode reader as well as RFID reader
- Supports control for beeper and vibrator
- Provides font size options
- Supports multi-languages for 5250 emulation

Chapter 1

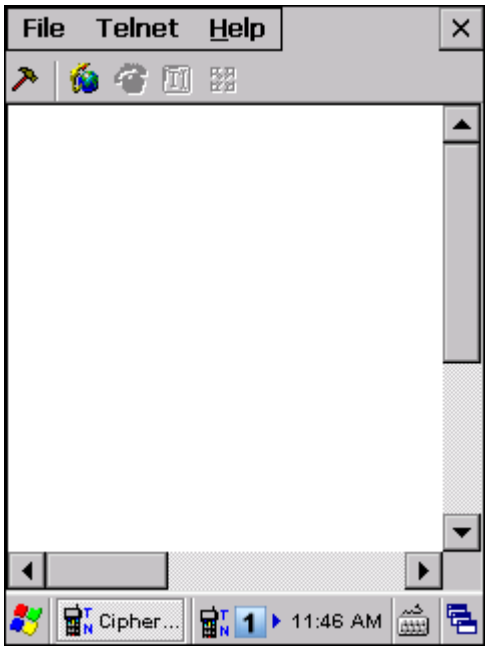
INSTALLING MIRROR TERMINAL EMULATION

Follow the steps below to install the software on the mobile computer.

1) Copy or move the program files (*.exe and *.dll) to the mobile computer via ActiveSync (to DiskOnChip\Terminal Emulation\).

Emulation Type	Program Files
5250	▸ CipherNet_TN.exe ▸ ReaderDll_CE.dll
VT	▸ CipherNet_VT.exe ▸ ReaderDll_CE.dll

2) Double-tap the application program from the install directory.

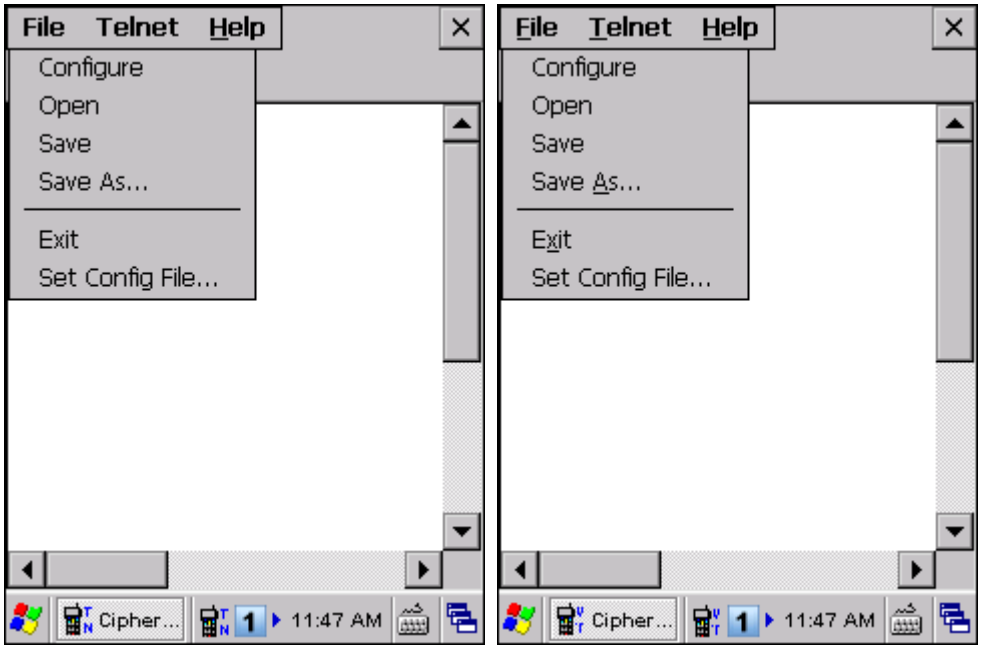


Warning: A cold boot will erase data and files that are NOT stored in flash memory on the mobile computer. It is recommended that you copy user programs to DiskOnChip in order to survive a cold boot.

1.1 MENU BAR

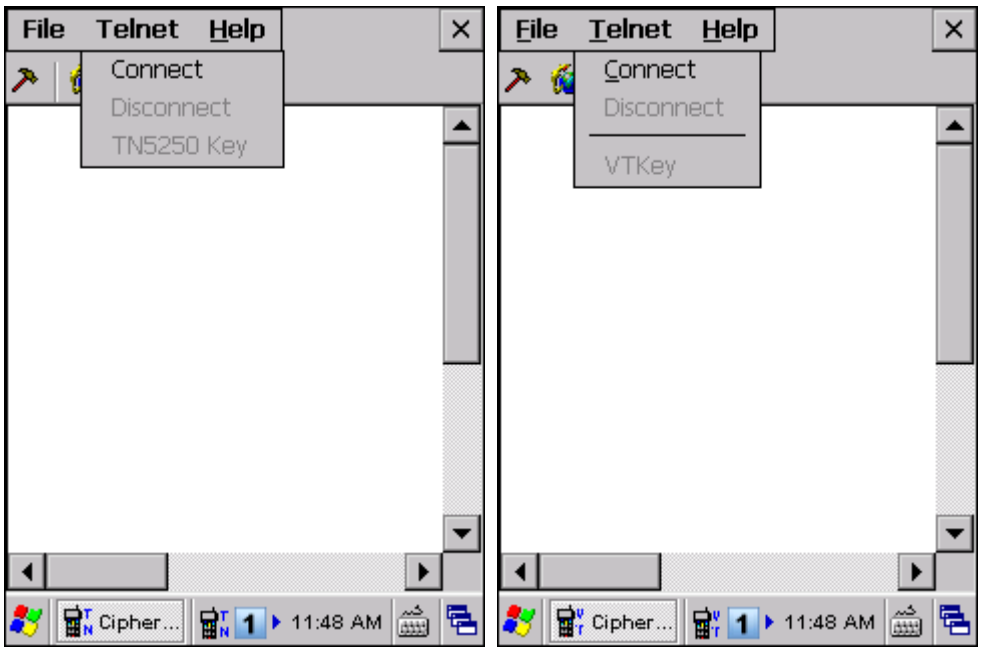
The Menu Bar contains a number of menus that specify which task you want the system to perform. Each menu contains a list of commands.

1.1.1 FILE MENU



Command	To Do...
Configure	Configure settings. Refer to Chapter 3 Configuring MIRROR Terminal Emulation.
Open	Open an existing configuration file. ▸ File path needs to be specified.
Save	Save the current settings to a configuration file. ▸ Netn files: *.netn for TN5250 ▸ Netv files: *.netv for VT
Save As	Save the current settings to a new file.
Exit	Close the application program.
Set Config File	Set a configuration file that will be automatically pre-loaded upon execution of the application program.

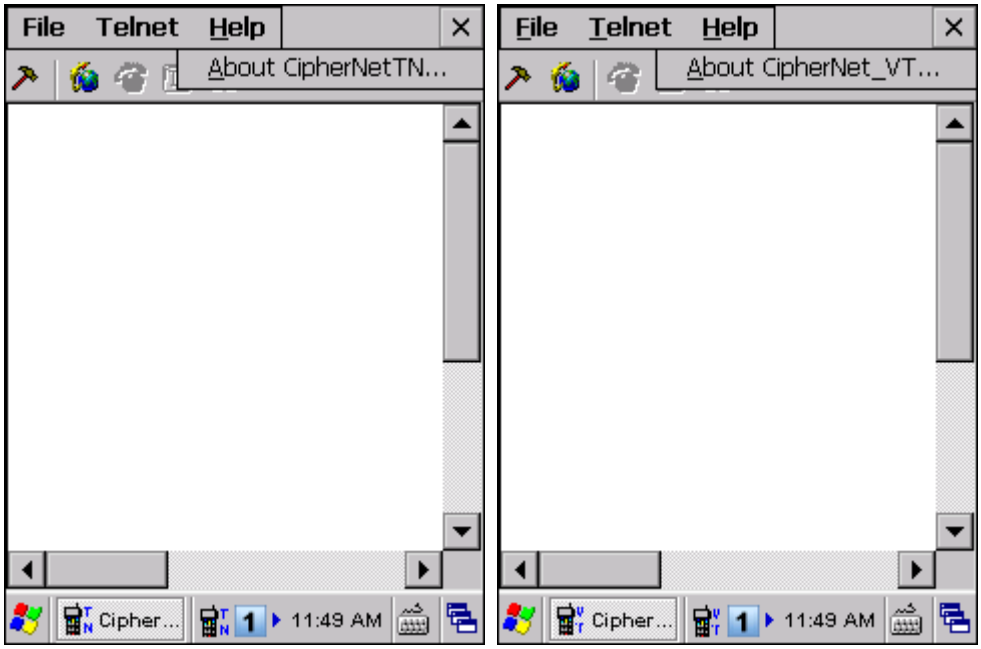
1.1.2 TELNET MENU



Command	To Do...
Connect	Connect to a host computer.
Disconnect	Disconnect with the host computer.
TN5250 Key	Display popular host keys – 5250 Key or VT Key
or	▸ A software keypad is displayed, as shown below, for you to make use of the special emulation host keys. For example, you can tap [F3] to exit the sign-on request or tap [F12] to exit to a previous screen via the TN5250 Key(pad).
VT Key	

1.1.3 HELP MENU

Here provides version information for diagnostic purpose.



1.2 TOOLBAR

The toolbar allows quick access to commands that are available in the current stage.

 (No telnet session.)

 (The telnet session has been established.)

From left to right, they stand for the following commands:

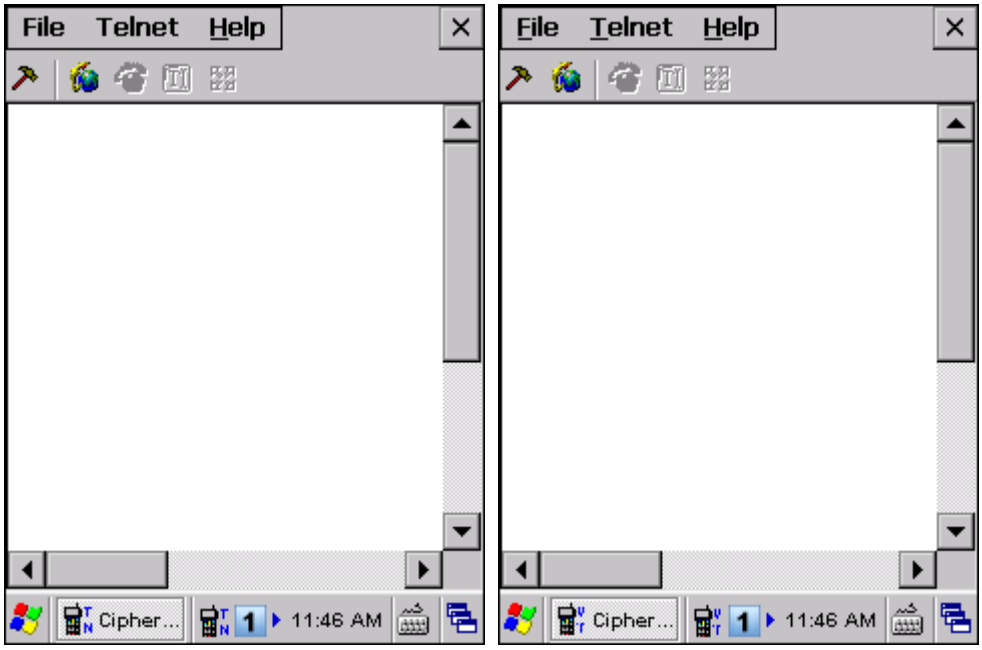
	File Menu > Configure
	Telnet Menu > Connect
	Telnet Menu > Disconnect
	Telnet Menu > TN5250 Key Or Telnet Menu > VT Key
	Full Screen – To maximize the telnet window to full screen. Press [Fn]+[ESC] to exit the full-screen mode.

Chapter 2

USING MIRROR TERMINAL EMULATION

2.1 START A TELNET SESSION

1) Double-tap the application program from the install directory.



2) Tap  on the toolbar to configure necessary settings.

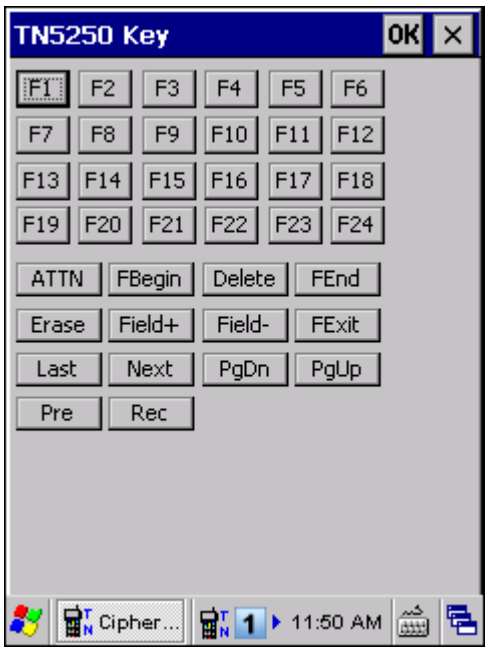
   Above all, specify the name or IP address of the host as well as which telnet port to use if not using port 23 by default.

   Refer to Chapter 3 Configuring MIRROR Terminal Emulation.

3) Tap  on the toolbar to establish a connection with the host.

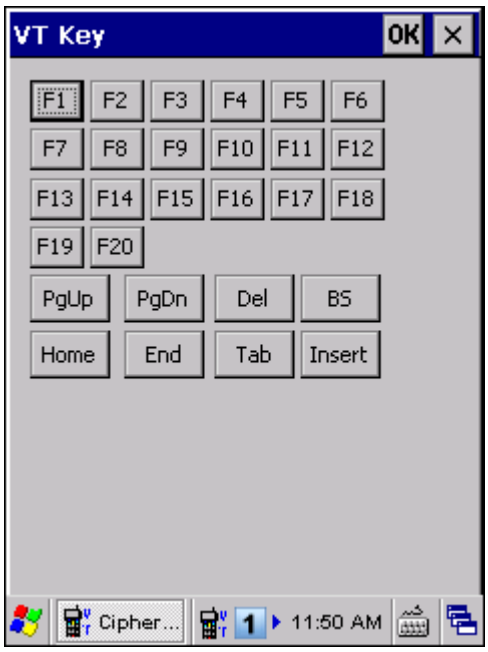
4) Type your login name and password to log onto the host system if the [Auto Sign On] setting is not enabled.

2.1.1 USING 5250 KEYPAD



5250 Host Keys	
F1~F24	5250 function keys
ATTN	Attention key
Delete	Delete character at cursor, and keep the cursor position
Erase	Erase all input fields
FBegin	Go to the beginning of a field
FEnd	Go to the end of a field
Field+	Field+ key
Field-	Field- key
FExit	Field Exit key
Last	Position cursor after the last character in a field
Next	Jump to next field
PgDn	Send Page Down (roll up) key to IBM Host
PgUp	Send Page Up (roll down) key to IBM Host
Pre	Jump to the beginning of the current field, or jump to the previous field if already at the beginning of a field
Rec	Record Backspace (home)

2.1.2 USING VT KEYPAD

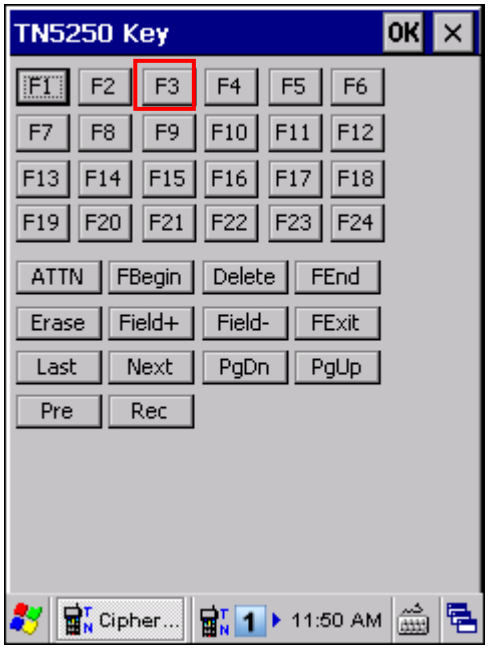


VT Host Keys	
F1~F20	VT function keys
PgDn	Page Down
PgUp	Page Up
Del	Delete
BS	Backspace
Home	Home
End	End
Tab	Tab
Insert	Insert

2.2 END A TELNET SESSION

1) Use the host key to exit the application.

   For 5250 emulation, tap  to invoke [5250 Key(pad)], and then tap [F3].



2) Tap  on the toolbar to disconnect with the host.

Chapter 3

CONFIGURING MIRROR TERMINAL EMULATION

Before you start a telnet session with the host computer, you must configure the related settings first. The settings for 5250 and VT100/VT220 emulation are slightly different –

5250 Emulation

- Host
- Others
- Barcode Reader
- Key Mapping

VT Emulation

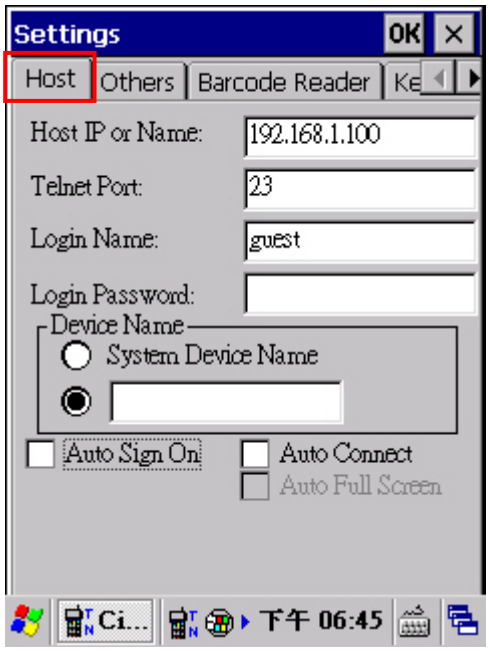
- Telnet
- Barcode Reader
- Function Key Mapping

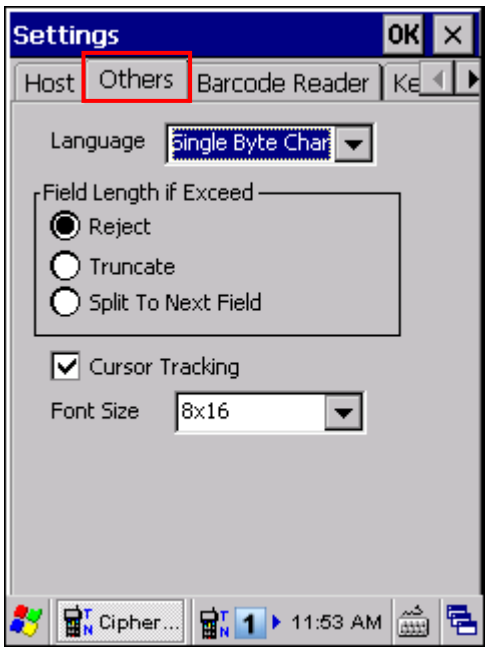
Tap File Menu > Configure or tap  on the toolbar to configure settings.

3.1 TELNET SETTINGS

Here are the basic settings to let you establish a telnet connection with a remote host.

3.1.1 HOST SETTINGS & OTHERS (5250)

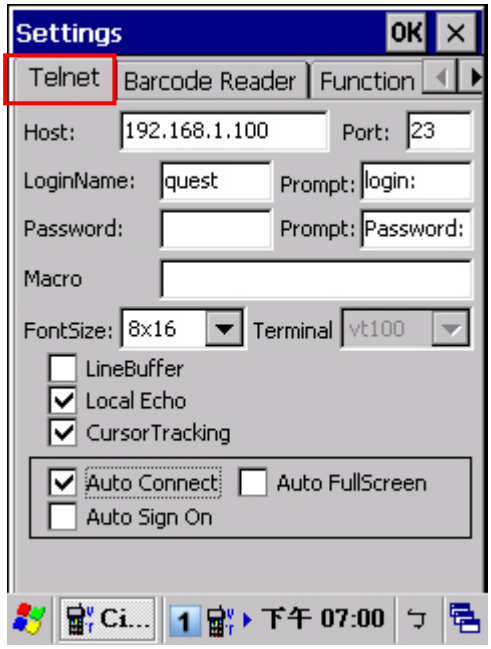




5250 Emulation – Host Settings	
Host IP / Name	Specify the IP address or host name of the remote server for the mobile computer to connect to.
Telnet Port	Specify the port number for the telnet session. The default is port 23.
Login Name	Type user name to login the host system automatically if [Auto Sign On] is enabled. It is limited up to 20 characters.
Login Password	Type user password to login the host system automatically if [Auto Sign On] is enabled. It is limited up to 20 characters.
Device Name	By default, this feature is disabled. Type a name for identifying the mobile computer, or select to display the system device name. ▸ For this feature to work properly, the string cannot exceed 10 characters.
Auto Sign On	By default, this feature is disabled. The host will request Username and Password every time the mobile computer attempts to log on. If this feature is supported by the host, select the check box so that the mobile computer can be allowed to automatically log on to the host. ▸ For this feature to work properly, Username/Password and each prompt string must be specified correctly and cannot exceed 20 characters.
Auto Connect	By default, this feature is disabled. Select the check box to establish a connection with the host upon execution of the application program. ▸ For this feature to work properly, Auto Sign On must be enabled.

Auto Full Screen	By default, this feature is disabled. To active this function, you have to enable the Auto Connect firstly.
5250 Emulation – Others	
Language	Select the language that the host system uses.
Field Length if Exceed	The field length in 5250 emulation is pre-defined. Decide how to handle data when it exceeds the field length.
Cursor Tracking	This feature is enabled by default. The terminal screen will automatically adjust itself so that the cursor will always be visible on the screen. Thus, every screen received from the host will be displayed with the cursor visible to indicate the first input field. When you disable the Cursor Tracking feature, the coordinates (0,0) on the terminal screen are related to (0,0) on the host screen. Thus, every screen received from the host will be first displayed starting from (0,0) regardless of the cursor. The relationship between the terminal screen (small) and the host screen (large) is based on the upper-left point of the screens. The cursor is outside of the terminal screen. To view the hidden information or locate the cursor, you need to adjust the terminal screen manually. This feature only works when a screen refresh incident occurs on the host.
Font Size	Select an appropriate font size for the host screen to be displayed properly on your mobile screen. Options include 5×10, 6×12, 8×10, 8×16, 10x20.

3.1.2 TELNET (VT)



VT Emulation – Telnet Settings	
Host IP / Name	Specify the IP address or host name of the remote server for the mobile computer to connect to.

Telnet Port	Specify the port number for the telnet session. The default is port 23.

Login Name	Type user name to login the host system automatically if [Auto Sign On] is enabled. It is limited up to 20 characters. ▸ Specify the prompt strings that request you to enter username and password. They must be exactly the same as received from the host.
Login Password	Type user password to login the host system automatically if [Auto Sign On] is enabled. It is limited up to 20 characters. ▸ Specify the prompt strings that request you to enter username and password. They must be exactly the same as received from the host.
Macro Frame	Specify a macro frame if necessary. When starting a telnet session, the mobile computer will send a string of characters upon request from the server.
Font Size	Select an appropriate font size for the host screen to be displayed properly on your mobile screen. Options include 5×10, 6×12, 8×10, 8×16, 10x20.
Terminal	Select the terminal type of the host system – VT100, VT102, VT220 or ANSI.
Line Buffer	By default, this feature is disabled. Select the check box to operate in line buffer mode.
Local Echo	This feature is enabled by default. It will echo typed text locally on the mobile computer.
Cursor Tracking	This feature is enabled by default. The terminal screen will automatically adjust itself so that the cursor will always be visible on the screen. Thus, every screen received from the host will be displayed with the cursor visible to indicate the first input field. When you disable the Cursor Tracking feature, the coordinates (0,0) on the terminal screen are related to (0,0) on the host screen. Thus, every screen received from the host will be first displayed starting from (0,0) regardless of the cursor. The relationship between the terminal screen (small) and the host screen (large) is based on the upper-left point of the screens. The cursor is outside of the terminal screen. To view the hidden information or locate the cursor, you need to adjust the terminal screen manually. ▸ This feature only works when a screen refresh incident occurs on the host.
Auto Connect	By default, this feature is disabled. Select the check box to establish a connection with the host upon execution of the application program. ▸ For this feature to work properly, Auto Sign On must be enabled.
Auto Full Screen	By default, this feature is disabled. To active this function, you have to enable the Auto Connect firstly.
Auto Sign On	By default, this feature is disabled. The host will request Username and Password every time the mobile computer attempts to log on. If this feature is supported by the host, select the check box so that the mobile computer can be allowed to automatically log on to the host. ▸ For this feature to work properly, Username/Password and each prompt string must be specified correctly and cannot exceed 20 characters.

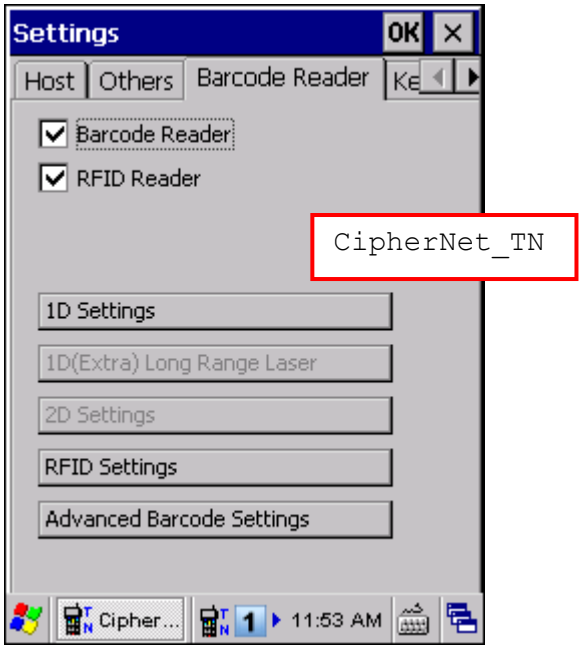
Note: If any of the prompt strings of the host system exceeds 20 characters, you will fail to sign on automatically.

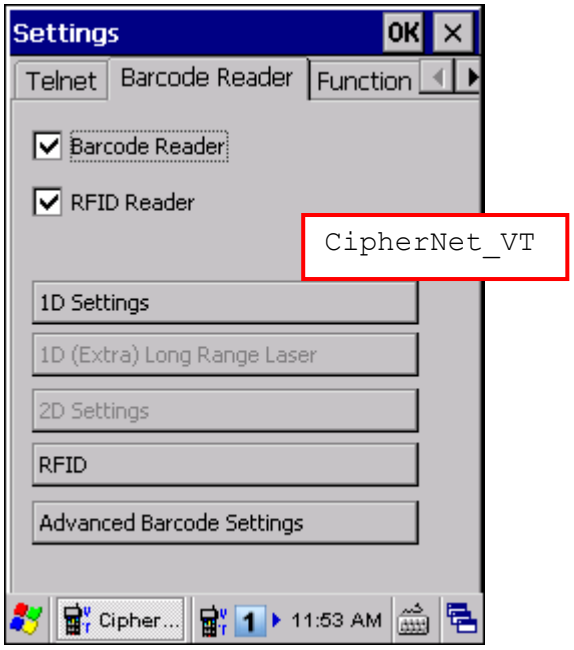
3.2 READER SETTINGS

Once launched, it will automatically detect the scan engine(s) installed on the mobile computer. As shown on the screenshots below, the scan engine(s) detected will be displayed in black and each is supposed to be enabled by default.

Tap the Barcode Reader tab, and you may cancel the check box to disable a reader. Configurable options associated with the specific barcode or RFID reader will be available as well.

Refer to Appendix I - Scan Engine Settings for details.





3.2.1 BARCODE READER

According to the requirements of a specific application, you may enable or disable any of the barcode symbologies and configure the associated parameters.

1D SETTINGS

For 9600, refer to Appendix II – Linear Imager (CCD), Laser (SE950) for details. For 9300, refer to Appendix III - Laser (SE955) for details.

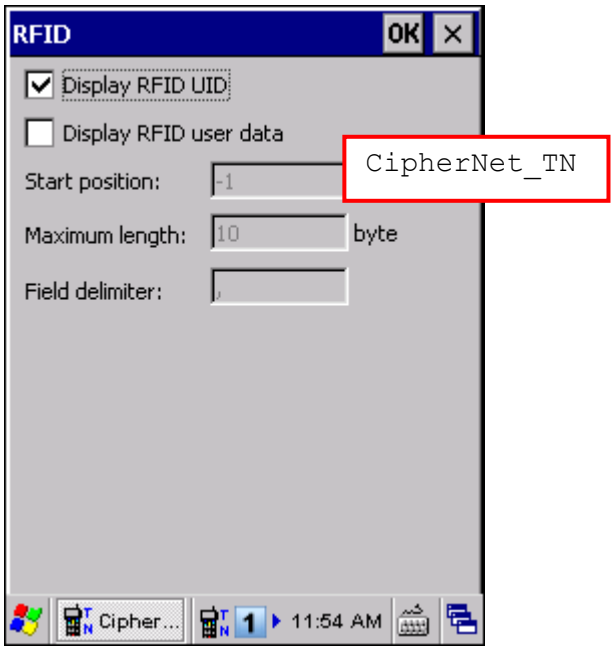
2D SETTINGS

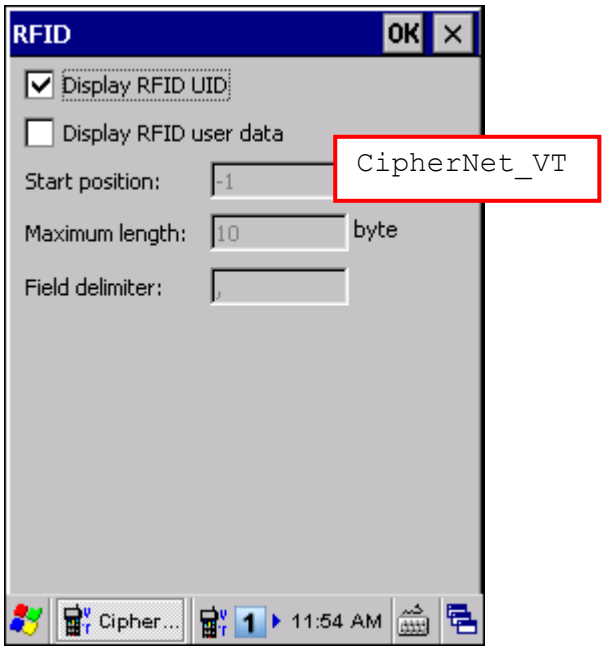
Refer to Appendix V - 2D Imager for details.

3.2.2 RFID READER

Select the check box to enable the RFID reader. Advanced settings are provided as shown below.

RFID SETTINGS





Display RFID UID
By default, the RFID reader is set to read UID (Unique Identification).
Display RFID User Data
Select the check box so that RFID user data can be read. ▸ If only partial data is required, specify the start position and maximum length. ▸ When both UID and user data are read, specify a delimiter to separate UID from user data. Tap the editing box and select one character from the Field Delimiter (ASCII codes).

Note: Because it is possible to read barcode and RFID tag at the same time, it is recommended that only one scan engine is enabled at a time to prevent from misreading.

For reference only, the table below lists the start page for a number of RFID tags.

Start Page	Tag Type	Standard
-1	Start from byte 0 of the default page (see below) for all tags	
4	Mifare	ISO 14443A
4	SR176	ISO 14443B

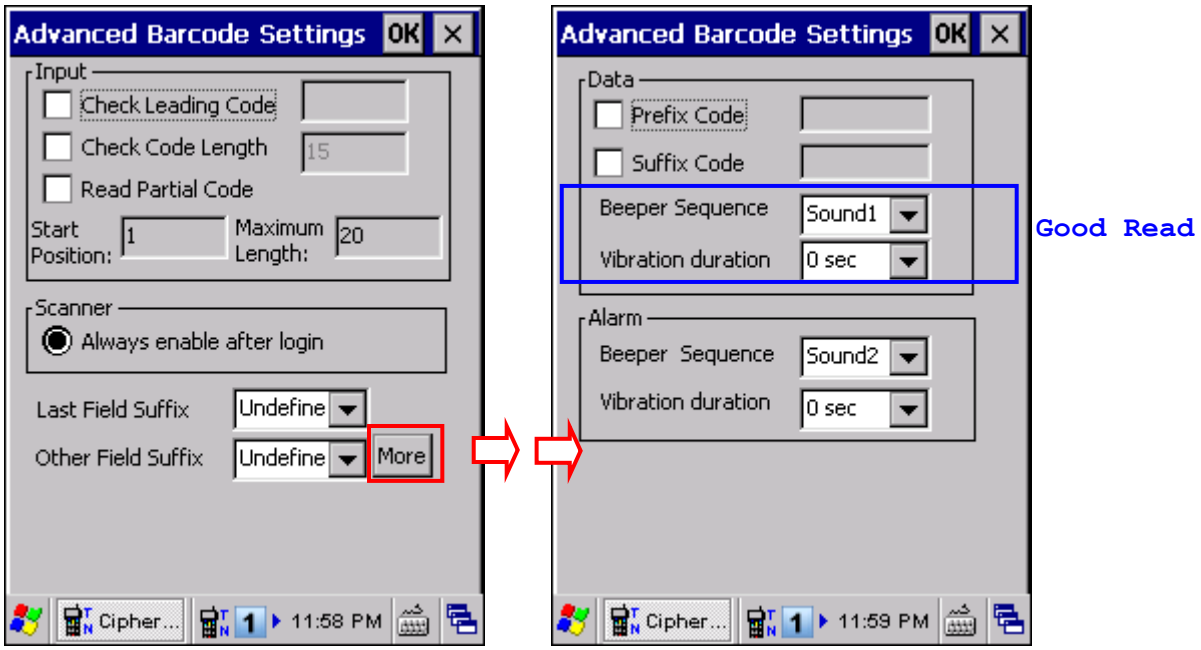
3	ICODE SLI	ISO 15693
0	LRI512	ISO 15693
3	SRF55VxxP	ISO 15693
0	EM4135	ISO 15693
0	Tag-it HF-I	ISO 15693
0	Others	ISO 15693
5	ICODE	ICODE® (Phillips)
0	Tag-it	Tag-it® (TI)

Note: Please refer to the specifications of your RFID tags for memory organization.

3.2.3 ADVANCED BARCODE SETTINGS

Depending on the emulation type, you may specify how to control the scan engine and handle barcode data.

5250 EMULATION



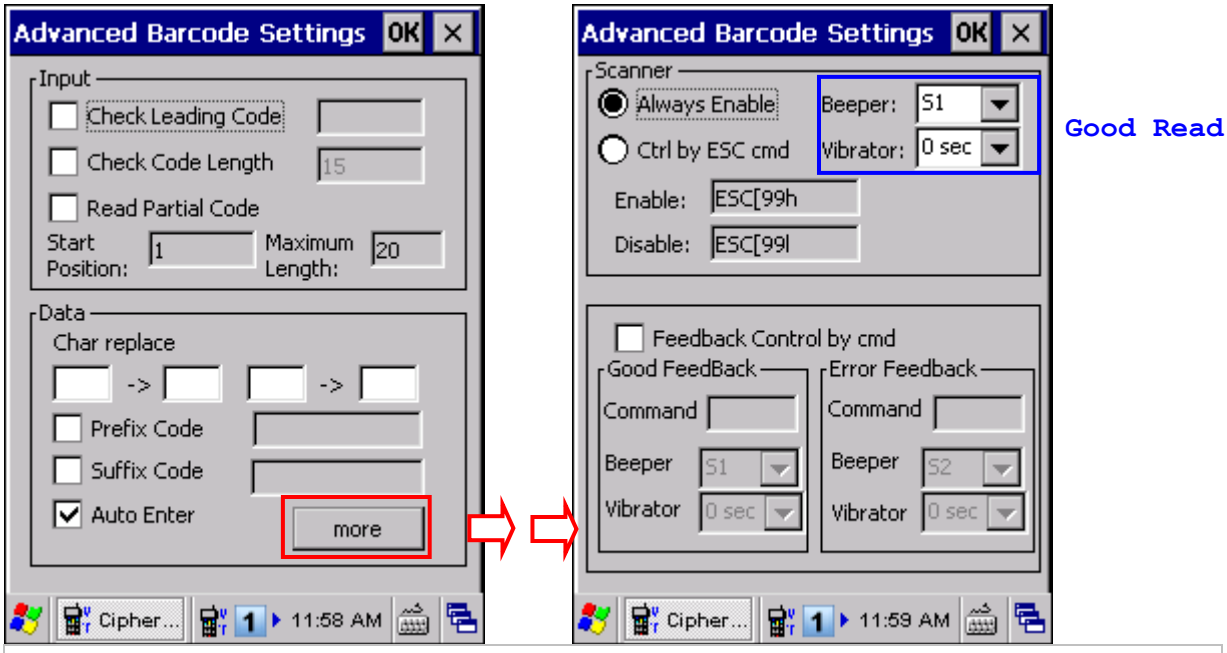
Input	
Check Leading Code	The leading code refers to the digit in the start position of a barcode. Select the check box to verify the barcode input. When the leading code is found mismatching, the barcode will be rejected.
Check Code Length	By default, the maximum barcode length is 50. Select the check box so that it will perform a length check on the barcode according to the length setting. When the barcode is found longer than the specified length, it will be rejected.
Read Partial Code	By default, it will return the whole barcode that has been decoded. Select the check box so that it will return partial barcode according to the settings of the start position and maximum length.
Scanner	
Always enable after login	The barcode reader is always enabled after login because the scan engine detected is enabled by default.
Data	
Last Field Suffix	Select from the drop-down list to suffix a code to the last input field only. For example, you may use this setting to automatically add "ENTER" to the last field.

Other Field Suffix	Select from the drop-down list to suffix a code to the input fields except the last one. For example, you may use this setting to automatically add "NEXT" to the rest fields so that each can advance to a next field.
Prefix Code	Select the check box to prefix a code to the input data. Tap the editing box and select one or more characters from the Prefix Code. For example, you may add a dollar sign "$" to the front of the input data for price information.
Suffix Code	Select the check box to suffix a code to the input data. Tap the editing box and select one or more characters from the Suffix Code.

Note: You may use prefix and suffix code(s) to wrap the input data.

Good Read	
Beeper Sequence	Select a sound to indicate a barcode has been read successfully. ▸ By default, it is set to Sound 1.
Vibrator Duration	Specify how long the vibrator is turned on to indicate a barcode has been read successfully. ▸ By default, it is disabled.
Alarm	
Beeper Sequence	Select a sound to indicate an error occurs in reading a barcode. ▸ By default, it is set to Sound 2.
Vibrator Duration	Specify how long the vibrator is turned on to indicate an error occurs in reading a barcode. ▸ By default, it is disabled.

VT EMULATION



Input	
Check Leading Code	The leading code refers to the digit in the start position of a barcode. Select the check box to verify the barcode input. When the leading code is found mismatching, the barcode will be rejected.
Check Code Length	By default, the maximum barcode length is 50. Select the check box so that it will perform a length check on the barcode according to the length setting. When the barcode is found longer than the specified length, it will be rejected.
Read Partial Code	By default, it will return the whole barcode that has been decoded. Select the check box so that it will return partial barcode according to the settings of the start position and maximum length.
Data	
Character Replacement	Up to two sets of character replacement are allowed. You may specify to replace a target character with another character. When the target character is found in the barcode data, it will automatically be replaced by the specified character.
Prefix Code	Select the check box to prefix a code to the input data. Tap the editing box and select one or more characters from the Prefix Code. For example, you may add a dollar sign "$" to the front of the input data for price information.
Suffix Code	Select the check box to suffix a code to the Suffix Code. Tap the editing box and select one or more characters from the Suffix Code.
Auto Enter	By default, a carriage return will be automatically added to the end of the barcode input (= Scan+ENTER). It can then directly proceed to next task upon completion of data input without requiring you to press the [Enter] key on the mobile computer. For barcode scanning, it proves to be timesaving.

Note: You may use prefix and suffix code(s) to wrap the input data.

Scanner	
Always enable after login	The barcode reader is always enabled after login because the scan engine detected is enabled by default.
Controlled by ESC Command	If selected, the barcode reader is suspended and must be controlled by ESC commands. Specify the escape sequence to enable or disable the scanner.
Feedback Control by Command	Select the check box if you wish to send an escape sequence from the host to control the beeper and vibrator. Proceed to **Good Feedback/Error Feedback** below. Otherwise, select a sound for the beeper and specify how long the vibrator works to indicate a good read. ▸ By default, the beeper is set to produce Sound 1 (S1) and the vibrator is disabled.
Good Feedback	
Command	You may specify an escape sequence to signal a good read. When the mobile computer receives this command from the host computer, it will beep and/or vibrate as specified below.
Beeper Sequence	Select a sound to indicate a barcode has been read successfully.
Vibrator Time	Specify how long the vibrator is turned on (in units of 0.5 second) to indicate a barcode has been read successfully.
Error Feedback	
Command	You may specify an escape sequence to signal an error. When the mobile computer receives this command from the host computer, it will beep and/or vibrate as specified below.
Beeper Sequence	Select a sound to indicate an error occurs in reading a barcode.
Vibrator Time	Specify how long the vibrator is turned on (in units of 0.5 second) to indicate an error occurs in reading a barcode.

3.3 FUNCTION KEY MAPPING

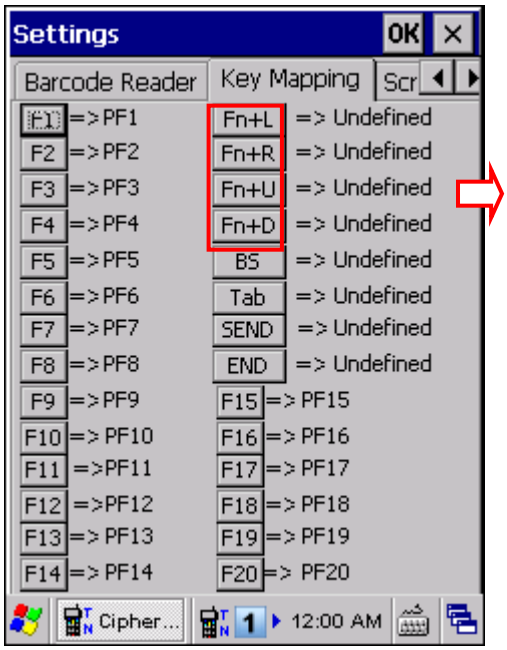
The function key is one of the keys on the mobile physical keypad that transmit control codes. Control codes do not produce displayable characters but are codes for functions. If these codes are received by the mobile computer, it will perform the associated function as defined.

For example, the following function keys may be required during a telnet session.

Function Key	Mapped to	Remarks
Any available key	F3	Exit the sign-on request.
	F12	Cancel a task.

3.3.1 KEY MAPPING (5250)

Tap an available key and map it to a desired host key.

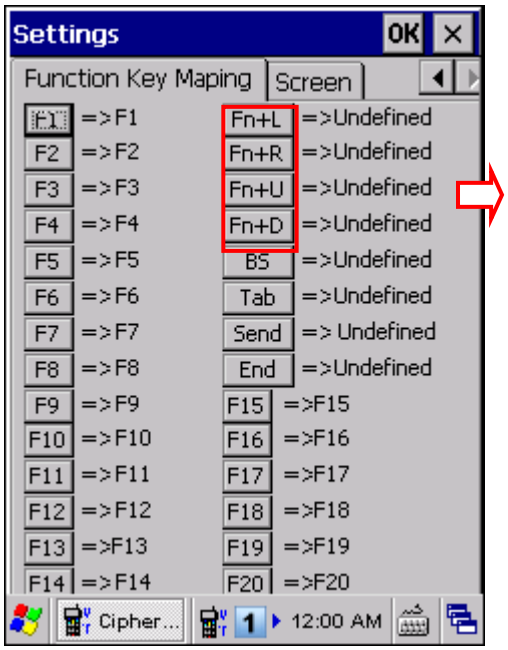


Function Keys	Stand for
Fn+L	Fn+Left Arrow Key ◁ (= Home)
Fn+R	Fn+Right Arrow Key ▷ (= End)
Fn+U	Fn+Up Arrow Key △ (= PgUp)
Fn+D	Fn+Down Arrow Key ▽ (= PgDn)

Note: Send and End function keys are available for 9600 only.

3.3.2 KEY MAPPING (VT)

Tap an available key and map it to a desired host key. You may re-define key code to meet a specific need.



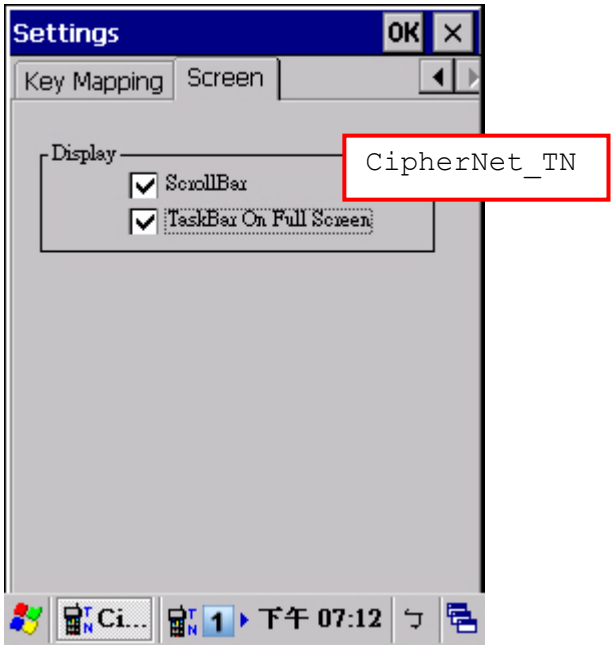
Function Keys	Stand for
Fn+L	Fn+Left Arrow Key ◁ (= Home)
Fn+R	Fn+Right Arrow Key ▷ (= End)
Fn+U	Fn+Up Arrow Key △ (= PgUp)
Fn+D	Fn+Down Arrow Key ▽ (= PgDn)

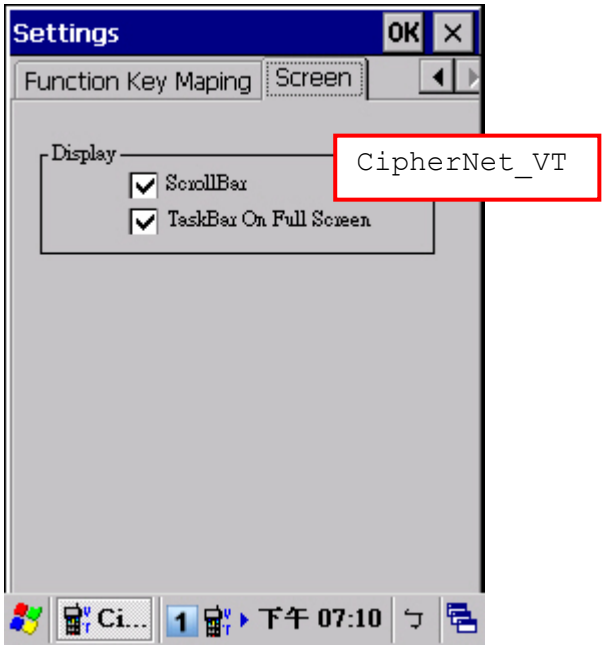
Note: Send and End function keys are available for 9600 only.

3.4 SCROLLBAR SETTING

The scrollbar is available during a telnet session by default. However, you may tap the Screen tab, and cancel the check box to hide the scrollbar.

For Screen tab also allows you to enable/disable the TaskBar On Full Screen function. Select the "TaskBar On Full Screen" check box, the TaskBar will appear when the window is in a Full screen mode.





Appendix I

SCAN ENGINE SETTINGS

MIRROR Terminal Emulator supports the following reader types, depending on the module equipped on your mobile computer:

Scan Engine		ID	9300	9600
1D	*Linear Imager*	*CCD*	×	✓
	Laser	*SE950*	×	✓
		SE955	✓	×
2D	*2D Imager*	*PL4507*	✓	✓
RFID	*ID_MOD_MP_RFID*		×	✓

Options of different reader combination are allowed, such as 1D+RFID and 2D+RFID. For each combination, both readers can be initialized and ready for scanning at the same time (dual mode operation). For example, if you press the [SCAN] button while running the CipherNet program on the mobile computer, it will read a barcode in position or an RFID tag in proximity depending on which one comes first.

Note: You cannot have 1D+2D scan engines installed on the mobile computer because they are both barcode readers!

SYMBOLOGIES SUPPORTED

Varying by the scan engine installed, the supported symbologies or tag types are listed below. For details on configuring associated settings, please refer to each Appendix separately.

Symbology	CCD, SE950	SE955	2D
Codabar	✓	✓	✓
Code 11	×	✓	✓
Code 93	✓	✓	✓
Composite Code	×	×	✓
MSI	✓	✓	✓
Plessey	✓	×	×
Postal Codes	×	×	✓
Telepen	✓	×	×

Code 128	Code 128	✓	✓	✓
	GS1-128 (EAN-128)	✓	✓	✓
	ISBT 128	✓	✓	✓
Code 2 of 5	Industrial 25 (Discrete 25)	✓	✓	✓
	Interleaved 25	✓	✓	✓
	Matrix 25	✓	×	✓
	Chinese 25	×	✓	✓
Code 3 of 9	Code 39	✓	✓	✓
	Trioptic Code 39	×	✓	✓
	Italian Pharmacode (Code 32)	✓	✓	✓
	French Pharmacode	✓	×	×
EAN/UPC	EAN-8	✓	✓	✓
	EAN-13	✓	✓	✓
	Bookland EAN (ISBN)	✓	✓	✓
	UPC-E0	✓	✓	✓
	UPC-E1	✓	✓	✓
	UPC-A	✓	✓	✓
GS1 DataBar (RSS)	GS1 DataBar Omnidirectional (RSS-14)	✓	✓	✓
	GS1 DataBar Truncated	✓	✓	✓
	GS1 DataBar Stacked	✓	✓	✓
	GS1 DataBar Stacked Omnidirectional	✓	✓	✓
	GS1 DataBar Limited (RSS Limited)	✓	✓	✓
	GS1 DataBar Expanded (RSS Expanded)	✓	✓	✓
	GS1 DataBar Expanded Stacked	✓	✓	✓
2D Symbologies	PDF417	×	×	✓
	MicroPDF417	×	×	✓
	Data Matrix	×	×	✓
	Maxicode	×	×	✓
	QR Code	×	×	✓
	MicroQR	×	×	✓
	Aztec	×	×	✓

RFID TAGS SUPPORTED

The RFID reader supports read/write operations depending on the tags. The supported labels include ISO 15693, Icode®, ISO 14443A, and ISO 14443B.

Currently, the performance of some tags has been confirmed, and the results are listed below for your reference.

Note: You should study the specifications of RFID tags before use.

ID_MOD_MP_RFID		UID Only	Read Page	Write Page
ISO 14443A	Mifare Standard 1K	✓	✓	✓
	Mifare Standard 4K	✓	✓	✓
	Mifare Ultralight	✓	✓	✓
	Mifare DESFire	✓	---	---
	Mifare S50	✓	✓	✓
	SLE44R35	✓	✓	✓
	SLE66R35	✓	✓	✓
ISO 14443B	SRIX 4K	---	---	---
	SR176	✓	✓	✓
ISO 15693	ICODE SLI	✓	✓	✓
	SRF55V02P	✓	✓	✓
	SRF55V02S	✓	✓	✓
	SRF55V10P	✓	✓	✓
	TI Tag-it HF-I	✓	✓	✓
	ST LRI512	✓	✓	✓

Appendix II

LINEAR IMAGER (CCD), LASER (SE950)

The tables below list reader settings as well as symbology settings for the Linear Imager (CCD) or Laser (SE950) scan engine.

READER SETTINGS TABLE

CCD/Laser Engine	Description	Default
Time-out		**3 sec.**
1~9 (second)	Set the maximum time for decoding to continue during a scan attempt. It applies to the following scan modes only – ▸ Laser mode ▸ Auto Off mode	
Scan Mode		**Laser mode**
Continuous Mode	Non-stop scanning ▸ To decode the same barcode repeatedly, move away the scan beam and target it at the barcode for each scanning.	
Test Mode	Non-stop scanning ▸ Capable of decoding the same barcode repeatedly	
Alternate Mode	Press the scan trigger to start with scanning. ▸ The scanning won't stop until you press the trigger again.	
Laser Mode	Hold down the scan trigger to start with scanning. ▸ The scanning won't stop until (a) a barcode is read, (b) the preset timeout expires, or (c) you release the trigger.	
Auto Off Mode	Press the scan trigger to start with scanning. ▸ The scanning won't stop until (a) a barcode is read or (b) the preset timeout expires.	
Redundancy Level		**None**
None	No redundancy means one successful decoding will make the reading valid and induce the "READER Event".	
One time, Two times, or Three times	The higher the reading security is (that is, the more redundancy the user selects), the slower the reading speed gets. ▸ If "Three Times" is selected, it will take a total of four consecutive successful decodings of the same barcode to make the reading valid.	

SYMBOLOGY SETTINGS TABLE

CCD/Laser Engine	Description	Default
Codabar		**Enable**
Select Start/Stop Characters	If "Transmit Start/Stop Characters" is desired, select one set: ▸ abcd / abcd ▸ abcd / tn*e ▸ ABCD / ABCD ▸ ABCD / TN*E	abcd / abcd
Transmit Start/Stop Characters	Decide whether to include the start/stop characters in the data being transmitted.	No
Code 128		**Enable**
GS1-128 (EAN-128)		**Enable**
Transmit Code ID	Decide whether to include Code ID (“]C1”) will be included in the data being transmitted.	No
Replace Field Separator	Decide whether to replace the field separator. If the barcode contains Field Separator “0x1D”, it will be changed to the desired Field Separator. For example, type the desired character “;” (semicolon) as the new field separator. Then if the barcode contains Field Separator “0x1D”, it will be changed to “;”.	No
ISBT 128		**Enable**
Industrial 25 (Discrete 25)		**Enable**
Start/Stop Selection	This decides the readability of all 2 of 5 symbology variants. For example, flight tickets actually use an Industrial 2 of 5 barcode but with Interleaved 2 of 5 start/stop pattern. In order to read this barcode, the start/stop pattern selection parameter of Industrial 2 of 5 should set to "Interleaved 25".	Industrial 25
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes
Select Length	▸ One or two fixed lengths ▸ Range	4~127
Interleaved 25		**Enable**
Start/Stop Selection	Refer to Industrial 25.	Interleaved 25
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes

Select Length	▸ One or two fixed lengths ▸ Range	4~127
Matrix 25		**Enable**
Start/Stop Selection	Refer to Industrial 25.	Matrix 25
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes
Select Length	▸ One or two fixed lengths ▸ Range	4~127
French Pharmacode		**Disable**
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes
Italian Pharmacode (Code 32)		**Disable**
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes

Note: For French/Italian Pharmacode, "Transmit Start/Stop Character" is not provided in UI but it is controlled by the same setting of Code 39.

Code 39		**Enable**
Transmit Start/Stop Character	Decide whether to include the start/stop characters "*" in the data being transmitted.	No
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes
Code 39 Full ASCII	Code 39 Full ASCII includes all the alphanumeric and special characters.	Disable
Code 93		**Enable**
MSI		**Disable**
Verify Check Digit	Select one of the three calculation formulas to verify the check digit. If the check digit is incorrect, the barcode will not be accepted. ▸ Single Modulo 10 ▸ Double Modulo 10 ▸ Modulo 11 & 10	Single Modulo 10
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ Last digit not transmitted ▸ Both digits transmitted ▸ Both digits not transmitted	Both digits transmitted

Select Length		▸ One or two fixed lengths ▸ Range	4~127
Negative Barcode			**Disable**
Plessey			**Disable**
Convert to UK Plessey		When applied, each occurrence of the character "A" in the barcode data will be replaced by the character "X".	No
Transmit Check Digit		Decide whether to include the two check digits in the data being transmitted.	Yes
Telepen			**Disable**
Original Telepen (Numeric)		The original Telepen includes numeric characters.	Yes
AIM Telepen (Full ASCII)		AIM Telepen (Full ASCII) includes all the alphanumeric and special characters.	No
GS1 Databar-14/Expanded			**Disable**
GS1 Databar-14	Transmit Code ID	Decide whether to include Code ID ("]e0") will be included in the data being transmitted. GS1 DataBar-14 is short for GS1 DataBar Omnidirectional. This group consists of (1) GS1 DataBar Omnidirectional, (2) GS1 DataBar Truncated, (3) GS1 DataBar Stacked, and (4) GS1 DataBar Stacked Omnidirectional.	Yes
GS1 Databar Expanded	Transmit Code ID	Decide whether to include Code ID ("]e0") will be included in the data being transmitted. This group consists of (1) GS1 DataBar Expanded, and (2) GS1 DataBar Expanded Stacked.	
Transmit Application ID		Decide whether to include the Application ID ("01") in the data being transmitted.	Yes
Transmit Check Digit		Decide whether to include the check digit in the data being transmitted.	Yes
GS1 Databar Limited			**Disable**
Transmit Code ID		Refer to GS1 Databar-14.	Yes
Transmit Application ID		Refer to GS1 Databar-14.	Yes
Transmit Check Digit		Refer to GS1 Databar-14.	Yes
EAN-8			**Enable**
Convert to EAN-13		The EAN-8 barcode will be expanded into EAN-13, and the next processing will follow the settings configured for EAN-13.	No
Transmit Check Digit		Decide whether to include the check digit in the data being transmitted.	Yes
Addon 2 / Addon 5		Decide whether to decode EAN-8 with addons.	No
EAN-13 / UPC-A			**Enable**
ISBN Conversion		The EAN-13 barcode starting with 978 and 979 will be converted to ISBN.	No

ISSN Conversion	The EAN-13 barcode starting with 977 will be converted to ISSN.	No
GTIN for EAN-13	The EAN-13 barcode will be expanded into 14-digit Global Trade Item Number (GTIN).	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	Yes
Addon 2 / Addon 5	Decide whether to decode EAN-13/UPC-A with addons.	No
(UPC-A) Convert to EAN-13	The UPC-A barcode will be expanded into EAN-13, and the next processing will follow the settings configured for EAN-13.	Yes
(UPC-A) Transmit Check Digit	Decide whether to include the UPC-A check digit in the data being transmitted.	Yes
(UPC-A) Transmit System Number	Decide whether to include the UPC-A System Number in the data being transmitted.	Yes
UPC-E		**Enable**
UPC-E0 / UPC-E1	Decide whether to decode the UPC-E0 barcodes only or both UPC-E0 and UPC-E1 barcodes.	UPC-E0 only
Convert to UPC-A	The UPC-E barcode will be expanded into UPC-A, and the next processing will follow the settings configured for UPC-A.	No
Transmit Check Digit	Decide whether to include the UPC-E check digit in the data being transmitted.	Yes
Transmit System Number	Decide whether to include the UPC-E System Number in the data being transmitted.	No
Addon 2 / Addon 5	Decide whether to decode UPC-E with addons.	No

Appendix III

LASER (SE955)

The tables below list reader settings as well as symbology settings for the Laser (SE955) scan engine.

READER SETTINGS TABLE

<table>
<tr><th>Laser (SE955) Engine</th><th>Description</th><th>Default</th></tr>
<tr><td>Decode Time-out</td><td>Set the maximum time for decoding to continue during a scan attempt.
▸ 1~9 (second)</td><td>3 sec.</td></tr>
<tr><td colspan="2">Redundancy Level</td><td>Level 1</td></tr>
<tr><td>Level 1</td><td colspan="2">The following barcodes must be successfully read twice before being decoded:
<table>
<tr><th>Barcode Types</th><th>Code Length</th></tr>
<tr><td>Codabar</td><td>All</td></tr>
<tr><td>MSI</td><td>4 characters or less</td></tr>
<tr><td>Industrial 25 (Discrete 25)</td><td>8 characters or less</td></tr>
<tr><td>Interleaved 25</td><td>8 characters or less</td></tr>
</table></td></tr>
<tr><td>Level 2</td><td colspan="2">All barcodes must be successfully read twice before being decoded.</td></tr>
<tr><td>Level 3</td><td colspan="2">All barcodes except for the following barcodes must be successfully read twice before being decoded. The following barcodes must be read three times:
<table>
<tr><th>Barcode Types “Excluded”</th><th>Code Length</th></tr>
<tr><td>MSI</td><td>4 characters or less</td></tr>
<tr><td>Industrial 25 (Discrete 25)</td><td>8 characters or less</td></tr>
<tr><td>Interleaved 25</td><td>8 characters or less</td></tr>
</table></td></tr>
<tr><td>Level 4</td><td colspan="2">All barcodes must be successfully read three times before being decoded.</td></tr>
<tr><td>Scan Angle</td><td>▸ “narrow” for 35°
▸ “wide” for 47°</td><td>Wide</td></tr>
<tr><td colspan="2">Scan Mode</td><td>Laser mode</td></tr>
<tr><td>Continuous Mode</td><td colspan="2">Non-stop scanning
▸ To decode the same barcode repeatedly, move away the scan beam and target it at the barcode for each scanning.</td></tr>
<tr><td>Laser Mode</td><td colspan="2">Hold down the scan trigger to start with scanning.
▸ The scanning won't stop until (a) a barcode is read, (b) the preset timeout expires, or (c) you release the trigger.</td></tr>
</table>

Timeout between Same Symbol	When in Continuous mode, set the minimum time that must elapse before the scan engine decodes a second barcode, which is identical to the one that has just been decoded. This reduces the risk of accidently scanning the same barcode twice. ▸ 0.0~9.9 (second)	**1.0 sec.**

SYMBOLOGY SETTINGS TABLE

Laser (SE955) Engine	Description	Default
Code 11		**Enable**
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted. ▸ No verification ▸ One Check Digit ▸ Two Check Digits	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Codabar		**Enable**
CLSI Editing	When applied, the CLSI editing strips the start/stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar barcode. ▸ The 14-character barcode length does not include start/stop characters.	No
NOTIS Editing	Decide whether to include the start/stop characters in the data being transmitted. ▸ NOTIS Editing is to strip the start/stop characters, i.e. to disable "Transmit Start/Stop Characters".	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Code 128		**---**
Code 128	Read standard Code 128 barcodes (= without leading FNC1 character).	Enable
GS1-128 (UCC/EAN-128)	Read GS1-128 barcodes with leading FNC1 character.	Enable
ISBT 128	Read ISBT 128 barcodes.	Enable
Industrial 25 (Discrete 25)		**Enable**
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55

Interleaved 25		**Enable**
Convert to EAN-13	Convert a 14-character barcode into EAN-13 if the following requirements are met: ▸ The barcode must have a leading 0 and a valid EAN-13 check digit. ▸ "Verify Check Digit" must be disabled.	No
Verify Check Digit	Decide whether to verify the check digit. If desired, select one of the algorithms below. If the check digit is incorrect, the barcode will not be accepted. ▸ No ▸ USS algorithm ▸ OPCC algorithm	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Chinese 25		**Enable**
Code 39		**Enable**
Convert to Code 32	Convert to Italian Pharmacode.	No
Code 32 Prefix	Prefix character "A" to Code 32 barcodes.	No
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Code 39 Full ASCII	Code 39 Full ASCII includes all the alphanumeric and special characters.	Disable
Trioptic Code 39	Decide whether to decode Trioptic Code 39. ▸ Trioptic Code 39 is a variant of Code 39 used in the marking of computer tape cartridges. It always contains six characters.	Disable
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Code 93		**Enable**
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
MSI		**Enable**
Verify Check Digit	If Two Check Digits option is selected, an additional verification is required to ensure integrity. Select one of the algorithms below. If the check digit is incorrect, the barcode will not be accepted.	Single Modulo 10

	Check Digit / **Algorithm** ne Check Digit / Single Modulo 10 Two Check Digits / ▸ Mod 10/Mod 11 ▸ Mod 10/Mod 10	
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
GS1 DataBar (RSS)		**---**
GS1 Databar-14	GS1 DataBar-14 is short for GS1 DataBar Omnidirectional. This group consists of (1) GS1 DataBar Omnidirectional, (2) GS1 DataBar Truncated, (3) GS1 DataBar Stacked, and (4) GS1 DataBar Stacked Omnidirectional.	Enable
GS1 Databar Limited		Enable
GS1 Databar Expanded	This group consists of (1) GS1 DataBar Expanded, and (2) GS1 DataBar Expanded Stacked.	Enable
Convert RSS to UPC/EAN	"Convert to UPC/EAN" only applies to GS1 Databar-14 and GS1 Databar Limited barcodes not decoded as part of a Composite barcode. **Convert to EAN-13** Strip the leading "010" from barcodes. ▸ "01" is the Application ID and must be followed by a single zero (the first digit encoded) **Convert to UPC-A** Strip the leading "0100" from barcodes. ▸ "01" is the Application ID and must be followed by two or more zeros (but not six zeros)	No
EAN-8		**Enable**
Convert to EAN-13	The EAN-8 barcode will be expanded into EAN-13, and the next processing will follow the settings configured for EAN-13.	No
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
EAN-13		**Enable**
Bookland EAN (ISBN)	The EAN-13 barcode starting with 978 will be converted to ISBN.	Yes
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
UPC-A		**Enable**
Transmit Check Digit	Decide whether to include the UPC-A check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-A preamble System Number (and Country Code) in the data being transmitted.	System Number

Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
UPC-E0		**Enable**
Transmit Check Digit	Decide whether to include the UPC-E0 check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-E0 preamble System Number (and Country Code) in the data being transmitted.	System Number
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
Convert to UPC-A	The UPC-E0 barcode will be expanded into UPC-A, and the next processing will follow the settings configured for UPC-A.	No
UPC-E1		**Disable**
Transmit Check Digit	Decide whether to include the UPC-E1 check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-E1 preamble System Number (and Country Code) in the data being transmitted.	System Number
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
Convert to UPC-A	The UPC-E1 barcode will be expanded into UPC-A, and the next processing will follow the settings configured for UPC-A.	No
UCC Coupon Extended Code		**Disable**
Read UPC-A barcodes starting with digit "5", EAN-13 barcodes starting with digits "99", and UPC-A/EAN-128 Coupon Codes. ▸ UPC-A, EAN-13, and EAN-128 must be enabled first! ▸ Use "Addon Redundancy" to control auto-discrimination of the EAN-128 (right half) of a coupon code.		
UPC/EAN Addon		**---**
Addon 2 / Addon 5	Decide whether to decode EAN-8, EAN-13, UPC-E0, UPC-E1, UPC-A with addons. ▸ Ignore Addons ▸ Decode Only With Addons ▸ Auto-discriminate	Ignore…
Addon Redundancy	When "Auto-discriminate" is applied, decide the number of times (2~30) of supplementary decoding the same barcode that makes a valid reading.	7 times
UPC/EAN Security Level		**Level 2**
Decide the decode security for UPC/EAN barcodes. Higher security levels are selected for decreasing levels of barcode quality. Note that increasing security level decreases the scan engine's aggressiveness; choose only that level of security necessary for the application. ▸ Level 0 – Select this option for the scan engine to operate in its most aggressive state, providing sufficient security in decoding most "in-spec" UPC/EAN barcodes. ▸ Level 1 – As barcode quality level diminish, certain characters become prone to mis-decodes before others (i.e. 1, 2, 7, 8). Select this option for the scan engine to eliminate mis-decodes, which are limited to characters 1, 2, 7 and 8.		

- Level 2 – This default setting allows the scan engine to eliminate most mis-decodes when the poorly printed barcodes occurrence not limited to characters 1, 2, 7 and 8.
- Level 3 – Select this option if Level 2 still fails to eliminate mis-decodes. However, selecting this option impairs the decoding ability of the scan engine. If this level of security is necessary, try to improve the barcode quality.

MISCELLANEOUS

Laser (SE955) Engine	Description	Default
Miscellaneous Options		**---**
Transmit Code ID	Decide whether to include AIM Code ID in the beginning of data. Each AIM Code ID contains the three-character string "**]cm**" – ▸] = Flag Character (ASCII 93) ▸ c = Code Character (see below) ▸ m = Modifier Character (see below)	Disable

AIM CODE ID – CODE CHARACTERS

Code Character	Code Type
A	Code 39
C	Code 128
E	UPC/EAN
F	Codabar
G	Code 93
H	Code 11
I	Interleaved 25
M	MSI
S	Industrial 25 (Discrete 25), IATA 2 of 5
X	Code 39 Trioptic, Bookland EAN

AIM CODE ID – MODIFIER CHARACTERS

Code Type	Option Value	Option
Code 39	0	No check character or Full ASCII processing.
	1	Check digit has been verified.
	3	Check digit has been verified and stripped.
	4	Full ASCII conversion has been performed.
	5	Result of option values 1 and 4.
	7	Result of option values 3 and 4.

Code 128	0	Standard data packet. No Function Code 1"FNC1" in the first character position.
	1	Function Code 1"FNC1" in the first character position.
	2	Function Code 1"FNC1" in the second character position.
Interleaved 25	0	No check digit processing.
	1	Check digit has been verified.
	3	Check digit has been verified and stripped.
Codabar	0	No check digit processing.
Code 93	0	Always transmit 0.
MSI	0	Modulo 10 check digit verified and transmitted.
	1	Modulo 10 check digit verified but not transmitted.
Industrial 25 (Discrete 25)	0	Always transmit 0.
UPC/EAN	0	Standard data packet in full EAN country code format, which is 13 digits for UPC-A and UPC-E (not including addons).
	1	Two-digit addons only.
	2	Five-digit addons only.
	4	EAN-8 data packet.
	A UPC-A with Addon 2 barcode, 012345678905-10, is transmitted to the host as a 21-character string,]E0 0012345678905]E1 10.	
Bookland EAN	0	Always transmit 0.
Trioptic Code 39	0	Always transmit 0.

Appendix IV

2D IMAGER

The tables below list reader settings as well as symbology settings for the 2D scan engine.

READER SETTINGS TABLE

<table>
<tr><th>2D Engine</th><th>Description</th><th>Default</th></tr>
<tr><td>Decode Time-out</td><td>Set the maximum time for decoding to continue during a scan attempt.
▸ 1~9 (second)</td><td>3 sec.</td></tr>
<tr><td>Decode Illumination</td><td>Decide whether to flash illumination on every barcode capture to aid decoding.
▸ Turn On (Internal LED)
▸ Turn Off</td><td>On</td></tr>
<tr><td>Aiming Pattern</td><td>Decide whether to project the aiming pattern during barcode capture.
▸ Turn On
▸ Turn Off</td><td>On</td></tr>
<tr><td colspan="2">Redundancy Level</td><td>Level 1</td></tr>
<tr><td>Level 1</td><td colspan="2">The following barcodes must be successfully read twice before being decoded:
<table>
<tr><th>Barcode Types</th><th>Code Length</th></tr>
<tr><td>Codabar</td><td>8 characters or less</td></tr>
<tr><td>MSI</td><td>4 characters or less</td></tr>
<tr><td>Industrial 25 (Discrete 25)</td><td>8 characters or less</td></tr>
<tr><td>Interleaved 25</td><td>8 characters or less</td></tr>
</table></td></tr>
<tr><td>Level 2</td><td colspan="2">All barcodes must be successfully read twice before being decoded.</td></tr>
<tr><td>Level 3</td><td colspan="2">All barcodes except for the following barcodes must be successfully read twice before being decoded.
The following barcodes must be read three times:
<table>
<tr><th>Barcode Types “Excluded”</th><th>Code Length</th></tr>
<tr><td>Codabar</td><td>8 characters or less</td></tr>
<tr><td>MSI</td><td>4 characters or less</td></tr>
<tr><td>Industrial 25 (Discrete 25)</td><td>8 characters or less</td></tr>
<tr><td>Interleaved 25</td><td>8 characters or less</td></tr>
</table></td></tr>
</table>

Level 4	All barcodes must be successfully read three times before being decoded.	
Security Level	Select a decode security level appropriate for the barcode quality when reading delta barcodes such as Code 128, Code 93, UPC/EAN. ▸ Security Level 0 – This default setting allows the scan engine to operate in its most aggressive state, providing sufficient security in decoding most "in-spec" barcodes. ▸ Security Level 1 – Select this option if misdecodes occur. This level should eliminate most misdecodes. ▸ Security Level 2 – Select this option if Security Level 1 fails to eliminate misdecodes. ▸ Security Level 3 – Select this option if Security Level 2 also fails to eliminate misdecodes. However, selecting this option impairs the decoding ability of the scan engine. If this level of security is necessary, try to improve the barcode quality.	**Level 0**

SYMBOLOGY SETTINGS TABLE

1D SYMBOLOGIES

2D Engine	Description	Default
Codabar		**Enable**
CLSI Editing	When applied, the CLSI editing strips the start/stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar barcode. ▸ The 14-character barcode length does not include start/stop characters.	No
NOTIS Editing	Decide whether to include the start/stop characters in the data being transmitted. ▸ NOTIS Editing is to strip the start/stop characters, i.e. to disable "Transmit Start/Stop Characters".	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Intercharacter Gap Size	The Code 39 and Codabar symbologies have an intercharacter gap that is typically quite small. Due to various barcode printing technologies, this gap can grow larger than the maximum size allowed, preventing the scan engine from decoding a barcode. If this problem occurs, set it to "Large Intercharacter Gaps" to tolerate these out-of-specification barcodes. ▸ Normal intercharacter gaps ▸ Large intercharacter gaps	Normal
Code 128		**---**
Code 128	Read standard Code 128 barcodes (= without leading FNC1 character).	Enable
GS1-128 (UCC/EAN-128)	Read GS1-128 barcodes with leading FNC1 character.	Enable
ISBT 128	Read ISBT 128 barcodes.	Enable
ISBT Concatenation	Decide whether to decode and concatenate pairs of ISBT barcodes. ▸ Disable ▸ Enable – When this option is selected, there must be two ISBT barcodes for the scanner to decode and perform concatenation. ▸ Auto-discriminate – When this option is selected, the scanner decodes and concatenates pairs of ISBT barcodes immediately. If only a single ISBT barcode is present, the scanner must decode 10 times before transmitting its data to confirm that there is no additional ISBT barcode.	Disable
ISBT Concatenation Redundancy	When "Auto-discriminate" is applied, decide the concatenation redundancy (2~20 times).	10 times

Industrial 25 (Discrete 25)		**Enable**
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Interleaved 25		**Enable**
Convert to EAN-13	Convert a 14-character barcode into EAN-13 if the following requirements are met: ▸ The barcode must have a leading 0 and a valid EAN-13 check digit.	No
Verify Check Digit	Decide whether to verify the check digit. If desired, select one of the algorithms below. If the check digit is incorrect, the barcode will not be accepted. ▸ No ▸ USS algorithm ▸ OPCC algorithm	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Matrix 25		**Enable**
Redundancy	Decide whether to enable read redundancy.	Disable
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Chinese 25		**Enable**
Code 39		**Enable**
Convert to Code 32	Convert to Italian Pharmacode.	No
Code 32 Prefix	Prefix character "A" to Code 32 barcodes.	No
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted.	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Code 39 Full ASCII	Code 39 Full ASCII includes all the alphanumeric and special characters.	Disable

<table>
<tr><td>Trioptic Code 39</td><td>Decide whether to decode Trioptic Code 39.
Trioptic Code 39 is a variant of Code 39 used in the marking of computer tape cartridges. It always contains six characters.</td><td>Disable</td></tr>
<tr><td>Select Length</td><td>One or two fixed lengths
Range (1~55)</td><td>4~55</td></tr>
<tr><td>Intercharacter Gap Size</td><td>The Code 39 and Codabar symbologies have an intercharacter gap that is typically quite small. Due to various barcode printing technologies, this gap can grow larger than the maximum size allowed, preventing the scan engine from decoding a barcode. If this problem occurs, set it to “Large Intercharacter Gaps” to tolerate these out-of-specification barcodes.
Normal intercharacter gaps
Large intercharacter gaps</td><td>Normal</td></tr>
<tr><td colspan="2">Code 93</td><td>Enable</td></tr>
<tr><td>Select Length</td><td>One or two fixed lengths
Range (1~55)</td><td>4~55</td></tr>
<tr><td colspan="2">MSI</td><td>Enable</td></tr>
<tr><td>Verify Check Digit</td><td>If Two Check Digits option is selected, an additional verification is required to ensure integrity. Select one of the algorithms below. If the check digit is incorrect, the barcode will not be accepted.<table><tr><th>Check Digit</th><th>Algorithm</th></tr><tr><td>One Check Digit</td><td>Single Modulo 10</td></tr><tr><td>Two Check Digits</td><td>Mod 10/Mod 11
Mod 10/Mod 10</td></tr></table></td><td>Single Modulo 10</td></tr>
<tr><td>Transmit Check Digit</td><td>Decide whether to include the check digit in the data being transmitted.</td><td>No</td></tr>
<tr><td>Select Length</td><td>One or two fixed lengths
Range (1~55)</td><td>4~55</td></tr>
<tr><td colspan="2">GS1 DataBar (RSS)</td><td>---</td></tr>
<tr><td>GS1 Databar-14</td><td>GS1 DataBar-14 is short for GS1 DataBar Omnidirectional. This group consists of (1) GS1 DataBar Omnidirectional, (2) GS1 DataBar Truncated, (3) GS1 DataBar Stacked, and (4) GS1 DataBar Stacked Omnidirectional.</td><td>Enable</td></tr>
<tr><td>GS1 Databar Limited</td><td></td><td>Enable</td></tr>
<tr><td>GS1 Databar Expanded</td><td>This group consists of (1) GS1 DataBar Expanded, and (2) GS1 DataBar Expanded Stacked.</td><td>Enable</td></tr>
</table>

Convert RSS to UPC/EAN	"Convert to UPC/EAN" only applies to GS1 Databar-14 and GS1 Databar Limited barcodes not decoded as part of a Composite barcode. **Convert to EAN-13** Strip the leading "010" from barcodes. ▸ "01" is the Application ID and must be followed by a single zero (the first digit encoded) **Convert to UPC-A** Strip the leading "0100" from barcodes. ▸ "01" is the Application ID and must be followed by two or more zeros (but not six zeros)	No
EAN-8		**Enable**
Convert to EAN-13	The EAN-8 barcode will be expanded into EAN-13, and the next processing will follow the settings configured for EAN-13.	No
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
EAN-13		**Enable**
Bookland EAN (ISBN)	The EAN-13 barcode starting with 978 will be converted to ISBN.	Yes
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
UPC-A		**Enable**
Transmit Check Digit	Decide whether to include the UPC-A check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-A preamble System Number (and Country Code) in the data being transmitted.	System Number
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
UPC-E0		**Enable**
Transmit Check Digit	Decide whether to include the UPC-E0 check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-E0 preamble System Number (and Country Code) in the data being transmitted.	System Number
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	
Convert to UPC-A	The UPC-E0 barcode will be expanded into UPC-A, and the next processing will follow the settings configured for UPC-A.	No
UPC-E1		**Disable**
Transmit Check Digit	Decide whether to include the UPC-E1 check digit in the data being transmitted.	Yes
Transmit Preamble	Decide whether to include the UPC-E1 preamble System Number (and Country Code) in the data being transmitted.	System Number
Addon 2 / Addon 5	Refer to UPC/EAN Addon setting.	

Convert to UPC-A	The UPC-E1 barcode will be expanded into UPC-A, and the next processing will follow the settings configured for UPC-A.	No
UCC Coupon Extended Code		**Disable**
Read UPC-A barcodes starting with digit "5", EAN-13 barcodes starting with digits "99", and UPC-A/ GS1-128 Coupon Codes. ▸ UPC-A, EAN-13, and EAN-128 must be enabled first! ▸ Use "Addon Redundancy" to control auto-discrimination of the GS1-128 (right half) of a coupon code.		
UPC/EAN Addon		**---**
Addon 2 / Addon 5	Decide whether to decode EAN-8, EAN-13, UPC-E0, UPC-E1, UPC-A with addons. ▸ Ignore Addons ▸ Decode Only With Addons ▸ Auto-discriminate	Ignore…
Addon Redundancy	When "Auto-discriminate" is applied, decide the number of times of supplementary decoding the same barcode that makes a valid reading.	10 times
Code 11		**Enable**
Verify Check Digit	Decide whether to verify the check digit. If the check digit is incorrect, the barcode will not be accepted. ▸ No verification ▸ One Check Digit ▸ Two Check Digits	No
Transmit Check Digit	Decide whether to include the check digit in the data being transmitted. ▸ "Verify Check Digit" must be enabled.	No
Select Length	▸ One or two fixed lengths ▸ Range (1~55)	4~55
Postal Codes		**---**
US Postnet		Enable
US Planet		Enable
Transmit US Postal Check Digit	US Postnet or US Planet must be enabled first!	Enable
UK Postal		Enable
Transmit UK Postal Check Digit	UK Postal must be enabled first!	Enable
Japan Postal		Enable
Australian Postal		Enable
Dutch Postal		Enable

Composite Codes		---
Composite CC-C		Enable
Composite CC-A/B		Disable
Composite TLC-39		Disable
GS1-128 Emulation Mode for UCC/EAN Composite Codes	Transmit UCC/EAN Composite Code data as if it was encoded in GS1-128 barcodes.	Disable
UPC Composite Mode	UPC barcodes can be "linked" with a 2D barcode during transmission as if they were one barcode. **UPC Never Linked** Transmit UPC barcodes regardless of whether a 2D barcode is detected. **UPC Always Linked** Transmit UPC barcodes and the 2D portion. If the 2D portion is not detected, the UPC barcode will not be transmitted. ▸ CC-A/B or CC-C must be enabled! **Auto-discriminate UPC Composites** Transmit UPC barcodes as well as the 2D portion if present.	UPC Always Linked

2D SYMBOLOGIES

2D Engine	Description	Default
2D Symbologies		**---**
PDF417		Enable
MicroPDF417		Disable
MicroPDF417 Code 128 Emulation	Transmit data from certain MicroPDF417 barcodes as if it was encoded in Code 128 barcodes. ▸ Transmit AIM Code Identifier must be enabled first! When applied, the MicroPDF417 barcodes are transmitted with one of these prefixes: **The first codeword of MicroPDF417 is 903-907, 912, 914, 915:** The original Code ID "]L3" will be changed to "]C1". **The first codeword of MicroPDF417 is 908 or 909:** The original Code ID "]L4" will be changed to "]C2". **The first codeword of MicroPDF417 is 910 or 911:** The original Code ID "]L5" will be changed to "]C0".	Disable
Data Matrix		Enable
Data Matrix Inverse	Decide whether to decode Data Matrix Inverse. **Regular Only** Decode regular Data Matrix barcodes only. **Inverse Only** Decode inverse Data Matrix barcodes only. **Inverse Autodetect** Decode both regular and inverse Data Matrix barcodes.	Regular Only
Maxicode		Enable
QR Code		Enable
QR Code Inverse	Decide whether to decode QR Code Inverse. **Regular Only** Decode regular QR Code only. **Inverse Only** Decode inverse QR Code only.	Regular Only

	Inverse Autodetect Decode both regular and inverse QR Code.	
MicroQR		Enable
Aztec		Enable
Aztec Inverse	Decide whether to decode Aztec Inverse. **Regular Only** Decode regular Aztec barcodes only. **Inverse Only** Decode inverse Aztec barcodes only. **Inverse Autodetect** Decode both regular and inverse Aztec barcodes.	Regular Only
2D Symbologies - Macro PDF		**---**
Macro PDF is a special feature for concatenating multiple PDF barcodes into one file, known as Macro PDF417 or Macro MicroPDF417.		
Transmit/Decode Mode	Decide how to handle Macro PDF decoding. **Buffer All Symbols / Transmit Macro PDF When Complete** Transmit all decoded data from an entire Macro PDF sequence only when the entire sequence is scanned and decoded. If the decoded data exceeds the limit of 50 symbols, no transmission because the entire sequence was not scanned! **Transmit Any Symbol in Set / No Particular Order** Transmit data from each Macro PDF symbol as decoded, regardless of the sequence. **Passthrough All Symbols** Transmit and decode all Macro PDF symbols and perform no processing. In this mode, the host is responsible for detecting and parsing the Macro PDF sequences.	Passthrough All Symbols
ESC Characters	When enabled, it uses the backslash "\" as an Escape character for systems that can process transmissions containing special data sequences. It will format special data according to the Global Label Identifier (GLI) protocol, which only affects the data portion of a Macro PDF symbol transmission. The Control Header, if enabled, is always sent with GLI formatting.	None

Note: When printing barcodes, keep each Macro PDF sequence separate, as each has a unique identifier. Do not mix barcodes from several Macro PDF sequences, even if they encode the same data. When you scan Macro PDF sequences, scan the entire Macro PDF sequence without interruption!

MISCELLANEOUS

2D Engine	Description	Default
Miscellaneous Options		---
Transmit Code ID	Decide whether to include AIM Code ID in the beginning of data. Each AIM Code ID contains the three-character string "**]cm**" – ▸] = Flag Character (ASCII 93) ▸ c = Code Character (see below) ▸ m = Modifier Character (see below)	Disable

AIM CODE ID – CODE CHARACTERS

Code Character	Code Type
A	Code 39, Code 39 Full ASCII, Code 32
C	Code 128, Coupon (Code 128 portion)
d	Data Matrix
E	UPC/EAN, Coupon (UPC portion)
e	GS1 DataBar (RSS)
F	Codabar
G	Code 93
H	Code 11
I	Interleaved 25
L	PDF417, Macro PDF417, Micro PDF417
M	MSI
Q	QR Code
S	Industrial 25 (Discrete 25), IATA 2 of 5
U	Maxicode
X	Code 39 Trioptic, Bookland EAN, US Postnet, US Planet, UK Postal, Japan Postal, Australian Postal, Dutch Postal

AIM CODE ID – MODIFIER CHARACTERS

Code Type	Option Value	Option
Code 39	0	No check character or Full ASCII processing.
	1	Check digit has been verified.
	3	Check digit has been verified and stripped.
	4	Full ASCII conversion has been performed.
	5	Result of option values 1 and 4.
	7	Result of option values 3 and 4.
Code 128	0	Standard data packet. No Function Code 1"FNC1" in the first character position.
	1	Function Code 1"FNC1" in the first character position.
	2	Function Code 1"FNC1" in the second character position.
Interleaved 25	0	No check digit processing.
	1	Check digit has been verified.
	3	Check digit has been verified and stripped.
Codabar	0	No check digit processing.
Code 93	0	Always transmit 0.
MSI	0	Modulo 10 check digit verified and transmitted.
	1	Modulo 10 check digit verified but not transmitted.
Industrial 25 (Discrete 25)	0	Always transmit 0.
UPC/EAN	0	Standard data packet in full EAN country code format, which is 13 digits for UPC-A and UPC-E (not including addons).
	3	Standard data packet with two-digit or five-digit addons.
	4	EAN-8 data packet.
	A UPC-A with Addon 2 barcode, 012345678905-10, is transmitted to the host as a 18-character string,]E3001234567890510.	
Bookland EAN	0	Always transmit 0.
Trioptic Code 39	0	Always transmit 0.
Code 11	0	Single check digit (has been verified.)
	1	Two check digits (has been verified.)
	3	Check digit has been verified but not transmitted.
GS1 DataBar (RSS)	0	Always transmit 0.
	RSS-14 and RSS Limited will be transmitted with an Application Identifier "01". For example, an RSS-14 barcode, 10012345678902, is transmitted as]e00110012345678902.	

Note: In GS1-128 emulation mode, RSS is transmitted using Code 128 rules (= "]C1").

EAN.UCC Composites (RSS, GS1-128, 2D portion of UPC composite)	Native mode transmission	
	0	Standard data packet
	1	Data packet containing the data following an encoded symbol separator character.
	2	Data packet containing the data following an escape mechanism character. The data packet does not support the ECI protocol.
	3	Data packet containing the data following an escape mechanism character. The data packet supports the ECI protocol.
	GS1-128 emulation	
	1	Data packet is a GS1-128 barcode (= data is preceded with "]JC1").

Note: UPC portion of composite is transmitted using UPC rules.

PDF417, Micro PDF417	0	Scan engine is set to conform to protocol defined in 1994 PDF417 symbology specifications. ▸ When this option is transmitted, the receiver cannot reliably determine whether ECIs have been invoked or whether data byte 92_{DEC} has been doubled in transmission.
	1	Scan engine is set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92_{DEC} are doubled.
	2	Scan engine is set for Basic Channel operation (no escape character transmission protocol). Data characters 92_{DEC} are not doubled. ▸ When decoders are set to this mode, unbuffered Macro symbols and symbols requiring the decoder to convey ECI escape sequences cannot be transmitted.
	3	The barcode contains a GS1-128 symbol, and the first codeword is 903-907, 912, 914, 915.
	4	The barcode contains a GS1-128 symbol, and the first codeword is in the range 908-909.
	5	The barcode contains a GS1-128 symbol, and the first codeword is in the range 910-911.
	A PDF417 barcode, ABCD, with no transmission protocol enabled, is transmitted as]L2ABCD.	
Data Matrix	0	ECC 000-140, not supported.
	1	ECC 200.
	2	ECC 200, FNC1 in first or fifth position.
	3	ECC 200, FNC1 in second or sixth position.
	4	ECC 200, ECI protocol implemented.
	5	ECC 200, FNC1 in first or fifth position, ECI protocol implemented.

	6	ECC 200, FNC1 in second or sixth position, ECI protocol implemented.
Maxicode	0	Mode 4 or 5
	1	Mode 2 or 3
	2	Mode 4 or 5, ECI protocol implemented.
	3	Mode 2 or 3, ECI protocol implemented in secondary message.
QR Code	0	Model 1
	1	Model 2, ECI protocol not implemented.
	2	Model 2, ECI protocol implemented.
	3	Model 2, ECI protocol not implemented, FNC1 implied in first position.
	4	Model 2, ECI protocol implemented, FNC1 implied in first position.
	5	Model 2, ECI protocol not implemented, FNC1 implied in second position.
	6	Model 2, ECI protocol implemented, FNC1 implied in second position