

Toshiba Global Commerce Solutions
POS Virtual Serial Drivers



Toshiba POS Virtual Serial Drivers User's Guide

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About this guide

The guide describes how to install and configure Toshiba POS Virtual Serial Drivers 1.8.

Who should read this guide?

This guide is intended for personnel who are connecting Toshiba Point of Sale (POS) devices to RS232 POS applications.

Summary of changes

April 2015

- Initial release
- Added MSR Support for TCx® Wave

Early July 2015

- Added Line Display Support for TCx® Wave

Late July 2015

- Added iButton Support for TCx® Wave

September 2015

- Added Cash Drawer (USB) Support for TCx® Wave
- Added Device Demo into Configuration Tool

December 2015

- Added Cash Drawer (PCI) Support for TCx300/SurePOS300

May 2018

- Added Printer (USB) Support

June 2018

- Changed installer's graphical user interface as well as silent mode installation and removal commands

October 2018

- Concurrent printing mode support.

July 2019

- Added support TCx® 300 3x1 and TCx® 700 7x7
- Support for USB TCx® Double Side Display
- Support for TCx® 800 RJ11/SDL Cash Drawer on Head and Tail
- Support for RS232 flow control signals for TCx® Printer
 - Printer Cover Open
 - Printer Paper Out

February 2020

- DBCS usage support

November 2021

- Added support for TCx® 810 6201-2xx/Exx
- Added support for TCx® 810E 4828-T2x/E2x

Chapter 1. Introduction

System Requirements

This section lists the hardware and software that the Virtual Serial Drivers supports.

Hardware Requirements

The following are the supported devices on various POS Terminals:

POS Systems Devices	TCx® 810/ TCx® 810E	TCx® 800	TCx® Wave	TCx® 300/SurePOS 300 (4810-360/370/380 & 4810-35x)	Other Toshiba POS Systems
TCx® Wave Integrated MSR	✓	✓	✓		
TCx® Wave Integrated 2x20 Line Display	✓	✓	✓		
TCx® Wave Integrated iButton	✓	✓	✓		
Cash Drawer (USB)	✓	✓	✓		
Cash Drawer (PCI)				✓	
Cash Drawer (RJ11/SDL) ¹	✓	✓			
TCx® Printer	✓	✓	✓	✓	✓
TCx® Double Side Display ²	✓	✓	✓	✓	✓
TCx® Single Side Display	✓	✓	✓	✓	✓

Software Requirements

The Virtual Serial Drivers requires the following software environment:

Operating System	One of the following: <ul style="list-style-type: none">Windows 10 (64-bit)
-------------------------	---

¹ For Cash Drawer (RJ11/SDL) the support is available only for TCx® 800 Head/Base – USB.

² The support for the TCx® Double Side display exists on Toshiba Virtual Serial Port version 1.6 and above, yet only one side of the display can be configured.

Chapter 2. Installing the Virtual Serial Drivers

This chapter describes the Toshiba POS Virtual Serial Drivers Installation for Windows.

Using Virtual Serial Drivers Printer with Toshiba UnifiedPOS Drivers (UPOS)

To use the Virtual Serial Drivers for Printer with UPOS, changes will have to be made to JavaPOS/OPOS driver installation.

For OPOS, the following registry entry must be added at '**HKLM\SOFTWARE\Toshiba\Point of Sale Subsystem**'. This entry will prevent OPOS drivers from claiming the printer and allow printer for use with Virtual Serial Drivers.

Name: DisableUSB
Type: String
Value: 0f66:4535

For JavaPOS, ensure that the check box "Using Virtual COM Port Driver for Printer" is selected during installation.

To find out more information on configuring JavaPOS/OPOS drivers, please refer to the Toshiba UnifiedPOS User's Guide.

Using Virtual Serial Drivers with Toshiba Native Windows Driver (NWD)

Virtual Serial Driver (VSD) devices, other than printer, can co-exist with NWD Driver. VSD printer will log an error if attempted to be configured when NWD Driver is installed and VSD printing functionality will be disabled.

Since at the time the NWD Driver is installed in the system the '**HKLM\SOFTWARE\Toshiba\Point of Sale Subsystem**' registry is created to disable the VSD Printer

Name: DisableUSB
Type: String
Value: 0f66:4535

If the key is deleted when NWD is installed, VSD printer will be able to print but it may cause malfunctions in both drivers

To avoid this printing malfunctioning, please ensure that the only printer driver is NWD Driver (if installed), leaving the VSD driver to manage the other serial devices.

Installation Procedure

You have two installation options for the Virtual Serial Drivers: interactive installation and silent installation.

Please note that not all files are deleted during uninstallation. There will be configuration and log files left in the installation directory. To remove all files, delete them manually from the directory after uninstallation.

Interactive Installation

1. Run the installer and follow the directions on each panel.
2. In the Choose COM Ports Dialog, you can select the number of Virtual COM Ports to be created (maximum 6).

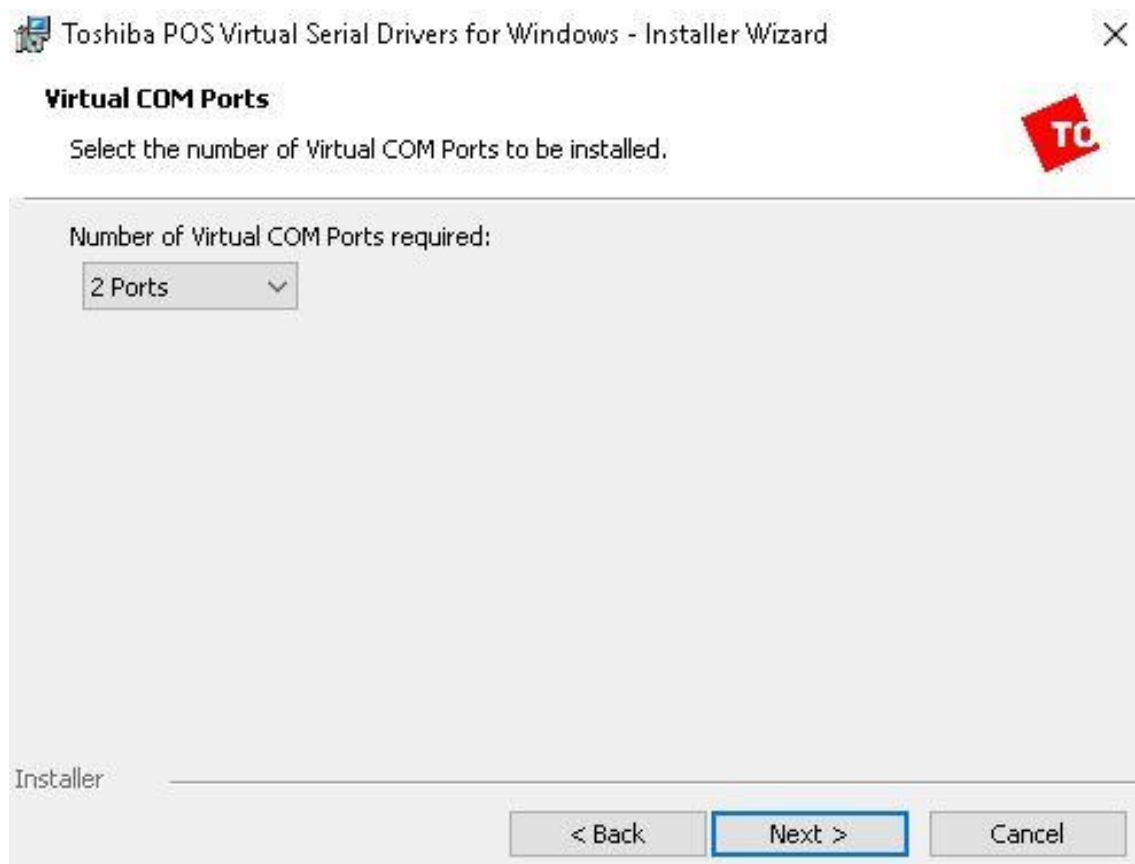


Figure 1 - Choose COM Ports Dialog

3. After the installation is complete, a Toshiba Virtual Serial Port Device is created and can be seen using Windows Device Manager.

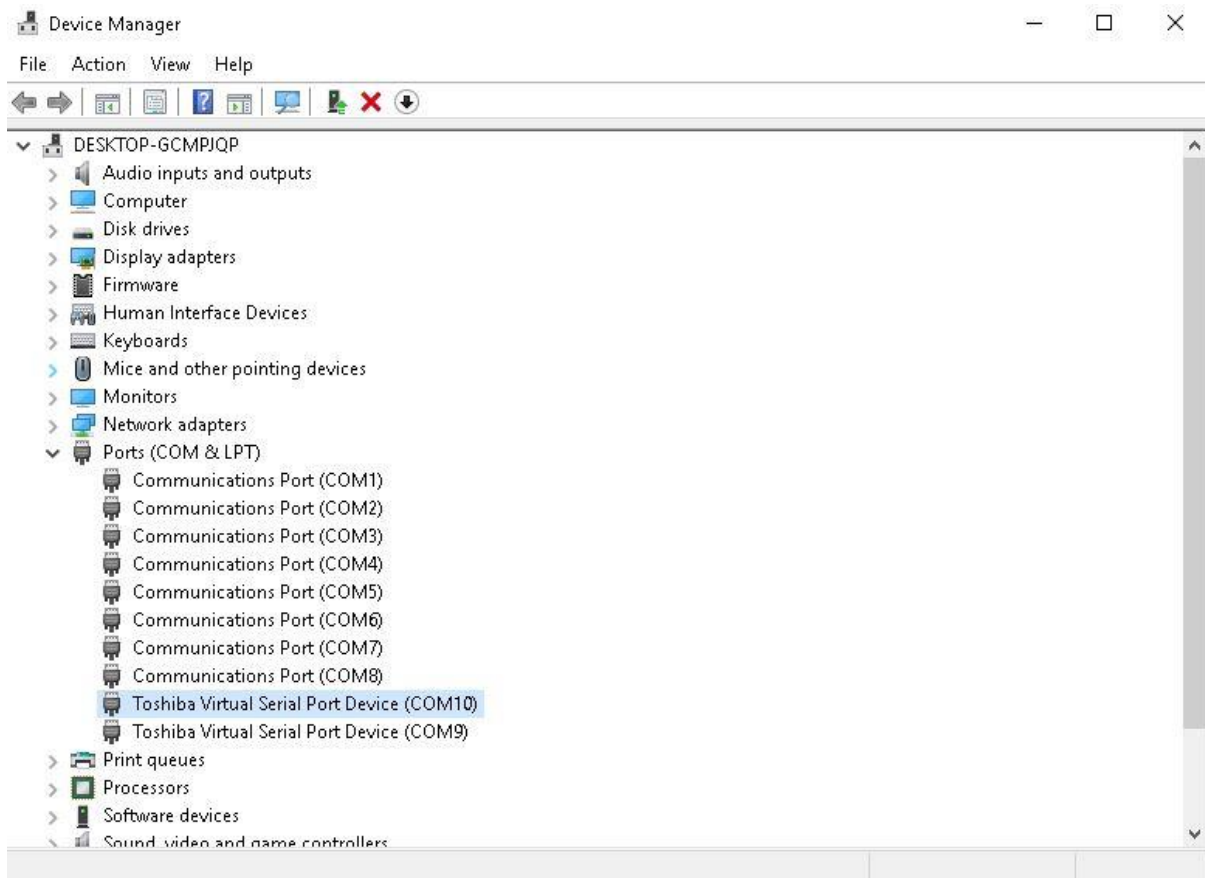


Figure 2 - Toshiba Virtual Serial Port Device

4. Restart the system after installation.
5. Configure the Virtual Serial Drivers (see [Chapter 3. Configuring the Virtual Serial Drivers](#)) before usage.

Silent Installation

To do a silent (unattended) installation, open Windows Command Prompt as Administrator and enter the following:

```
setup.exe -q NUMBER_OF_REQ_COM_PORTS=<req_com_ports_number>
```

Example, to install `1` Virtual COM Port the following is entered:

```
setup.exe -q NUMBER_OF_REQ_COM_PORTS=1
```

The valid values for *NUMBER_OF_REQ_COM_PORTS* are: **1**, **2**, **3**, **4**, **5** and **6**.

The system will reboot upon successful installation.

Notes:

1. The ``setup.exe`` file should be executed where it is located at.

Silent Uninstallation

To execute the silent uninstallation, open Windows Command Prompt as Administrator and enter the following:

setup.exe -uninstall -quiet

The system will reboot upon successful uninstallation.

Chapter 3. Configuring the Virtual Serial Drivers

Configuration Tool

The configuration utility is found inside the "BIN" folder in the installation directory. A shortcut to the tool is also created in the Windows Start Menu. The utility must be run with Administrator rights if the settings are to be changed.

To enable the settings, click the *Apply* button on the individual tabs where the change has been made. The Virtual Serial Drivers services will be restarted, when the tool is closed, if any of the settings have been changed and applied.

COM Port Configuration

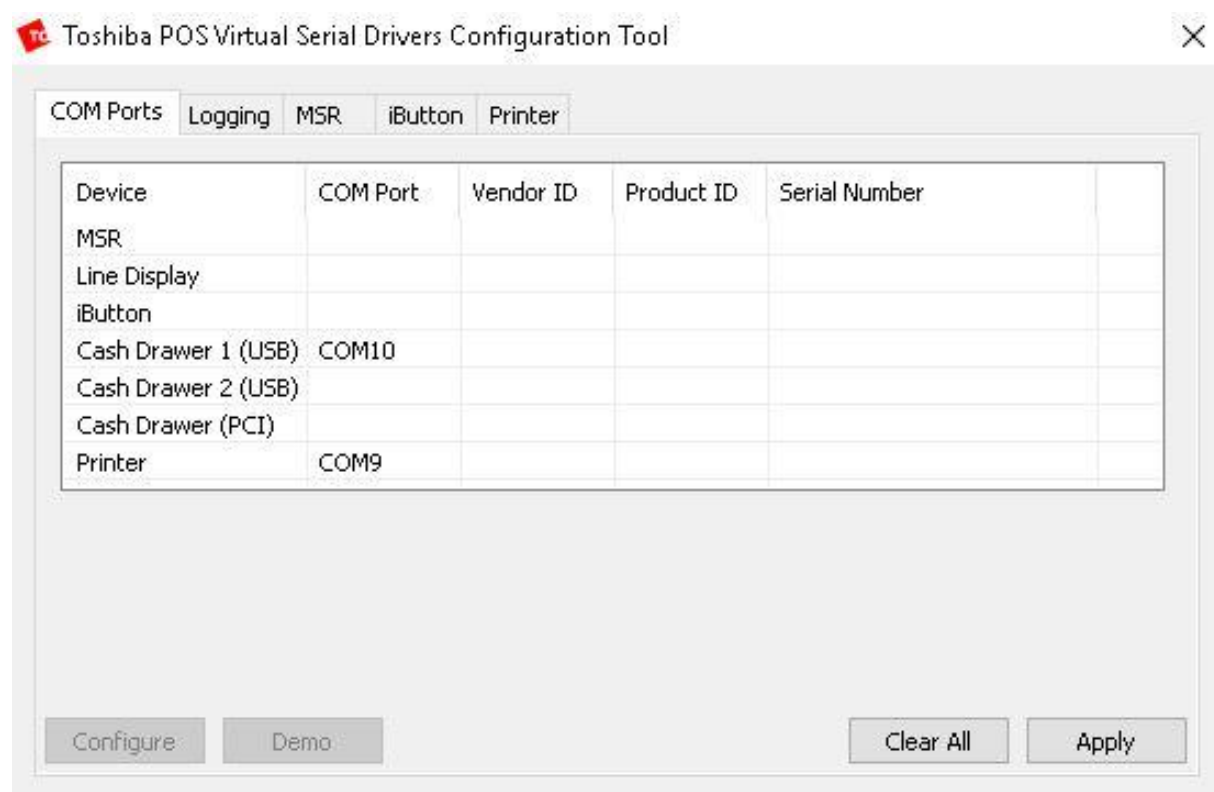
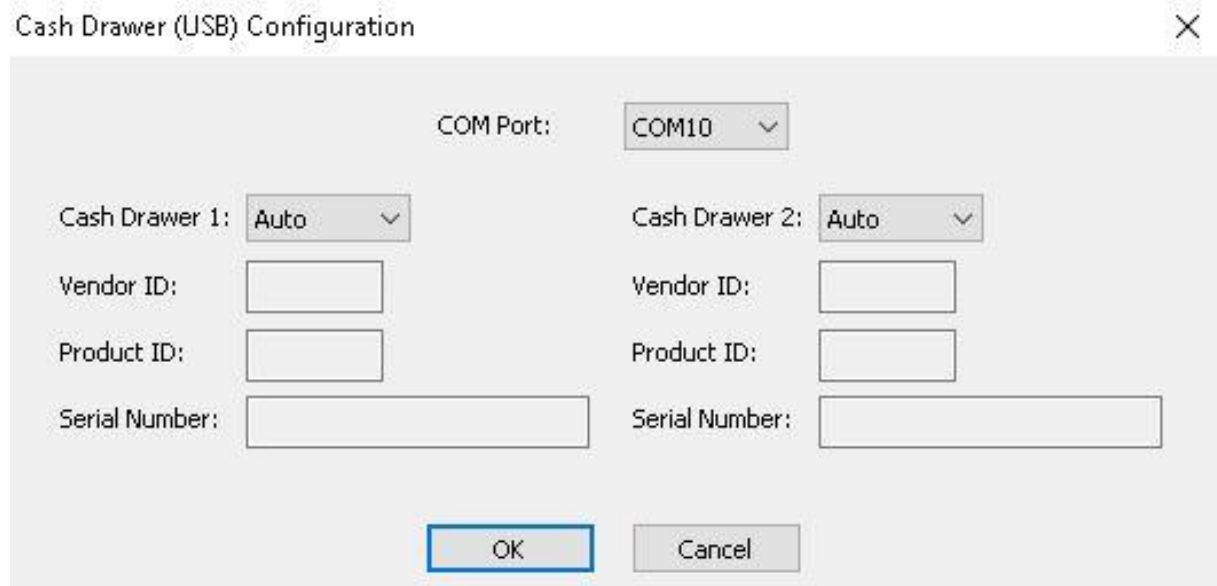


Figure 3 - COM Ports Dialog

Select the COM Port that is to be used by selecting a device and pressing the '*Configure*' button. A dialog box will appear, and the COM Port Number can be selected from there. If the COM Port Number is not selected, the device will not work. Only virtual serial ports created by the installation are available for selection.

It is not necessary for the Vendor ID, Product ID and Serial Number fields to be filled for the driver to work. These are only needed in certain circumstances (see [COM Port Configuration – USB Selection](#)).

COM Port Configuration – USB Selection



Cash Drawer (USB) Configuration

COM Port: COM10

Cash Drawer 1: Auto

Cash Drawer 2: Auto

Vendor ID:

Vendor ID:

Product ID:

Product ID:

Serial Number:

Serial Number:

OK Cancel

Figure 4 - COM Port Configuration Dialog - Cash Drawer

Additional configuration for the USB Cash Drawers is needed if two USB Cash Drawers are attached. The selections must be made in the *'Cash Drawer 1'* and *'Cash Drawer 2'* combo boxes.

Once a selection is made, Vendor ID, Product ID and Serial Number will be filled in automatically by the tool based on the Cash Drawers connected to the system. The Cash Drawers are differentiated by the USB's Vendor ID, Product ID and Serial Number and these are used by the driver to allocate the primary and secondary Cash Drawers.

Internally VSP recognize a *valid* Cash Drawer connected in the HEAD/BASE on TCx® 800 expansion card, *no matter if the Cash Drawer is plugged in SDL/RJ11 ports* for HEAD/BASE cards. Custom enumeration for *'Cash Drawer 1'* and *'Cash Drawer 2'*, could be done in the *Cash Drawer (USB) configuration* window of *'VSDConfig.exe'* utility.

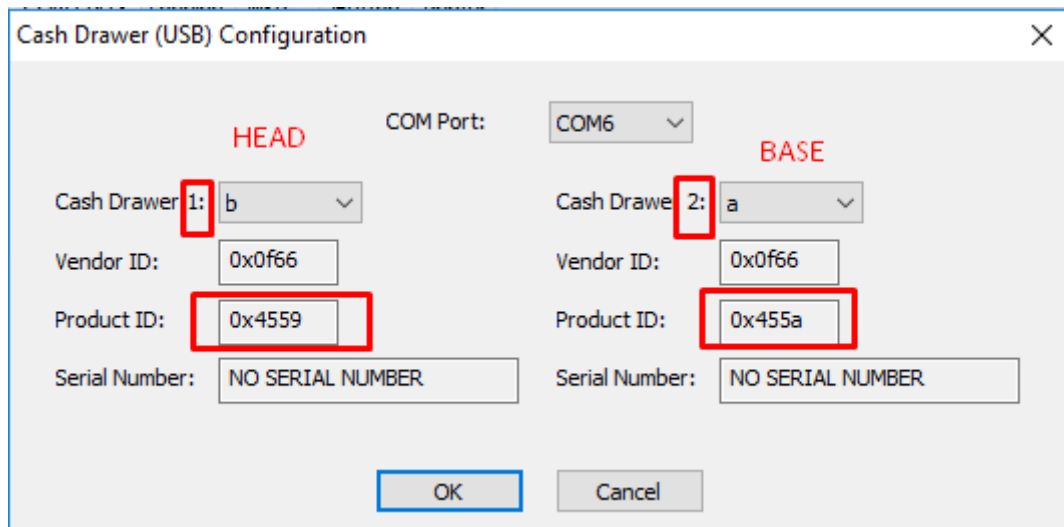


Figure 5 - HEAD/BASE Cash Drawers configuration on TCX800.

If you do not know the USB's Vendor ID, Product ID and Serial Number, and would like to configure two Cash Drawers, first ensure that only the primary Cash Drawer is attached. Start the Configuration Tool and configure Cash Drawer 1 (there should be only one selection available). Once Cash Drawer 1 is chosen, exit the Configuration Tool and attach the secondary Cash Drawer. Run the Configuration Tool again and configure Cash Drawer 2 by choosing the other selection.

If only a single USB Cash Drawer is attached and used, the selections can be left as "Auto". When two USB Cash Drawers are attached, and both the selections are "Auto", either of the Cash Drawers could be designated as the primary Cash Drawer.

If an USB Cash Drawer was configured and then it is replaced it with a different one, it is recommended to run again the VSP Configuration Tool.

COM Port Configuration – USB Selection Cash Drawer Limitation

When the *Toshiba AnyPlace POS* Hub is attached and the Cash Drawer on the hub (Port 3A) is selected, the Configuration Tool will only allow the Cash Drawer 1 to be selected. The Cash Drawer 2 will be disabled.

Logging Configuration

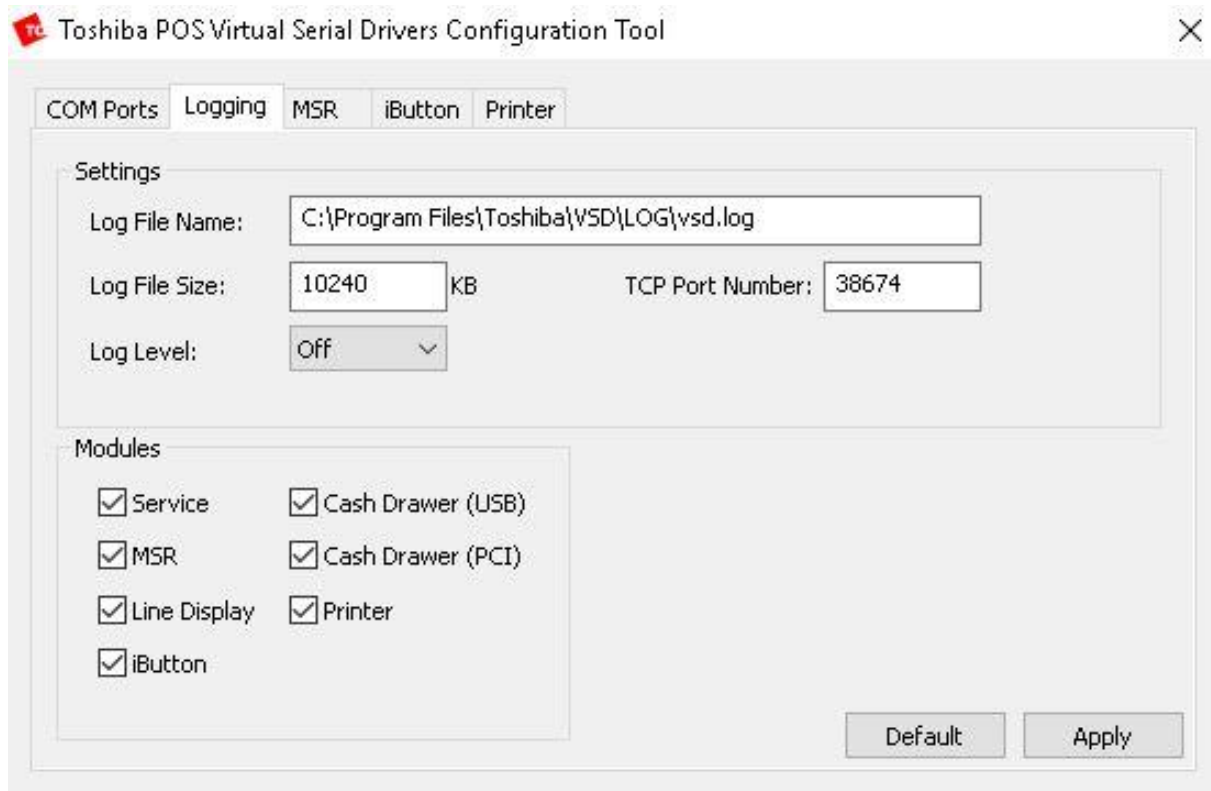


Figure 6 - Logging Dialog

The Logging Configuration affects where the log files are stored and what level of logging is supported. These are used for determining and resolving problems.

The various settings are:

- Log File Name: Full file path of the log file.
- Log File Size: Maximum log file size. Once the maximum file size is reached, a new log file will be created, and the old log file will be saved in the same directory.
- TCP Port Number: TCP Port Number that the modules use to send the log details to the logging service.
- Log Level:

6 levels are supported. They are:

- "Off",
 - "Error",
 - "Warning",
 - "Info",
 - "Verbose",
 - "Trace".
- Modules: The various modules that will be logged.

MSR Configuration

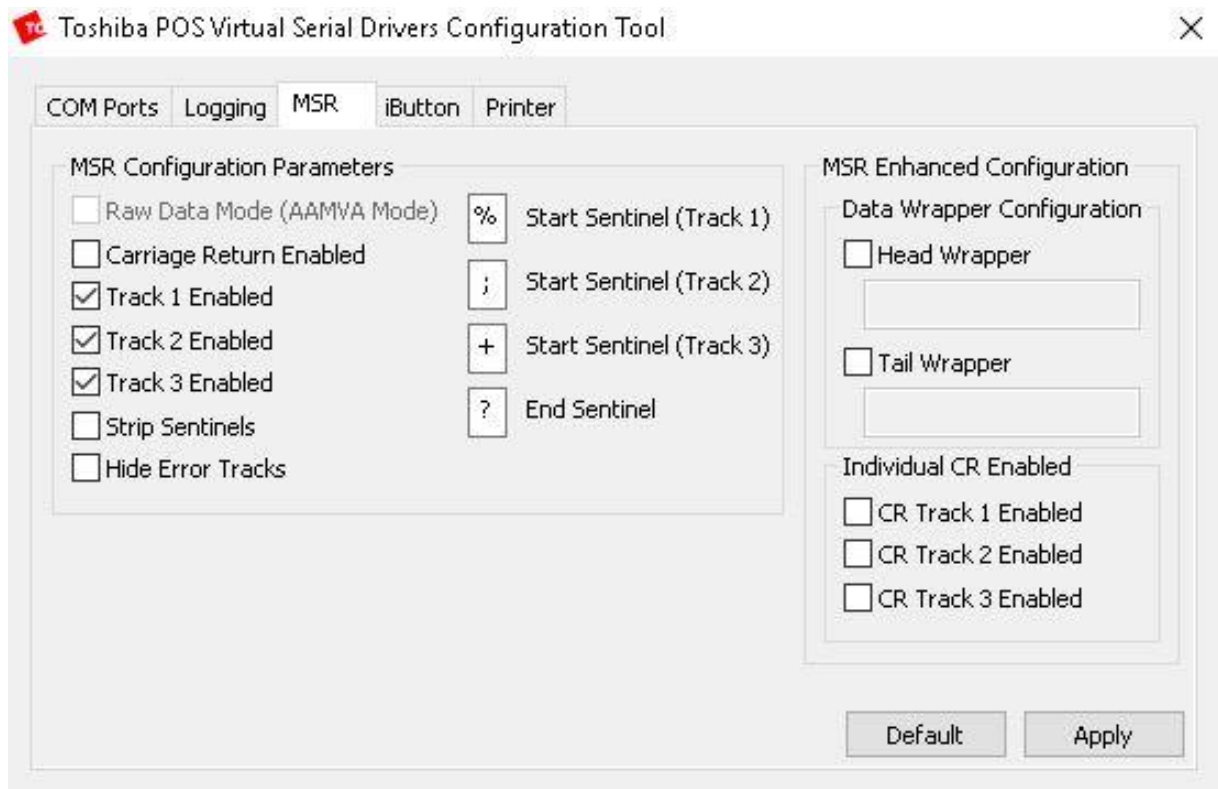


Figure 7 - MSR Dialog

The MSR Configuration provides a mechanism by which the MSR can be configured. Configuration must be done before using the MSR.

Figure 7- MSR Dialog and **Table 1 – MSR Configuration Options** explains the MSR Configuration Options and MSR Enhanced Configuration Options respectively.

Options	Default Settings	Description
Raw Data Mode (AAMVA Mode)	Disabled	When enabled, the MSR returns raw data from each read track. No manipulation of start/stop sentinels is performed. Note: This setting is not supported by the Virtual Serial Drivers.
Carriage Return Enabled³	Disabled	A carriage return is appended to each track of data.
Track 1 Enabled	Enabled	Returns Track 1 (if present) from a swiped card.
Track 2 Enabled	Enabled	Returns Track 2 (if present) from a swiped card.
Track 3 Enabled	Enabled	Returns Track 3 (if present) from a swiped card.
Strip Sentinels	Disabled	Strips start and stop sentinels from data returned after a card swipe.
Hide Error Tracks	Disabled	When an error occurs while reading a track from a card, an "E" is returned for that track. Enabling this option prevents the "E" from being sent in response to an error.
Start Sentinel (Track 1)	%	Character which is pre-pended to the start of the returned Track 1 data (if present).
Start Sentinel (Track 2)	;	Character which is pre-pended to the start of the returned Track 2 data (if present).
Start Sentinel (Track 3)	+	Character which is pre-pended to the start of the returned Track 3 data (if present).
End Sentinel	?	Data which is appended to the end of each returned track of data.

Table 1 - MSR Configuration Options

Options	Default Settings	Description
Data Wrapper	Empty	Configuring the head data wrapper or/and tail data wrapper for each data track. Able to configure supported ASCII code from 032 to 127, including non-text characters. Total data wrapper length is 14-characters for configured head, tail or both data wrapper.
Individual CR Enabled	Disabled	A carriage return is appended to each track of data, individually.

Table 2 - MSR Enhanced Configuration Options

³ Only a single carriage return per track will be appended even if both the **Carriage Return Enabled** and **Individual CR Enabled** are enabled.

iButton Configuration

Toshiba POS Virtual Serial Drivers Configuration Tool

COM Ports | Logging | MSR | **iButton** | Printer

iButton Configuration Parameters

ID Start: 1 ID Length: 16 Delimiter: CR+LF

Prefix: ...

Suffix (Postfix): ...

On Remove: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...

ASCII to HEX Converter

ASCII:

HEX:

Note: "Prefix", "Suffix" and "On Remove" accept HEX values only.

Default Apply

Figure 8 - iButton Dialog

The *iButton* Configuration allows the formatting of the data received when the *iButton* is attached/removed. The values (in hexadecimal) for "Prefix", "Suffix" and "On Remove" can be entered directly into the individual text boxes.


To enter ASCII characters, use the "ASCII to HEX Converter". After entering the ASCII characters in the ASCII text box, press the  button (beside the "Prefix", "Suffix" and "On Remove" text box) to copy from the "HEX" text box.

Table 3 lists out the various *iButton* configurations available.

Options	Default Settings	Description
ID Start	1	Sets the starting digit from which the 16-digit iButton ID will be returned.
ID Length	16	Sets the length of the iButton ID to be returned.
Prefix	Empty	Sets the data (in hexadecimal) to be placed before the iButton ID.
Suffix (Postfix)	Empty	Sets the data (in hexadecimal) to be placed after the iButton ID.
Delimiter	CR + LF	Sets the character(s) to be appended to the end of all the data.
On Remove	16 NULL Characters	Sets the data (in hexadecimal) to be returned when an iButton is removed.

Table 3 - iButton Configuration Options

Printer Configuration

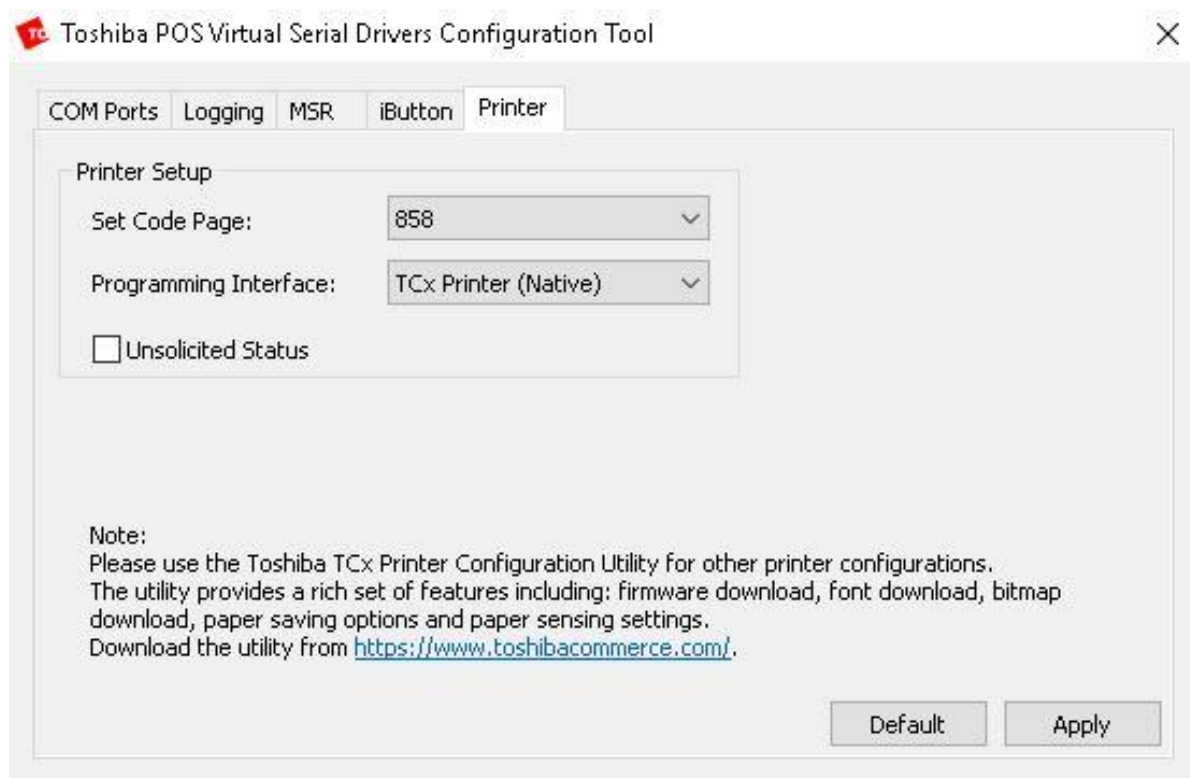


Figure 9 - Printer Dialog

The Printer Configuration allows basic printer settings to be set.

The settings are:

- Set Code Page
- Programming Interface: The modes available are "TCx® Printer (Native)", TCx® Printer (Compatibility)" and "Epson Emulation".⁴
- Unsolicited Status check box is to enable the RS232 signals reporting for TCx® Printers

Support for DBCS Code Pages

The Virtual Serial Driver supports DBCS font usage, this is achieved by selecting the item "Printer Default" listed in the dropdown list of the "Set Code Page" control. By doing this if a DBCS font is loaded in printer DBCS1 position, it will use the uploaded font as the default, otherwise the printer will use the shipment default code page 858.

It is important to know that if a code page was set prior to selecting the "Printer Default" code page option, a manual reset must be done by the user, to avoid using the previously selected code page.

To adjust other printer settings, please download and use the TCx® Printer Configuration Utility from <https://commerce.toshiba.com/>. The utility provides a rich set of features including firmware download, font download, bitmap download, paper saving options and paper sensing settings.

⁴ If the user sets the Programming Interface as "Epson Emulation" to return to a Native or Compatibility mode a printer reset must be done manually

Configuration for Multiple Systems

To deploy the Virtual Serial Drivers on multiple system without reconfiguring all settings, you can extract and load the configuration file to systems across the enterprise.

The configuration file '**VSDConfig.xml**' is found inside the "BIN" folder in the installation directory. Use the file in the configured system to replace the configuration file in the other systems.

Please take note that the virtual COM Port created by the installer is affected by the COM Ports already present in the systems, thus there may be a need to reconfigure the COM Port number (as shown in [COM Port Configuration](#)) for the various IO devices when a configuration file is used for multiple systems.

If two USB Cash Drawers are to be used, reconfigure the USB Selection (see [COM Port Configuration – USB Selection](#)) as the USB details for the Cash Drawers will be different.

Demo Tool

A basic Demo utility is provided for testing the devices and the configurations.

Ensure that all configurations have been configured and applied before running the demo. Select the configured device and then select the *Demo* button. If any of the configuration has been applied, the Virtual Serial Drivers' services must be restarted and there will be a prompt to allow the tool to restart the services. Depending on which device was selected, the Demo dialogs for that device will appear.

MSR Demo

The MSR Demo contains a text box that displays COM Port statuses and the received serial data. Data is received when a card is swiped. To show the received data in Hex, select the "Show Data In Hex" Check Box, if not, the data will be displayed in ASCII.

Line Display Demo

The Line Display Demo has a "Send Text" button. When pressed, it will reset the Line Display and send the following data: "TOSHIBA<CR><LF>0123456789".

The Line Display Demo also contains a text box that displays COM Port statuses.

iButton Demo

The iButton Demo contains a text box that displays COM Port statuses and the received serial data. Data will be received when an iButton is attached or removed. To show the received data in Hex, select the "Show Data In Hex" Check Box, if not, the data will be displayed in ASCII.

Cash Drawer Demo

The Cash Drawer Demo has the "Open CDs" and "Get Status" buttons. The "Open CDs" button will open both Cash Drawers (if present) by sending: <07H><1BH><07H>. The "Get Status" button will obtain the Cash Drawers statuses by sending: <06H>.

The Cash Drawer Demo also contains a text box that displays COM Port statuses and the received serial data. Data is received when the Cash Drawers statuses are received.

Printer Demo

The Printer Demo has a "Print Receipt" button. When pressed, it will send a test receipt to the printer.

The Printer Demo also contains a text box that displays COM Port statuses.

Chapter 4. MSR Data Format

This chapter describes the incoming data for the 3-track MSR.

Table 4 – MSR Data Format shows the default MSR data format of the track data sent to the application. The expected output can be different if the configuration parameters are modified by the Configuration Tool.

Mode	Data	Format
Successful Read (Serial)	SS Card Data ES	Start Sentinel (SS) character = ASCII % for track 1 Start Sentinel (SS) character = ASCII ; for track 2 Start Sentinel (SS) character = ASCII + for track 3 End Sentinel (ES) character = ASCII ? for all tracks
Unsuccessful Read (Serial)	Error	ASCII E

Table 4 – MSR Data Format

Chapter 5. Line Display Command Set

Line Display Command Set Summary

This section describes the RS232 Command Set that is used to communicate with the Line Displays.

Table 5 – Line Display Command Summary contains the summary of the commands.

No	Command (Hexadecimal)	Command Description
1	00 nn	Emulation Mode Select
2	02 nn	Character Set Select
3	03 <Character #> <Character Data>	User Character Definition
4	04 nn	Brightness Control (Not Supported by Virtual Serial Drivers)
5	05 <Data>	Alphanumeric Message Scroll
6	08	Backspace
7	09	Horizontal Tab
8	0A	Line Feed
9	0D	Carriage Return
10	0F	Test
11	10 nn	Display
12	11	Normal Display Control Mode
13	12	Vertical Scroll Display Control Mode
14	13	Cursor On (Not Supported by Virtual Serial Drivers)
15	14	Cursor Off (Not Supported by Virtual Serial Drivers)
16	1F	Reset
17	Undefined values between 00 and 1F	Null Characters

Table 5 - Line Display Command Summary

Line Display Command Set Description

Emulation Mode Select (00H)

Command Sequence: 00 nn

Purpose: Sets the specified emulation mode as defined below.

00H Logic Controls Mode (default)

01H IBM Mode

Example: 00 00

This example sets the Logic Controls Mode.

Character Select (02H)

Command Sequence: 02 nn

Purpose: Selects the specified character set as defined below.

00H Code Page 437 (Original PC Character Set)

01H Code Page 897 (Katakana)

02H Code Page 858 (Multilingual International)

03H Code Page 852 (Central Europe)

04H Code Page 855 (Cyrillic)

05H Code Page 857 (Turkey)

06H Code Page 862 (Israel)

07H Code Page 863 (Canadian French)

08H Code Page 864 (Arabic)

09H Code Page 865 (Nordic)

0AH Code Page 808 (Cyrillic – Russia)

0BH Code Page 869 (Greece)

Example: 02 00

This example selects Code Page 437

Note: This command is effective only in IBM Mode.

User Character Definition (03H)

Command Sequence: 03 <Character #> <Character Data>

Purpose: Defines a custom character as specified below. The character definition is different for each emulation mode.

Logic Controls Emulation Mode: The byte following the command byte contains the ASCII character (20h - 7Fh) of a keyboard key to be redefined. This byte is followed by 5 bytes that define the bit patterns of the user defined character. Logic Controls only allows one keyboard key to be redefined. This means there is only one user definable character in this mode. Once a key is redefined, any occurrence of that character on the display will change to the user defined character. If a new key is redefined the previously redefined key is restored to the original character on all places on the display and the newly redefined key will be changed to the user definable character. The format of this data stream is shown in **Table 6 – User Character Definition – Logic Controls Mode**. The hyphen character indicates a do-not-care bit.

Byte #	Bit 0 (LSB)	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7 (MSB)
1	P1	P2	P3	P4	P5	P6	P7	P8
2	P9	P10	P11	P12	P13	P14	P15	P16
3	P17	P18	P19	P20	P21	P22	P23	P24
4	P25	P26	P27	P28	P29	P30	P31	P32
5	P33	P34	P35	-	-	-	-	-

Table 6 - User Character Definition - Logic Controls Mode

Px below represents a character pixel position in the character, a 1 indicating the pixel is ON, and 0 indicating the pixel is OFF.

<----- 5 pixels wide ----->

P1	P2	P3	P4	P5	
P6	P7	P8	P9	P10	
P11	P12	P13	P14	P15	
P16	P17	P18	P19	P20	
P21	P22	P23	P24	P25	
P26	P27	P28	P29	P30	
P31	P32	P33	P34	P35	

<--- 7 pixels tall --->

IBM Mode: The byte following the command byte represents an address between 15H and 1AH or between 1CH and 1DH⁵. The address byte is followed by 8 bytes that define the actual bit patterns of the user defined character. The format of this data stream is shown in **Table 7 – User Character Definition: IBM Mode**. The hyphen character indicates a do-not-care bit.

Byte #	Bit 0 (LSB)	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7 (MSB)
1	-	-	-	P1	P2	P3	P4	P5
2	-	-	-	P6	P7	P8	P9	P10
3	-	-	-	P11	P12	P13	P14	P15
4	-	-	-	P16	P17	P18	P19	P20
5	-	-	-	P21	P22	P23	P24	P25
6	-	-	-	P26	P27	P28	P29	P30
7	-	-	-	P31	P32	P33	P34	P35
8 ⁶	-	-	-	-	-	-	-	-

Table 7 - User Character Definition: IBM Mode

Px below represents a character pixel position in the character, a 1 indicating the pixel is ON, and 0 indicating the pixel is OFF.

<----- 5 pixels wide ----->

P1	P2	P3	P4	P5	
P6	P7	P8	P9	P10	
P11	P12	P13	P14	P15	
P16	P17	P18	P19	P20	
P21	P22	P23	P24	P25	
P26	P27	P28	P29	P30	
P31	P32	P33	P34	P35	

<--- 7 pixels tall --->

Note: User defined characters will NOT remain on the display if the display control mode is switched (with the RS232 Line Displays, user defined characters remain on the display when the display control mode is switched).⁷ This means that, when switching from IBM Mode to Logic Controls Mode, the IBM user defined characters will be replaced with the space (20H) character.

⁵ The RS232 2x20 Line Display supports 1EH as a user defined character. However, due to RS232 and USB Line Displays firmware differences, the Virtual Serial Drivers will not support 1EH as a user defined character.

⁶ This is maintained for application compatibility for displays with 5x8 character boxes.

⁷ The implementation is different from the RS232 2x20 Line Display due to differences between the RS232 and USB Line Displays firmware.

Brightness Control (04H)

Command Sequence: 04 nn

Purpose: Specifies a brightness setting for the display as percentage of maximum brightness.

FFH	100%
60H	60%
40H	40%
20H	20%

Example: 04 60

Sets the brightness at 60% of maximum.

Note: This command is not supported by Virtual Serial Drivers. The command shall have no effect on the display.

Alphanumeric Message Scroll (05H)

Command Sequence: 05 <Data>

Purpose: The bytes following the command compose a message of up to 45 characters in length that are continuously scrolled on the top line of the display. Any data received after the 45th are ignored except a carriage return (0Dh). The message will be displayed after the carriage return command is received. If the cursor position is on the top line when this command is received, it is moved to the first position on the bottom line. If the cursor position is on the bottom line, the cursor position is not changed. Any text on the bottom line is left unchanged when this command is issued. Data will continue scrolling on the top line until a valid character, *`Backspace`*, *`Horizontal Tab`*, *`Line Feed`*, *`Carriage Return`*, or *`Display Position`* command is written when the cursor position is on the top line. Test and Reset will stop the scrolling message regardless of the display position.

Example: 05 48 65 6C 6C 6F 0D

Sets "Hello" as the scrolling message.

Backspace (08H)

Command Sequence: 08

Purpose: Decrements the cursor position by one, and clears any character displayed in that position. If the write position is at the lower left position, the position is moved to the upper right, and if the write position is at the upper left, the write position is moved to the lower right. This command will stop the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Horizontal Tab (09H)

Command Sequence: 09

Purpose: Increments the cursor position by one. No character erasure takes place. This command will stop the scrolling alphanumeric message if the cursor position is on the top line when this command is sent. At the end of a line, the display behaviour is determined by the state of the DC1/DC2 mode as follows:

Normal Display Control (DC1) Mode: If the cursor is at the upper right position, it is moved to the lower left position. If the cursor is at the lower right position, it is moved to the upper left position.

Vertical Scroll Display Control (DC2) Mode: If the cursor position is at the upper right position, it is moved to the lower left. If the cursor is at the lower right position, the characters displayed on the bottom line are moved to the top line, the bottom line is cleared, and the cursor is moved to the lower left position.

Line Feed (0AH)

Command Sequence: 0A

Purpose: The display behaviour is determined by the state of the DC1/DC2 mode as follows:

Normal Display (DC1) Mode: The cursor is moved to the same position in the complementary line. In this mode, a line feed command will stop the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Vertical Scroll (DC2) Mode: If the cursor position is on the top line, it is moved to the complementary position on the bottom line. If the cursor position is on the bottom line, all characters on that line are moved to the top line, the bottom line is cleared, and the cursor position is unchanged. This command will always stop the scrolling alphanumeric message.

Carriage Return (0DH)

Command Sequence: 0D

Purpose: Causes the cursor to move to the left most position of the current line. This command will stop the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Test (0FH)

Command Sequence: 0F

Purpose: Causes the first 40 characters in the currently selected character set to be displayed one time. In addition, at the end of the test, a test pattern is written that turn all pixels ON. At the end of the test routine, the display is cleared, and the display is reset to the "reset" state defined below.

Display Position (10H)

Command Sequence: 10

Purpose: Changes the cursor position. The byte following the command byte indicates the character position where the next data string write will start. Address 00h is the top left, address 13h is the top right, address 14h is the bottom left and address 27h is the bottom right. Any values greater than 27h are ignored and the cursor position will remain unchanged. This command will stop the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Normal Display Control Mode (DC1) (11H)

Command Sequence: 11

Purpose: Data can be written into either line. After writing a character, the cursor moves one position to the right. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When the display position is at the last position of the bottom line, the cursor moves to the first position of the top line. The display remains in DC1 mode until a DC2 mode command is issued, a reset command is issued, or power is removed from the display.

Vertical Scroll Display Control Mode (DC2) (12H)

Command Sequence: 12

Purpose: Data may be written to either line. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When valid character data or a horizontal tab command is sent to the last position of the bottom line, the data on the bottom line will be transferred to the top line and the cursor will be moved to the lower left position. Note that a carriage return command does not cause the data on the bottom line to be transferred to the top line.

DC2 mode is the power up and reset default. The display remains in DC2 mode until a DC1 mode command is issued.

Cursor On (13H)

Command Sequence: 13

Purpose: Turns on the cursor. This is the power-up default.

Note: This command is not supported by Virtual Serial Drivers. The command shall have no effect on the display.

Cursor Off (14H)

Command Sequence: 14

Purpose: Turns off the cursor.

Note: This command is not supported by Virtual Serial Drivers. The command shall have no effect on the display.

Reset (1FH)

Command Sequence: 1F

Purpose: Causes the display to reset some programmable parameters back to the power-on state. This state is defined to be:

- Scrolling alphanumeric message OFF
- All pixels OFF (all character positions are filled with 20h)
- Write position for next write at position 00h (top left)
- Default code page (437) selected
- Vertical Scroll Display (DC2) mode enabled
- Default (Logic Controls) emulation mode selected
- IBM user defined characters are NOT erased. The Logic Controls user defined character key is RESET.

Null Commands

All other bytes between 00H and 1FH not defined above are completely ignored by the display in the Logic Controls mode. User defined characters in the IBM mode that have not been previously defined are spaces.

Character Set Supported by Line Display in Virtual Serial Drivers

Table 8 – Character sets supported by line display in Virtual Serial Drivers shows the country character sets supported by the line displays in Virtual Serial Drivers. The US/European character set contains at least the upper-case characters from many of the other code pages (excluding Cyrillic). These are duplicated in the code pages for those countries.

Code Page	TCx® Wave
437 (US/European)	✓
897 (Katakana)	
858 (Multilingual)	✓
852 (Central Europe)	✓
855 (Cyrillic)	✓
857 (Turkey)	✓
862 (Israel)	✓
863 (Canadian French)	✓
864 (Arabic)	✓
865 (Nordic)	✓
808 (Cyrillic – Russia)	✓
869 (Greece)	✓

Table 8 - Character sets supported by line display in Virtual Serial Drivers

Chapter 6. iButton Data Format

This chapter describes the incoming data for the iButton.

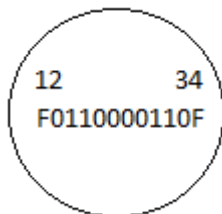
Table 9 – iButton Data Format shows the iButton data format sent to the application.

Mode	Data
iButton Attached	<Prefix> <iButton ID> <Suffix> <Delimiter>
iButton Removed	<On Remove> <Delimiter> Note: <Delimiter> is not sent if <On Remove> is empty.

Table 9 - iButton Data Format

Example:

iButton:



Prefix (in hexadecimal): 53 54 41 52 54

Suffix (in hexadecimal): 45 4E 44

Delimiter: CR + LF

On Remove: 52 45 4D 4F 56 45

Note: The values above are configured using the Configuration Tool and are not the defaults.

When the iButton is attached the following data (in hexadecimal) will be received:

53 54 41 52 54 31 32 46 30 31 31 30 30 30 30 31 31 30 46 33 34 45 4E
44 0D 0A

In ASCII, those values will be:

START12F0110000110F34END

When the iButton is removed the following data (in hexadecimal) will be received:

52 45 4D 4F 56 45 0D 0A

In ASCII, those values will be:

REMOVE

Chapter 7: Cash Drawer Command Set

Cash Drawer Command Set Summary

This section describes the RS232 Command Set that is used to communicate with the Cash Drawer.

Table 10 – Cash Drawer Command Summary contains the summary of the commands.

No	Command (Hexadecimal)	Command Description
1	06	Read Cash Drawer Status
2	1B 06	Enable/Disable Unsolicited Cash Drawer Status
3	07	Open Cash Drawer 1
4	1B 07	Open Cash Drawer 2
5	Undefined values	Null Characters

Table 10 - Cash Drawer Command Summary

Cash Drawer Command Set Description

Read Cash Drawer Status (06H)

Command Sequence: 06

Purpose: Obtains a 1-byte status information for the Cash Drawers.

Cash Drawer Status are defined as follows:

Bit	Status Description
7 (MSB)	Always 0; Reserved for compatibility
6	Cash Drawer 1 Sensor: '1' = Cash Drawer 1 Opened '0' = Cash Drawer 1 Closed
5	Cash Drawer 2 Sensor: '1' = Cash Drawer 2 Opened '0' = Cash Drawer 2 Closed
4	Cash Drawer 1 Present Indicator: '1' = Cash Drawer 1 is Present '0' = Cash Drawer 1 is Not Present
3	Cash Drawer 2 Present Indicator: '1' = Cash Drawer 2 is Present '0' = Cash Drawer 2 is Not Present
2	Unsolicited Status Function State: '1' = Unsolicited Status Function is ON '0' = Unsolicited Status Function is OFF
1	Always 0; Reserved for compatibility
0 (LSB)	Always 0; Reserved for compatibility

Table 11 - Cash Drawer Status

Enable/Disable Unsolicited Cash Drawer Status (1BH 06H)

Command Sequence: 1B 06

Purpose: Toggles the unsolicited Cash Drawer status function ON or OFF. The default setting is OFF, and this setting will be saved by the system. If the status is ON, the Cash Drawer status will be sent when there is a change in the status. Sending an open Cash Drawer command will also cause the Cash Drawer to return the status byte if the Cash Drawer was previously closed.

Open Cash Drawer 1 (07H)

Command Sequence: 1B 06

Purpose: Opens Cash Drawer 1.

Open Cash Drawer 2 (1BH 07H)

Command Sequence: 1B 06

Purpose: Opens Cash Drawer 2.

Null Commands

All other bytes not defined above are ignored by the Cash Drawer.

Chapter 8: Printer Command Set

Applications will communicate to the TCx[®] Printer using the RS232 command set.

To find out more about the printer command set, please refer to the TCx[®] Printer Programming Guide.

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