Setup Manual
for
CXC
(Vers. 7.4.11 and higher)
Network Terminal Appliance

Revision: 1/2007

SmartFLeX Technology, Inc.

31 Stonecroft Drive, Suite 105
Easton, PA 18045-2812, USA

Phone: +1 (610) 849-0196
Fax: +1 (610) 849-0197

http://www.smartflextech.com

Table of Contents

What is CXC?

CXC is a Thin Client Network Appliance that may be deployed as either an XDMCP Terminal or a character-based Network Terminal for Linux and UNIX environments.

CXC is a product of SmartFLeX Technology Inc. It's firmware is based on the popular and powerful Linux kernel and additional proprietary client software modules.

CXC was developed with input from many of our customers. They supplied us with their thoughts and ideas on how a modern XDMCP and character-based Network Terminal Appliance should function. As a result we have designed the most enhanced dedicated Linux/Unix Desktop Workplace for today's sophisticated Linux and Unix multi user systems.

In XDMCP Terminal Mode, CXC allows the user to work on a Linux or Unix server's graphical remote desktop manager, giving the user the same feeling as working on a local Linux or Unix workstation. Connection is via network 10/100 MBit/s.

In Character-Based Terminal Mode, CXC allows the user to work on Linux or Unix in its native character-based legacy mode, taking advantage of thousands of legacy applications written for their respective Linux or Unix environment. The embedded emulators provide a wide variety of the most common terminal emulators. Network or serial line connection is possible only in this mode.

Both modes are supported by a very sophisticated printing system and direct port addressing via TCP ports. A special "TCP/IP to tty" server module for RedHat is available, allowing to map incoming data from a serial port on the terminal to a tty port that can be read by an application running on the server. This allows CXC to be deployed in POS, Kiosk and Office Applications, anywhere applications are running on a Linux/Unix host system and a cost-effective desktop system can be connected to it via a 10/100 MBit/s Ethernet connection.

So what does CXC stand for?

The first "C" stands for its character-based mode.
The "X" stands for the products X-Terminal mode.
The second "C" stands for client as in SmartClient.

Installation

Depending on the actual HW supplied the part list can be different with different models.

The box should be undamaged and should contain the following parts:

- 1 External Power Supply Unit (only with CXC/LX800 and CXC/EPIA5000)
- 1 AC Cable
- 1 PS\2 Mouse (only with some units)
- 1 (optional) USB to serial port converter (only applicable with CXC/LX800)
- 1 CXC Unit
- SFT-Software Licensing (to comply with GPL and LGPL)
- 1 Quick Setup Sheet
- This manual can be downloaded from our WEB Site

Inspect all parts visually for damage. If any part is visually damaged, please call the shipping carrier immediately, report the damage and file an insurance claim.

If all parts seem to be undamaged, proceed with the following steps:

Connect a VESA compatible monitor or LCD monitor to the video port in the back of the unit.

Connect mouse and keyboard to their respective connectors in the back of the unit. A mouse is only needed if the unit is to be configured or used as a X-Terminal. If the unit is intended to be used as a character-based terminal only, a mouse is not needed. The setup is then controlled by pressing the Alt key simultaneously with "underscored character" as shown on the screen.

Connect a CAT 5 Ethernet cable to the Ethernet port in the back of the unit and connect the other end of the Ethernet cable to an available port on a Ethernet hub. If you connect the unit via a serial (null modem) cable, please set up this connection now. If the USB to serial converter is being used it needs to be connected to the unit before booting. The USB to serial converter will be detected as an additional (mostly the last available) serial port.

Connect the round Power Supply connector to the respective port in the back of the unit if the unit is equipped with an external power supply.

Connect the AC Cable to the Power Supply AC input and an AC outlet.

To turn the unit on, press the ON/OFF button on the front panel of the unit.
To turn the unit off, press and hold the ON/OFF button on the front of the unit until unit turns off (3 sec).

Configuration and Setup

To enter the unit's SETUP turn on the unit and immediately press and hold "s" until the SmartFLeX Logo is visible **or** let the unit boot and press ESC twice when the SmartFLeX Technology logo and the message "Loading Linux kernel ......" appears on the screen . If the "ESC" method is used, type setup and press <enter> at the appearing "boot:" prompt. Either way, the unit will continue to boot directly into the setup mode. If the unit is new or has been reset to factory settings it will boot directly into the setup screen without a need to press the "s" key or "ESC" key.

A three-selection menu will appear on the screen allowing you to select if the unit is to continue boot into the character-based network terminal or XDMCP terminal setup mode, or to reset the unit to its manufacturing defaults. This screen also shows the firmware revision of this unit. Some menu options show underscored letters which means that the menu option can be selected by pressing <Alt><underscored letter>.

This method allows to control the main setup screen and the character-mode setup completely without a mouse.

A mouse is always needed to setup the X-Mode setup.

Note:
The unit's operation-mode will automatically set to character mode or XDMCP mode, depending in what setup mode the last changes had been saved.

Restore Factory Defaults

Restores all system settings to a "save to boot" default.

X-Terminal Mode

Click on this selection to turn this unit into an X-Terminal. The setup procedure will continue and display the setup screen for this mode.

C-Terminal Mode

Click on this selection to turn this unit into a Character Mode-Terminal. The setup procedure will continue and display the setup screen for this mode.

Note:
The setup is now divided into several screens. The individual setup screens can be accessed by clicking on the respective icon on the left side of the screen or by using the underscored letter method for mouse-less operation. The settings of the items in the screens is described below. The description of the setup items is not necessary in the same order as the icons appear on the screen.

Both Modes

In both setup modes, any experienced system administrator will have no problem finding his or her way around to complete the respective setup. On the left side of the screen is the Menu for the individual setup screens. Click on any of the icons to enter the specific setup screen. Please do not forget to click the "save settings" button on any screen before rebooting the unit.

In both modes the following steps MUST to be completed:

Network (not applicable for serial character based terminal mode)

Use DHCP (for retrieving an IP address from a DHCP server)
IP Addressing (default IP address: 192.168.100.99)

Netmask (optional if default netmask is 255.255.255.0)

Select if the unit is to receive its local IP address via DHCP or via a static IP address entered into the IP address field after clicking off DHCP.

Gateway (for example router address if connecting over the Internet)

force 10baseT (unit is in 100baseT mode by default)

If the unit is attached to a 10 MBit/s Ethernet port click the "force 10 MBit/s " checkbox to force the unit into a 10 MBit/s Ethernet mode. By default (checkbox is unchecked) the unit is set to 100 MBit/s Ethernet mode. This procedure is sometimes more reliable than auto-sensing, which caused problems in the past to connect to a 10 MBit/s Ethernet network.

Webinterface

Select if the unit should allow remote administration. We strongly recommend to leave this option enabled! It allows a system administrator to remotely manage the setup or recover from incorrect setup choices. The default setting for this option is "selected", but if security becomes a concern deselected it.

Send Client Up Message

This client supports a method to start X applications automatically from the server to be executed on the client itself. During boot a server software module recognizes the active client and automatically publishes the defined application tot he client. The server daemon is to be installed on the server and a script has to be created to start the X application to be executed locally on the client. To identify the active client the client must send a ID signal to the network, This function can be enabled by setting "Send Client Up Message". The accompanying selection for this feature is to send the ID only once or nonstop, and to send the ID as a broadcast signal or to a specific device (server).

After downloading and extracting the server software, the resulting hb_client can be started by the user that is in need to start an application on the terminal automatically at boot time.

To start the hb_client it needs to be set executable and an argument needs to be added at startup. This startup argument is a script that the system administrator has to create for the application to be started.

The following is a sample script to start the mozilla browser with the mwm window-manager automatically on the terminal after boot:

---------- SNIP --------------

```
#!/bin/sh
export DISPLAY=$1:0.0
mwm&
mozilla
```

---------- SNIP --------------

Save this script and give it a name and than run:

hb_client <script name>

Important:

This software is still experimental and we need feedback from our customers about any problems they might have with this new feature !!!

NOTE:
It is not a good idea at this time to stop the running hb_client, it

will not restart again. Changes on the script can be made during
run-time without the need of restarting the server module. Just keep the
hb_client running.

Terminal: X-Mode only!

Broadcast (default)
Indirect
Direct
XDMCP Server:

If the Terminal is to be used as an X-Terminal the necessary XDMCP
settings MUST be completed. Input the IP address of the XDMCP Server to
DIRECTLY connect to in the field labeled XDMCP, or select **BROADCAST** to
receive a list of XDM capable hosts, available within your network, after
startup. Enable "**INDIRECT**" if the host selection is supplied via another server
in the network.

Font Server (default port: 7100):

Provide the IP address of a font server if external fonts are supposed to be
supplied to the terminal to extend its internal font set.

For font services a nfs server and nfs font path can be configured as well.

Terminal: C-Mode only!

Emulator:
Select one of the available emulators, depending on your hosts requirements.

Server Address:
If the terminal will be connected via a network connection, provide the IP
address of the host to connect to with the above selected emulator.

A valid session name **must** be provided. A valid session name is a freely single
word **without** any spaces. The default "New Session" is not a valid session
name!

Connect:
Select the method to connect to the host: network, com1, com2, or com x

If the Terminal is to be used as a character-based Terminal you can

select all emulator, screen and key-map options for the Emulator suite in this setup session.

To add a session click terminal icon on the left menu bar and then click ADD on the right screen. A new screen opens allowing to select a variety of different options for this session. After selecting all options click save settings and the option screen will be closed. On the main terminal screen you will now see the new session listed in the list box. You can edit or delete a sessions by clicking the EDIT or DELETE button accordingly.

Hint:

If multiple sessions with the same emulator are to be defined, the selected emulator may not show in the selection box after the first session had been defined and saved. To select the same emulator in any other session again, first select one other emulator first and then click the pull down menu again to select the correct emulator.

Multiple sessions can be addressed later during run-time via Alt-TAB (round robin) or directly via Alt-Fx, where the first defined session is F1, the second defined session is F2 and so on.

In addition, after switching to a new session the session name will be displayed briefly on the upper right corner of the screen.

Note:
In SCO-ANSI mode character auto-wrap mode is set to on.

Key mapping supports single character, single function (".", "/", "+" ...), and in addition ESC-sequence mapping for the function keys.

ESC-sequence mapping:
  Escape-sequences are for F1 - F12 only:
  \x1b\[OP equals ESC+[+O+P or
  \x0a equals a simple linefeed
  where
  \x describes a key code in hexadecimal code.

  This way almost any code (including spaces) can be assigned!

After all settings have been defined you need to reboot the unit to test your sessions. If more than one session has been defined you can switch between session screens by pressing "Alt-Tab", which takes you through the available sessions in a round-robin fashion.

Supported Printer Modes

BSD/lpd (on port 515)
JetDirect (on port 9100)
rsh (on port 514)
transparent (InStream) printing

Unlike most other Terminals and Thin Clients on the market, CXC supports multiple concurrent printers on all available ports. Select the print mode if a printer is to be attached to one or more of these ports.

LPT1
COM1
COM2
USB

Print Server supported on Linux or Unix Server side:

CUPs
lpr

"rsh" printing:

For rsh printing the the following sequence MUST be used:
cat <filename> | rsh <IP-Address of Terminal> LPT (COM1, COM2)

"filename" means a file that is formatted for a particular printer!

Note:
The embedded rsh daemon can only be used for printing! It is a proprietary software module that does not support any other functionality.

How does the printing work?

BSD/lpd on port 515: Once a printer is assigned in setup to LPT, COM1, COM2 or USB, the embedded lpd daemon will recognize this printer. On the server a network printer has to be setup. The procedure to do this depends on your Server OS! During setup you will be asked for the IP address of the network printe server and port. Type the IP address of the terminal and the port (LPT, COM1, COM2 or USB) where the printer is attached to. Your application should direct its printer output data to the network printer defined on your server.

JetDirect on port 9100 (LPT only): Once a printer (one only, since there is only one port 9100) is assigned in setup to LPT, the embedded JetDirect daemon will recognize this printer. On the server a JetDirect printer software has to be setup. The procedure to do this depends on your Server OS! Your software needs to support the JetDirect printing method.

To test the JetDirect printing on a Linux or Unix system type:

cat <filename of printer formatted print file> | netcat <IP address of terminal> 9100

"***rsh" printing on port 514:*** For rsh printing the the following sequence MUST be used:

cat <filename> | rsh <IP-Address of Terminal> LPT **or** COM1 **or** COM2 **or** USB)

The LPT (COM1, COM2, USB) statement at the end is needed and addresses the port related print queue.

"filename" means a file that is formatted for a particular printer!

Note:

If a port is used that does not have a printer assigned to it, the print job will still be accepted but rerouted to the NULL device and will therefore be lost. This avoids a hung system.

The embedded rsh daemon can only be used for printing! It is a proprietary software module that does not support any other functionality.

Screen

640 x 480 (C-Mode only!)
800 x 600
1024 x 768
1280 x 1024 (only on selected models)
1600 x 1200 (only on selected models)

Select the screen resolution, to be effective after the next reboot (setup always runs in 640x480 mode). All resolution settings refer to the standard VESA 2.x modes.

Mouse

PS/2 (default)
PS/2 wheel mouse
USB
USB wheel mouse

Select mouse type, keyboard and language settings.

NOTE:
The character-based terminal mode does not require a mouse to be connected at any time. A mouse (or other compatible pointing device) is always needed for X-Mode setup and run time.

Keyboard

US_[104_key]
Germany_[105_key]
Italian_[105_key]
Spanish_[105_key]
French_[105_key]
UK_[105_key]

Firmware Update

This unit supports a firmware update feature, allowing the replacement of the internal Flash-Linux based OS with a new revision. This procedure requires a stable network environment and can only be initiated locally on the unit itself. To start the update from within the web interface proved to be unpredictable causing the unit to become un-bootable at times, especially if the update procedure was unintentionally interrupted by an end user.

Local address [required]:
Provide temporary local IP address even if unit runs in DHCP mode! If unit runs in static IP mode the IP address selected here can be identical to the IP address used in normal operation mode.

TFTP server address:
Provide the IP address of the TFTP server that provides the new "firmware system files" in its root directory.

Procedure to setup the required tftp server on a Red Hat 8 and 9 Linux system

1) Copy the file in.tftpd to /usr/bin
2) Add the following lines at the end of the /etc/xinetd.conf file :

service tftp
{
socket_type = dgram
protocol = udp
wait = yes
user = root
instances = 8
server = /usr/sbin/in.tftpd
server_args = -s /tftpboot
}

3) Create the directory /tftpboot
4) Reboot the server or restart the inetd service.

Copy the update file update tar file you downloaded form our ftp server into this directory and decompress and unpack the file using the command

tar -zxvf <file name>

You will see two update files for the two HW platform we support. You also will see a md5.dat file and the "check" script to test the downloaded files for accuracy.

To run the "check" script type ./check. The script will test the files and display their status. The output should show "o.k." on all tested files.

TCP Ports, also called Port Redirection

COM1   TCP Port 3001
COM2   TCP Port 3002
LPT   TCP Port 3003

(USB is not available for direct port access via TCP!)

CXC-PortServer

For some peripheral (serial) devices (like POS pin-pads) it is desirable to address them directly via a port assignment.
For this reason we have developed the datad port server that can be downloaded from our WEB site. The included datad.conf file explains how to deploy the datad portserver daemon.

Sound Ports

This unit supports audio signals (sound) being sent from the application running on the server to the terminal and from the terminal to the application running on the server. The terminal provides TCP ports for this purpose. In the sound section of the X-Mode setup you will find certain sound quality setup options to control the local sound system. The stream channel is TCP port 9138 and the control channel, if enabled in setup, is TCP port 9139. The sound server has to be part of the application set that is running on the server.

Remote Administration

This unit supports a Web-based administration tool, allowing to adjust **certain terminal settings**. To invoke this tool you need to have a browser (we recommend Mozilla or Firefox) available within the network and you need to know the IP address of the terminal to be managed. In the browser's URL field please type:

http://<IP Address of the terminal>:8081

NOTE:
Since the user invoking the admin interface does not have any access to the terminals file system, it is not necessary to protect the setup with a password. We have found in many installations that password protecting a unit's setup is more trouble for system administrators than the occasional setup failure created by inexperienced end users. There is NO terminal window provided that would allow an end user to modify the units system via shell commands. The browser will display the unit setup screen, where all functions and settings for the active terminal mode can be changed.

Trouble Shooting

This unit is generally trouble free and most support calls are a result of configuration errors. Here is a list of common problems areas:

Unit has no DC power ("Power" LED not lit):
Replace unit.

Unit cannot boot but is turned on ("Power" LED on front panel is lit)
Filesystem on Flash Firmware is corrupted or destroyed, Flash Memory defective; call support for RMA number and return unit for repair.

Unit will start booting, but will not boot all the way up
Check if server IP is entered in setup for XDMCP (X-Mode) or Terminalserver (C-Mode); if server IP is present make sure that respective server is available and accepting connections. If unit does not allow access to setup, try accessing the setup via the units remote admin feature to correct the problem.

Unit cannot connect
DHCP server not available or responsive; check network connection and availability of DHCP services
Static IP address is not unique within the network segment; ping network to get a list of on-line IP adresses and make sure that your desired IP address is not in use by any other device.
Server (IP) to connect to is not available or wrong server IP
Network problem(s)

No screen output
Wrong monitor, non-VESA monitors may not sync correctly with unit's video modes. Replace monitor.
Video circuit defective; call support.
Wrong video mode selected in setup; check refresh rate for compatibility with selected monitor.

Printer does not work
Wrong printer protocol selected in units setup; contact your system administrator for information about print system in use and correct settings.
Server printer services mis-configured or not available, contact your system administrator.
Printer port defective; call support

WARRANTY AND R.M.A POLICY

Unless otherwise provided by law or specified in the Policy below, SmartFLeX Technology, Inc DISCLAIMS ANY AND ALL PROMISES, REPRESENTATIONS, AND WARRANTIES EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, WITH RESPECT TO ANY MATERIAL FURNISHED HEREUNDER, OR ANY COMPONENT THEREOF, INCLUDING THE CONDITION, THE CONFORMITY TO ANY REPRESENTATION OR DESCRIPTION, THE EXISTENCE OF ANY LATENT OR PATENT DEFECTS, AND THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE THEREFOR.

WARRANTY

Limited Warranty:

Within the time specified below, SmartFLeX Technology, Inc. (SmartFLeX Technology) warrants that its products are free from defects at the time of shipping. During warranty times, SmartFLeX Technology will repair or replace defective product. **SmartFLeX Technology is not liable for any consequential damages caused by the product and can not be held liable for original (parts) manufacturers discontinuing certain parts or not honoring warranty terms for whatever reason. Warranty is effective from the date of original invoice, issued by SmartFLeX Technology. SmartFLeX Technology's liability is limited to the purchase price of the merchandise.** Incompatibility reasons, shipping defects and are excluded.

Warranty will be voided for any one of the following reasons:

1. Warranty expiration

2. Manufacturer discontinues or does not honor warranty terms

3. Removal of the serial number or anti- tampering labels

4. Mishandling, tampering, improper use, and abuse of the product

5. Defects caused by natural disasters (lightning, water, EMS, etc.)

6. Improper or inadequate packing causing damages during return

7. Shipping defects

The terms of warranty are only countable to our direct customers.

a. Software: SmartFLeX Technology provides a life-time free update service for bug-fixes on SmartFLeX Technology developed software. Third party software is covered according to the respective manufacturers warranty terms.

b. Hardware: SmartFLeX Technology provides warranty services according to original Manufacturer's Warranty Policy.

RMA POLICY

General Policy

You must obtain a Return Merchandise Authorization (RMA) number before returning any item to us. To obtain an RMA number, please provide in writing via fax **(610-849-0186)** or e-mail (support@smartflextech.com) with the following requirements:

  a. Company name, (b) Contact person, (c) Description of the item to return, (d) Detailed reasons for the return, (e) Serial number of the item, (f) Copy of the invoice.

  b. A RMA number will be void if the item is not received by SmartFLeX Technology within fifteen working days upon issuance of the RMA number. Customers must pay for the return freight.

  c. Items sent to SmartFLeX Technology without an RMA as specified above will be refused to sender freight collect.

  d. All claims must be reported after 7 days receipt of open-boxed items.

  e. Items returned for repair, found to be not defective or operating within their specifications are subject to a $ 50.00 testing fee + return shipment fees.

DOA (Dead on Arrival/Defective) items must be received within 10 days from the invoice date for replacement.

Return for Credit

  a. Generally, all SALES ARE FINAL, and credit will only be considered after carefully evaluating the special circumstances involved.

  All return for credit must be processed through and agreed to by our sales department. A RMA number will not be issued for credit return.

  b. To receive credit, products must not be damaged or mishandled in any way, and must be returned within 30 days from the invoice date. Items returned for credit must be accompanied with a copy of the invoice and must be in their original packaging, including manuals, cables, accessories, if applicable, in substantially the same condition as purchased.

Shipping

All items are send back to customers via ground service, unless otherwise specified. Request for special delivery (air, overnight, 2nd day, or 3rd day) must be made in writing and will be made by cash on delivery (C.O.D.)

**Please note, that all retired items that cannot be repaired or replaced during Warranty might be reimbursed by an equivalent item, which could be repaired or refurbished by the original manufacturer.

The above warranty and policy are subject to change without notice.

After Warranty Services

After warranty repair is governed by the same rules and terms as described above under RMA policy. Parts, labor and return shipment costs will be invoiced and are due C.O.D. or according to set account credit terms. After warranty repair services can only be offered for products where parts are still available from the hardware manufacturer(s).

Product Registration

Products shipped are automatically registered in our central database. The following information is stored:

- Product Name

- Company Name of buyer

- Serial Number(s)

- Purchase date

Any warranty RMA requests will be compared to the entries in this database.

If you sell or resell the product to a third party, make sure that this third party re-registers with us by calling us at 610-849-0186.

The following information may be faxed to 610-849-0197 or e-mailed to sales@smartflextech.com instead:

- Product Name

- Serial Number(s) of unit
- Company Name
- Company Address
- Type of business
- Company Phone and Fax numbers
- Company URL and e-mail address of registrar
- Purchased from (reseller …) and when (date)

Support

For product installation support please call 610-849-0186 or better, e-mail to support@smartflextech.com.

Each product comes with a free 90 days installation support. Our support is limited to installation of the unit only. We do not provide server side configuration support as a free service.

Integration support and deployment consulting are available on request and will be billed at our hourly consulting rate.

Software License for SmartClient Products

SmartFLeX Technology, Inc.
31 Stonecroft Drive, Suite 105
Easton, PA 18045-2812, USA

Phone: +1 (610) 849-0196, Fax: +1 (610) 849-0197
http://www.smartflextech.com

Copyright © 2001 – 2006, SmartFLeX Technology, Inc.

SmartClient Products may contain software code protected by the GPL. This software code can be obtained as a copy on CD until 3 years after the product has reached its 'end of life' cycle. To obtain this GPL protected code please contact our sales department to order this fee-based service. The fee is not a payment for the software but a payment for our efforts to copy the software to a CD, label it and mail it to the customers destination.

The Flash Memory Disk containing the OS for this product contains copies of the GPL and LGPL.

Copies of GPL and LGPL can also be downloaded from our WEB sites download section for your convenience.

The Flash Memory Disk contains proprietary SmartFLeX Technology developed software. This software is protected by international copyright laws. The Flash Memory Disk cannot be copied by any electrical or mechanical means without written permission of SmartFLeX Technology, Inc.

The content of this Flash Memory Disk can only be accessed and 'read' to operate the terminal under normal operating conditions. It cannot be accessed or 'read' for any other means than operating the unit for its intended purpose.

The Flash Memory Disk Module cannot be sold individually without written permission of SmartFLeX Technology, Inc. The Flash Memory Disk can be sold individually without SmartFLeX Technology, Inc. permission only if its contents has been completely and unrecoverable erased.

A copy and eventually updated version of this Software License is also available in the copyright section of our WEB site at http://www.smartflextech.com.