

January 2008

BLACK BOX® *ServSwitch* DTX5000/5002



Welcome to the ServSwitch™ Family!

Thank you for purchasing a BLACK BOX® ServSwitch DTX system! We appreciate your business, and we think you'll appreciate the many ways that your new DTX System will save you money, time and effort.

The BLACK BOX® DTX system allows desktop users to access a full computer experience from anywhere on the corporate TCP/IP network, while maintaining the computers securely housed in a corporate data center. This desktop experience includes access for the desktop user to keyboard, mouse, both digital and analog video, and audio devices.

This solution can be deployed as a point-to-point extender system or may be over-laid on the standard 100 Mbps/1 Gbps TCP/IP network. The ServSwitch™ family from BLACK BOX—the one-stop answer for all your KVM switching needs!

*

This manual will tell you all about your new ServSwitch DTX system, including how to install, operate and troubleshoot it. For an introduction to the ServSwitch DTX system see Chapter 2.

**FEDERAL COMMUNICATIONS COMMISSION
AND INDUSTRY CANADA****RADIO-FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio-frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in the European standard EN55022. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses and can radiate radio-frequency energy, and if not installed and used in accordance with the instructions, might cause harmful interference to radio or television reception.

However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, you can correct the interference with one or more of the following measures:

- a. Reorient or relocate the receiving antenna.
- b. Increase the separation between the equipment and the receiver.
- c. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Consult the supplier or an experienced radio/TV technician for help.

USA Notification

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Notification

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

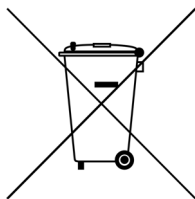
Japanese Approvals

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Safety and EMC Approvals and Markings

UL, FCC, cUL, VCCI, C-Tick

This equipment has also been found to comply with European standards EN50082 and EN60950.



Other Agency Approvals

USA (UL, FCC)

Canada (cUL, ICES-003)

European Union (CE)

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ServSwitch DTX5000/5002 User Guide



Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Dangerous Voltage

This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



Power On

This symbol indicates the principal on/off switch is in the on position.



Power Off

This symbol indicates the principal on/off switch is in the off position.



Protective Grounding Terminal

This symbol indicates a terminal which must be connected to earth ground prior to making any other connections to the equipment.

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1. Specifications

During the course of this product’s lifetime, modifications might be made to its hardware or firmware that could cause these specifications to change without notice.

DTX5000-R Product Specifications

Network	
Ethernet Standard	Ethernet II
IP Port Usage	Port 16384 - Video Port 16385 - Audio Port 16386 - Keyboard\Mouse Port 16387 - vMedia Ports 4463, 4464, 4465 - Control
Extension Ports	
Number	1
Connectors	RJ-45
User Ports	
Number	PS/2: 2; USB: 4; DVI-I video: 1; audio microphone: 1; audio line out: 1; power jack: 1
Type	PS/2, USB Type A, DVI-I video
Connectors	6-pin miniDIN, PS/2 keyboard and mouse; USB Type A, USB keyboard and mouse; DVI-I, female; 3.5 mm stereo audio jacks, line out and mic; 2.5 mm DC power jack.
Encryption	
Type	Authenticated SSL
Console Port	
Number	1
Type	Three-wire Serial interface: RX, TX, GND via 16450-compatible UART
Connectors	9-pin D-Shell (DB9)
Dimensions	
H x W x D	28 x 210 x 130 mm (1.10 x 8.27 x 5.12 in)
Weight	0.7 Kg (1.54 lb) without packaging, cables, power supply and literature

DTX5000-R Product Specifications (Continued)

Environmental	
Heat Dissipation	22 W/H
Power Consumption	20 W (including power supplied to USB ports)
AC-input power	100-240 V AC
AC-input current rating	1 A
AC-frequency	50/60 Hz
Operating Temperature	0° to 35° Celsius (32° to 95° Fahrenheit)
Storage Temperature	-20° to 60° Celsius (-4° to 140° Fahrenheit)
Transit Temperature	-30° to 60° Celsius (-22° to 140° Fahrenheit)
Operating Humidity	10 to 90% noncondensing
Storage Humidity	5 to 95%
Supported Hardware	
Peripherals	PS/2 keyboard and mouse, USB keyboard and mouse, speakers, microphone
Keyboard	Standard 104/105/109 keyboards for PC, Macintosh, and Sun USB keyboards for PC, Macintosh and Sun Default keyboard drivers are fully supported for Microsoft Windows, MacOS, Solaris and Red Hat Linux
Mouse	2-, 3-, and 5-button; scroll and tilt wheel
Mass Storage Devices	All Mass Storage Class devices that use: SCSI Mass Storage subclass Bulk Only Transfer Protocol

DTX5000-R Product Specifications (Continued)

Video Resolution	640 x 350 @ 85 Hz
	640 x 480 @ 60 Hz
	640 x 480 @ 72 Hz
	640 x 480 @ 75 Hz
	640 x 480 @ 85 Hz
	720 x 400 @ 70 Hz
	720 x 400 @ 85 Hz
	800 x 600 @ 60 Hz
	800 x 600 @ 72 Hz
	800 x 600 @ 75 Hz
	800 x 600 @ 85 Hz
	1024 x 768 @ 60 Hz
	1024 x 768 @ 70 Hz
	1024 x 768 @ 75 Hz
	1024 x 768 @ 85 Hz
	1152 x 864 @ 75 Hz
	1280 x 960 @ 60 Hz
	1280 x 1024 @ 60 Hz

The following widescreen resolutions are also supported:

1360 x 768 @ 60 Hz
 1280 x 720 @ 50 Hz
 1280 x 720 @ 60 Hz

Check www.blackbox.com for the latest list of supported video resolutions and refresh rates.

Video Standard	DDC version 2B
----------------	----------------

Color Depth	24 Bit
-------------	--------

Audio Standard	PC99
----------------	------

Audio Performance

High Performance	Line out: 44.1 kHz over stereo channels at a resolution of 16 bits
------------------	---

Microphone: 44.1 kHz over a single channel at a resolution of 16 bits
--

Medium Performance	Line out: 8 kHz over stereo channels at a resolution of 16 bits
--------------------	--

Microphone: 8 kHz over a single channel at a resolution of 16 bits

Target Sync Types (Analog output only)	Separate horizontal and vertical
---	----------------------------------

Safety and EMC Approvals and Markings	UL, FCC, cUL, VCCI, C-Tick
--	----------------------------

DTX5000-T Product Specifications

Network	
Ethernet Standard	Ethernet II
Extension Ports	
Number	1
Connectors	RJ-45
Computer Ports	
Number	USB: 2; DVI-I video: 1; audio microphone: 1; audio line out: 1
Type	USB Type A, DVI-I video
Connectors	USB, male; DVI-I, male; 3.5 mm stereo audio jacks, line out and mic; 2.5 mm DC power jack.
Encryption	
Type	Authenticated SSL
Dimensions	
H x W x D	68 x 21 x 153 mm (2.68 x 0.83 x 6.02 in)
Weight	0.3 Kg (0.66 lb) including cables
Environmental	
Heat Dissipation	22 W/H
Power Consumption	6 W
AC-input power	100-240 V AC
AC-input current rating	1 A
AC-frequency	50/60 Hz
DC-input power	5 V
DC-input current rating	1.1 A
Operating Temperature	0° to 35° Celsius (32° to 95° Fahrenheit)
Storage Temperature	-20° to 60° Celsius (-4° to 140° Fahrenheit)
Transit Temperature	-30° to 60° Celsius (-22° to 140° Fahrenheit)
Operating Humidity	10 to 90% noncondensing
Storage Humidity	5 to 95%

DTX5000-T Product Specifications (Continued)**Supported Hardware**

Video Resolution	640 x 350 @ 85 Hz
	640 x 480 @ 60 Hz
	640 x 480 @ 72 Hz
	640 x 480 @ 75 Hz
	640 x 480 @ 85 Hz
	720 x 400 @ 70 Hz
	720 x 400 @ 85 Hz
	800 x 600 @ 60 Hz
	800 x 600 @ 72 Hz
	800 x 600 @ 75 Hz
	800 x 600 @ 85 Hz
	1024 x 768 @ 60 Hz
	1024 x 768 @ 70 Hz
	1024 x 768 @ 75 Hz
	1024 x 768 @ 85 Hz
	1152 x 864 @ 75 Hz
	1280 x 960 @ 60 Hz
	1280 x 1024 @ 60 Hz

The following widescreen resolutions are also supported:

1360 x 768 @ 60 Hz
 1280 x 720 @ 50 Hz
 1280 x 720 @ 60 Hz

Check www.blackbox.com for the latest list of supported video resolutions and refresh rates.

Video Standard	DDC version 2B
----------------	----------------

Color Depth	24 Bit
-------------	--------

Audio Standard	PC99
----------------	------

Audio Performance

High Performance	Line out: 44.1 kHz over stereo channels at a resolution of 16 bits
	Microphone: 44.1 kHz over a single channel at a resolution of 16 bits

Medium Performance	Line out: 8 kHz over stereo channels at a resolution of 16 bits
	Microphone: 8 kHz over a single channel at a resolution of 16 bits

Target Sync Types (Analog input only)	Separate horizontal and vertical
--	----------------------------------

DTX5000-T Product Specifications (Continued)

EDID table settings	Normal aspect or wide screen resolutions
Safety and EMC Approvals and Markings	UL, FCC, cUL, VCCI, C-Tick

DTX5002-R Product Specifications

Network	
Ethernet Standard	Ethernet II
IP Port Usage	Port 16384 - Video Port 16388 - Video Port 16385 - Audio Port 16386 - Keyboard/Mouse Port 16387 - vMedia Ports 4463, 4464, 4465 - Control
Extension Ports	
Number	1
Connectors	RJ-45
User Ports	
Number	USB: 4; DVI-I video: 2; audio line out: 1; power jack: 1
Type	USB Type A, DVI-I video
Connectors	USB Type A, USB keyboard and mouse; DVI-I, female; 3.5 mm stereo audio jack, line out; 2.5 mm DC power jack.
Encryption	
Type	Authenticated SSL
Console Port	
Number	1
Type	Three-wire Serial interface: RX, TX, GND via 16450-compatible UART
Connectors	9-pin D-Shell (DB9)
Dimensions	
H x W x D	28 x 210 x 154 mm (1.10 x 8.27 x 6.06 in)
Weight	0.95 Kg (2.09 lb) without packaging, cables, power supply and literature

DTX5002-R Product Specifications (Continued)

Environmental	
Heat Dissipation	22 W/H
Power Consumption	20 W (including power supplied to USB ports)
AC-input power	100-240 V AC
AC-input current rating	1 A
AC-frequency	50/60 Hz
Operating Temperature	0° to 35° Celsius (32° to 95° Fahrenheit)
Storage Temperature	-20° to 60° Celsius (-4° to 140° Fahrenheit)
Transit Temperature	-30° to 60° Celsius (-22° to 140° Fahrenheit)
Operating Humidity	10 to 90% noncondensing
Storage Humidity	5 to 95%
Supported Hardware	
Peripherals	USB keyboard and mouse, speakers
Keyboard	Standard 104/105/109 keyboards for PC, Macintosh and Sun USB keyboards for PC, Macintosh and Sun Default keyboard drivers are fully supported for Microsoft Windows, MacOS, Solaris and Red Hat Linux
Mouse	2-, 3-, and 5-button; scroll and tilt wheel
Mass Storage Devices	All Mass Storage Class devices that use: SCSI Mass Storage subclass Bulk Only Transfer Protocol

DTX5002-R Product Specifications (Continued)

Video Resolution	640 x 350 @ 85 Hz
	640 x 480 @ 60 Hz
	640 x 480 @ 72 Hz
	640 x 480 @ 75 Hz
	640 x 480 @ 85 Hz
	720 x 400 @ 70 Hz
	720 x 400 @ 85 Hz
	720 x 480 @ 60 Hz
	800 x 600 @ 60 Hz
	800 x 600 @ 72 Hz
	800 x 600 @ 75 Hz
	800 x 600 @ 85 Hz
	1024 x 768 @ 60 Hz
	1024 x 768 @ 70 Hz
	1024 x 768 @ 75 Hz
	1024 x 768 @ 85 Hz
	1152 x 864 @ 75 Hz
	1280 x 960 @ 60 Hz
	1280 x 1024 @ 60 Hz
	1600 x 1200 @ 60 Hz

The following widescreen resolutions are also supported:

1360 x 768 @ 60 Hz
 1280 x 720 @ 50 Hz
 1280 x 720 @ 60 Hz
 1440 x 900 @ 60 Hz
 1920 x 1200 @ 60 Hz (DVI Monitor only)

Check www.blackbox.com for the latest list of supported video resolutions and refresh rates.

Video Standard	DDC version 2B
Color Depth	24 Bit
Audio Standard	PC99
Audio Performance	
High Performance	Line out: 44.1 kHz over stereo channels at a resolution of 16 bits
Medium Performance	Line out: 8 kHz over stereo channels at a resolution of 16 bits
Target Sync Types (Analog output only)	Separate horizontal and vertical
Safety and EMC Approvals and Markings	UL, FCC, cUL, VCCI, C-Tick

DTX5002-T Product Specifications

Network	
Ethernet Standard	Ethernet II
Extension Ports	
Number	1
Connectors	RJ-45
Console Ports	
Number	USB: 1; DVI-I video: 2; audio line out: 1
Type	USB Type A, DVI-D video
Connectors	USB, male; DVI-I, male; 3.5 mm stereo audio jack, 2.5 mm DC power jack.
Encryption	
Type	Authenticated SSL
Dimensions	
H x W x D	28 x 127 x 200 mm (1.10 x 5.00 x 7.87 in)
Weight	0.75 Kg (1.65 lb) including cables
Environmental	
Heat Dissipation	22 W/H
Power Consumption	20 W
AC-input power	100-240 V AC
AC-input current rating	1 A
AC-frequency	50/60 Hz
DC-input power	5 V
DC-input current rating	1.1 A
Operating Temperature	0° to 35° Celsius (32° to 95° Fahrenheit)
Storage Temperature	-20° to 60° Celsius (-4° to 140° Fahrenheit)
Transit Temperature	-30° to 60° Celsius (-22° to 140° Fahrenheit)
Operating Humidity	10 to 90% noncondensing
Storage Humidity	5 to 95%

DTX5002-T Product Specifications (Continued)

Supported Hardware

Video Resolution	640 x 350 @ 85 Hz
	640 x 480 @ 60 Hz
	640 x 480 @ 72 Hz
	640 x 480 @ 75 Hz
	640 x 480 @ 85 Hz
	720 x 400 @ 70 Hz
	720 x 400 @ 85 Hz
	720 x 480 @ 60 Hz
	800 x 600 @ 60 Hz
	800 x 600 @ 72 Hz
	800 x 600 @ 75 Hz
	800 x 600 @ 85 Hz
	1024 x 768 @ 60 Hz
	1024 x 768 @ 70 Hz
	1024 x 768 @ 75 Hz
	1024 x 768 @ 85 Hz
	1152 x 864 @ 75 Hz
	1280 x 960 @ 60 Hz
	1280 x 1024 @ 60 Hz
	1600 x 1200 @ 60 Hz

The following widescreen resolutions are also supported:

1360 x 768 @ 60 Hz
 1280 x 720 @ 50 Hz
 1280 x 720 @ 60 Hz
 1440 x 900 @ 60 Hz
 1920 x 1200 @ 60 Hz (DVI Monitor only)

Check www.blackbox.com for the latest list of supported video resolutions and refresh rates.

Video Standard	DDC version 2B
----------------	----------------

Color Depth	24 Bit
-------------	--------

Audio Standard	PC99
----------------	------

Audio Performance

High Performance	Line out: 44.1 kHz over stereo channels at a resolution of 16 bits
------------------	---

Medium Performance	Line out: 8 kHz over stereo channels at a resolution of 16 bits
--------------------	--

Target Sync Types (Analog input only)	Separate horizontal and vertical
--	----------------------------------

EDID table settings	Normal aspect or wide screen resolutions
----------------------------	--

Safety and EMC Approvals and Markings	UL, FCC, cUL, VCCI, C-Tick
--	----------------------------

1.1 Factory Default Settings

Black Box ServSwitch DTX5000 Extender

DTX Receiver	
Name	RX_<MAC address>
IP Address	192.168.13.1
Default Gateway	0.0.0.0
Netmask	255.255.255.0
OSD Hotkey Sequence	PRINT SCREEN
OSD Inactivity Timer	00 hours 10 minutes
OSD Inactivity Check Box	Enabled
Session Inactivity Timer	00 hours 10 minutes
Session Inactivity Check Box	Disabled
Session Retry Timeout	1 second
Audio Performance	Medium
Network Speed	Auto-Negotiate
Password	'password'
Appliance Mode	Extender
Static/DHCP Network Configuration	Static
DTX Transmitter	
Name	TX_<MAC address>
IP Address	192.168.13.2
Default Gateway	0.0.0.0
Netmask	255.255.255.0
Audio Performance	Medium
Network Speed	Auto-Negotiate
Password	'password'
Video	DVI - Normal
Video Performance	5

Bandwidth Management	Unlimited
----------------------	-----------

Static/DHCP Network Configuration	Static
-----------------------------------	--------

Black Box ServSwitch DTX5002 Extender

DTX Receiver

Name	RX_<MAC address>
------	------------------

IP Address	192.168.13.1
------------	--------------

Default Gateway	0.0.0.0
-----------------	---------

Netmask	255.255.255.0
---------	---------------

OSD Hotkey Sequence	PRINT SCREEN
---------------------	--------------

OSD Inactivity Timer	00 hours 10 minutes
----------------------	---------------------

OSD Inactivity Check Box	Enabled
--------------------------	---------

Session Inactivity Timer	00 hours 10 minutes
--------------------------	---------------------

Session Inactivity Check Box	Disabled
------------------------------	----------

Session Retry Timeout	1 second
-----------------------	----------

Audio Performance	Medium
-------------------	--------

Network Speed	Auto-Negotiate
---------------	----------------

Password	'password'
----------	------------

Appliance Mode	Extender
----------------	----------

Static/DHCP Network Configuration	Static
-----------------------------------	--------

DTX Transmitter

Name	TX_<MAC address>
------	------------------

IP Address	192.168.13.2
------------	--------------

Default Gateway	0.0.0.0
-----------------	---------

Netmask	255.255.255.0
---------	---------------

Audio Performance	Medium
-------------------	--------

Network Speed	Auto-Negotiate
---------------	----------------

Black Box ServSwitch DTX5002 Extender

Password	'password'
Video	DVI
Video Performance	5
Bandwidth Management	Unlimited
Static/DHCP Network Configuration	Static

2. Product Overview

2.1 Introduction

The Black Box ServSwitch Extender provide users with a full computer desktop experience from anywhere on the corporate TCP/IP network, while maintaining the computers securely housed in a corporate data center. This desktop experience includes access for the desktop user to keyboard, mouse, video, audio and USB mass storage devices.

The Black Box ServSwitch DTX5000 can operate in two modes - Extender Mode and Desktop Mode.

The Black Box ServSwitch DTX5002 operates *only* in Extender Mode.

In Extender Mode the platform auto-connects a transmitter to a receiver on a point-to-point link. The Black Box ServSwitch DTX™ Control (Management Appliance) is not required as part of the system.

In Desktop Mode a user can connect from a receiver to any transmitter on the network - either to a specific transmitter or one from a list of transmitters. The specific transmitter or list of transmitters being connected to is configured by the administrator on the Management Appliance. The Management Appliance is a web server application that can be accessed by the administrator through a standard web browser.

If the user has access to a list of transmitters, then a specific one from the list can be selected from the On-Screen Display (OSD) of the receiver.

The administrator can change the mode of a receiver to Extender or Desktop via serial port CLI.

This manual refers to the list of products in Table 1.1.

Table 1.1: List of Products

Name	Model
Management Appliance	Black Box ServSwitch DTX™ Control
Transmitter	DTX5000-T, DTX5002-T
Receiver	DTX5000-R, DTX5002-R
DTX5000 Extender	ServSwitch DTX5000
DTX5002 Extender	ServSwitch DTX5002
ServSwitch Extender	DTX5000 Digital Extender, DTX5002 Digital Extender

2.2 Features and Benefits

The Black Box ServSwitch Extender consists of:

- The transmitter that connects externally to the remote computer
- The receiver that is located at the user's desk

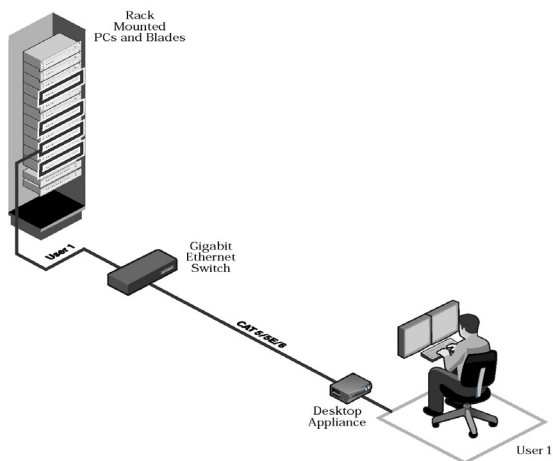


Figure 2-1. Black Box ServSwitch Extender

Management Appliance

The Black Box ServSwitch DTX™ Control (Management Appliance) is a web browser-based management solution that allows administrators to remotely manage and monitor networks of receivers and transmitters (units) that comprise the ServSwitch Extender system.

Using the Management Appliance, an administrator can add units, view and edit unit properties and initiate a variety of other operations.

NOTE:

The ServSwitch DTX5002 operates in Extender Mode only.

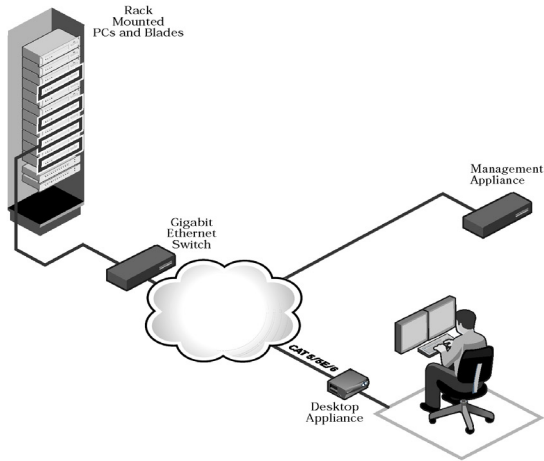


Figure 2-2. Black Box ServSwitch Extender System - Desktop Mode

Transmitter

The DTX Transmitter connects externally to the video, audio and USB port(s) of the remote computer.

The Black Box DTX5000-T transmitter is attached directly to the remote computer and draws its power directly from two USB ports on the remote computer.

NOTE:

If the remote computer cannot supply the required power or if two USB connections are not available, an external power supply (part no. DTX5000-PSU) can be obtained from Black Box.

The Black Box DTX5002 Extender Transmitter is powered by an external power supply. The transmitter captures, compresses and encrypts the computer's media streams and transmits them to the DTX Receiver over a standard TCP/IP network.

Receiver

The receiver enables the desktop user's keyboard, mouse, video, audio and mass storage devices to connect to the Black Box ServSwitch Extender. It is available as a desktop user station.

Automatic connection

In Extender Mode when the receiver is powered up, a connection is automatically established with the remote computer via the transmitter. No intervention is required from the user. See "Accessing the System" on page 36.

In Desktop Mode the receiver and transmitter reside on an IP network and a Management Appliance is present. The user gains access to their target PC by logging into any receiver

on the network. A user can have a fixed (configurable) association with a specific target device or have access to a number of target devices. The user may choose which target device to connect to by selecting from the On-Screen Display (OSD).

NOTE:

In Desktop Mode the administrator uses the Management Appliance to configure the target transmitter.

A transmitter is associated with a specific user, in which case the transmitter is independent of the receiver used, or a specific receiver can be configured to connect to a specific transmitter, independent of the user using the receiver.

Autologin

When in Desktop Mode 'autologin' can be enabled by the administrator. In this scenario the administrator sets the relationship so that the user has to use a specific receiver. Then when the user powers up this receiver they automatically gain access to their target PC. For further details see Chapter 3, *Black Box ServSwitch DTX™ Control User Guide*.

Ethernet addressing

The receiver and the transmitter are IP-addressable devices; this gives you the flexibility to locate back-racked computers anywhere within your enterprise and at any distance from your desktop users. The receiver and the transmitter use standard network protocols to transfer data streams between the remote computer and the peripheral devices located at the user's desk. The Black Box ServSwitch Extender can operate on a network connection of 100 Mbps or 1 Gbps. For optimum performance a 1 Gbps connection is recommended. For further information see Chapter 3.

Interface to external system

The Black Box ServSwitch Extender System interfaces to a DHCP server. In Desktop and Extender Modes the receiver and transmitter can obtain their IP address data from a DHCP server.

Multiplatform support

The transmitter is connected to the remote computer via USB connectors. This enables the Black Box ServSwitch Extender to interoperate seamlessly with PC, Sun and Macintosh target computers. PC, Sun and Macintosh USB keyboards can be connected to the receiver. PS/2 keyboards and mice can also be used.

You can attach the Black Box ServSwitch Extender to computers running the following operating systems:

- Microsoft Windows™
- Linux
- Solaris
- Microsoft Windows Vista™
- MacOS

The default keyboard drivers for these operating systems are fully supported by the Black Box ServSwitch Extender.

Flexible installation

The Black Box ServSwitch Extender provides you with the following flexible installation options:

- The receiver can be desk mounted or mounted on the back of a monitor
- Installation requires no new drivers or software
- Standard UTP cabling makes installation simple and keeps costs low

Security

The Black Box ServSwitch Extender supports Secure Sockets Layer (SSL) over a TCP/IP connection. All media streams transmitted between the receiver and the transmitter are encrypted. Password protection is also provided to control access to all administration functions, such as network configuration. See “Authentication” on page 52.

On-Screen Display (OSD)

The receiver includes an OSD that allows you to view information about the configuration of your system. See “The OSD” on page 36.

Operations administration and maintenance

The receiver incorporates a serial menu that allows you to perform administration and maintenance tasks for both the receiver and the transmitter. Examples of tasks you can perform include configuration of network settings and firmware Flash upgrades. See “The Serial Menu” on page 41.

If you are in Desktop Mode, the Management Appliance application forms the operations, administration and maintenance interface for the Black Box ServSwitch Extender System. It also manages authentication, authorization, initiation and removal of media sessions between the receiver and transmitter.

NOTE:

For more information see *Black Box ServSwitch DTX™ Control User Guide*

Flash upgradeable

Upgrade your firmware at any time using the XMODEM or HTTP protocols to ensure that your Black Box ServSwitch Extender is always running the most current version available. Both the transmitter and the receiver are Flash upgradeable. See “Flash Upgrading your Black Box ServSwitch Extender” on page 56.

Upgrades can also be carried out via the Management Appliance.

Support for keyboards and mice

USB and PS/2 keyboards and mice are fully supported by the Black Box ServSwitch Extender. The system also allows for mix and match of USB and PS/2 peripherals. For example, it is possible to use a USB keyboard in conjunction with a PS/2 mouse. The default keyboard and mouse drivers of the remote computer are fully supported. This enables the Black Box ServSwitch Extender to support 2-, 3- and 5-button mice with scroll- and tilt-wheel capability. Composite mouse and keyboard devices are also supported.

USB support

The Black Box ServSwitch Extender is compatible with the USB 2.0 standard. The receiver provides four USB 2.0 compliant ports that can be used to access USB keyboards and mice. Hot-plugging of USB devices is supported.

NOTE:

A hub cannot be used to expand the number of USB ports available.

The DTX5000 transmitter provides two USB interfaces:

- One is a low/full speed port that is used for all keyboard and mouse peripheral devices interfacing with the target PC, along with providing power for the transmitter.
- The other is a high-speed port that is used for virtual media (mass storage devices) peripheral devices interfacing with the target PC, along with providing power for the transmitter (this power supply option is applicable only to the DTX5000 Transmitter).

The DTX5002 provides the same interfaces as the DTX5000 but one USB cable, using an integrated hub in the transmitter.

Virtual media

Mass storage devices, such as removable drives and external CD-ROM drives, can be attached to the receiver and will function as if they are directly connected to the remote computer. Data can be both read from and written to these mass storage devices. You can connect both a removable drive and an external drive at any one time to the receiver.

The transfer speed between the mass storage device and the remote computer is dependant on the Ethernet network. A 1 Gbps connection is required for high-performance virtual media transfer. The system is capable, however, of operating over a 100 Mbps Ethernet connection.

The following mass storage devices are supported:

- Removable drives
- External USB hard drives
- External USB CD-ROM drives
- External USB DVD-ROM drives
- USB memory sticks

Hot plugging of USB mass storage devices is supported.

NOTE:

The system supports the default drivers for mass storage devices.

Audio

The Black Box ServSwitch Extender supports CD-quality stereo from the remote computer to peripheral speakers, and mono-quality audio from a peripheral microphone to the remote computer.

The Black Box ServSwitch DTX5002 Extender supports CD-quality stereo from the remote computer to peripheral speakers.

Video

Video of 24-bit color depth up to a resolution of 1280 x 1024 at 60 Hz is supported by the Black Box ServSwitch Extender. Both CRT and flat-panel LCD monitors are supported, and can be connected to the Black Box ServSwitch Extender via a DVI-I video connector. For the Black Box Extender VGA monitors can be attached to the system by using a DVI to VGA adaptor. The system supports DDC version 2B.

The DTX5002 Extender supports video of 24-bit color depth up to a resolution of 1920x1200 at 60 Hz. At the transmitter only DVI-D PC video sources are supported. However, as DVI-I is supported at the receiver a VGA adapter can be used to connect to a VGA monitor.

Screen aspect ratio

The transmitter can be configured through the serial console to allow either normal aspect resolutions or wide screen resolutions as the preferred setting on its EDID table.

Bandwidth usage (DTX5000 only)

It is possible to restrict the aggregate bandwidth used on the Ethernet link from the serial console. The bandwidth options are:

- Unlimited
- 100MBits/s
- 50MBits/s
- 20MBits/s
- 10MBits/s

Reduced Total Cost of Ownership (TCO)

The Black Box ServSwitch Extender delivers significantly lower TCO when compared to traditional distributed computer systems. Centralized maintenance enables greater security and convenience as well as reduced workplace disruption and down-time.

IT administration costs are also significantly reduced by housing all PCs in one central location. Relocating the computer away from the user frees up valuable office space and reduces desktop power and heating, ventilation and air conditioning (HVAC) requirements.

2.3 Safety Precautions

To avoid potential video and/or keyboard problems when using Black Box products:

- If the building has 3-phase AC power, ensure that the computer and monitor are on the same phase. For best results, they should be on the same circuit.

To avoid potentially fatal shock hazard and possible damage to equipment, please observe the following precautions:

- Do not use a 2-wire extension cord in any Black Box product configuration.
- Test AC outlets at the computer and monitor for proper polarity and grounding.
- Use only with grounded outlets at both the computer and monitor. When using a backup Uninterruptible Power Supply (UPS), power the computer and the transmitter off the same supply.

NOTE:

The AC inlet is the main disconnect.

3. Installation

3.1 Getting started with the Black Box ServSwitch Extender

Before installing your Black Box ServSwitch Extender, refer to the list below to ensure that you have all the items necessary for installation.

NOTE:

For installation of the Management Appliance, see *Black Box ServSwitch DTX™ Control User Guide*.

Needed to install the Black Box ServSwitch Extender

- Receiver
- Transmitter
- External power supply for the receiver
- IEC power cord
- Black Box ServSwitch Extender Quick Installation Guide
- UTP cable (not supplied)
- Three-wire serial cable or null modem cable (not supplied)

Needed for non-standard installations

To connect a VGA monitor to the receiver:

- A DVI to VGA adaptor (not supplied)

To connect the transmitter to a remote computer that has VGA video output:

- A VGA to DVI-I adaptor (not supplied)

To connect the transmitter to a remote computer that has DVI-D video output:

- A DVI-D to DVI-I adaptor (not supplied)

To power the transmitter if a remote computer does not have two available USB ports:

- A DTX5000-PSU power supply (not supplied)

3.2 Mounting Option

The receiver features the following mounting option that allows you to adapt easily to most work environments:

- Mounting to the rear of a flat-panel monitor via a mounting plate accessory

NOTE:

Mounting accessories are ordered separately. Contact Black Box for more information.

3.3 Installation Options



CAUTION:

To reduce the risk of electric shock or damage to your equipment, disconnect the power from the receiver by unplugging the power supply from the electrical outlet.

**CAUTION:**

To reduce the risk of electric shock or damage to your equipment, power up the remote computer and the receiver in the order described in the following procedures.

You can install the Black Box ServSwitch Extender in one of two ways:

1. Point-to-point
2. Networked

Point-to-point installation

The following instructions will enable you to install your Black Box ServSwitch Extender in a point-to-point configuration. In a point-to-point configuration no administrator setup of the transmitter or the receiver is required. This enables you to install the system quickly, directly out-of-the-box. However, if you choose the point-to-point configuration you can install only one transmitter and receiver pair on a subnet. If you use this configuration you must also locate both the transmitter and the receiver on the same subnet.

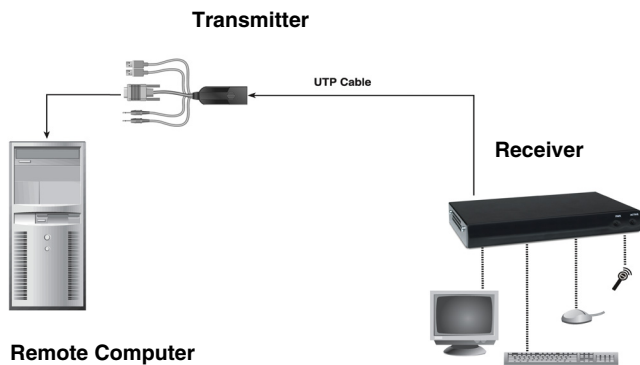


Figure 3-1. Point-to-point Installation

To connect the transmitter:

Before connecting the transmitter to the remote computer, ensure that the resolution and the refresh rate of the remote computer are supported by the Black Box ServSwitch Extender system. Set the screen resolution and refresh rate of the remote computer according to Table . Unsupported settings will cause blank video at the receiver.

NOTE:

For new information on supported resolutions and refresh rates see www.blackbox.com

1. Power down the remote computer.
2. The transmitter has two USB connectors. Connect each of these connectors to a corresponding USB port on the remote computer.

NOTE:

The transmitter provides two USB interfaces:

3. Connect the video connector on the transmitter to the appropriately labeled port on the back of the computer.

NOTE:

A VGA-only computer can be connected to the transmitter using a VGA to DVI-I adaptor. You must configure the transmitter video settings for VGA through the serial menu. For more information see "Configuring Video Input Settings" on page 63.

4. Connect the transmitter's audio and microphone connectors to the appropriately labeled ports on the back of the computer.

NOTE:

For CD-quality audio, you must configure the transmitter and the receiver using the serial menu. For more information see "Audio Performance Settings" on page 68.

5. Connect the UTP cable to the transmitter's RJ-45 connector.
6. Power up the computer.
7. Route the other end of the UTP cable to the location you have chosen for the receiver. If necessary you can extend the UTP cable via junctions or a hub - subject to normal Ethernet cabling practices.

The transmitter draws electrical power from two USB ports on the remote computer. One USB port is not sufficient to power the transmitter. If you have only one USB port on your remote computer, you will need to order an external power supply for the transmitter from Black Box.

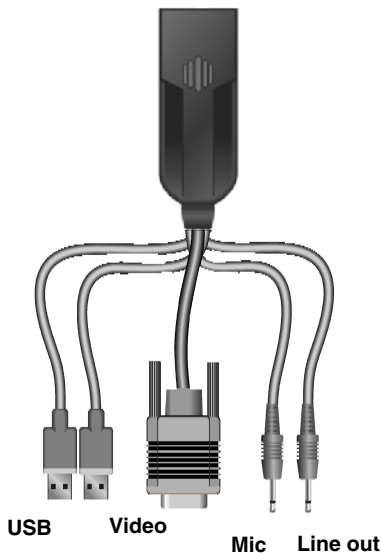


Figure 3-2. Transmitter

To connect the receiver:

1. Connect your keyboard, monitor, mouse and other peripherals cables to the appropriately labeled ports on the back of the receiver.
2. Connect the UTP cable to the RJ-45 port on the back of the receiver.

- Power up the receiver. A connection will be automatically established with the remote computer.

NOTE:

VGA monitors can be connected to the receiver by using a DVI-I to VGA adaptor.

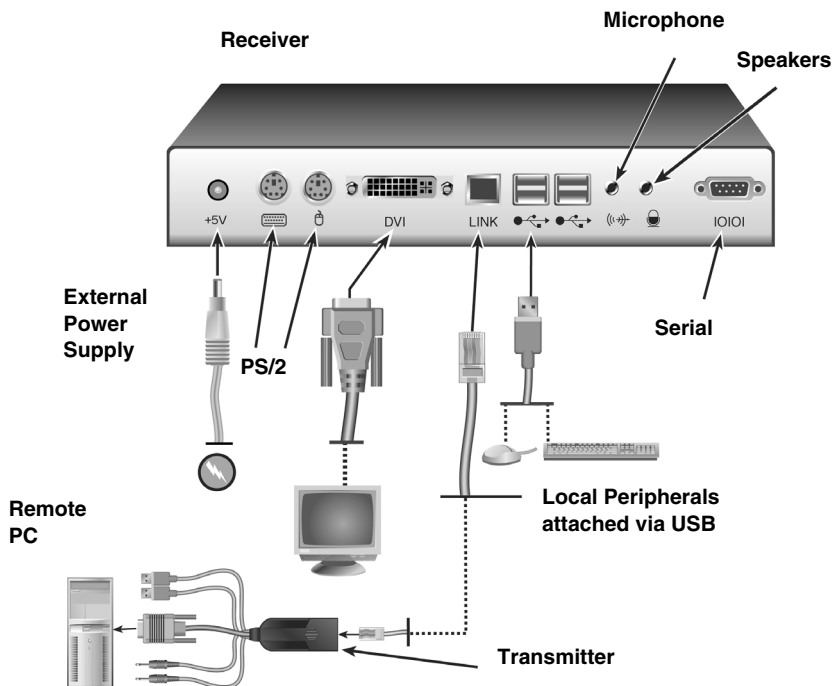


Figure 3-3. Receiver and transmitter Installation

Connecting Power

The receiver features an external power supply. A DC power jack is located on the rear of the receiver.

NOTE:

Use only the power supply provided by Black Box.

To connect power to the receiver:

- Plug the external power supply's 2.5mm connector into the DC power jack on the rear of the receiver.
- Connect the detachable IEC power cord to the power supply.
- Plug the IEC power cord into an appropriate wall outlet.

Networked Installation

The following instructions will enable you to install your Black Box ServSwitch Extender in a networked configuration. In this installation, multiple transmitters and receivers are attached via the same Ethernet network. In this case, it is important for each unit to be configured with a unique IP address.

NOTE:

In Desktop and Extender Modes the receiver and transmitter can obtain their IP address data from a DHCP server.

Transmitters and receivers may be configured for use on a single subnet or for use across routers. Use of routers, however, will cause a slight increase in end-to-end latencies, which may not be acceptable for all applications.

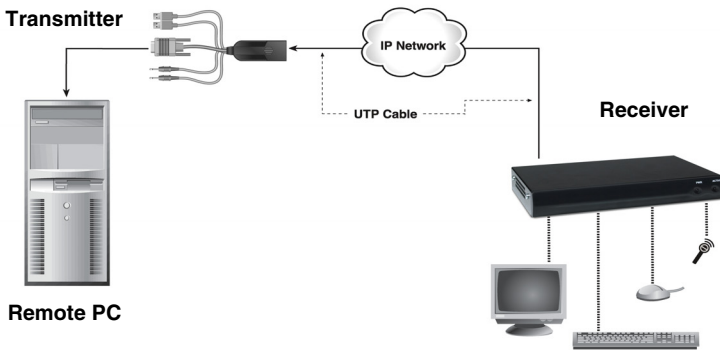


Figure 3-4. Networked Installation

The Black Box ServSwitch Extender has been pre-configured with factory-default network settings. If you install only one Black Box ServSwitch Extender on a subnet, you do not need to change these default network settings. If you install multiple units on the same subnet, you will need to assign a unique IP address to each unit or configure them for DHCP. This can be done via the serial port and must be carried out before displaying multiple devices on the same network.

NOTE:

The DHCP server must be configured to assign IP addresses to the unit that do not expire.

NOTE:

Do not change the mode to DHCP unless the equipment is connected to a DHCP server.

See “The Serial Menu” on page 41

Default network settings

Component	IP Address	Type	Default Gateway	Subnet Mask
Receiver	192.168.13.1	static	0.0.0.0	255.255.255.0
Transmitter	192.168.13.2	static	0.0.0.0	255.255.255.0

To install the Black Box ServSwitch Extender on a network:

1. Connect the transmitter to the remote computer as described previously in “Point-to-point installation” on page 24. Connect one end of the UTP cable to the transmitter’s RJ-45 connector. Connect the other end of the UTP cable to the Ethernet network.
2. Connect the receiver to the peripherals as described above in “Point-to-point installation” on page 24. Use a length of UTP cable to connect the receiver to the Ethernet network via the RJ-45 connector on the rear of the receiver.
3. Power up the receiver. A connection will be automatically established with the remote computer.
4. Use the serial menu to re-configure the network settings for the transmitter. For more information on how to do this see “Configuring Network Settings” on page 43.

NOTE:

If the receiver and transmitter are to be located on different subnets, configure their network settings before you connect to the network.

NOTE:

If there are already transmitter/receiver pairs operating on the subnet, configure network settings of new transmitter/receiver pairs before connecting them to the network.

5. Use the serial menu to re-configure the network settings for the receiver. For more information on how to do this see “Configuring Network Settings” on page 43.
6. Repeat this procedure for each transmitter and receiver pair you wish to install on the network.

To install the Black Box ServSwitch Extender on a network in Desktop Mode:

1. Ensure that each transmitter and receiver has a unique IP address.
2. From the ServSwitch DTX Control discover and add the units to the Management Appliance database. For information on how to do this refer to the *Black Box ServSwitch DTX™ Control User Guide*.

3.4 Getting started with the Black Box DTX5002 Extender

Before installing your Black Box DTX5002 Extender, refer to the list below to ensure that you have all the items necessary for installation.

Needed to install the Black Box DTX5002 Extender

- Receiver
- Transmitter
- External power supply x 2
- IEC power cord x 2
- Black Box ServSwitch Extender Quick Installation Guide
- KVM cable
- UTP cable (not supplied)
- Three-wire serial cable or null modem cable (not supplied)

Needed for non-standard installations

To connect a VGA monitor to the receiver:

- A DVI to VGA adaptor (not supplied)

3.5 Mounting Option

The receiver features the following mounting option that allows you to adapt easily to most work environments:

- Mounting to the rear of a flat-panel monitor via a mounting plate accessory

NOTE:

Mounting accessories are ordered separately. Contact Black Box for more information.

3.6 Installation Options



CAUTION:

To reduce the risk of electric shock or damage to your equipment, disconnect the power from the receiver by unplugging the power supply from the electrical outlet.



CAUTION:

To reduce the risk of electric shock or damage to your equipment, power up the remote computer and the receiver in the order described in the following procedures.

You can install the Black Box ServSwitch Extender in one of two ways:

1. Point-to-point
2. Networked

Point-to-point installation

The following instructions will enable you to install your Black Box ServSwitch DTX5002 Extender in a point-to-point configuration. In a point-to-point configuration no administrator setup of the transmitter or the receiver is required. This enables you to install the system quickly, directly out-of-the-box. However, if you choose the point-to-point configuration you can install only one transmitter and receiver pair on a subnet. If you use this configuration you must also locate both the transmitter and the receiver on the same subnet.

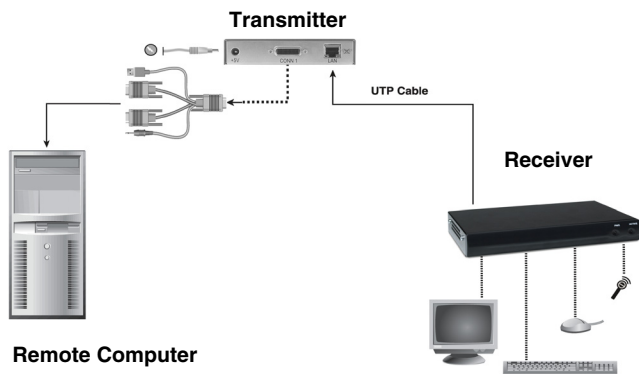


Figure 3-5. Point-to-point Installation

To connect the transmitter:

Before connecting the transmitter to the remote computer, ensure that the resolution and the refresh rate of the remote computer are supported by the Black Box ServSwitch DTX5002 Extender system. Set the screen resolution and refresh rate of the remote computer according to Table . Unsupported settings will cause blank video at the receiver.

NOTE:

For new information on supported resolutions and refresh rates see www.blackbox.com

1. Power down the remote computer.
2. Connect the USB connector on the transmitter cable to the corresponding USB port on the remote computer.
3. Connect the video connector on the transmitter cable to the appropriately labeled port on the back of the computer.
4. Connect the transmitter audio connection to the appropriately labeled port on the back of the computer.

NOTE:

For CD-quality audio, you must configure the transmitter and the receiver using the serial menu. For more information see "Audio Performance Settings" on page 68.

5. Connect the UTP cable to the transmitter's RJ-45 connector.
6. Power up the computer.

7. Route the other end of the UTP cable to the location you have chosen for the receiver. If necessary you can extend the UTP cable via junctions or a hub - subject to normal Ethernet cabling practices.

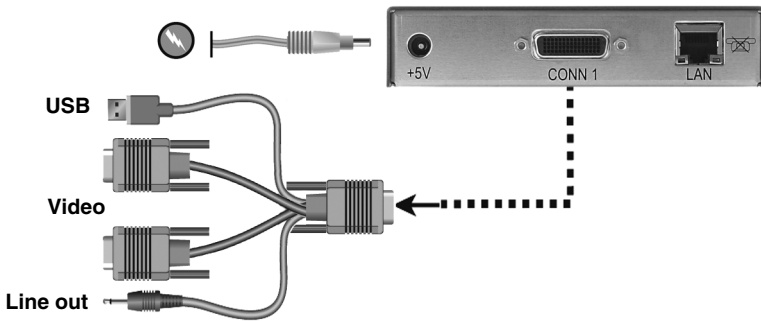


Figure 3-6. Transmitter

To connect the receiver:

1. Connect your keyboard, monitor, mouse and other peripherals cables to the appropriately labeled ports on the back of the receiver.
2. Connect the UTP cable to the RJ-45 port on the back of the receiver.

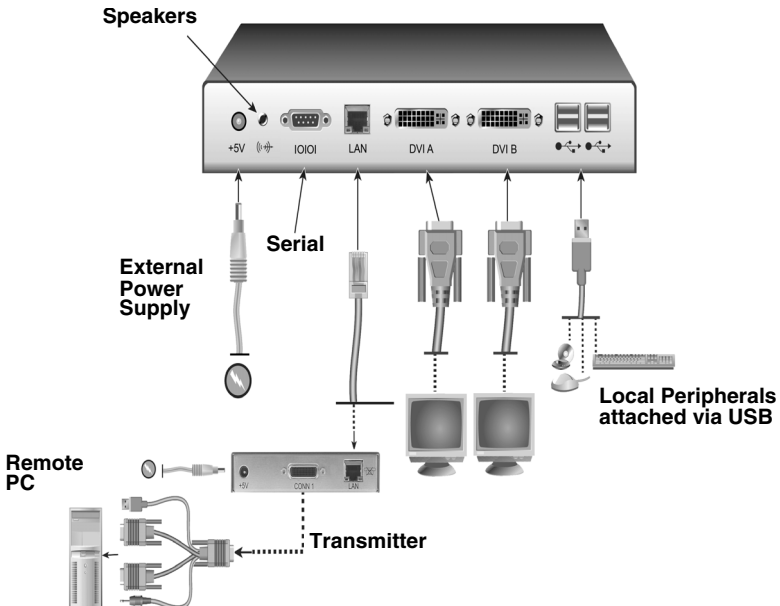


Figure 3-7. Receiver and transmitter Installation

Connecting Power

Both the receiver and transmitter feature an external power supply. A DC power jack is located on the rear of the receiver and on the rear of the transmitter.

NOTE:

Use only the power supply provided by Black Box.

To connect power to the receiver/transmitter:

1. Plug the external power supply's 2.5mm connector into the DC power jack on the rear of the receiver/transmitter.
2. Connect the detachable IEC power cord to the power supply.
3. Plug the IEC power cord into an appropriate wall outlet.

Networked Installation

The following instructions will enable you to install your Black Box ServSwitch Extender in a networked configuration. In this installation, multiple transmitters and receivers are attached via the same Ethernet network. In this case, it is important for each unit to be configured with a unique IP address.

NOTE:

The receiver and transmitter can obtain their IP address data from a DHCP server.

Transmitters and receivers may be configured for use on a single subnet or for use across routers. Use of routers, however, will cause a slight increase in end-to-end latencies, which may not be acceptable for all applications.

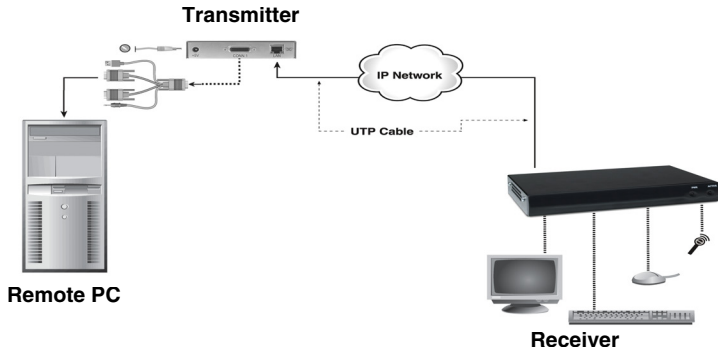


Figure 3-8. Networked Installation

The Black Box ServSwitch DTX5002 Extender has been pre-configured with factory-default network settings. If you install only one Black Box ServSwitch DTX5002 Extender on a subnet, you do not need to change these default network settings. If you install multiple units on the same subnet, you will need to assign a unique IP address to each unit or configure them for DHCP. This can be done via the serial port and must be carried out before displaying multiple devices on the same network.

NOTE:

The DHCP server must be configured to assign IP addresses to the unit that do not expire.

NOTE:

Do not change the mode to DHCP unless the equipment is connected to a DHCP server.

See *The Serial Menu* on page 41

Default network settings

Component	IP Address	Type	Default Gateway	Subnet Mask
Receiver	192.168.13.1	static	0.0.0.0	255.255.255.0
Transmitter	192.168.13.2	static	0.0.0.0	255.255.255.0

To install the Black Box ServSwitch DTX5002 Extender on a network:

1. Connect the transmitter to the remote computer as described previously in “Point-to-point installation” on page 24. Connect one end of the UTP cable to the transmitter’s RJ-45 connector. Connect the other end of the UTP cable to the Ethernet network.
2. Connect the receiver to the peripherals as described above in “Point-to-point installation” on page 24. Use a length of UTP cable to connect the receiver to the Ethernet network via the RJ-45 connector on the rear of the receiver.
3. Power up the receiver. A connection will be automatically established with the remote computer.
4. Use the serial menu to re-configure the network settings for the transmitter. For more information on how to do this see “Configuring Network Settings” on page 43.

NOTE:

If the receiver and transmitter are to be located on different subnets, configure their network settings before you connect to the network.

NOTE:

If there are already transmitter/receiver pairs operating on the subnet, configure network settings of new transmitter/receiver pairs before connecting them to the network.

5. Use the serial menu to re-configure the network settings for the receiver. For more information on how to do this see “Configuring Network Settings” on page 43.
6. Repeat this procedure for each transmitter and receiver pair you wish to install on the network.

4. Operations

4.1 Overview

Operating a computer through the Black Box ServSwitch Extender is no different than working directly connected to your computer. All peripherals operate as if directly connected, even though the computer is located at a distance. When you power up the receiver, a connection is automatically established with the computer.

While the default settings of your Black Box ServSwitch Extenders will work with most systems, you may choose to change settings to better fit your system. Internal settings such as connection settings can be configured via the serial menu. See “The Serial Menu” on page 41. You can also upgrade the Black Box ServSwitch Extenders via the serial menu. The On-Screen Display (OSD) displays system settings and information about your connected transmitter.

In Desktop Mode the receiver and transmitter reside on an IP network and a Management Appliance is present. The user gains access to their target PC by logging into any receiver on the network. A user can have a fixed association with a specific target PC or have access to a number of target PCs. The user may choose which target PC to connect to using the OSD. There is a fixed (configurable) association between the user and the target PC.

The administrator can configure the Desktop Mode so that there is a fixed association between a receiver and the target PC. You can access your target PC by powering up the associated receiver. This is commonly referred to as ‘Autologin.’ You then remain connected to the target PC until the receiver or target PC is powered down.

NOTE:

The Black Box ServSwitch DTX5002 operates in Extender Mode only.

LED Identification

Front panel

There are two blue LEDs on the front panel of the receiver. The PWR LED will light up when the receiver has been powered up. The ACTIVE LED will blink slowly until the receiver establishes a connection with the transmitter. When a connection has been established between the receiver and the transmitter the ACTIVE LED will stop blinking and will remain lit.

Rear panel

Two LEDs are built into both the RJ-45 connector on the rear of the receiver, and into the RJ-45 connector on the transmitter. The following table illustrates their operation.

RJ-45 Connector LEDs

LED	Indication	Meaning
LED 1	Green static	Linked at 1 Gbps
	Green flashing	Linked at 100 Mbps
	Green off	No Link
LED 2	Yellow static	Linked but no activity
	Yellow flashing	Transmit/receive activity

4.2 Accessing the System

When the receiver is powered up, it will automatically initiate a connection with the remote computer.

To access the remote computer:

1. Power up the receiver.
2. A series of messages will be displayed on the screen to inform you of the progress of the connection.
3. You will be able to interact with the remote computer as if it were located at your desk.

NOTE:

If the remote computer has been powered down, the receiver cannot establish a connection.

4.3 The OSD

The receiver incorporates an On-Screen Display (OSD) that allows you to view information about the configuration of your system in Desktop Mode and in Extender Mode.

Displaying system information using the OSD

The OSD enables you to display the firmware release of the receiver and the transmitter. For optimum performance, keep your firmware current. For more information, see “Flash Upgrading your Black Box ServSwitch Extender” on page 56. The OSD also enables you to view the IP address and MAC address of both the receiver and transmitter.

To display system information in Desktop Mode:

1. Press **Print Screen**. If the user has access to only a specified target device, the *User* dialog box will appear. The *User* dialog box displays user information on the screen.



Figure 4-1. User dialog box (Desktop Mode)

If the user has access to a list of target devices, then the *Target* dialog box will appear. The *Target* dialog box displays a list of target devices to which the user has access.

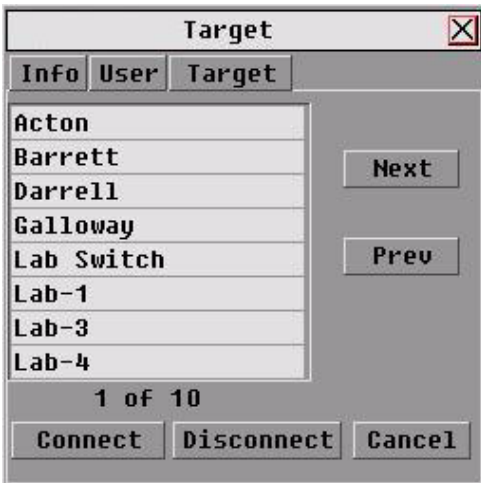


Figure 4-2. Target dialog box

2. Click the *Info* radio button to view system information for your receiver and transmitter. The *Info* dialog box will update to display system information for your receiver and transmitter.

- Click the *Rcvr* radio button to view the system information for your receiver.

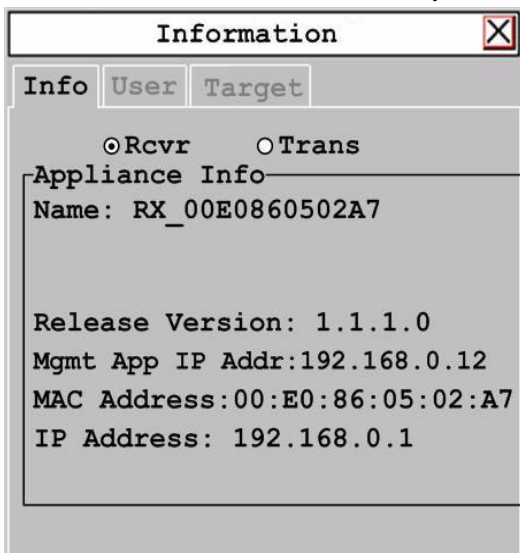


Figure 4-3. Receiver connected to transmitter

- Click the *Trans* radio button to view the system information for your transmitter. If there is no transmitter connected, the *Trans* radio button option will display as *No Target*.

To initiate a connection with a remote computer in Desktop Mode

- Press the Hotkey sequence.
- If it is in desktop mode the login screen appears.

NOTE:

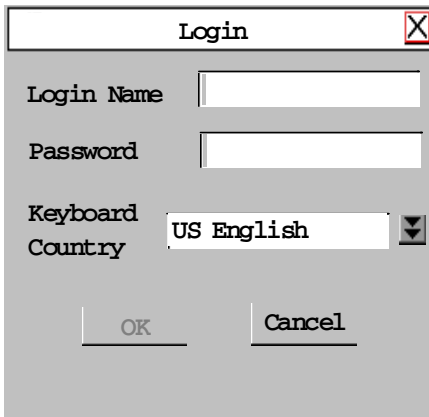
If the inactivity time is exceeded the screen becomes blank. When that happens press Print Screen. This will summon the User dialog box, which allows you to log in.

- Enter *Login Name* and *Password*, ensuring that the appropriate keyboard has been selected (the default *Keyboard Country* is US English). For information on setting the Login Name and Password see *Black Box ServSwitch DTX™ Control User Guide*.
-

NOTE:

If you wish, you can designate a different key or combination of keys (hotkeys) to access the OSD. See "Configuring the OSD Hotkey Sequence" on page 65.

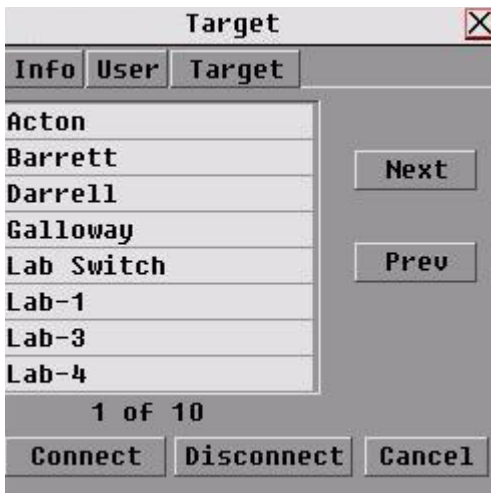
4. Click the *OK* button. If the user has access to one target device the *login progress message* will then appear and a connection will be established..



The Login dialog box has a title bar with the text "Login" and a close button (X). It contains three input fields: "Login Name", "Password", and "Keyboard Country". The "Keyboard Country" field is a dropdown menu currently showing "US English". At the bottom are two buttons: "OK" and "Cancel".

Figure 4-4. Login screen

5. If the user has access to more than one target device, then the list of target devices is presented to the user via the On-Screen Display.
6. Click on the *Connect* button or on a particular target device in the list to establish a connection.



The Target dialog box has a title bar with the text "Target" and a close button (X). It features three tabs: "Info", "User", and "Target", with the "Target" tab currently selected. Below the tabs is a list of target devices: "Acton", "Barrett", "Darrell", "Galloway", "Lab Switch", "Lab-1", "Lab-3", and "Lab-4". To the right of the list are two buttons: "Next" and "Prev". Below the list, it says "1 of 10". At the bottom are three buttons: "Connect", "Disconnect", and "Cancel".

Figure 4-5. Target dialog box

Access through Auto-Login Mode

Using the Management Appliance, an administrator can enable Auto-Login Mode. For details see *Black Box ServSwitch DTX™ Control User Guide*). Once this step is complete, the receiver is reset by the Management Appliance and it attempts to connect to the specified transmitter. A login progress message will be seen at this point.

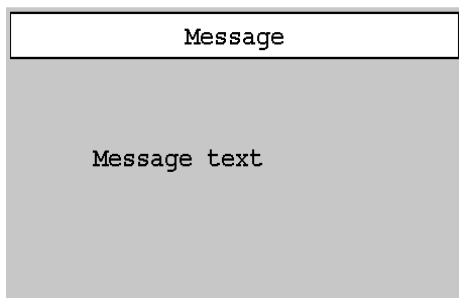


Figure 4-6. Progress message

The message text will comprise the relevant progress information.

NOTE:

The OSD will clear after a defined period of inactivity. To reactivate the OSD, enter a valid hotkey sequence. See "OSD Inactivity Timeout" on page 67.

To display system information in Extender Mode:

Press **Print Screen**. The *Info* dialog box will appear. By default, the *Info* dialog box displays user information for your receiver.

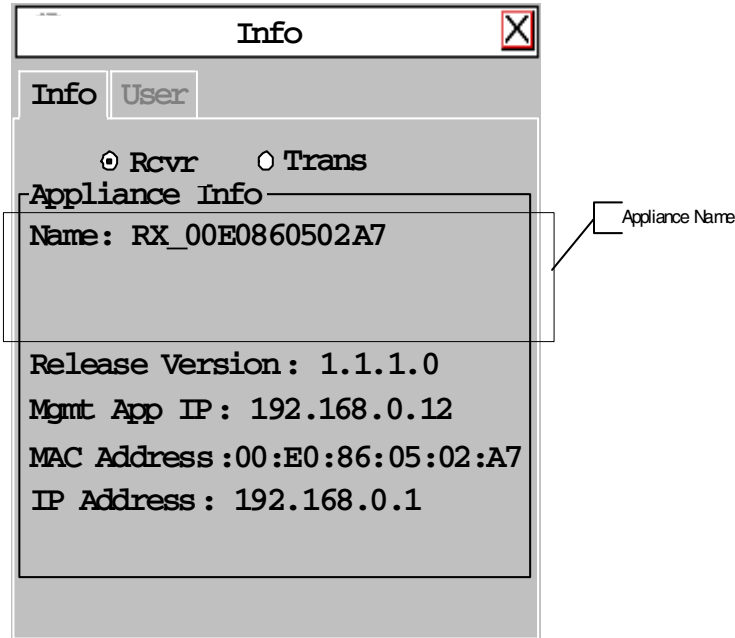


Figure 4-7. Receiver connected to transmitter

1. Click the *Rcvr* radio button to view system information for your receiver.
2. Click the *Trans* radio button to view the system information for your transmitter.

If there is no transmitter connected, the *Trans* radio button option will display as *No Target*.

To dismiss the OSD:

On the keyboard, press **ESC** or use the mouse to click the 'X' button on the top right-hand corner of the OSD dialog box.

4.4 The Serial Menu

The receiver incorporates a serial menu that allows you to:

- Configure network settings for the receiver
- Configure network settings for the transmitter
- Set or change passwords
- Upgrade your firmware for the receiver and transmitter
- Reset to factory defaults
- Set a session time-out value
- Change the audio performance settings
- Configure the transmitter for normal aspect or wide screen resolutions

Accessing the serial menu

You can access the serial menu via the serial port on the back of the receiver. All terminal commands are executed through a terminal or PC running HyperTerminal® emulation software or equivalent. By default, two passwords are required to access the Black Box ServSwitch Extenders via the receiver. One password controls access to the receiver, the other password controls access to the transmitter. In both cases, the default password is “password”. For information on how to change the default password, see “Authentication” on page 52.

Items needed to access the serial menu

- Networked computer with a serial port
- Null-modem serial cable (male DB9) or three-wire serial cable
- HyperTerminal emulation software or equivalent

To access the serial menu:

1. Connect one end of the serial cable to the serial port on the back of the receiver.
2. Connect the other end of the serial cable to the serial port of your PC.
3. Launch HyperTerminal.
4. Configure the HyperTerminal session for 57600 bits per second, 8 data bits, no parity, 1 stop bit and no flow control.

NOTE:

Software (XON/XOFF) flow control is supported. However, it should not be used when using XMODEM.

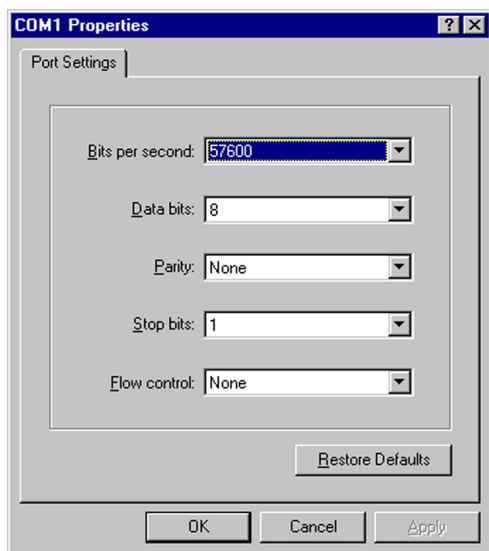


Figure 4-8. Com1 Properties

5. Confirm the HyperTerminal settings.

6. Press **Enter** to display the serial menu. The Appliance Selection Menu will be displayed.

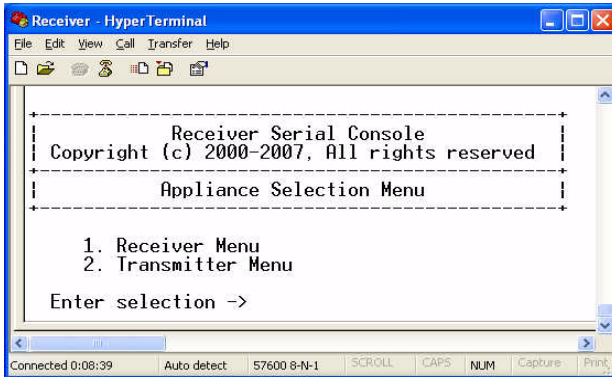


Figure 4-9. Appliance Selection Menu

7. Select receiver or transmitter. You will be prompted to enter a password.
8. Type the password and press **Enter**.

NOTE:

If there is no transmitter connected to the receiver, an error message will display and you will be returned to the Appliance Selection Menu.

Navigating the serial menu

The serial menu is driven by a series of simple nested sub-menus. To navigate through the serial menu, simply type the number or letter that corresponds to the option you wish to choose and press **Enter**. This action will bring you to a sub-menu or to a screen where you can make configuration changes. To exit a menu or screen and to confirm any configuration changes you have made, type **0** (zero) and press **Enter**. To navigate back up through the menus, continue to type **0** and press **Enter** at each screen.

4.5 Configuring Network Settings

The Black Box ServSwitch Extenders is shipped with default network settings pre-configured for your receiver and transmitter. For more information see “Networked Installation” on page 27 and “Interface to external system” on page 18. You can change the network settings (from the default values) for your system using the serial menu. If you wish, you can place the receiver on a different subnet from the transmitter.

NOTE:

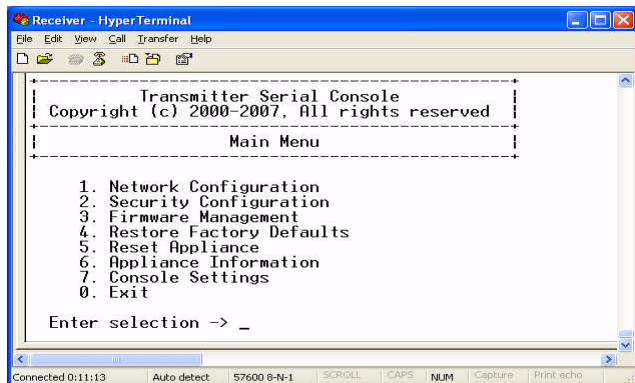
IP address data can be obtained by DHCP or can be set to Static.

NOTE:

It is recommended that you configure the network settings for the transmitter before you configure the network settings for the receiver.

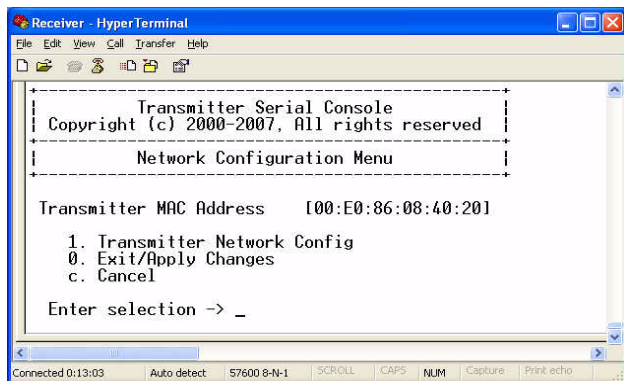
To configure network settings for the transmitter:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Transmitter Main Menu will appear.

**Figure 4-10. Transmitter Main Menu****NOTE:**

The Reset option in the transmitter Main Menu applies only to network settings.

4. Choose *Network Configuration*. The Network Configuration Menu will appear.

**Figure 4-11. Network Configuration Menu**

5. Choose *Transmitter Network Config*. The Transmitter Network Configuration Menu will appear.

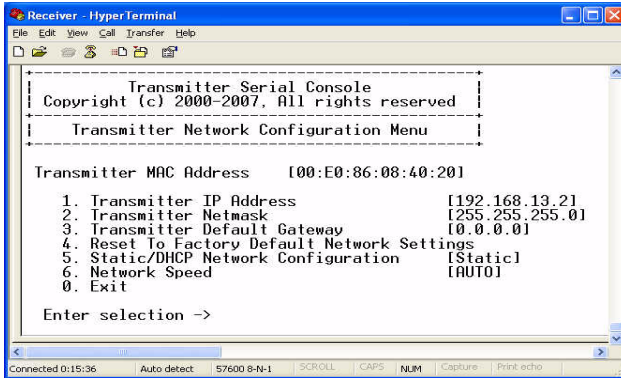


Figure 4-12. Transmitter Network Configuration Menu

NOTE:

For option 5, the administrator can configure the Transmitter IP Address as DHCP or Static. Static is the default configuration.

6. Choose *Transmitter IP Address*.
7. Type a valid IP address. Press **Enter** to return to the Transmitter Network Configuration Menu.
8. Choose *Transmitter Netmask*.
9. Type a valid Transmitter Netmask. Press **Enter** to return to the Transmitter Network Configuration Menu.
10. Choose *Transmitter Default Gateway*.
11. Type a valid Transmitter Default Gateway. Press **Enter** to return to the Transmitter Network Configuration Menu.
12. Type **0** (zero) and press **Enter** to return to the Network Configuration Menu.
13. If you made a mistake and do not wish to save the changes you made to the network settings type **C** and press **Enter**.
14. To confirm your changes and apply those settings type **0** (zero) and press **Enter**.
15. A system message will appear that states “Connection to the transmitter is lost”. You will be automatically returned to the Appliance Selection Menu screen.
16. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
17. Type the password and press **Enter**. The Receiver Main Menu will appear.

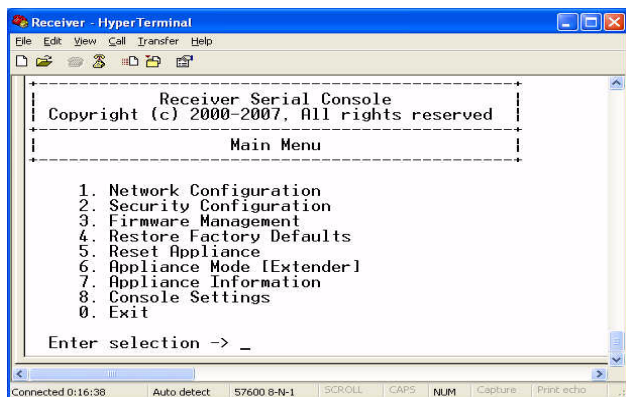


Figure 4-13. Receiver Main Menu

NOTE:

The Network Configuration Menu is different for the Extender and Desktop modes.

To access the Network Configuration Menu in Extender Mode:

18. Choose *Network Configuration*. The Network Configuration Menu (Extender Mode) will appear.

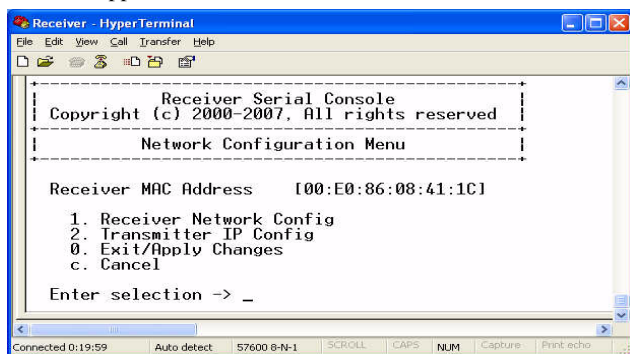


Figure 4-14. Network Configuration Menu (Extender Mode)

19. Choose *Transmitter IP Config*. The Transmitter IP Config menu will appear. The old transmitter IP address is displayed beside menu option 1.

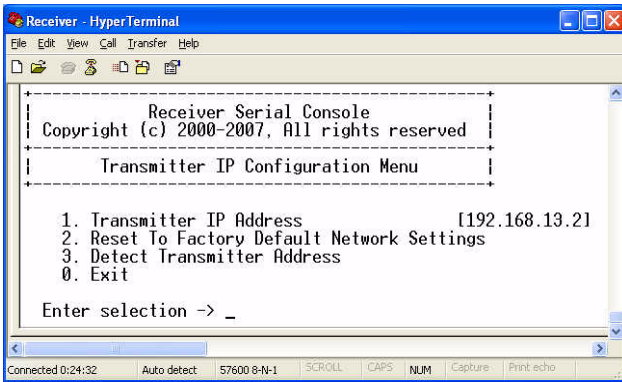


Figure 4-15. Transmitter Configuration Menu on the receiver

20. Choose *Transmitter IP Address*. Type the new IP address for the transmitter. Press **Enter** to return to the Transmitter IP Configuration Menu.
21. Type **0** (zero) and press **Enter** to return to the Network Configuration Menu.
22. If you made a mistake and do not wish to save the changes you made to the network settings type **C** and press **Enter**.
23. To confirm your changes and apply those settings type **0** (zero) and press **Enter**.

The receiver will now automatically reset to apply the new network configuration.

You will be automatically returned to the Appliance Selection Menu screen.

The connection to the transmitter will be automatically restored.

To access the Network Configuration Menu in Desktop Mode:

24. Choose *Appliance Mode* in the Receiver Main Menu.
25. Press **Enter**. The Appliance Mode Menu will appear.
26. Select *Desktop Mode* and press **Enter**.
27. To confirm your changes and apply those settings type **0** (zero) and press **Enter**.
You are now in Desktop Mode.

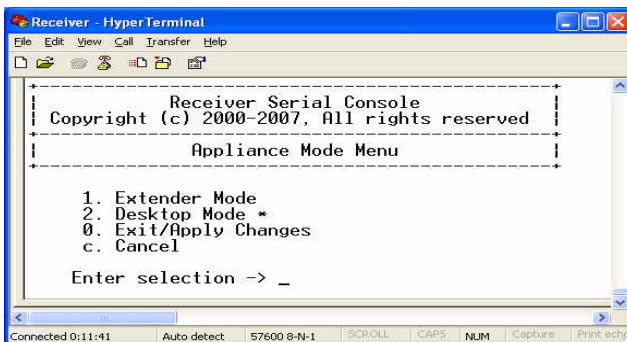


Figure 4-16. Appliance Mode Menu

28. Now activate the serial menu as described in “Accessing the serial menu” on page 42.
29. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
30. Type the password and press **Enter**. The Receiver Main Menu (Desktop Mode) will appear.
31. Chose *Network Configuration*. The Network Configuration Menu (Desktop Mode) will appear.

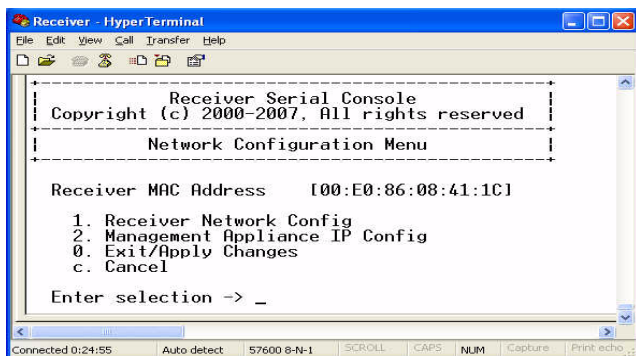


Figure 4-17. Network Configuration Menu (Desktop Mode)

To configure the network settings for the receiver:

1. Choose *Receiver Network Config* in the Network Configuration Menu (in either Extender or Desktop Mode).
2. Press **Enter**. The Receiver Network Configuration Menu will appear.

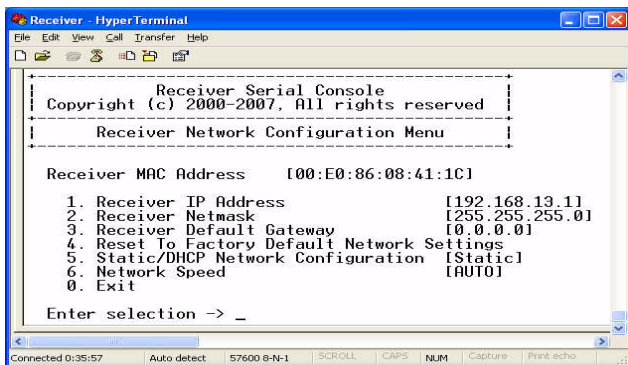


Figure 4-18. Receiver Network Configuration Menu (Extender and Desktop Mode)

NOTE:

In appearance, the Receiver Network Configuration Menu is identical in both Extender and Desktop modes.

NOTE:

The Reset option in the Receiver Network Configuration Menu applies only to network settings.

3. Choose *Receiver IP Address*.

4. Type a valid IP address. Press **Enter** to return to the receiver Network Configuration Menu.
5. Choose *Receiver Netmask*.
6. Type a valid Receiver Netmask. Press **Enter** to return to the receiver Network Configuration Menu.
7. Choose *Receiver Default Gateway*.
8. Type a valid receiver Default Gateway. Press **Enter** to return to the receiver Network Configuration Menu.
9. Choose *Static/DHCP Network Configuration* option to toggle between *Static* and *DHCP* mode.
10. Type **0** (zero) and press **Enter** to return to the Network Configuration Menu.
11. If you made a mistake and do not wish to save the changes you made to the network settings type **C** and press **Enter**.
12. To confirm your changes and apply those settings, type **0** (zero) and press **Enter**.

NOTE:

Changes to network configurations are applied only after you exit the Network Configuration Menu

13. The receiver will now automatically reset to apply the new network configuration. During reset, the receiver will drop its connection to the transmitter. You will be automatically returned to the Appliance Selection Menu screen. The connection will be restored.

To access the Network Speed Menu:

1. Choose *Network Speed* in the Receiver Network Configuration Menu.
2. Press **Enter**. The Network Speed Menu will appear.

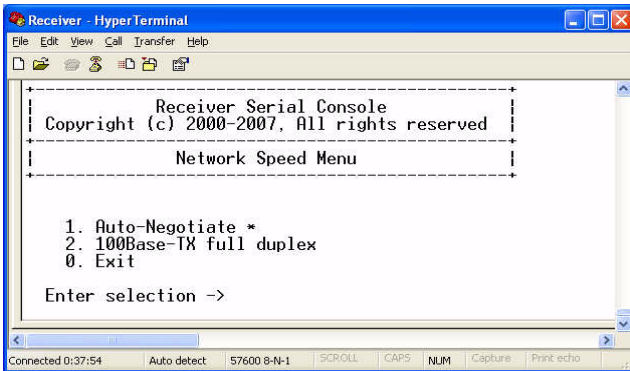


Figure 4-19. Network Speed Menu

NOTE:

The currently selected network speed, Auto-Negotiate, is marked with an asterisk.

To access the Management Appliance IP Configuration Menu:

3. Choose *Appliance Mode* in the Receiver Main Menu.
4. Press **Enter**. The Appliance Mode Menu will appear.

5. Select *Desktop Mode* and press **Enter**. You are now in Desktop Mode.
6. Now activate the serial menu as described in “Accessing the serial menu” on page 42.
7. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
8. Type the password and press **Enter**. The Receiver Main Menu (Desktop Mode) will appear.
9. Choose *Network Configuration*. The Network Configuration Menu (Desktop Mode) will appear.
10. Choose *Management Appliance IP Config* in the Network Configuration Menu (Desktop Mode). The Management Appliance IP Configuration Menu will appear.

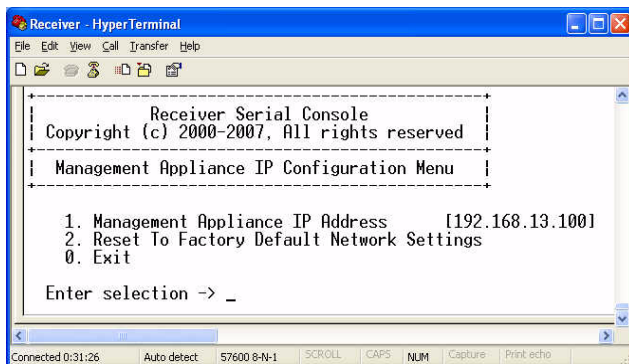


Figure 4-20. Management Appliance IP Configuration Menu

4.6 Detecting a transmitter IP Address

In the event that you forget the IP address of a transmitter, you can use the serial menu to detect the IP address of a transmitter that is connected to the receiver.

NOTE:

This can only be done if the transmitter has been assigned a static IP address

To detect the IP address of a connected transmitter:

1. Power down the transmitter and directly connect it to the receiver.

NOTE:

This can only be done in Extender Mode and not in Desktop Mode.

NOTE:

If the transmitter receives its power from an external power supply, disconnect the transmitter from that external power supply.

2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.

3. Type the password and press **Enter**. The Receiver Main Menu will appear.

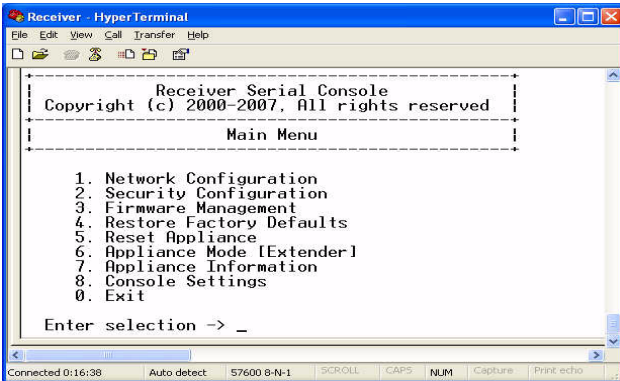


Figure 4-21. Receiver Main Menu

4. Choose *Network Configuration*. The Network Configuration Menu will appear.

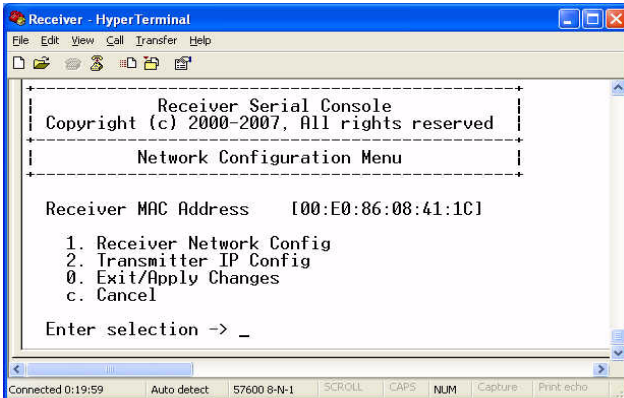


Figure 4-22. Network Configuration Menu

- Choose *Transmitter IP Config*. The Transmitter IP Config menu will appear. The old transmitter IP address is displayed beside menu option 1.

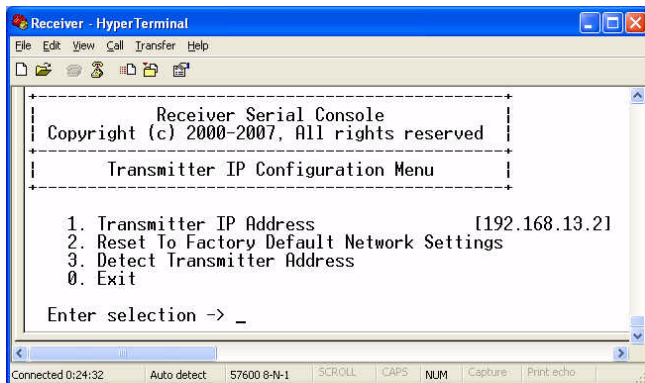


Figure 4-23. Transmitter IP Configuration Menu on the receiver

NOTE:

This screen is available only in Extender Mode.

- Choose *Detect Transmitter Address*. The following message will be displayed, “Directly connect the transmitter and receiver, then power up the transmitter. Press any key to abort.”
- Power up the transmitter.
- The receiver will detect and save the IP address of the connected transmitter. The Transmitter IP Configuration Menu will refresh, and the current IP address of the connected transmitter will be displayed beside menu option 1.
- To save your changes and exit the menu, type **0** (zero) and press **Enter**.

4.7 Authentication

By default, two passwords are required to access the Black Box ServSwitch Extenders via the serial menu. One password is for access to the serial menus that control the receiver. The other password is for access to the serial menus that control the transmitter. In both cases, the default password is “password”.

Authentication for the receiver

You can change the password settings for the receiver through the serial menu via the Receiver Security Configuration Menu.

To access the Receiver Security Configuration Menu:

- Activate the serial menu as described in “Accessing the serial menu” on page 42.
- Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
- Type the password and press **Enter**. The Receiver Main Menu will appear.

4. Choose *Security Configuration*. The Security Configuration Menu will appear.

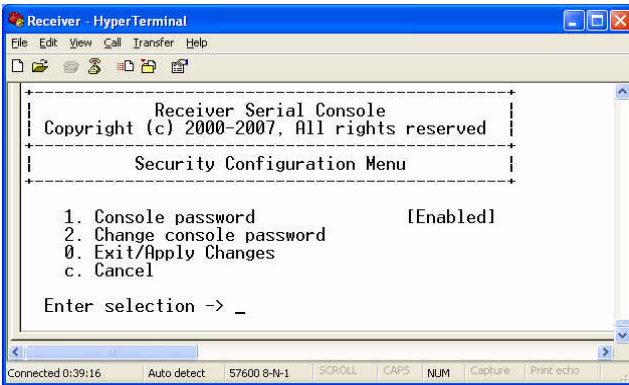


Figure 4-24. The Receiver Security Configuration Menu

To disable or enable the receiver password:

1. Choose *Console Password* on the Security Configuration Menu and press **Enter**. If a password had been enabled, this action will disable the password.
2. If a password had been disabled, you will be prompted to enter a password.
3. Type the new password and press **Enter**.

NOTE:

Each password must consist of ASCII characters and contain between 6 and 64 characters.

4. Confirm the new password. If successful, you will see a message stating that the password has been changed.
5. Press **Enter**.
6. To save your changes and exit the menu, type **0** (zero) and press **Enter**.

To change the receiver password:

1. Choose *Change Console Password* on the Security Configuration Menu. You will be prompted to enter your current password.
2. Type your current password and press **Enter**. You will be prompted to enter the new password.
3. Type the new password and press **Enter**.

NOTE:

Each password must consist of ASCII characters and contain between 6 and 64 characters.

4. Confirm the new password. If successful, you will see a message stating that the password has been changed.
5. Press **Enter**.
6. To save your changes and exit the menu, type **0** (zero) and press **Enter**.

If you lose your receiver password:

If you lose your receiver password, you can reset the system to the default password with the help of Black Box Technical Support.

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu.
3. You will be prompted to enter your current password.
4. Type **??????** (six question marks) and press **Enter**. The serial menu will generate a code and display it to you. The code is a 16 character hex sequence. The serial menu will also prompt you to enter a Key.



Figure 4-25. Password Reset Mode

5. Contact Black Box Technical Support to obtain the Key. The Technical Support Specialist will ask you for the 16 character hex code. Read out the code exactly as it appears on the serial menu. The Technical Support Specialist will now give you another 16 character hex sequence.
6. In the serial menu at the Key prompt, type the 16 character hex sequence provided to you by Black Box Technical Support. Press **Enter**.
7. The default password is now active.

For information on how to change your password, see “Authentication for the receiver” on page 52.

Authentication for the transmitter

You can change the password settings for the transmitter through the serial menu using the Transmitter Security Configuration Menu.

To access the Transmitter Security Configuration Menu:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Transmitter Main Menu will appear.

4. Choose *Security Configuration*. The Security Configuration Menu will appear.

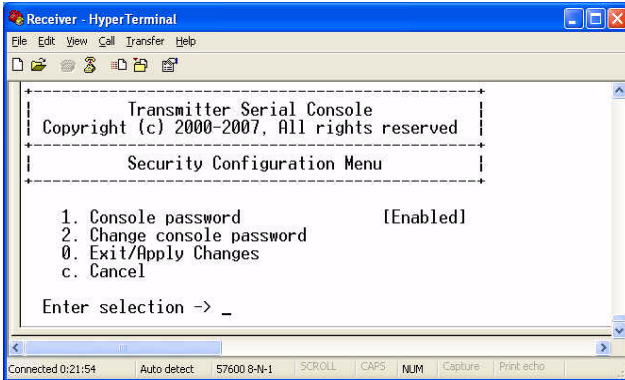


Figure 4-26. Transmitter Security Configuration Menu

To disable or enable the transmitter password:

1. Choose *Console Password* on the Security Configuration Menu and press **Enter**. If a password has been enabled, this action will disable the password.
2. If a password has been disabled, you will be prompted to enter a password.
3. Type the new password and press **Enter**.

NOTE:

Each password must consist of ASCII characters and contain between 6 and 64 characters.

4. Confirm the new password. If successful, you will see a message stating that the password has been changed.
5. Press **Enter**.
6. To save your changes and exit the menu, type **0** (zero) and press **Enter**.

To change the transmitter password:

1. Choose *Change Console Password* on the Security Configuration Menu. You will be prompted to enter your current password.
2. Type your current password and press **Enter**. You will be prompted to enter the new password.
3. Type the new password and press **Enter**.

NOTE:

Each password must consist of ASCII characters and contain between 6 and 64 characters.

4. Confirm the new password. If successful, you will see a message stating that the password has been changed.
5. Press **Enter**.
6. To confirm the new password and exit the screen, type **0** (zero) and press **Enter**.

If you lose your transmitter password:

If you lose your transmitter password, you can reset the system to the default password with the help of Black Box Technical Support.

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu.
3. You will be prompted to enter your current password.
4. Type **??????** (six question marks) and press **Enter**. The serial menu will generate a code and display it to you. The code is a 16 character hex sequence. The serial menu will also prompt you to enter a Key.
5. Contact Black Box Technical Support to obtain the Key. The Technical Support Specialist will ask you for the 16 character hex code. Read out the code exactly as it appears on the serial menu. The Technical Support Specialist will now give you another 16 character hex sequence.
6. In the serial menu at the Key prompt, type the 16 character hex sequence provided to you by Black Box Technical Support. Press **Enter**.
7. The default password is now active.

For details on how to change your password see “Authentication for the transmitter” on page 54.

4.8 Flash Upgrading your Black Box ServSwitch Extender

You can Flash upgrade your receiver and transmitter. You can Flash upgrade your Black Box ServSwitch Extenders using either XMODEM or HTTP. The receiver and transmitter are upgraded separately using individual upgrade files. The upgrade files are supplied by Black Box. For optimum system performance keep your firmware versions current.

NOTE:

Do not use software (XON/XOFF) flow control when using XMODEM.

NOTE:

It is recommended that you flash upgrade the transmitter before you flash upgrade the receiver.

NOTE:

Transmitters and receivers should have the same version for guaranteed operation.

To Flash upgrade your transmitter using XMODEM:

1. Download the transmitter upgrade file from Black Box.
2. Activate the serial menu as described in “Accessing the serial menu” on page 42.
3. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
4. Type the password and press **Enter**. The Transmitter Main Menu will appear.

5. Choose *Firmware Management*. The Firmware Management Menu will appear.

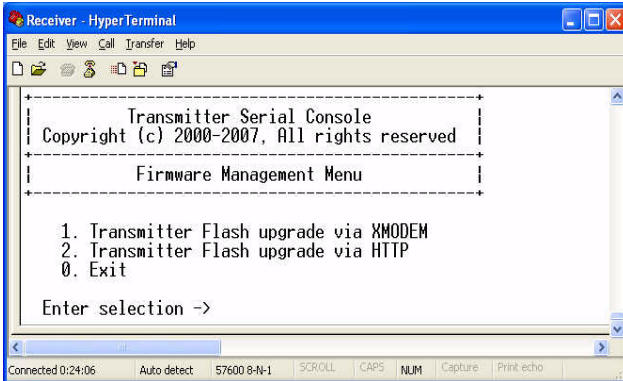


Figure 4-27. Transmitter Firmware Management Menu (upgrade via XMODEM)

6. Choose *Transmitter Flash Upgrade Via XMODEM*.
7. Specify the location of the upgrade file and initiate the file transfer.
8. When the transfer has completed, a message will display stating "Firmware update successful. Resetting Appliance..." During reset the transmitter will drop the connection to the receiver. A second system message will appear that states "Connection to the transmitter is lost". You will be automatically returned to the Appliance Selection Menu screen.

NOTE:

If the transmitter determines that the upgrade file is invalid, the transmitter cancels the upgrade and maintains the previous firmware version. A message displays indicating that the upgrade has failed.

To Flash upgrade your transmitter using HTTP:

1. Download the transmitter upgrade file from Black Box.
2. Activate the serial menu as described in "Accessing the serial menu" on page 42.
3. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See "Authentication" on page 52.
4. Type the password and press **Enter**. The Transmitter Main Menu will appear.

5. Choose *Firmware Management*. The *Firmware Management Menu* will appear.

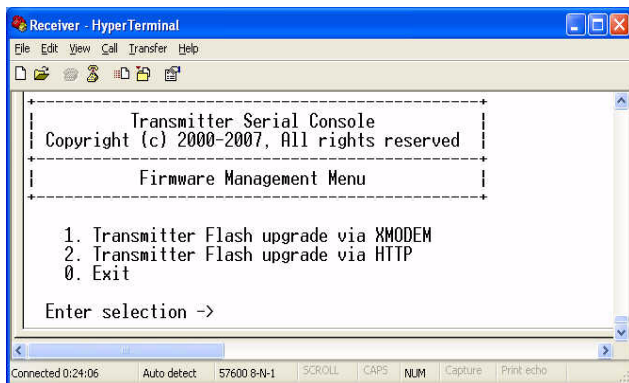


Figure 4-28. Transmitter Firmware Management Menu (upgrade via HTTP)

6. Choose *Transmitter Flash Upgrade Via HTTP*. You will be prompted to enter the URL for the upgrade file.
7. Enter the URL for the upgrade file using the following syntax:
`http://<server ip address>[:server port]/<upgrade file path>`
 For example:
`http://192.168.13.3:8080/TX.dld`

NOTE:

If the server is set up on standard port 80, the port information can be omitted.

8. To initiate the file transfer press **Enter**. The connection to the transmitter will be dropped.
9. When the transfer has completed, a message will display stating “Firmware update successful. Resetting Appliance...” During reset the transmitter will drop the connection to the receiver. A second system message will appear that states “Connection to the transmitter is lost”. You will be automatically returned to the Appliance Selection Menu screen.

NOTE:

If the transmitter determines that the upgrade file is invalid, the transmitter cancels the upgrade and maintains the previous firmware version. A message displays indicating that the upgrade has failed.

To Flash upgrade your receiver using XMODEM:

NOTE:

It is recommended that you flash upgrade the transmitter before you flash upgrade the receiver.

- Download the receiver upgrade file from Black Box.
- Activate the serial menu as described in “Accessing the serial menu” on page 42.
- Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
- Type the password and press **Enter**. The Receiver Main Menu will appear.

5. Choose *Firmware Management*. The Firmware Management Menu will appear.

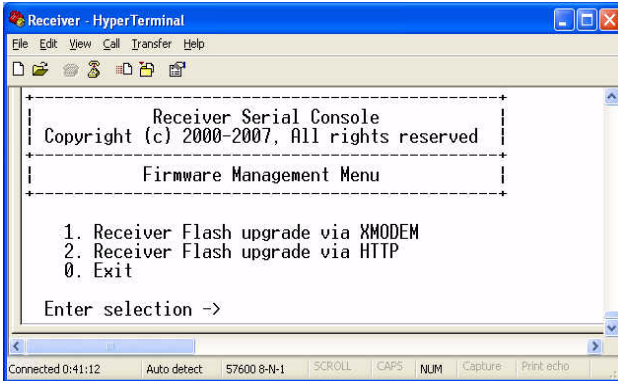


Figure 4-29. Receiver Firmware Management Menu (upgrade via XMODEM)

6. Choose *Receiver Flash Upgrade Via XMODEM*. The connection to the transmitter will be dropped.
7. Specify the location of the upgrade file and initiate the file transfer.
8. When the transfer has completed, a message will display stating “Firmware update successful. Resetting Appliance...”
9. The connection to the receiver will be restored.

NOTE:

If the receiver determines that the upgrade file is invalid, the receiver cancels the upgrade and maintains the previous firmware version. A message will display indicating that the firmware upgrade has failed.

To Flash upgrade your receiver using HTTP:

1. Download the receiver upgrade file from Black Box.
2. Activate the serial menu as described in “Accessing the serial menu” on page 42.
3. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
4. Type the password and press **Enter**. The Receiver Main Menu will appear.

- Choose *Firmware Management*. The Firmware Management Menu will appear.

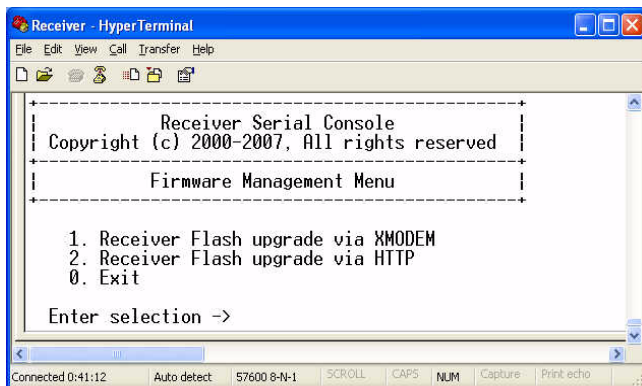


Figure 4-30. Receiver Firmware Management Menu (upgrade via HTTP)

- Choose *Receiver Flash Upgrade Via HTTP*. You will be prompted to enter the URL for the upgrade file.
- Enter the URL for the upgrade file using the following syntax:
`http://<server ip address>[:server port]/<upgrade file path>`
 For example:
`http://192.168.13.3:8080/RX.dld`

NOTE:

If the server is set up on standard port 80, the port information can be omitted.

- To initiate the file transfer press **Enter**. The connection to the transmitter will be dropped.
- When the transfer has completed, a message will display stating “Firmware update successful. Resetting Appliance...”
- The connection to the transmitter will be restored.

NOTE:

If the receiver determines that the upgrade file is invalid, the receiver cancels the upgrade and maintains the previous firmware version. A message will display indicating that the firmware upgrade has failed.

4.9 Restoring Factory Default Settings

The serial menu enables you to easily restore the factory default settings of both the receiver and the transmitter. To view a full list of the factory default settings, see “Factory Default Settings” on page 11.

NOTE:

Restoring factory default settings will also reset network settings. Before restoring factory default settings, assess whether this is likely to cause conflicts with other devices on the network.

To restore the receiver factory default settings:

- Activate the serial menu as described in “Accessing the serial menu” on page 42.
- Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.

3. Type the password and press **Enter**. The receiver Main Menu will appear.
4. Choose *Restore Factory Defaults*.
5. The receiver will now automatically reset. You will be automatically returned to the Appliance Selection Menu screen.
6. During reset the receiver will drop the connection to the transmitter. When reset is complete the receiver will restore the connection to the transmitter using the new settings.

To restore the transmitter factory default settings:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Transmitter Main Menu will appear.
4. Choose *Restore Factory Defaults*.
5. The transmitter will now automatically reset. During reset the transmitter will drop the connection to the receiver. A system message will appear that states “Connection to the transmitter is lost”. You will be returned to the Appliance Selection Menu screen. The connection to the receiver will be restored.

4.10 Resetting the Black Box ServSwitch Digital Workstation Extender

To reset the receiver:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. The receiver Main Menu will appear.
4. Choose *Reset Appliance*. The Reset Appliance Menu will appear.

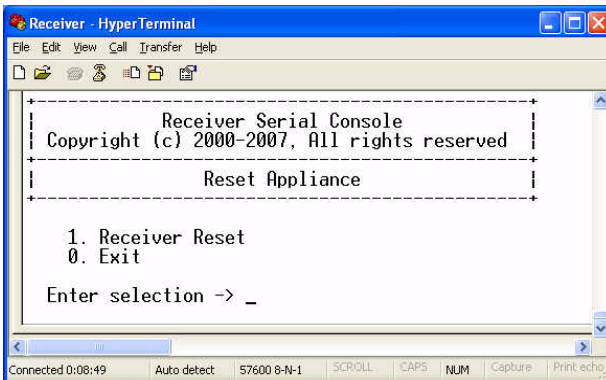


Figure 4-31. Receiver Reset Appliance Menu

5. Choose *Receiver Reset* to initiate the reset. A message will be displayed on the serial menu that states “Resetting appliance...”. During reset the connection to the transmitter is dropped. When the reset is complete, you will be automatically

returned to the Appliance Selection Menu. The connection to the transmitter will be automatically restored.

To reset the transmitter:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. The transmitter Main Menu will appear.
4. Choose *Reset Appliance*. The Reset Appliance Menu will appear.
5. Choose *Transmitter Reset* to initiate the reset. A message will be displayed on the serial menu that states “Resetting appliance...”. During reset the transmitter will drop the connection to the receiver. A second system message will appear that states “Connection to the transmitter is lost.” You will be automatically returned to the Appliance Selection Menu screen. The connection will be automatically restored.

4.11 Viewing System Information

The serial menu enables you to display the firmware release and details of the receiver and of the transmitter.

To view receiver system information:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Receiver Main Menu will appear.
4. Choose *Appliance Information*. The Appliance Information Menu will appear.

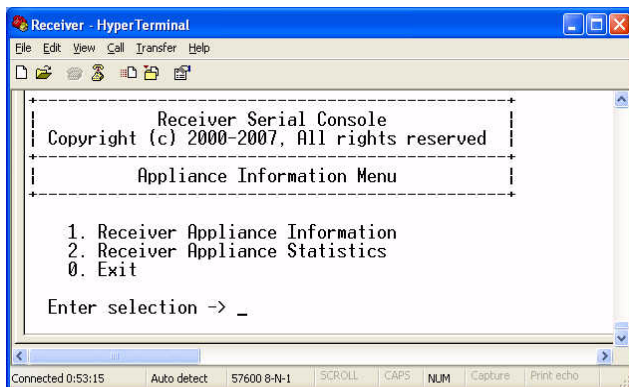


Figure 4-32. Appliance Information Menu

5. Choose *Receiver Appliance Information*. The Receiver Appliance Information Menu will appear.

The Receiver Appliance Information Menu screen contains the following information:

- receiver name;
- EID number;
- release version;
- application;

- boot and FPGA firmware version numbers;
- manufacturing part number.

All values are read-only.

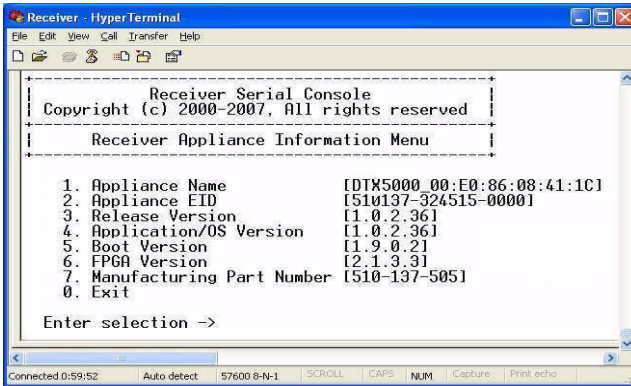


Figure 4-33. Receiver Appliance Information Menu

To view transmitter system information:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The transmitter Main Menu will appear.
4. Choose *Appliance Information*. The Appliance Information Menu will appear.
5. Choose *Transmitter Appliance Information*. The Transmitter Appliance Information Menu will appear.

The Transmitter Appliance Information Menu screen contains the following information:

- transmitter name;
- EID number;
- release version;
- application;
- boot and FPGA firmware version numbers;
- manufacturing part number.

All values are read-only.

4.12 Configuring Video Input Settings

The Black Box ServSwitch DTX5000 Extender system is capable of transmitting either digital (DVI) or analog video (VGA) from the remote computer to your analog/digital monitor.

The Black Box DTX5002 Extender system is capable of transmitting *only* digital (DVI) video from the remote computer to your analog/digital monitor.

The extender will normally operate well when set on its default settings. However, some computers need the transmitter to be set for the dedicated video type to operate correctly (DTX5000 only). In the case of the DTX5002, this is catered for automatically.

NOTE:

Video-display problems may occur if video input settings are not configured correctly,

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Transmitter Main Menu will appear.
4. Choose *Console Settings*. The Console Settings Menu will display. The current video input setting is displayed beside menu item 1. Target Video

NOTE:

In selection 2, *Video Performance*, 1 signifies lowest quality while 5 signifies highest quality.

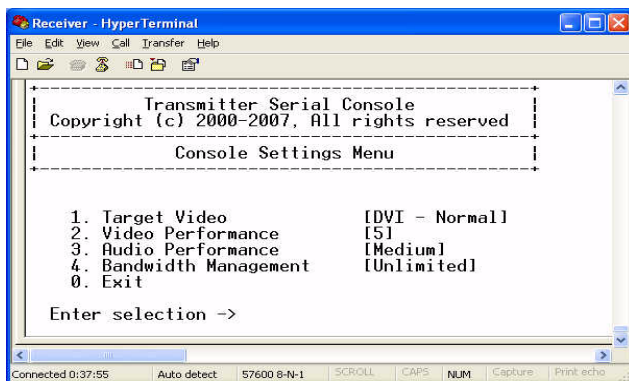


Figure 4-34. Transmitter Console Settings Menu

5. Choose *Target Video*. The Target Video Menu will display (DTX5000 only).

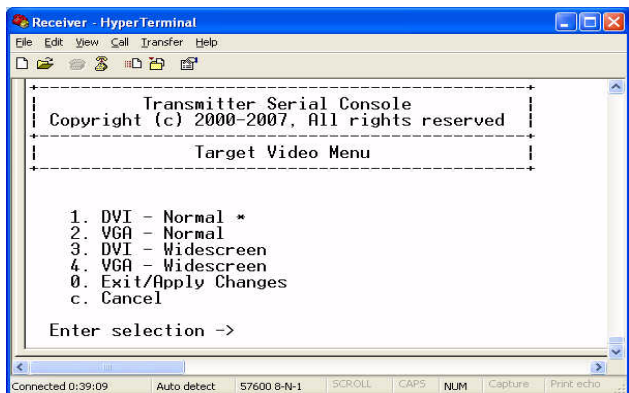


Figure 4-35. Transmitter Target Video Menu

6. Choose menu item 1, DVI Normal.
7. Select the appropriate menu item.
8. To save your changes and exit the menu, type **0** (zero) and press **Enter**. The unit resets after you press **Enter**.

4.13 Session Retry Settings

The Black Box ServSwitch Extenders is designed to automatically establish a connection between the receiver and the remote computer. By default, if the receiver cannot immediately establish a connection with the remote computer it will retry once per second until a connection is successfully established. You can change the default session retry settings using the serial menu.

To access the Session Retry Menu:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The receiver Main Menu will appear.
4. Choose *Console Settings*. The Console Settings Menu will appear.
5. Choose *Session Retry*. The Session Retry Menu will appear.

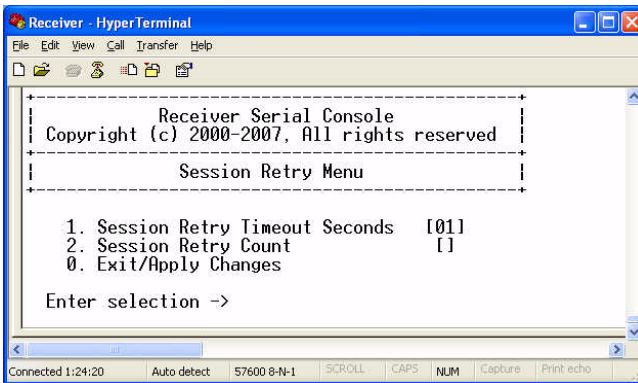


Figure 4-36. Session Retry Menu

To change the retry settings:

1. Access the *Session Retry Menu* via the serial menu as described above.
2. To change the time interval between retry attempts, choose *Session Retry Timeout Seconds*. You will be prompted to enter a new timeout value in SS (seconds) format.
3. Type a value between 1 and 60 (inclusive) and press **Enter**.

To confirm your selection and exit the screen, type **0** (zero) and press **Enter**.

NOTE:

Selection 2, *Session Retry Count*, can be set in Desktop Mode but is 0 in Extender Mode.

4.14 Configuring the OSD Hotkey Sequence

To change the hotkey sequence that activates your OSD:

1. Activate the Serial Interface menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.

3. Type the password and press Enter. The Receiver Main Menu will appear.
4. Choose Console Settings. The Console Settings Menu will appear. Your currently selected OSD hotkey sequence is displayed beside menu item 1. OSD Hotkey

NOTE:

The layout of the Console Settings Menu is different for the Desktop and Extender modes. In this example the screen is in Extender mode.

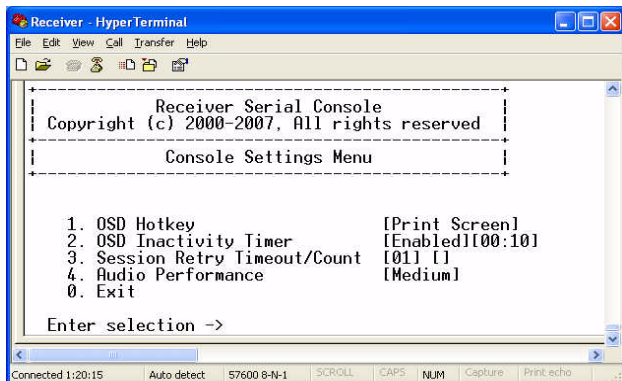


Figure 4-37. Receiver Console Settings Menu

5. Choose OSD Hotkey. The OSD Hotkey Menu will appear. This menu shows you the hotkey sequences that you can choose from. The current hotkey sequence is indicated by an asterisk symbol *.

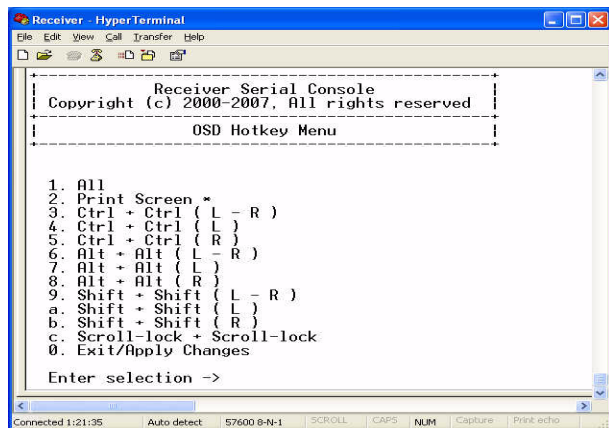


Figure 4-38. OSD Hotkey Menu

6. Type the number that corresponds to the hotkey sequence you wish to apply and press **Enter**.
7. To confirm your selection and exit the screen, type **0** (zero) and press **Enter**.

OSD Hotkey Sequences

Hotkey Sequences	
All	Print Screen (Default)
Ctrl + Ctrl (L - R)	Ctrl + Ctrl (L)
Ctrl + Ctrl (R)	Alt + Alt (L - R)
Alt + Alt (L)	Alt + Alt (R)
Shift + Shift (L - R)	Shift + Shift (L)
Shift + Shift (R)	Scroll-lock + Scroll-lock

4.15 OSD Inactivity Timeout

By default, the receiver is configured to dismiss the OSD after an inactivity period of 10 minutes. To reactivate the OSD, you must enter a valid OSD hotkey sequence. See “Configuring the OSD Hotkey Sequence” on page 65.

Using the Serial Interface, you can modify the default configuration. You can disable the OSD timeout or you can change the timeout period to any value between zero minutes and 10 hours. Setting the timeout period to 0 means that the OSD will not timeout. The maximum timeout period that can be configured is 9 hours and 59 minutes.

NOTE:

You can dismiss the OSD at any time by pressing ESC

To change the OSD timeout period:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press Enter. The Receiver Main Menu will appear.
4. Choose Console Settings. The Console Settings Menu will appear. The current OSD Timeout configuration is displayed beside menu item 2. OSD Inactivity Timer.

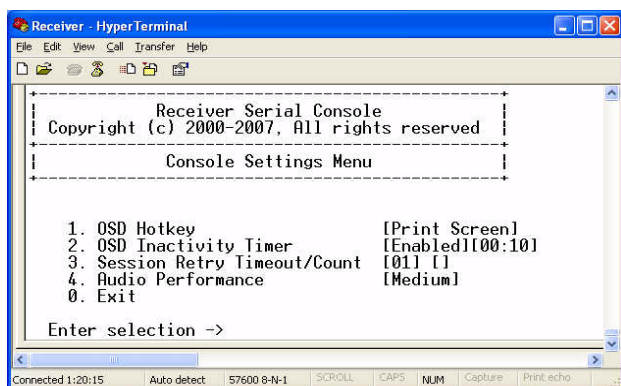


Figure 4-39. Receiver Console Settings Menu

5. Choose OSD Inactivity Timer. The OSD Inactivity Timer Menu will appear.

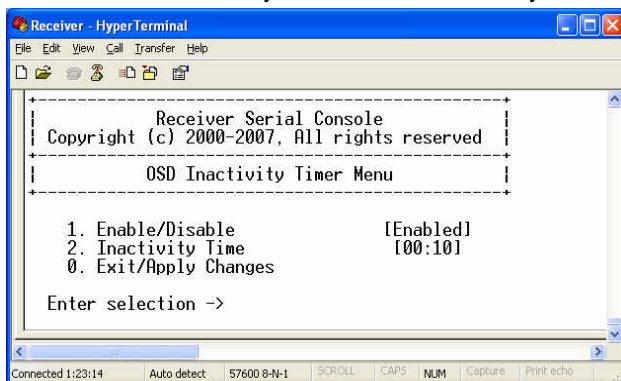


Figure 4-40. OSD Inactivity Timer Menu

6. Choose Inactivity Time. You will be prompted to enter a timeout period in the format HH:MM. The maximum timeout period you can enter is 9 hours and 59 minutes (09:59).
7. Type the timeout period and press Enter.
8. To confirm your selection and exit the screen, type **0** (zero) and press **Enter**.

NOTE:

To disable the OSD timeout, choose *Disable* in the OSD Inactivity Timer Menu.

4.16 Audio Performance Settings

You can use this option to modify the audio performance settings or to disable audio support. There are three settings available: high, medium and off. The high setting provides the best audio performance and should be used when high network bandwidth is available. The medium setting should be used if network bandwidth is limited or if the network latency is high. If you choose *off* audio support will be disabled.

NOTE:

To ensure that audio operates correctly, configure the receiver and the transmitter with identical audio performance settings.

To change the audio performance setting for the transmitter:

1. Activate the serial menu as described in “Accessing the serial menu” on page 42.
2. Choose option 2 to access the transmitter menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
3. Type the password and press **Enter**. The Transmitter Main Menu will appear.
4. Choose *Console Settings*. The Console Settings Menu will appear. The current audio performance setting is displayed beside menu item 3. Audio Performance.

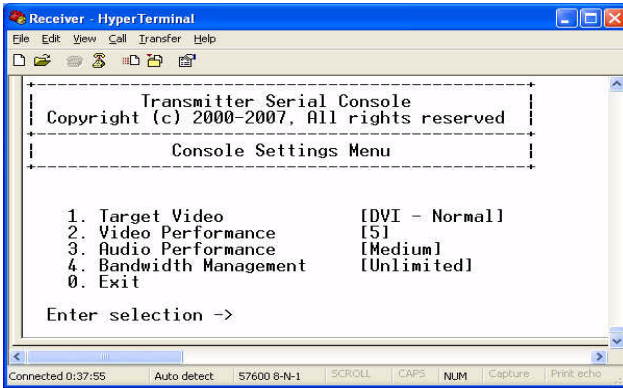


Figure 4-41. Transmitter Console Settings Menu

- Choose *Audio Performance*. The Audio Performance Menu will appear. This menu shows you the audio settings that you can choose from. The current setting is indicated by an asterisk symbol *

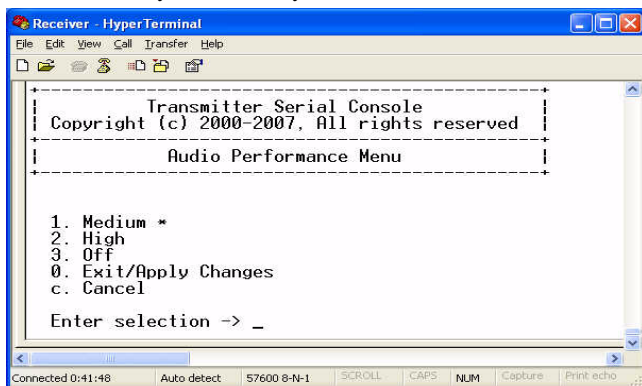


Figure 4-42. Transmitter Audio Performance Menu

- Type the number that corresponds to the audio setting you wish to apply and press **Enter**.

NOTE:

If you choose “off,” audio support will be disabled.

- To confirm your selection and exit the screen, type **0** (zero) and press **Enter**. The unit resets after you press **Enter**.

To change the audio performance setting for the receiver:

- Activate the serial menu as described in “Accessing the serial menu” on page 42.
- Choose option 1 to access the receiver menu. If the password option is enabled, you will be prompted for a password. See “Authentication” on page 52.
- Type the password and press **Enter**. The Receiver Main Menu will appear.
- Choose *Console Settings*. The Console Settings Menu will appear. The current audio performance setting is displayed beside menu item 4. Audio Performance.

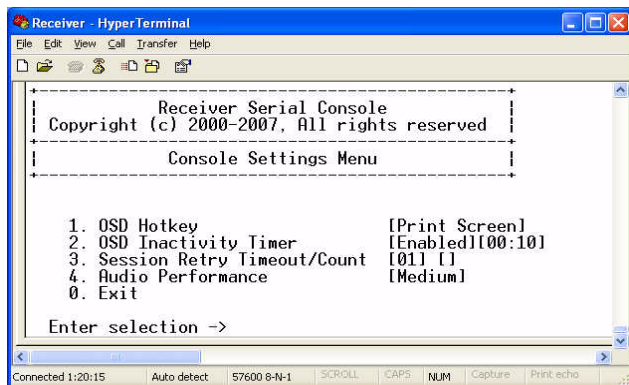


Figure 4-43. Receiver Console Settings Menu

5. Choose *Audio Performance*. The Audio Performance Menu will appear. This menu shows you the audio settings that you can choose from. The current setting is indicated by an asterisk *

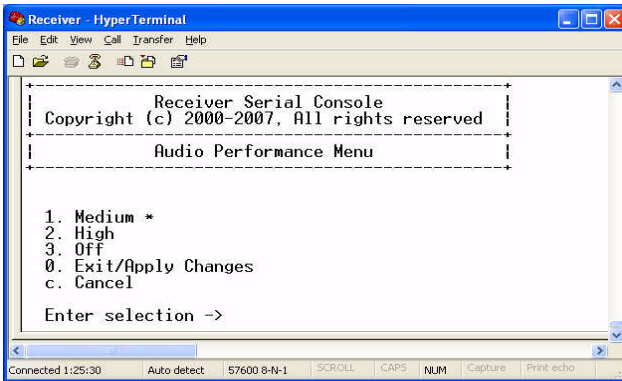


Figure 4-44. Receiver Audio Performance Menu

6. Type the number that corresponds to the audio setting you wish to apply and press **Enter**.

NOTE:

If you choose "off," audio support will be disabled.

7. To confirm your selection and exit the screen, type **0** (zero) and press **Enter**. The unit resets after you press **Enter**.

5. Troubleshooting

No power status light on receiver

- Verify that the power supply is plugged in correctly.
- Ensure that the power cable from the Black Box-supplied power supply is securely plugged into the receiver.

No video on monitor attached to receiver

- Verify that the monitor attached to the receiver has power.
- Ensure that the video cable from the monitor is securely plugged in to the correct connector on the receiver.
- Verify that the remote computer is powered.
- Confirm that a network connection exists between the transmitter and receiver.
- Verify that the address of the target transmitter that is configured in the receiver is correct.
- Confirm that the IP address used by the transmitter has not been assigned to a second device on the network.
- Confirm that the IP address used by the receiver has not been assigned to a second device on the network.
- Verify that the DTX5000-T transmitter is drawing sufficient power from the USB connections on the remote computer and that it has booted correctly:
 - If the green LED on the transmitter is on, the transmitter is drawing sufficient power.
 - If the transmitter cannot draw sufficient power from the remote computer you will need to obtain an external power supply unit for the transmitter from Black Box. If connected through a USB hub, ensure that the hub can supply enough power.
- Verify that the correct video setting has been configured in the transmitter serial menu:
 - If the remote computer provides DVI only video, verify that the transmitter serial menu has been configured for DVI. Then restart the remote computer.
 - If the remote computer provides VGA only video, verify that the DTX5000-T transmitter serial menu has been configured for VGA. Then restart the remote computer.
- The transmitter has an internal fan. Verify that the fan is functioning.
- Cycle power to the receiver. An informational message should appear on the monitor for a brief moment. If the message does not appear, check the monitor by plugging the video cable from the monitor directly into the remote computer to verify that the monitor is working and that the remote computer is generating active video. If this is functioning, check that the display settings for your remote computer are set no higher than a resolution of 1280 x 1024 at 60 Hz refresh rate. If the monitor does not function correctly, replace it.

- If the transmitter has been power cycled (by unplugging the USB cables), ensure that all other cables are disconnected before reconnecting the transmitter. Ensure that you connect the USB cables first.

No mouse or keyboard operation from peripherals attached to receiver

- Ensure that the mouse and keyboard cables are connected to the correct PS/2 or USB ports on the receiver. Match the connector color codes (green for mouse and purple for keyboard).
- Ensure that both of the USB connectors from the DTX5000-T transmitter are securely connected to the correct connectors on the remote computer.
- If the remote computer can provide only one USB port for the DTX5000-T transmitter:
 - Use an external power supply for the transmitter
 - Ensure that the transmitter USB cable labeled “2” is attached to the available USB port of the remote computer
- Ensure that the correct keyboard layout is configured on the remote computer for the keyboard you are using.
- Retest the mouse and keyboard by connecting them directly to the remote computer and rebooting. If one does not function correctly, replace it.

No audio from speakers attached to receiver

- Ensure that the audio cable is securely plugged into the line-out port of the remote computer (should be color-coded green).
- Ensure that the speaker cable is securely plugged into the line-out port of the receiver.
- Verify that the audio sample rate has not been set to “off” for either the transmitter or the receiver. See “Audio Performance Settings” on page 68.
- Ensure that the same audio sample rate has been set for both the transmitter and the receiver. See “Audio Performance Settings” on page 68.
- Verify that the speakers are powered.
- Retest the speakers by connecting them directly to the remote computer. If they do not function correctly, replace them.

Poor sound quality from speakers attached to receiver

1. Ensure that the same audio sample rate has been set for both the transmitter and the receiver. See “Audio Performance Settings” on page 68.

Poor video quality on monitor attached to receiver

- Reset video by pressing <F11>.
- Ensure that the video cable from the monitor is securely plugged in to the correct connector on the receiver.
- Check the video quality using a different monitor.

No response from USB mass media device attached to the receiver

- Ensure that the mass media device is connected directly to one of the USB connectors on the receiver. If the mass media device is connected to the receiver via a USB hub, it will not be possible to access it.
- Ensure that both of the USB connectors from the DTX5000-T transmitter are securely connected to the correct ports on the remote computer.
- Verify that the mass media device is functioning correctly by attaching it to the USB port on another computer. If the mass media device is not functioning correctly, replace it.

Slow file transfer rate from or to the USB mass media device

- Check if at least one of the DTX5000-T transmitter USB cables is connected to a high speed USB port on the remote computer. The transmitter will operate with Low Speed and Full Speed USB, but the file transfer rate will be slower.

Connection to remote computer is lost

- Verify that the network cable is securely connected to the RJ-45 connector at the rear of the receiver.
- Verify that the receiver is linked to the network and that it is receiving data. See “LED Identification” on page 35.
- Verify that the remote computer is powered.
- Ensure that both of the USB connectors from the DTX5000-T transmitter are securely connected to the correct connectors on the remote computer.
- Verify that the DTX5000-T transmitter is drawing sufficient power from the USB connections on the remote computer and that it has booted correctly:
 - If the green LED on the transmitter is on, the transmitter is drawing sufficient power.
 - If the transmitter cannot draw sufficient power from the remote computer, obtain an external power supply unit for the transmitter from Black Box.
- The transmitter has an internal fan. Verify that the fan is functioning.
- Ping the transmitter from another PC on the network to ensure it is connected.
- Reset the transmitter. See “Resetting the Black Box ServSwitch Digital Workstation Extender” on page 61.
- Reset the receiver. See “Resetting the Black Box ServSwitch Digital Workstation Extender” on page 61.

Verify that the Ethernet network is fully operational.

Transmitter disconnected from DHCP server (Extender Mode)

- Attempt to re-connected to DHCP server (new IP address should be visible).
- Return to the *Network Configuration Menu* on the receiver.
- Select option for *Transmitter IP Address*.
- Enter new IP address as specified on the DHCP server.

Transmitter disconnected from DHCP server (Desktop Mode)

- In ServSwitch DTX™ Control Explorer Window area, go to *Units* window.
- Add a single unit
- Select product without an IP address.
- Select the option '*No, the transmitter does not have an address.*'
- Plug the transmitter into the network and power it up.
- Enter the network settings of the DTX Transmitter that you wish to locate.
- Click *Save* and *Close*.

5.1 Calling Black Box

If you determine that your Black Box ServSwitch Extender system is malfunctioning, do not attempt to alter or repair it. It contains no user-serviceable parts. Refer to the table on page 78 for Black Box Technical Support Information.

Before contacting Black Box Technical Support, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem
- When the problem occurs
- The components involved in the problem
- Any particular application that, when used, appears to create the problem or make it worse
- The results of any testing you have already done

5.2 Shipping and Packaging

If you need to transport or ship your Black Box ServSwitch Extender:

- Package it carefully. We recommend that you use the original container.

If you are shipping the receiver for repair, make sure you include its power cord and the cables you are using with it. If you are returning the transmitter, make sure you include everything you received with it. Before you ship, contact Black Box to get a Return Authorization (RA) number.

6. Technical Support

Our Technical Support staff is ready to assist you with any installation or operating issues you encounter with your Black Box product. If an issue should develop, follow the steps below for the fastest possible service.

To resolve an issue:

1. Check the pertinent section of this manual to see if the issue can be resolved by following the procedures outlined.
2. Check our web site at www.blackbox.com/support to search the knowledge base or use the on-line service request.
3. Call the Black Box Technical Support location nearest you.

Please have the product serial number available when contacting Black Box Technical Support.

Black Box Technical Support

Country	Web Site/E-Mail	Phone	Fax
US	www.blackbox.com info@blackbox.com	(724) 746-5500	(724) 746-0746
Austria	www.black-box.at support@black-box.at	+43 1 256 98 56	+43 1 256 98 56
Belgium	www.blackbox.be support.nederlands@blackbox.be support.french@blackbox.be support.english@blackbox.be	+32 2 725 85 50	+32 2 725 92 12
Denmark	www.blackbox.dk blackbox@blackbox.dk	+45 56 63 30 10	+45 56 65 08 05
Finland	www.blackbox.fi tuki@blackbox.fi	+358 201 888 800	+358 201 888 808
France	www.blackbox.fr tech@blackbox.fr	+33 820 07 09 11	+33 820 05 07 09
Germany	www.black-box.de techsupp@black-box.de	+49 811 5541 110	+49 811 5541 499
Ireland	www.blackbox.co.uk techhelp@blackbox.co.uk	+353 1 662 2466	+353 1 662 2477
Italy	www.blackbox.it supporto.tecnico@blackbox.it	+39 02 27 404 700	+39 02 27 400 219
Netherlands	www.blackbox.nl techsupport@blackbox.nl	+31 30 241 7799	+31 30 241 4746
Norway	www.blackboxnorge.no support@blackboxnorge.no	+47 55 300 710	+47 55 300 701
Spain	www.blackbox.es tecnico@blackbox.es	+34 916590732	+34 916239784
Sweden	www.blackboxab.se support@blackboxab.se	+46 8 44 55 890	+46 08 38 04 30
Switzerland	www.black-box.ch support@black-box.ch	+41 55 451 70 71	+41 55 451 70 75
UK	www.blackbox.co.uk techhelp@blackbox.co.uk	+44 118 965 6000	+44 118 965 6001

7. Login error messages

Management Appliance and Receiver initiated error messages

Login error messages	Description
Login failed User not found	User attempts to log in to Management Appliance. User name has not been added to the internal authentication service of the Management Appliance.
Login failed Invalid password	User enters an invalid password.
Login failed User account is disabled	In situation where user account has explicitly been disabled by a Management Appliance administrator.
Login failed Target device not available	User cannot be connected to their target device. No target devices are available for the user to access.
Login failed DTX5000-R is not managed by Management Appliance	User logs in from a receiver that the Management Appliance does not manage. Administrator would need to ensure that receiver is added to the Management Appliance before a user can log in from that receiver.
Login failed DTX5000-T already in use	Transmitter already in use. A user is attempting to log in to a target PC; however, the Management Appliance already has a record of an active media session involving a different user who is currently using the same transmitter as part of their active media session.
Login failed DTX5000-R already in use	Receiver already in use. A user is attempting to log in to a target PC; however, the Management Appliance already has a record of an active media session involving a different user who is currently using the same receiver as part of their active media session.
Login failed Cannot send session certificate to DTX5000-R	Cannot send media session certificate to receiver.
Login failed Cannot send session certificate to DTX5000-T	Cannot send media session certificate to transmitter.
Login warning Different appliance release versions	A warning which may be received when a successful connection was made between the receiver and transmitter. The warning indicates that the transmitter and receiver have different firmware release versions.
Login failed Could not contact Management Appliance	Cannot contact Management Appliance.

Management Appliance and Receiver initiated error messages (Continued)

Login failed Management Appliance not specified	IP address not set for Management Appliance.
---	--

Login failed Timeout	Receiver access to transmitter timeout.
-------------------------	---

Login failed Out of service	This message appears when a log in attempt is made while the unit is being upgraded
--------------------------------	---

Login failed Internal error	This message appears when the log in fails but no error text is received from the Management Appliance. This should not occur during normal operation.
--------------------------------	--

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Version 2, June 1991

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