



SB70LC User's Manual

Revision: 1.0
February 6, 2009

Table of Contents

1. Overview	3
2. Initial Configuration	3
2.1 Hardware Configuration	3
2.2 Network Configuration	4
2.3 Operational Configuration	5
3. Web Page Configuration	5
3.1 Network Settings	6
3.2 UDP Configuration	7
3.3 TCP Configuration	8
3.3.1 TCP Server Mode	9
3.3.2 TCP Client Mode	9
3.3.3 TCP Packetization Options, valid for TCP Sever or Client Modes	9
3.3.4 TCP Advanced Serial Network Settings	10
4. SSH Configuration	12
4.1 SSH Key Configuration	14
4.2 SSH Advanced Serial Settings	15
5. Serial Settings	16
6. Password Settings	17
7. Hypertext Transfer Protocol over SSL (HTTPS) Configuration	18
8. LEDs	19
9. RS-232 NULL Modem Wiring	20
10. Network IP Address Configuration	20
11. Web Browsers and Proxy Servers	21
12. Testing with a Telnet Connection	21

1. Overview

The NetBurner SB70LC can be used in two ways:

1. The SB70LC is preprogrammed at the factory to provide dual serial to Ethernet functionality. Use the IPSetup utility to configure the device for DHCP or static IP addressing, then connect to the device's web server using your web browser to configure the serial and Ethernet settings. In this mode of operation the SB70LC provides two TTL level UART serial ports and RTS/CTS hardware flow control signals. The remainder of this users guide describes how to use the SB70LC with the factory serial to Ethernet program.
2. The SB70LC is a very fast 32-bit single board network computer that can be customized to suit any task. With the purchase of the NetBurner Network Development Kit (NNDK-SB70LC-KIT) you have the ability to write custom applications for networking, web pages, I2C bus, SPI bus, control of General Purpose Digital I/O pins and much more.

2. Initial Configuration

Before you can begin using your SB70LC, three areas of configuration are required to tell your SB70LC what type of serial interface you want to use, the network IP address network port number, and the serial data baud rate.

- Hardware configuration
- Network configuration
- Operational configuration

2.1 *Hardware Configuration*

The SB70LC has two asynchronous UART type serial ports, referred to as Port 0 and Port 1. The SB70LC provides two TTL level UART ports that include TX, RX, RTS and CTS. If you need RS-232 or RS-422/485 electrical levels, then you must add the appropriate level shifters to the TTL level signals. Port 0 can be configured for either RS-232 or RS-485 operation (the factory default is RS-232), while Port 1 is always used as RS-232. Note that in this case TTL operation is the same as RS-232.

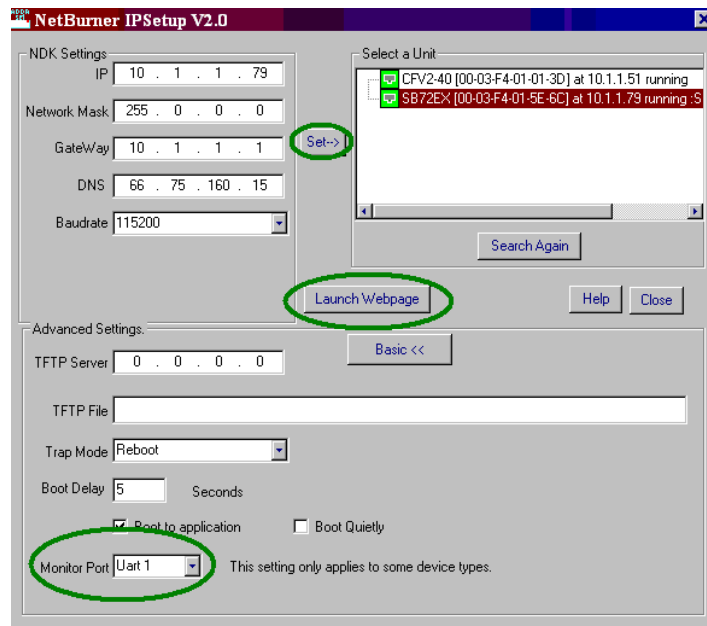
The "Debug Serial Port", or Debug Port for short, is used to display status messages from the application. If your application needs only a single serial port we recommend setting the other serial port to "Debug".

If your application requires a single RS-232 connection we recommend using Port 1 as the data port and Port 0 as the debug port.

If your application requires a single RS-422/485 connection we recommend configuring Port 1 as the debug port.

2.2 Network Configuration

1. Run IPSetup.exe (by double clicking its icon). This program is located on the CD-ROM that came with your SB70LC. To view the Advance Settings, click on the Advanced button (the button name will change to Basic). In this example, I am using Uart 1 as my Monitor port (screen shot below).
2. Locate your SB70LC in the "Select a Unit" pane by matching its MAC address. The MAC address is located on the bottom of your SB70LC. If your SB70LC device does not appear in the list box, verify the power, speed, and link LEDs are illuminated, and click the Search Again button. If you are still unable to see your SB70LC, remove power, correct any cabling errors, reapply power, and click the Search Again button. Note: IP Setup uses a UDP broadcast protocol and will not operate through a router.
3. If your network supports DHCP (factory default): The assigned IP Address will appear in the "Select a Unit" pane. Write down this address. If your network does not support DHCP, configure the IP Address and Network Mask fields as shown in the screen shot below. If you need help selecting values, please read the "Selecting an IP Address" section at the end of this guide. After you have entered all of your values, click the Set button in the center of the IP Setup window to configure your SB70LC with its new parameters. Note: If you do not click the Set button, your values will not be saved. If you have multiple NetBurner devices, make sure you selected your SB70LC in the "Select a Unit" pane (as shown in the screen shot) before you input your information.



2.3 Operational Configuration

Once the network parameters are, you can use the web server interface to modify the settings of your SB70LC. To access the web page, click on the Launch Webpage button in IP Setup, or you can open your web browser, and enter the numeric IP Address in the address field (e.g. <http://10.1.1.79>). Note: For the telnet example on page 19, I have set UART 1 as my Monitor Port.

3. Web Page Configuration

Once you have configured the IP address of your device you can connect to the SB70LC web server to configure your serial and network settings.

3.1 Network Settings

NetBurner
Networking in 1 day!

[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

Network

Protocol: (Changing will terminate all existing connections)

Device Name (for DHCP):

NetBIOS Name: SB70LCSX-9715

Version: 01.00.0000

	Static Settings	DHCP Assigned Values	Address Mode
Device IP Address	<input type="text" value="0.0.0.0"/>	(10.1.1.242)	<input type="button" value="Dynamic IP (DHCP)"/>
Device Subnet Mask	<input type="text" value="0.0.0.0"/>	(255.255.255.0)	
Device Gateway	<input type="text" value="0.0.0.0"/>	(10.1.1.1)	
DNS Server	<input type="text" value="0.0.0.0"/>	(66.75.160.15)	

Protocol	Selects the network protocol: SSH, TCP or UDP. Selecting a mode will enable the navigation links that apply to that protocol, and disable navigation links that do not apply. For example, if you select SSH, then the TCP and UDP configuration screens are disabled.
Device Name	Specifies the device name to be sent to your DHCP server, and is also used as the NETBIOS name. Note that NETBIOS names are limited to 14 characters and no spaces.
Version	Software version number
Address Mode	Select between DHCP and Static IP address settings.
Device IP Address Device Subnet Mask Device Gateway Device DNS	If Address Mode is set to DHCP, your DHCP server will provide these values and they will be displayed in the DHCP Assigned Values column. If you wish to specify these values yourself set the Address Mode to “static” and type the values in the appropriate fields. Note that if you do not specify a Gateway or DNS server you will not be able to communicate outside your LAN.

3.2 UDP Configuration

NetBurner
Networking in 1 day!

[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

UDP


Settings	Port 0	Port 1
Incoming port:	<input type="text" value="0"/>	<input type="text" value="23"/>
Outgoing port:	<input type="text" value="1000"/>	<input type="text" value="1000"/>
Send output to this address:	<input type="text" value="(Enter IP Address)"/>	<input type="text" value="(Enter IP Address)"/>
Learn outbound address from last incoming packet	<input type="checkbox"/>	<input type="checkbox"/>
Number of characters to accumulate before sending UDP packet:	<input type="text" value="32"/>	<input type="text" value="32"/>
Number msec to wait for accumulated characters: 0 waits forever.	<input type="text" value="100"/>	<input type="text" value="100"/>
Send UDP frame when this character is received: (Enter NA to disable)	<input type="text" value="NA"/>	<input type="text" value="NA"/>

Device Name: SB70LCSX-9715 | Version: 01.00.0000

Only available if the UDP Protocol is selected in Network Configuration. The column headings Port 0 and Port 1 refer to the serial ports and associated UARTs 0 and 1.

Incoming Port	The UDP port to listen on for incoming network data that will be sent out the associated serial port.
Outgoing Port	The UDP port used for outgoing serial data.
Send output to this address	The destination IP address for outgoing serial data.
Learn outbound address from last incoming packet	Send outbound serial to the IP address from the last received UDP packet. Useful for clients that may have changing IP addresses.
Number of characters to accumulate before sending UDP packet	Maximum number of characters to accumulate from received UDP packets before sending them out the serial port. This setting will be overridden if the accumulation delay time setting is used and the delay time expires.
Number msec to wait for accumulated characters (0 waits forever)	Specified maximum wait time for received UDP character accumulation setting.
Send UDP frame when this character is received: (Enter NA to disable)	If a character is specified, a UDP frame will be sent upon receipt of that character from the serial port.

3.3 TCP Configuration



[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

TCP		Port 0	Port 1
Listen for incoming network connections	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Listening network port:	<input type="text" value="0"/>	<input type="text" value="23"/>	
Timeout and disconnect after this many seconds of inactivity.	<input type="text" value="60"/>	<input type="text" value="60"/>	
Allow new connection if the existing connection has been idle for this many seconds.	<input type="text" value="30"/>	<input type="text" value="30"/>	
When to begin making outgoing serial connections:	<input type="text" value="Never"/>	<input type="text" value="Never"/>	
Connect on network port:	<input type="text" value="1000"/>	<input type="text" value="1000"/>	
Connect to this address:	<input type="text" value="(Enter IP Address)"/>	<input type="text" value="(Enter IP Address)"/>	
Timeout and disconnect after this many seconds of inactivity.	<input type="text" value="60"/>	<input type="text" value="60"/>	
Retry failed outgoing connections after this many seconds.	<input type="text" value="360"/>	<input type="text" value="360"/>	
Use custom packetization logic (below)	<input type="checkbox"/>	<input type="checkbox"/>	
Number of characters to accumulate before sending TCP packet:	<input type="text" value="32"/>	<input type="text" value="32"/>	
Number msec to wait for accumulated characters: 0 waits forever.	<input type="text" value="100"/>	<input type="text" value="100"/>	
Flush TCP frame when this character is received (Enter NA to disable):	<input type="text" value="NA"/>	<input type="text" value="NA"/>	
Network Settings on Serial Port - Advanced Serial Settings		<input type="button" value="Submit New Settings"/>	

Device Name: SB70LCSX-9715 | Version: 01.00.0000

Only available if the TCP Protocol is selected in Network Configuration. The column headings Port 0 and Port 1 refer to the serial ports and associated UARTs 0 and 1.

In TCP protocol mode you can configure the device to be a TCP Server, which listens for incoming connections, or a TCP Client, which makes outgoing connections. In TCP Client mode, you can choose to make an outgoing connection on device power-up, or you can choose to only connect when serial data is available to send. You cannot be a TCP Client and TCP Server at the same time.

3.3.1 TCP Server Mode

Listen for incoming network connections	Select checkbox to enable the port to listen for incoming TCP connection requests. Checking this box will override the TCP Client mode.
Listening network port	Port number to listen on. The default port is 23 (telnet). The listen port numbers for Port0 and Port1 must be different.
Timeout and disconnect after this many seconds of inactivity.	Terminate TCP connection if no incoming network data or outgoing serial data has occurred. This is useful because there is no way to detect if a client has crashed or abnormally terminated unless unacknowledged data exists and times out. A value of 0 disables this feature.
Allow new connection if the existing connection has been idle for this many seconds.	Similar to the disconnect timeout, but does not disconnect a connection until a new connection is requested. A value of 0 disables this feature.

3.3.2 TCP Client Mode


When to begin making outgoing serial connections	Selects between connect on power-up and connect on serial data available.
Connect on network port	Specifies destination TCP port number
Connect to this address	Specifies destination IP address
Timeout and disconnect after this many seconds of inactivity.	Terminate TCP connection if no incoming network data or outgoing serial data has occurred. This is useful because there is no way to detect if a client has crashed or abnormally terminated unless unacknowledged data exists and times out. A value of 0 disables this feature.
Retry failed outgoing connections after this many seconds.	Number of seconds to wait before retrying an outgoing connection.

3.3.3 TCP Packetization Options, valid for TCP Sever or Client Modes

Use custom packetization logic	Enables/disables custom packetization settings
Number of characters to accumulate before sending TCP packet	Maximum number of characters to accumulate from received TCP connection before sending them out the serial port. This setting will be overridden if the accumulation delay time setting is used and the delay time expires.
Number msec to wait for accumulated characters (0 waits forever)	Specified maximum wait time for received TCP character accumulation setting.
Flush TCP frame when this character is	Send all accumulated serial data upon receipt of this

received (Enter NA to disable)	character from the serial port.
Network Settings on Serial Port - Advanced Serial Settings	Link to advanced network settings that enable serial messages to be sent upon specific network events.

3.3.4 TCP Advanced Serial Network Settings



[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

Advanced Serial

Port 0: Serial Data Notification Settings

Send serial message when TCP connection is established.
 Message to send:

Send serial message when TCP connection is lost.
 Message to send:

[Message Formatting Codes](#)

Send serial break when incoming TCP connection is established.
 Break interval (in tenths of a second):

Send serial break when incoming character is received (2-digit hex, i.e. "02"):

Port 1: Serial Data Notification Settings

Send serial message when TCP connection is established.
 Message to send:

Send serial message when TCP connection is lost.
 Message to send:

[Message Formatting Codes](#)

Send serial break when incoming TCP connection is established.
 Break interval (in tenths of a second):


Send serial break when incoming character is received (2-digit hex, i.e. "02"):



Message Formatting Codes	
Character	Data Item
%%	Prints "%"
%r	Line feed (ASCII 10)
%n	Carriage return (ASCII 13)
%x	Any hex value is %X20 (ASCII space)

[Return to Setup Page](#)

4. SSH Configuration



[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

TCP

	Port 0	Port 1
Listen for incoming network connections	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Listening network port:	<input type="text" value="0"/>	<input type="text" value="23"/>
Timeout and disconnect after this many seconds of inactivity.	<input type="text" value="60"/>	<input type="text" value="60"/>
Allow new connection if the existing connection has been idle for this many seconds.	<input type="text" value="30"/>	<input type="text" value="30"/>
When to begin making outgoing serial connections:	Never <input type="button" value="v"/>	Never <input type="button" value="v"/>
Connect on network port:	<input type="text" value="1000"/>	<input type="text" value="1000"/>
Connect to this address:	<input type="text" value="(Enter IP Address)"/>	<input type="text" value="(Enter IP Address)"/>
Timeout and disconnect after this many seconds of inactivity.	<input type="text" value="60"/>	<input type="text" value="60"/>
Retry failed outgoing connections after this many seconds.	<input type="text" value="360"/>	<input type="text" value="360"/>
Use custom packetization logic (below)	<input type="checkbox"/>	<input type="checkbox"/>
Number of characters to accumulate before sending TCP packet:	<input type="text" value="32"/>	<input type="text" value="32"/>
Number msec to wait for accumulated characters: 0 waits forever.	<input type="text" value="100"/>	<input type="text" value="100"/>
Flush TCP frame when this character is received (Enter NA to disable):	<input type="text" value="NA"/>	<input type="text" value="NA"/>
Network Settings on Serial Port - Advanced Serial Settings		
<input type="button" value="Submit New Settings"/>		

Device Name: SB70LCSX-9715 | Version: 01.00.0000

Only available if the SSH Protocol is selected in Network Configuration. The column headings Port 0 and Port 1 refer to the serial ports and associated UARTs 0 and 1.

Listen for incoming network connections	Select checkbox to enable the port to listen for incoming SSH connection requests.
Listening network port	Port number to listen on. The default SSH port is 22. The listen port numbers for Port0 and Port1 must be different.
Timeout and disconnect after this many seconds of inactivity.	Terminate SSH connection if no incoming network data or outgoing serial data has occurred. This is useful because there is no way to detect if a client has crashed or abnormally terminated unless unacknowledged data exists and times out. A value of 0 disables this feature.
Allow new connection if the existing connection has been idle for this many seconds.	Similar to the disconnect timeout, but does not disconnect a connection until a new connection is requested. A value of 0 disables this feature.
Use custom packetization logic	Enables/disables custom packetization settings
Number of characters to accumulate before sending TCP packet	Maximum number of characters to accumulate from received SSH connection before sending them out the serial port. This setting will be overridden if the accumulation delay time setting is used and the delay time expires.
Number msec to wait for accumulated characters (0 waits forever)	Specified maximum wait time for received SSH character accumulation setting.
Flush TCP frame when this character is received (Enter NA to disable)	Send all accumulated serial data upon receipt of this character from the serial port.
SSH Keys	Link to the SSH key management page.
Network Settings on Serial Port - Advanced Serial Settings	Link to advanced network settings that enable serial messages to be sent upon specific network events.

4.1 SSH Key Configuration

The screenshot shows the NetBurner web interface for SSH Key Configuration. At the top left is the NetBurner logo with the tagline "Networking in 1 day!". To the right is a navigation menu with links for Network, UDP, TCP, SSH, Serial, Password, HTTPS, Advanced, and Help. The main content area is titled "SSH Keys" and contains three rows of configuration options:

RSA Public/Private Key Pair	Default	Display Public Key
DSA Public/Private Key Pair	Default	Display Public Key
RSA or DSA Key File to Install	<input type="text"/>	<input type="button" value="Browse..."/>

At the bottom right of the configuration area is an button. Below the configuration area, the device name and version are displayed: "Device Name: SB70LCSX-9715 | Version: 01.00.0000". A red warning message states: "SSH Keys - Key size must be at least 512 and no more than 4096 and in openSSH(openSSL) format."

Only available if the SSH Protocol is selected in Network Configuration. RSA and DSA are algorithms for public-key cryptography and involve a public key and a private key. The public key can be known to everyone and is used for encrypting messages. Messages encrypted with the public key can only be decrypted using the private key. For detailed information on the NetBurner SSH implementation, please refer to the NetBurner SSH product datasheet at www.netburner.com.

This configuration screen is used to display the current key configuration and provide the ability to upload your own key. Each private key also contains the public key, so uploading your own private key will also upload the public key. You can use the Display Public Key link to copy the public key and provide it for encryption purposes.

There are 3 possible key configurations. The first two are present so the system is functional if you have not uploaded your own user created keys.

1. The NetBurner factory key, designated by the name "NetBurner". This key is built into the SSH library and will be active if no other keys are present.
2. The SSH application key, designated by the description "Default". This key is compiled into the SSH application and will be used if no user created keys have been uploaded.
3. A key you have created and uploaded.

IMPORTANT: When creating your own keys the key size must be at least 512 bits and no more than 4096 bits and in openSSH(openSSL) format.

RSA Public/Private Key Pair	Displays current RSA key in use.
DSA Public/Private Key Pair	Displays current DSA key in use.
RSA or DSA Key File to Install	Use this field to select a user created key file to upload. Once selected, click on "Install Key" to upload.

4.2 SSH Advanced Serial Settings

These are the same as with TCP. Please refer to the TCP Advanced Serial Settings section.

5. Serial Settings

NetBurner
Networking in 1 day!

[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

Serial

	Port 0	Port 1
Data Port Settings (If both are DEBUG, defaults to Port 0):	DEBUG	RS-232
Data Baud Rate:	115200	115200
Data Bits:	8	8
Data Parity:	None	None
Stop Bits:	1	1
Flow Control:	None	None

[Submit New Settings](#)

Device Name: SB70LCSX-9715 | Version: 01.00.0000

The SB70LC provides two TTL level UARTs, Port 0 and Port 1. You may operate the serial ports in a number of different modes, but will need to add external level shifters for RS-232, RS-422 and RS-485. The mode is selectable here to accommodate the control signals and flow control.


Port 0 may be configured to operation in one of the following modes:

- RS-232 Select for use as TTL or if you have a RS-232 level shifter.
- RS-485 Select if you have a RS-485 level shifter installed for half or full duplex.
- DEBUG Specifies whether or not to use the serial port as stdin, stdout and stderr for serial status messages or debugging. Valid for TTL or RS-232 modes.

Port 1 may be configured for RS-232 or DEBUG only.

Data Port Settings (If both are DEBUG, defaults to Port 0)	Select serial mode RS-232, RS-485 or DEBUG.
Data Baud Rate	Set serial baud rate
Data bits	Serial data bits
Data parity	Serial parity
Stop bits	Number of stop bits
Flow control	Set to None for no flow control. If using RS-232 or TTL valid selections are None, Xon/Xoff software flow control, or RTS/CTS hardware flow control.

6. Password Settings



[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

Password

Administrator

User Name:

Password: (Leave blank for no password)

Repeat Password:

SSH User

User Name:

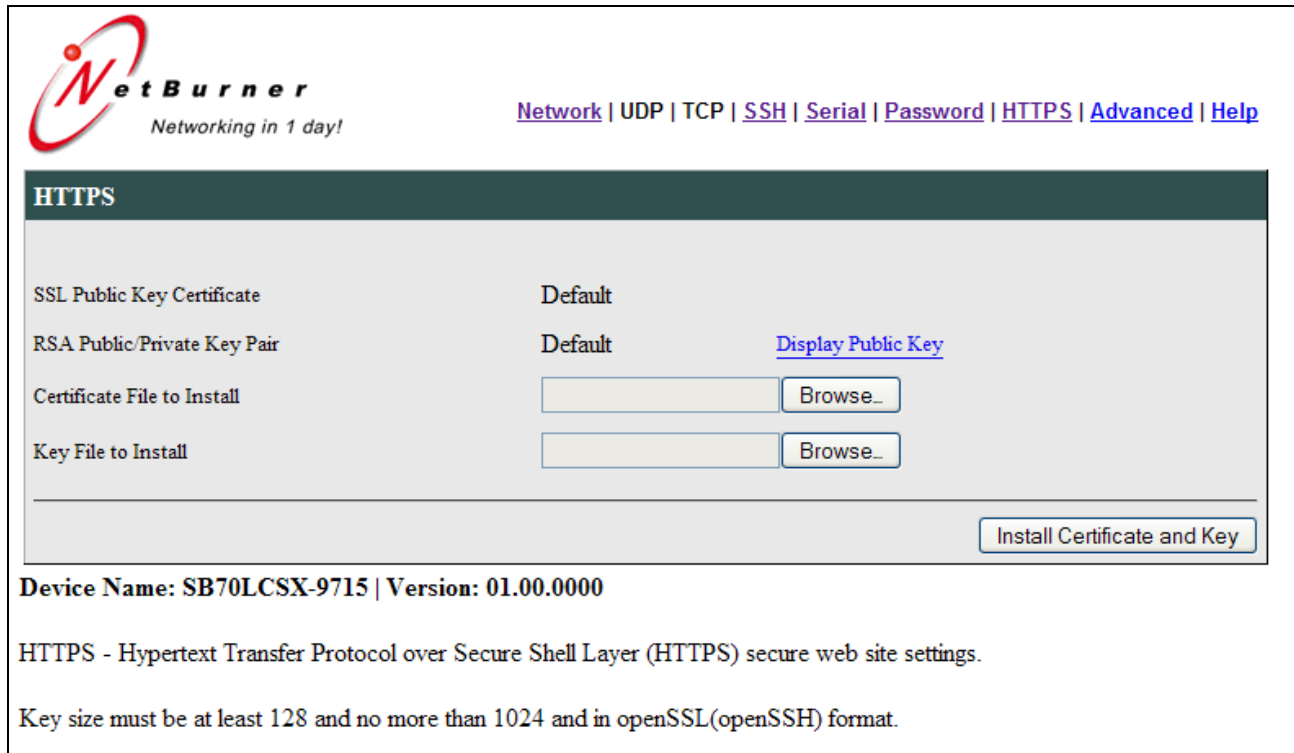
Password: (Leave blank for no password)

Repeat Password:

Device Name: SB70LCSX-9715 | Version: 01.00.0000

Administrator Password	<p>This password applies to:</p> <ul style="list-style-type: none"> Web page access Autoupdate capability for software updates Configuration changes with IPSetup SSH client log-in
SSH Password	Password for SSH clients with no administrative privileges.

7. Hypertext Transfer Protocol over SSL (HTTPS) Configuration



NetBurner
Networking in 1 day!

[Network](#) | [UDP](#) | [TCP](#) | [SSH](#) | [Serial](#) | [Password](#) | [HTTPS](#) | [Advanced](#) | [Help](#)

HTTPS

SSL Public Key Certificate	Default	
RSA Public/Private Key Pair	Default	Display Public Key
Certificate File to Install	<input type="text"/>	<input type="button" value="Browse.."/>
Key File to Install	<input type="text"/>	<input type="button" value="Browse.."/>

Device Name: SB70LCSX-9715 | Version: 01.00.0000

HTTPS - Hypertext Transfer Protocol over Secure Shell Layer (HTTPS) secure web site settings.

Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format.

HTTPS refers to HTTP over a secure SSL connection. To use HTTPS you can simply enter a URL of “https://xxxxx” instead of “http://xxxxx”. Your NetBurner device can simultaneously run both HTTP and HTTPS access to the web server.

HTTPS requires both a Certificate and a RSA public/private Key. The key must match the certificate and if you are creating your own self signed certificate or purchasing a certificate from a certificate authority, both the certificate and key must be uploaded at the same time. If you are creating your own certificate, called a self-signed certificate, anyone accessing the secure web page will first receive a warning message from the web browser asking to confirm whether or not the certificate should be accepted. For detailed information on the NetBurner SSL implementation, please refer to the NetBurner SSL product datasheet at www.netburner.com.

There are 3 possible key/certificate configurations. The first two are present so the system is functional if you have not uploaded your own user created certificate and key.

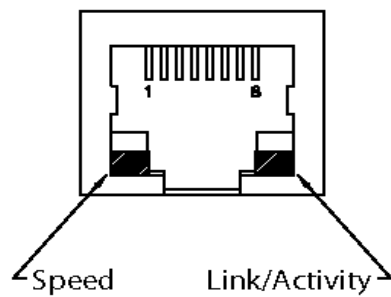
1. The NetBurner certificate/key built into the SSL library, designated by the name “NetBurner”, which will be used if no other keys are present.
2. The application certificate/key, designated by the description “Default”. This SSL certificate and key are compiled into the application and will be used if no user created certificate and key have been uploaded.
3. A certificate and key you have uploaded.

IMPORTANT: When creating your own key the key size must be at least 128 bits and no more than 1024 bits and in openSSL(openSSH) format.

SSL Public Key Certificate	Displays current certificate in use.
RSA Public/Private Key Pair	Displays the current keys in use.
Certificate file to install	Selects the certificate file to upload (must also upload the key).
Key file to install	Selects the RSA public/private key pair to upload (must also upload certificate).

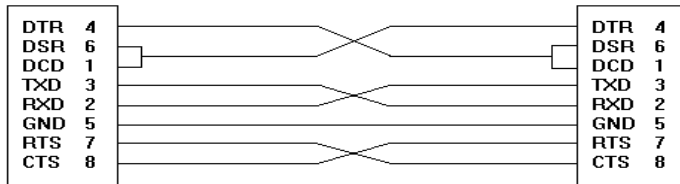
8. LEDs

- Power LED: Illuminated while power is applied.
- LED1 on RJ-45: Ethernet speed – 10 (off) or 100 (on)
- LED2 on RJ-45: Link and data activity



9. RS-232 NULL Modem Wiring

The following table and diagram shows how to create a null modem cable/adaptor for RS-232 connections. **IMPORTANT:** A null modem cable is **required** if you are connecting your SB70LC to a single computer. A standard serial cable will **not** work!



10. Network IP Address Configuration

If you are part of an existing network, are not using DHCP, stop reading now, and go get a Static IP Address and Network Mask address from your network administrator. If you follow the advice in this paragraph on an existing network without an assigned Static IP Address, your Network Administrator will hunt you down....

IP Addresses are used to route packets from place to place on an Intranet/Internet. If you are not part of an established network, and your Ethernet segment is isolated, you can choose just about any IP Address you desire. The "powers that be" have actually set aside some addresses for isolated networks. They are documented in RFC1918. The reserved ranges are:

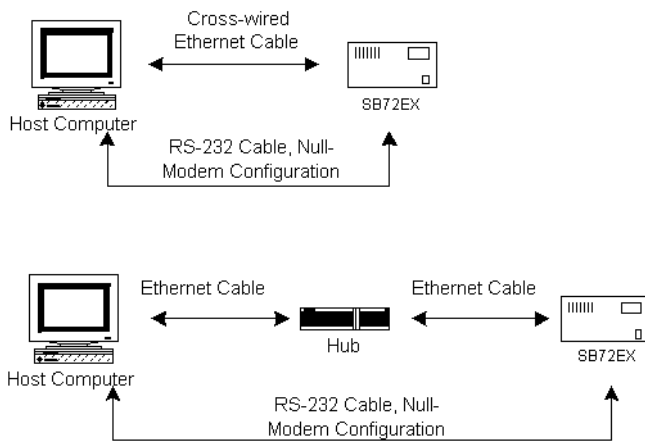
- Class A: 10.0.0.0 to 10.255.255.255
- Class B: 172.16.0.0 to 172.31.255.255
- Class C: 192.168.0.0 to 192.168.255.255

11. Web Browsers and Proxy Servers

If you are working on a corporate LAN that uses a proxy server for Internet web browsing, you will need to exclude the IP Address of your SB70LC in your web browser's proxy server settings/preferences. Otherwise, an attempt to connect to a web page on the LAN will **fail** because the proxy server will attempt to route the request outside the LAN. For most web browsers, this can be accomplished in the advanced settings for the proxy server configuration. Set the Network Mask for your host computer's network adapter and your SB70LC to 255.255.255.0.

12. Testing with a Telnet Connection

One quick way to test the functionality of your Serial-to-Ethernet connection is with the Telnet program and an RS-232 Serial terminal program (e.g. MTTY). Remember you must use a NULL modem able to connect your SB70LC to your host computer. To run this test, configure your system as one of the two examples shown below:



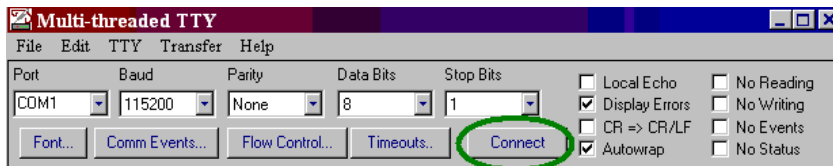
The objective of this example is to use a single host computer running telnet and a serial terminal program to send data in either direction. Therefore, if you type text in the telnet window, it should appear in the serial terminal window and visa versa. For a serial terminal, you can use MTTY (which is included in your NetBurner SB70LC CD-ROM) or HyperTerminal.

In the following example, an IP Address of 10.1.1.79 will be used for the SB70LC. Note: Replace this number with the specific IP Address you assigned (if using a Static IP Address) during configuration.

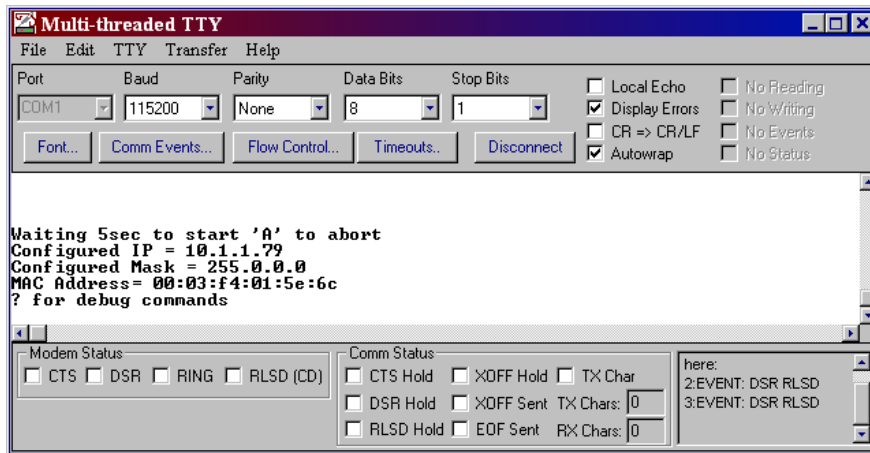
Procedure

1. Connect your hardware in one of the above configurations.
2. Open a command prompt window on your host computer.

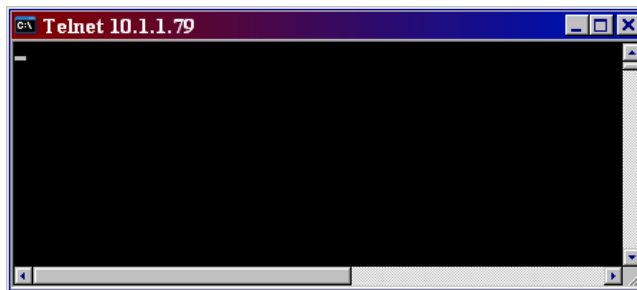
3. Verify everything is connected correctly by executing the command ping 10.1.1.79 and pressing the Enter key on your keyboard. You will see a valid ping response. Remember to substitute your IP Address for our example IP Address (i.e.10.1.1.79).
4. Run either HyperTerminal or MTTY. Set the baud rate to the value you assigned to the SB70LC during configuration. To use MTTY (with the factory default settings):
 - Connect your NULL modem cable from Port 0 on your SB70LC to your host computer's serial port. Remember, a standard serial cable will not work.
 - Run Mtty.exe (by double clicking its icon), which is located on the CD-ROM that came with your SB70LC. When the MTTY window appears use the factory default setting shown below:
 - The Port setting is the communication port that you connected the NULL modem cable to on your host computer.
 - The host computer and the attached SB70LC must agree on a speed or baud rate to use for the serial connection.
 - Parity checks whether the data has been lost or written over when transmitted between your host computer and your SB70LC.
 - Data Bits are the number of bits in a transmitted data package.
 - The Stop bit follows the data and parity bits in serial communication. It indicates the end of transmission.
 - Click the MTTY **Connect** button.



- Remove and reapply power to your SB70LC.
- The SB70LC factory application will boot.



5. Run Telnet by typing: telnet 10.1.1.79 24 after the prompt, and press the Enter key. Note: This assumes a port number of 24. You must replace this port number with the listening port number that you assigned in the “Device Connection Settings (TCP mode)” section. Remember to substitute your IP Address for our example IP Address (i.e.10.1.1.79).



6. At this point, anything you type in the Telnet window should appear in the serial terminal window and vice versa.