



# **SB700EX User's Manual**

Revision: 1.0  
October 7, 2009

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## 1. Overview



The NetBurner SB700EX can be used in two ways:

1. The SB700EX is preprogrammed at the factory to provide dual serial to Ethernet functionality using UDP, TCP or SSH. 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 SB700EX provides two serial ports that can be configured as two RS-232 ports, or one RS-232 port and one RS-422/485 port with half or full duplex. The remainder of this users guide describes how to use the SB700EX with the factory Serial-to-Ethernet program.
2. The SB700EX 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-SB700EX-KIT) you have the ability to write custom applications for networking, custom web pages, custom baud rates, real-time clock functions, and access to the Micro SD card and flash file system.

## 2. Initial Configuration

Before you can begin using your SB700EX, three areas of configuration are required to tell your SB700EX 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

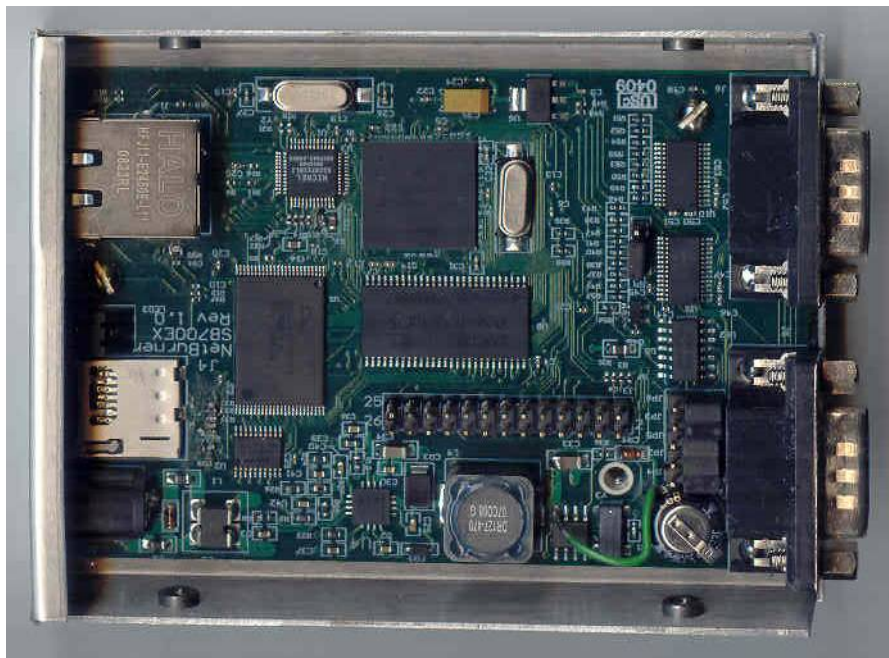
The SB700EX has two asynchronous UART type serial ports, referred to as Port 0 and Port 1. The ports can be configured as two RS-232 ports, or one RS-232 port and one RS-422/485 port (half or full duplex). Port 0 can be configured for either RS-232 or RS-422/485 operation (the factory default is RS-232), while Port 1 is always used as RS-232.

To configure the SB700EX for RS-422/485 operation you must:

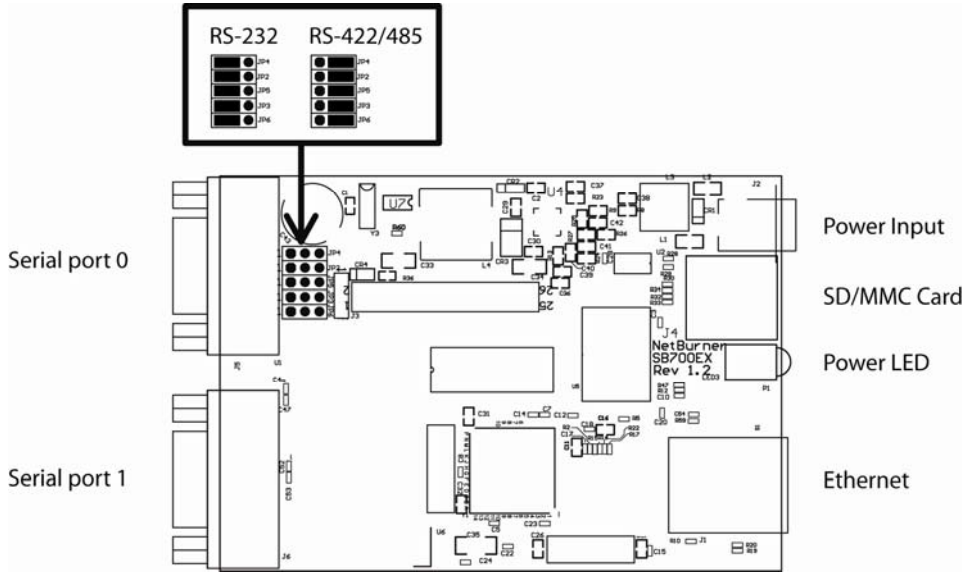
1. Open the SB700EX case and set the jumpers for Port 0 to RS-422/485 mode.
2. Configure the software setting in the Serial tab of the web page configuration to RS-422/485 mode.

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” rather than RS-232 (which would make it a data channel instead of a debug channel).

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.



## 2.1.1 Jumper Settings



## 2.1.2 DB9 Connector Pinouts

### NetBurner SB700EX Port 0-1 Signal Descriptions

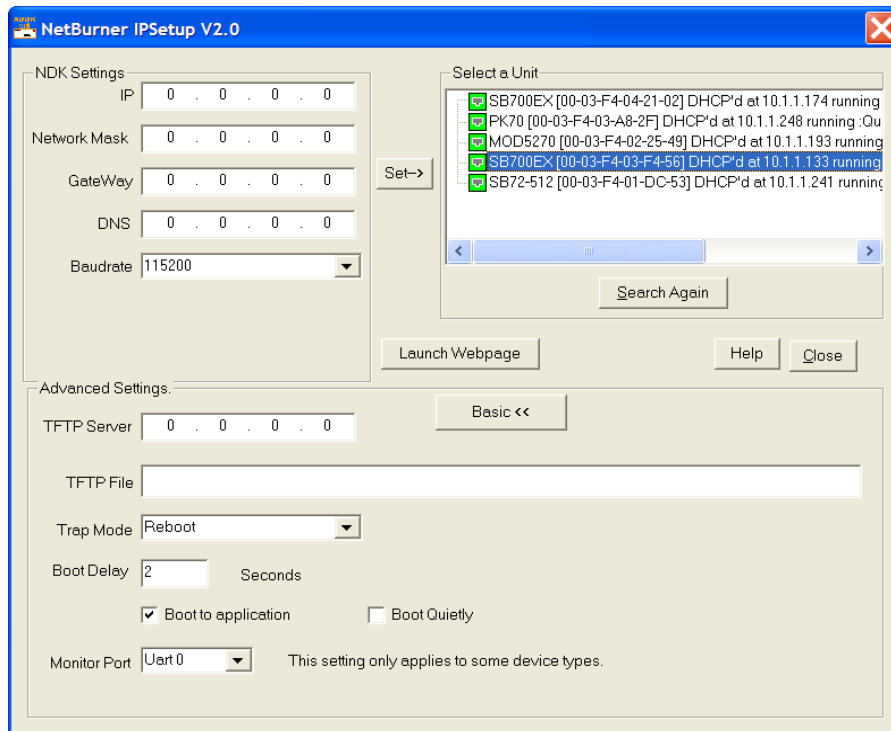
| Pin | Port 0 | Port 1              |                     |
|-----|--------|---------------------|---------------------|
|     | RS-232 | RS-232 <sup>1</sup> | RS-485 <sup>1</sup> |
| 1   | CD     | CD                  | -                   |
| 2   | RX     | RX                  | HD- / FD TX-        |
| 3   | TX     | TX                  | HD+ / FD TX+        |
| 4   | DTR    | DTR                 | -                   |
| 5   | GND    | GND                 | GND                 |
| 6   | DSR    | DSR                 | FD RX-              |
| 7   | RTS    | RTS                 | FD RX+              |
| 8   | CTS    | CTS                 | -                   |
| 9   | RI     | RI                  | -                   |

**Note:**

1. Port 1 can be configured as either RS-232 or RS-485

## 2.2 Network Configuration

1. Run IPSetup.exe (by double clicking its icon). This program is located on the SB700EX product page at [www.netburner.com](http://www.netburner.com). 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 SB700EX in the "Select a Unit" pane by matching its MAC address. The MAC address is located on the bottom of your SB700EX. If your SB700EX 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 SB700EX, 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 SB700EX 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 SB700EX 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 set, you can use the web server interface to modify the settings of your SB700EX. 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, we have set UART 1 as the Monitor/Debug Port.

## **3. Web Page Configuration**

Once you have configured the IP address of your device you can connect to the SB700EX web server to configure your serial and network settings.

### 3.1 Network Settings

|   |  |
|---|--|
| 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<br>Device Subnet Mask<br>Device Gateway<br>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

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#### 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:<br>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: SB700EXSX-F456 | 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



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## 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:<br>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"/>                 |
| <a href="#">Network Settings on Serial Port - Advanced Serial Settings</a>           |   |   |
| <input type="button" value="Submit New Settings"/>                                   |   |   |

**Device Name: SB700EXSX-F456 | 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



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#### 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



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### SSH

|  | 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="22"/>     |
| Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="180"/> | <input type="text" value="180"/>    |
| Allow new connection if the existing connection has been idle for 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:<br>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"/>     |

SSH Keys [SSH Keys](#)

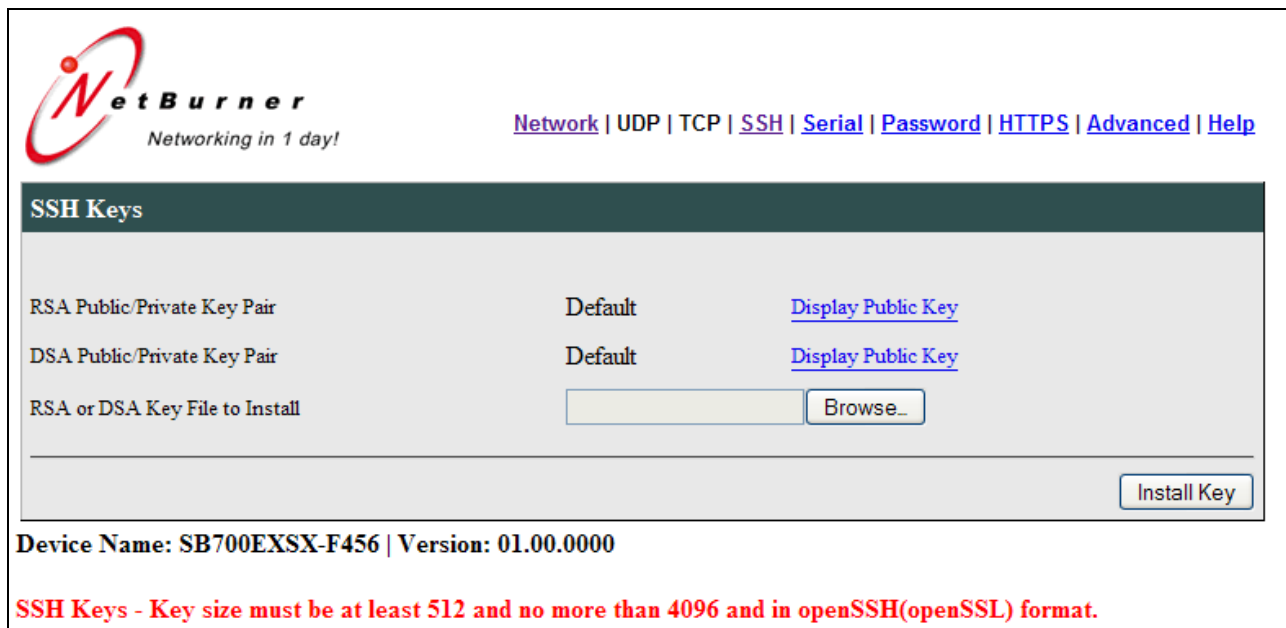
Network Settings on Serial Port - [Advanced Serial Settings](#)

Device Name: SB700EXSX-F456 | 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



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### SSH Keys

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

Device Name: SB700EXSX-F456 | Version: 01.00.0000

**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](http://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

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### 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: SB700EXSX-F456 | Version: 01.00.0000

The SB700EX provides two serial port, Port 0 and Port 1. Port 0 can be configured for RS-232 or RS-422/485 (need to set hardware jumpers to match), and Port 1 is configured as RS-232.

|  |  |
|--|--|
| 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, valid selections are None, Xon/Xoff software flow control, or RTS/CTS hardware flow control. |

## 6. Password Settings

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### 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: SB700EXSX-F456 | Version: 01.00.0000

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

## 7. Hypertext Transfer Protocol over SSL (HTTPS) Configuration

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### HTTPS

|                             |                      |  |
|-----------------------------|----------------------|--|
| SSL Public Key Certificate  | Default              |  |
| RSA Public/Private Key Pair | Default              | <a href="#">Display Public Key</a>       |
| 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: SB700EXSX-F456 | 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](http://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.

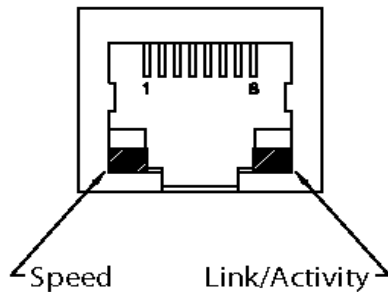
1. The NetBurner certificate/key built into the SSL library, designated by the name “NetBurner”, which will be used if no other keys are present.
2. The application certificate/key, designated by the description “Default”. This SSL certificate and key are compiled into the application and will be used 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). |

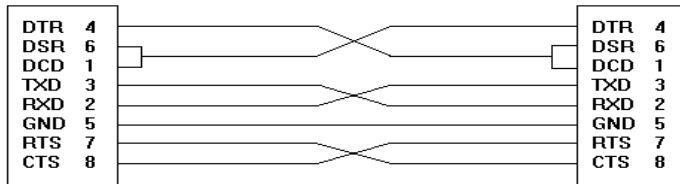
## 8. LEDs

- 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 SB700EX 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:

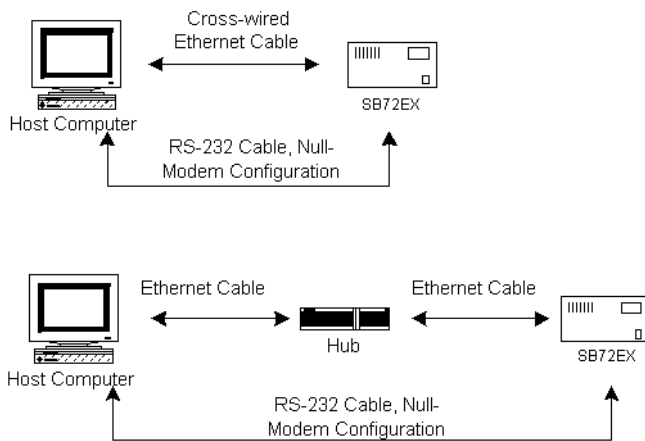
- Class A: 10.0.0.0 to 10.255.255.255
- Class B: 172.16.0.0 to 172.31.255.255
- Class C: 192.168.0.0 to 192.168.255.255

## 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 SB700EX 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 SB700EX 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 SB700EX to your host computer. To run this test, configure your system as one of the two examples shown below:



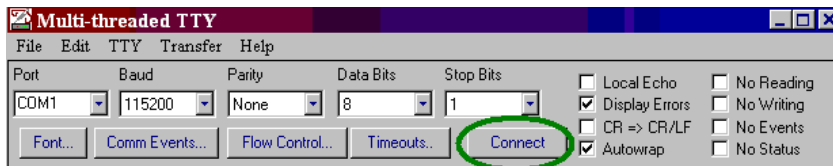
The objective of this example is to use a single host computer running telnet and a serial terminal program to send data in either direction. Therefore, if you type text in the telnet window, it should appear in the serial terminal window and visa versa. For a serial terminal, you can use MTTY (available as a download from the SB700EX product page at [www.netburner.com](http://www.netburner.com)) or HyperTerminal.

In the following example, an IP Address of 10.1.1.79 will be used for the SB700EX. Note: Replace this number with the specific IP Address you assigned (if using a Static IP Address) during configuration.

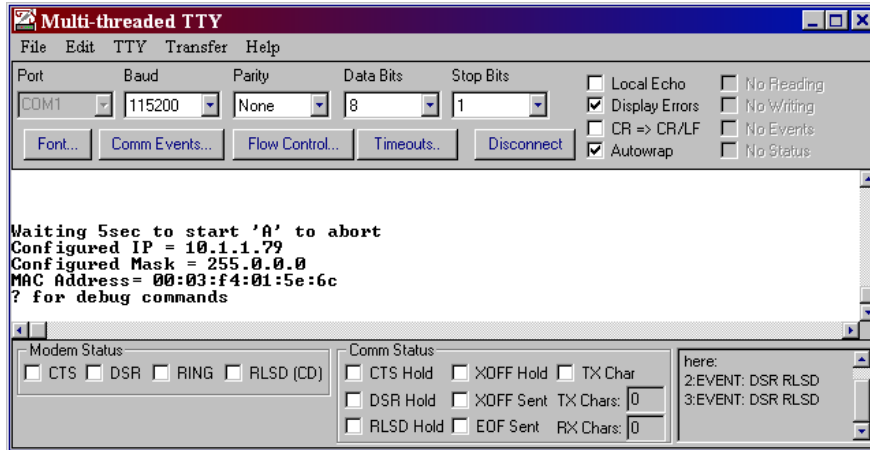
### Procedure

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

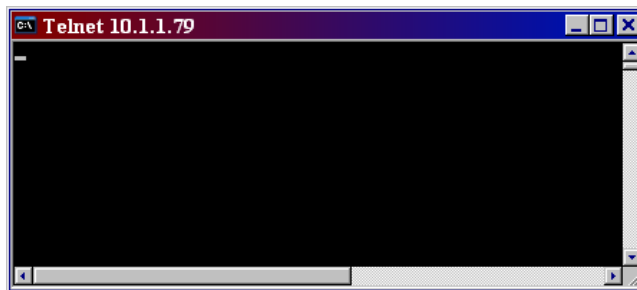
3. Verify everything is connected correctly by executing the command ping 10.1.1.79 and pressing the Enter key on your keyboard. You will see a valid ping response. Remember to substitute your IP Address for our example IP Address (i.e.10.1.1.79).
4. Run either HyperTerminal or MTTY. Set the baud rate to the value you assigned to the SB700EX during configuration. To use MTTY (with the factory default settings):
  - Connect your NULL modem cable from Port 0 on your SB700EX to your host computer's serial port. Remember, a standard serial cable will not work.
  - Run Mttty.exe (by double clicking its icon), available as a download from the SB700EX product page at [www.netburner.com](http://www.netburner.com). 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 SB700EX 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 SB700EX.
    - 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 SB700EX.
- The SB700EX 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.