



SB72 Quick Start Guide

NetBurner, Inc

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1 Introduction

1.1 Quick Start Guide Overview

The NetBurner Network Development Kit (NNDK) is designed as a complete development platform for NetBurner's hardware devices. This quick-start guide will help with the installation of the NetBurner software, hardware setup and accessing the factory application running on the device.

1.2 Software Licensing

The Software included in your NetBurner Network Development Kit is licensed to run only on NetBurner provided hardware. Please read the license.txt file located (by default) in your \Nburn\docs directory.

If your application involves manufacturing your own hardware, please contact sales@netburner.com for details on a royalty-free software license.

1.3 Kit Contents

- Quick start guide
 - SB72 Device
 - SB72-ADPT-100CR adapter board
 - Adapter Board Connector Ribbon
 - Power Adapter (US or International)
 - Serial Cable
 - Standard Ethernet Cable (Blue)
 - Red card with NNDK software and tools registration number and download link
-

1.4 SB72

The SB72 with NetBurner Network Development Kit (NNDK) is the fastest way to develop your network product. This kit includes everything you need to create network applications, and all the hardware and software components are integrated in a complete and easy to use package. For specific hardware information please read your Hardware User's Manual (located in C:). All documentation is located in your C: directory.

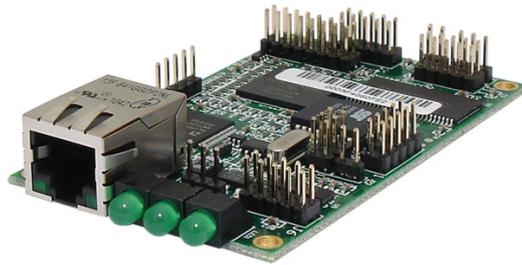


Figure 1: SB72

2 Software Installation

The NetBurner Network Development Kit includes all the software and documentation you need to develop an application for NetBurner hardware. To begin development, the first step is to install all software, drivers and documentation required to write an application and learn about the hardware.

2.1 Download the NNDK

All software used in this development kit must be downloaded from the NetBurner website. NNDK software download instructions are available at: <http://www.netburner.com/support/get-tools>

Note

Java Runtime Environment (JRE) (32-bit) 1.6 or later is required to run the NetBurner NBEclipse IDE. This software is not included with our installation. Please ensure that your OS Java tools are up to date before running the NetBurner NBEclipse IDE. The JRE can be downloaded at <http://java.com/en/download/>

2.2 Installing the Tools

After downloading the NNDK Software, run the setup application and follow the on screen directions to install the NNDK. During the installation, you must provide a valid serial number for each NetBurner platform type you wish to install. For example, if you have a MOD5441X and a MOD5270, you should include both a valid MOD5441X and a valid MOD5270 serial number in the serial number validation page.

Note

The serial number for your installation can be found on the red card that is included with your NNDK kit.

2.3 Tools Provided

The following software utilities are installed on your computer once the NNDK setup process is complete:

Tool	Function
NBEclipse	IDE used to develop, download and debug applications
AutoUpdate, TCPUpdate, SerialLoad	Download new applications to the module (SerialLoad for MOD5213)
IPSetup	Identify NetBurner modules on local Network
MTTTY	PC to NetBurner Serial communication
Application Wizard	Auto-generate basic applications
TaskScan	Monitor applications currently running on modules
TFTP Server	Host a TFTP Server
UDPTerminal	Send and receive UDP packets
WinAddr2Line	Decipher trap messages to get source location of program faults

2.4 Documentation

The following documentation, schematics, and guides are available in the /nburn/docs folder.

Tool	Function
NBEclipse Getting Started Guide	How to start using NBEclipse. This is required reading before using the integrated development environment (IDE)
NetBurner Runtime Libraries & uC/OS RTOS Library	Reference guides which list the function libraries available in the NNDK, as well as for the uC/OS real-time operating system
Freescale Manual	Detailed reference manual for the Freescale ColdFire microprocessor
GNU Manuals	Manuals for GNU C/C++ libraries, compiler and linker. This includes the C/C++ language API functions
NetBurner PC Tools Reference Guide	Reference manual for NetBurner tools that run on the PC, such as IPSetup, AutoUpdate, and MTTY
Platform Reference and Hardware Schematic	NetBurner hardware manuals that include memory map and design guides

3 Running the Factory Application

3.1 Device Setup

The NetBurner SB72 board was designed to provide flexible serial, Digital I/O, A/D and PWM connections in a large variety of installations. Serial interfaces include: RS-232, RS-422, RS-485 full and half duplex, and TTL. It is highly recommended that you become familiar with the NetBurner tools and development environment using the factory default configuration, described below:

- Remove all jumpers on your SB72 board.
- Connect your SB72 to the SB72-ADPT-100CR adapter board with the short 10-pin ribbon cable that was included in your NNDK. Note: The 10-pin headers are labeled as J5 on both your SB72 board your adapter board.

- Place jumpers on JP2 and JP3 on your adapter board as shown in the picture below.

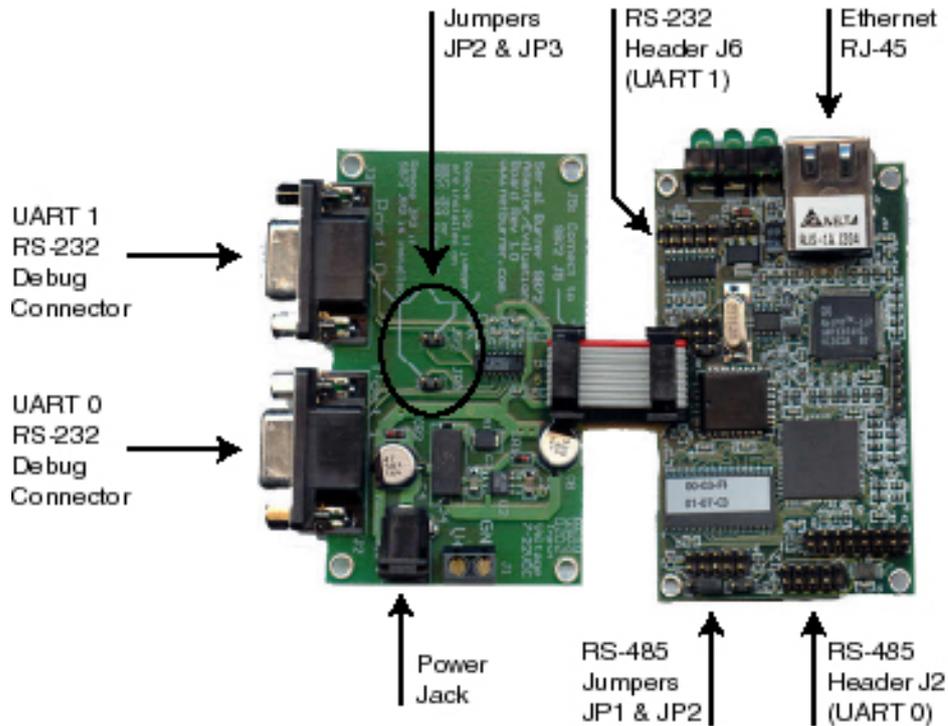


Figure 2: SB72 w/ SB72 Adapter Board

- Now, both serial ports will be routed to the two DB9 connectors on the adapter board. You can connect one or both ports to your host computer using standard serial cables. No gender changers, null-modem adapters, or level shifters are required. Note: A standard serial cable is included in your NNDK. In this configuration, with the boot monitor settings set to the factory defaults. Note: The DB9 port (J2) on the adapter board is the system monitor/debug port

3.2 Network Setup

Once your device is powered on and plugged in to the network, you may need to configure the network settings of the device. If a DHCP server in

running on the local network, then the module will automatically use the DHCP server when the factory application is running.

3.2.1 Dynamic IP Address (DHCP)

When the factory application boots, it will first attempt to obtain an address from a DHCP server. If you are connected to a network with a DHCP server, then the device IP address, network mask and gateway should be configured automatically. If your PC is on the same DHCP network, you will be able to communicate with the device after a short boot period of 2-3 seconds.

3.2.2 Static IP Address

If the module is plugged in to a network that does not have a DHCP server, you must provide a static IP address, network mask and gateway. These addresses should be provided by your network administrator. Ensure that the IP address and mask selected are able to communicate with the static IP settings of your PC.

3.2.3 Auto IP Address (APIPA)

The default factory application contains an auto IP negotiation system. This allows the device to automatically configure its address in the absence of a central DHCP server, and without the need for a static IP address. This scheme is utilized as a fallback that will activate when both dynamic and static IP addresses fail to initialize. In order to communicate with a device in auto IP mode, the host system must support auto IP. auto IP support is included in both Windows and OS X operating systems. By default, auto IP addressing starts in the 169.XXX.XXX.XXX address range.

The factory application that is included with the NetBurner module includes a simple web page, network configuration options and a demo of some of the hardware available on the device.

3.3 Find your Device

To begin, you will need to find out the IP address of your module. There are several ways to do this. One option is to use the included utility IP-Setup. If the device is powered on and plugged in to the same network as your PC, run IPSetup and all NetBurner devices on your network will be displayed with configuration options available.

Another option to find the IP address of your device is to use the NBEclipse IDE. As before, ensure that your device is powered on and plugged in to the same network as your PC. Open NBEclipse, and in the bottom left of the workspace, NBFind can be found running. This will list the I-P, application and MAC address of all NetBurner devices on your local network.

If these options are failing, there may be a firewall issue blocking the applications from sending the UDP broadcast that is used to locate NetBurner devices on the network. Always grant NetBurner applications the ability to get through your OS firewall. Ensure that UDP port 20034 is open for use.

3.4 View the Web Page

The factory application is running a web server with a basic web page detailing some of the features of the device and development board. Once you have found your device's IP address, open your favorite browser and point it at the IP address of the device.

3.5 Develop your own Application

Now that the NetBurner tools are installed, the hardware is set up and you have verified this by accessing the device's web server. You have now graduated beyond this quick start guide.

To begin writing an application, we recommend reading through the NBEclipse Getting Started guide and the NetBurner Programmers Guide. In the NBEclipse guide, you will find information on writing NetBurner applications, sending new applications to the module and debugging with the graphical debugger. The Programmers guide will teach you more about the NetBurner libraries, operating system, and writing of applications in

a multitask environment. Both of these documents can be found in the \nburn\docs folder of your NNDK software installation.

3.6 NetBurner Examples

The NNDK includes a multitude of examples that demonstrate the various hardware and software applications of the kit. These examples can be found in your NNDK installation directory, under the examples folder. The default location is \nburn\examples.

4 Hardware Errata

4.1 SB72 Connector Descriptions

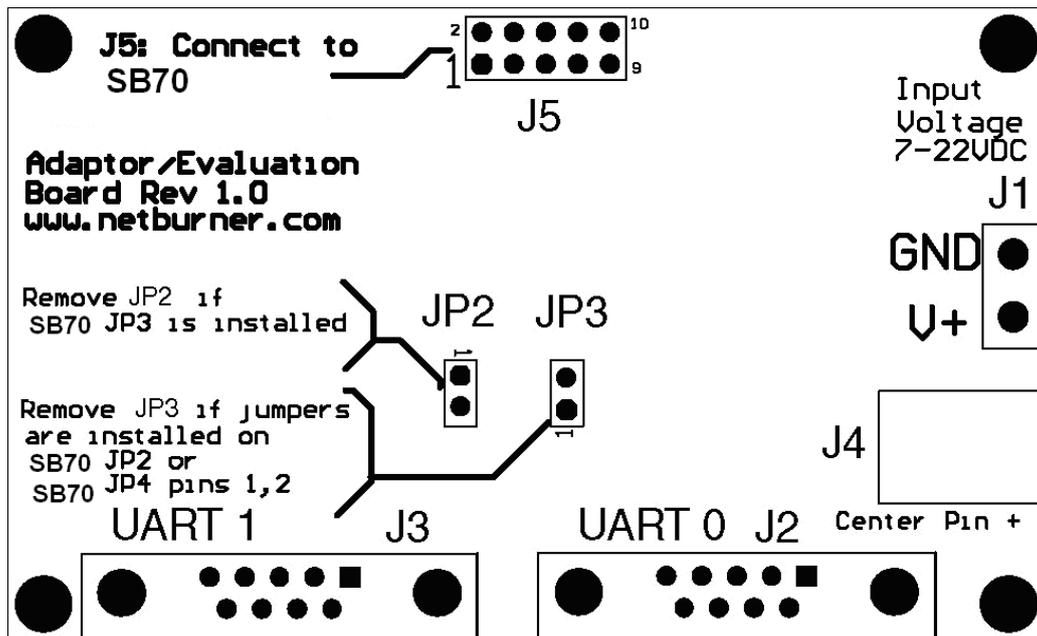


Figure 3: SB72 Adapter Board Connector Pinouts

J1 - Factory Test Connector, Dual Row 10-Pin Header

J1 is for factory use only.

J2 - RS-485, Dual Row 10-Pin Header

The RS-485 interface supports full duplex (FD) and half duplex (HD).

Pin	Signal	Pin	Signal
1	RX- (FD)	2	GND
3	RX+ (FD)	4	GND
5	NC	6	GND
7	TX+ (FD/HD)	8	GND
9	TX- (FD/HD)	10	GND

RS-485 10-Pin Header

J3 - Factory Test Connector, Dual Row 16-Pin Header

J3 is for factory use only.

J4 - SPI Interface Connector

J4 is a single row straight header used in SPI

Pin	Signal
1	GND
2	DOUT
3	CLK
4	DIN
5	/SPI_CS

SPI 5-Pin Header

J5 - Serial TTL, Dual Row 10-Pin Header

This connector allows access to TTL level serial ports 0 and 1. Note that pin 9 is a VCC 5V input, which allows for a single connector interface with TTL serial and power to the SB72.

Pin	Signal	Pin	Signal
1	GND	2	CTS1
3	TX1	4	RX1
5	RTS1	6	RTS0
7	CTS0	8	TX0
9	VCC 5V	10	RX0

Serial TTL, Dual Row Header

J6 - Serial RS-232, Dual Row 10-Pin Header

This connector provides RS-232 level signals for UART 0 and UART 1, or RS-232 levels with hardware handshaking for UART 1.

Pin	Signal	Pin	Signal
1	NC	2	Short to 7
3	RX1	4	RTS1 or TX0
5	TX1	6	CTS1 or RX0
7	Short to 2	8	NC
9	GND	10	NC

Serial TTL, Dual Row Header

J8 - Power Connector

J8 is a single row straight 3-Pin header

Pin	Signal
1	+5V
2	GND
3	+5V

Power Header

4.2 Jumper Configurations

Mode	Jumpers Enabled	Jumpers Removed
TTL UART0	N/A	JP1,JP2,JP3,JP4,JP5
TTL UART1	N/A	JP2
RS-232 UART0	JP4[1-2],JP5[1-2]	JP2
RS-232 UART1	JP4[2-3],JP5[2-3],JP3	N/A
RS-485 UART0 Half Duplex	JP1[2-3],JP2	JP4,JP5
RS-485 UART0 Full Duplex	JP1[1-2],JP2	JP4,JP5

Jumper Mode

/note The SB72 can run 2 channels without hardware handshaking. If RTS and CTS are required, then only UART 1 can be used. RTS and CTS are available at TTL levels on the J5 connector for both UARTs.

For the most up to date pin references and schematics, visit the product page for your device at <http://www.netburner.com>

5 Disclaimers

5.1 Life Support Disclaimer

NetBurner's products both hardware and software (including tools) are not authorized for use as critical components in life support s or systems, without the express written approval of NetBurner, Inc. prior to use. As used herein: (1) Life support s or systems are s or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user. (2) A critical component is any component of a life support or system whose failure to perform can be reasonably expected to cause the failure of the life support or system, or to affect its safety or effectiveness.

5.2 Anti-Piracy Policy

NetBurner, Inc. vigorously protects its copyrights, trademarks, patents and other intellectual property rights.

In the United States and many other countries, copyright law provides for severe civil and criminal penalties for the unauthorized reproduction or distribution of copyrighted material. Copyrighted material includes, but is not limited to: computer programs and accompanying sounds, images and text.

Under U.S. law, infringement may result in civil damages of up to \$150,000, and/or criminal penalties of up to five years imprisonment, and/or a \$250,000 fine. In addition, NetBurner, Inc. may seek to recover its attorneys' fees.
