Q7055A

BUILDING NETWORK ADAPTER BNA-1C/2CS/2DN

INSTALLATION INSTRUCTION & USER MANUAL

Quick Setup

In order to setup the BNA device properly, the following connections are prerequisite:

- *Null-Modem cable connected to a PC running a VT100 terminal emulation program or a VT100 compatible terminal (refer to Table 6-1: Terminal settings)*
- *LAN connection via UTP (RJ45 connector).*
- *Power connection.*
- *An active FTP-Server machine on the LAN*

The following BNA Bootloader commands are mandatory for setting up the BNA (for a detailed command description, refer to chapter *6.5 Command Description* on *Page 31*):

np	*Basic network parameters*
dc	*Download configuration*
load	*Load executable from FTP server*

Before the application firmware is started it is recommended to add some users (user roles) using command *um* (refer to chapter *6.5.8 um - User management* on *Page 37*).

After that, the BNA device can be installed at its final operating location.

Figure 1-1: Parts and Controls on the Front Side

Figure 1-2: Parts and Controls on the Rear Side
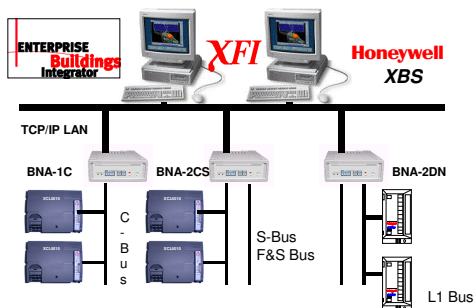
Technical Data

Supply Voltage	18-24 VAC (50...60 Hz); 18-24 VDC (external power supply required)
Power Consumption	5VA (connected via 10BaseT, twisted pair); 12VA (connected via 10Base5)
Temperature Limits	0...+50 °C (+32...+122 °F); 5...95% rh, non condensing
Ambient storage limits:	-35...+70 °C (-31...+160 °F); 5...95% rh, non condensing
System Data	
Processor	25 MHz, MC68EN360, 32 Bit Microprocessor (4.5MIPS)
Data Transfers	10Mbit/sec, 802.3 Ethernet
LAN-Interfaces	10BaseT (RJ45)
Field Bus	(BNA-2DN) RS485 AC coupled Manchester encoded channels (L1-Bus compatible) (BNA-2CS/1C) RS485 DC coupled
Device Interface	Serial RS232
Memory	4 MB SRAM, 2 MB Flash
MTBF	>100.000 h
Weight	800 g (1.76 lb)
Dimensions (H x W x D)	(76 x 158 x 200) mm (2.99 x 6.2 x 7.87) in.
Safety	
Protection standard	IP20 as per EN60529
Protection class	II as per EN60730-1
Flame retardant	V0 as per UL94
Agency Listings	
Electromagnetic compatibility (EMC)	EN50081-1 and EN50082-2
Electromagnetic emission (EME)	FCC Class A
Energy management	UL916
Fire protection and smoke control	UL864

Table of Contents

1   About BNA

The Building Network Adapter (BNA) delivers exceptional price/performance to meet the requirements of both building owners and service providers. With its combination of scalable performance, density, and low per-port pricing, the Building Network Adapter allows network-layer capabilities to be extended to a much wider range of network configurations and environments.

Customers can now gain the advantages of high-performance network and services, including traffic management to more locations throughout the network.

The Building Network Adapter uses the LAN-connection to provide seamless communication to the

requesting device. Status information like *LAN communication activity*, *field bus traffic communication*, and *system heartbeat* of the Building Network Adapter is indicated by LEDs on the front.

Technically, the Building Network Adapter provides an interface from various Honeywell controller busses that use RS232/RS485 signals to a local area network using 802.3 Ethernet protocol. This allows data to be used by high-level building management systems such as Enterprise Buildings Integrator (EBI), Excel Building Supervisor (XBS), and Excel Facility Integrator (XFI).

This *Installation Instruction and User Manual* covers all of the BNA device types listed below.

BNA-1C provides a single RS485 DC coupled C-Bus-compatible communication channel for XL5000 family devices with up to 76.8 kbps.

BNA-2CS provides two RS485 DC coupled C- / S- / FS-90-Bus compatible communication channels for different applications, like Excel IRC and Excel Classic as well as XL5000 family devices with up to 76.8 kbps.

BNA-2DN provides two RS485 AC coupled Manchester encoded L1-Bus (DeltaNet Peer bus) compatible communication channels.

Additionally, each BNA type is equipped with a RJ45 10Base T connector plus an RS232 interface.

2   Location of Parts and Controls

The numbering for the parts and controls in this section refers to the pictures on the rear side of the title page. In order to have a reference between the numbering here and the device pictures, it is possible to fold this page out.

2.1   Front Side

Differences between the various BNA types are explicitly noted in the corresponding element description.

1   Reset
Hardware reset button. Located directly behind the small hole in the front panel. To reach this button, a pointed object like a sharp pen or an unfolded paper clip is necessary. Pressing this button resets the BNA device immediately. This operation is similar to "power on" with the BNA device.

2   Mode
Mode switch button. This button is needed to change the bootloader modes. For a detailed description about BNA operation modes, please refer to chapter *6.2 Operating Modes* on *Page 25*.

3   LAN
Local Area Network (LAN) activity display.

Shows the actual LAN traffic using 4 LEDs.

Col   Collision indicator (**Red**). If this LED is on, then two or more devices on the network are transmitting at the same time. This is not a fault, but a normal occurrence on an Ethernet network. However, when the Collision LED remains on for all transmission attempts, it may indicate an abnormal condition such as an open end-of-line termination.

Rx   Receive indicator (**Green**) on means that data is being received by the BNA over the Ethernet.

Tx   Transmit indicator (**Green**). If this LED is lit up, the BNA device is sending data to the Ethernet. When data is being transmitted, the Rx indicator LED is lit up simultaneously.

Lnk   Link indicator (**Green**) will always be lit when the BNA is connected via the RJ45 connector to the Ethernet. If this LED is dark, it will not be possible to send or receive any data.

4   **Ch1**

Bus Channel 1 activity display. This display contains two green LEDs, one showing BNA

reception activity (Rx) and the other showing BNA transmission activity (Tx).

5   Ch2
Bus Channel 2 activity display. This display contains two green LEDs, one showing BNA reception activity (Rx) and the other showing BNA transmission activity (Tx)

NOTE: Ch2 indication is available on two-channel devices only. It is not available on a BNA 1C device.

6   Heartbeat
System heartbeat display. During BNA system runtime, this LED flashes continuously. This LED is a two-color LED. A red flashing LED means that the BNA bootloader is currently active. A green flashing LED means that an application firmware is running.

7   Power
Power indicator. This LED lights up when power is connected to the BNA device.

2.2   Rear Side

Differences between the various BNA types are explicitly noted in the corresponding element description.

8   Ch2

3-pin connector for field bus channel 2 connection electrically isolated meets the EMC-and FCC-requirements.

Field Bus wiring is described in chapter *5.2 Field Bus Connection (Ch1 / Ch2)* on *Page 20*.

NOTE: The Ch2 field bus connector is available on two-channel devices only. It is not available on a BNA 1C device.

9   Ch1/Ch2 Bus Termination Switches

These switches are used to select between different field bus terminations. For a detailed description of the different Bus Termination Switch positions, please refer to chapter *5.3 Bus Termination Switch* on *Page 20*.

NOTE: The Bus Termination Switch option is available on BNA 1C and BNA 2CS devices only.

The Bus Termination Switch near the Ch2 field bus connector is available on two-channel devices only. It is not available on a BNA 1C device.

10   Ch1

3-pin connector for field bus channel 1 connection electrically isolated meets the EMC-and FCC-requirements. Field Bus wiring is described in chapter *5.2 Field Bus Connection (Ch1 / Ch2)* on *Page 20.*

11   AC/DC IN 18-24V

Power connector for 18-24V AC (50...60Hz) or 18-24V DC power supplies.

Power consumption is 5VA (connected via 10BaseT, twisted pair) or 12VA (connected via 10Base5). An external power supply is required. See also chapter *5.1 Power Connection* on *Page 19.*

12   RS232

9-pin SUB-D male RS232 connector, electrically isolated, PC pin compatible, protected against spikes.

This interface is used for initial device set-up and requires a standard Null-Modem cable when interfacing to a PC.

13   10BaseT

10BaseT RJ-45 Ethernet LAN-connector, meets the requirements of ANSI/TIA/EIA 586 Category 5, for unshielded twisted pair connections.

3   Before Installation

Please pay attention to the steps listed below prior to installing the Building Network Adapter device.

1   Verify that the product has been received without damage.

2   Verify that the correct BNA type has been delivered.

3   Check package contents. The following items are included in each product package:

Pieces	Item
1	Building Network Adapter device
1	Building Network Adapter Installation Instruction & User Manual
1	Small bag with installation material

The small installation material bag contains the following parts:

Pieces	Item
1	2-pole Phoenix power connector

Pieces	Item
2	3-pole Phoenix controller bus channel connectors
4	Optional wall mounting clips
4	Small inserts
4	Screws

4 Please read chapter *5 Connections on page 19* carefully prior to connecting any power and data interface cables to the BNA.

5 Please refer to the installation instruction manuals of each component that shall be connected to the BNA, like 95-7545 XLS1000 Installation Instructions, 95-7421 FS90 Installation Instructions, and 95-7551 LAN Installation Instructions, etc.

WARNING:

Do not remove the cover of a BNA device.

There are no user-serviceable parts inside.

Any unauthorized modification of this equipment may result in the revocation of the owner's authority to continue its operation.

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4   BNA Operating Positions

4.1   Single Device

Figure 4-1: Single device operating position

Figure 4-1 shows the normal BNA device operating position e.g. on a desk.

4.2 Stacked Devices

Figure 4-2: Stacked Devices

BNA Devices may also be stacked. Because of stability issues, it is recommended not to stack more than 3 devices.

4.3 Wall Mounting

It is also possible to mount the BNA device to a wall. The following sequence describes how the

device has to be prepared prior to mounting it to a wall.

Figure 4-3

Put the BNA-adapter with the top side down on the desk (*Figure 4-3*).

Figure 4-4

Remove the four feet (Figure 4-3) from the bottom of the BNA by pushing them horizontally away from the housing with a flat screwdriver (*Figure 4-4*).

Figure 4-5

Push the four inserts (included) fully and horizontally into the housing (*Figure 4-5*).

Figure 4-6

Adjust the four retaining clips (included) on top of the inserts. Fasten the retaining clips with the included four screws (*Figure 4-6*).

Figure 4-7

Use the housing with the clips to mark the positions of the four mounting holes on the wall surface. Drill ∅ 4mm (~0.16 inch) holes for the mounting screws (not included) and fix the BNA device.

5   Connections

This chapter describes how to connect power and the field bus to the BNA device.

Together with the BNA device, a supply pack with installation material is delivered containing the required connectors for power and field bus.

5.1   Power Connection

For the BNA device, an external power supply with the following specification is required:

18-24V AC (50...60Hz) or 18-24V DC.

Power consumption of the BNA device is 5VA (connected via 10BaseT, twisted pair) or 12VA (connected via 10Base5).

For the power connection, the 2-pole Phoenix connector is required (included). If an off-the-shelf power supply is used, cut off the original connector at the end of the cable. Then strip the two cable ends and insert each cable end into the openings of the 2-pole Phoenix connector. Fasten them with a screwdriver.

The polarity (+/-) of the 2-pole Phoenix power connector for DC power supplies is don't care.

5.2 Field Bus Connection (Ch1 / Ch2)

Regardless of the type of BNA device, the wiring of the field bus connector is always identical.

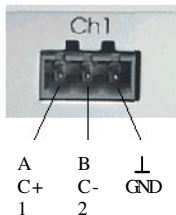For connecting the field bus, the 3-pole Phoenix connectors (included) are required.


```
A        B       ⊥
C+       C-      GND
1        2
```

Figure 5-1

Figure 5-1 shows the pin layout of the field bus connectors Ch1 and Ch2. Pins 1 and 2 shall be used to connect the field bus.

5.3 Bus Termination Switch

This section applies to BNA 2CS and BNA 1C devices only.

The Bus Termination Switch is used to select between different field bus terminations on DC coupled RS485 busses.

For each channel the required termination setting can be adjusted individually.

At the rear side of the device, a pictogram (*Figure 5-2*) symbolizes the different possible bus terminations.
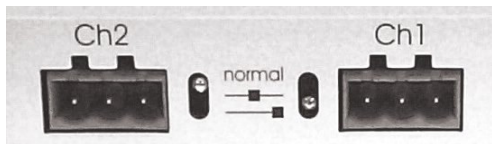

Figure 5-2

normal **XD505 compatible bus termination for C-/S-/FS90-Bus connections**
It is required to use this switch position for S-Bus and FS90-Bus in any case. For C-Bus connections, this position must be used when at least one XL IRC or XL MC is connected to the C-Bus.

—■— **XD508 compatible; bus termination disabled**
XD508 compatible switch position for C-Busses equipped only with XL500 family controllers with bus termination disabled. This switch position must be used if the BNA device is installed in the middle of such a C-Bus.

■   **XD508 compatible; bus termination enabled**
XD508 compatible switch position for C-Busses equipped only with XL500 family controllers with bus termination enabled. This switch position must be used if the BNA device is installed at the end of such a C-Bus.

5.4   L1 Bus Termination

This section applies to BNA 2DN devices only.

The required L1 bus EOLRs (End of Line Resistors) can be connected externally onto each CH1 / CH2 connector.

When the L1 bus uses 18 gauge, twisted pair, non-shielded wire, the ends of the line should be terminated with a 62 Ω ±10% 0,5 W carbon resistor between each wire and ground.

When the L1 bus uses 24 gauge, dedicated solid copper pair, standard balanced telephone cable, the ends of the line should be terminated with a 100 Ω ±5% 0,5 W carbon resistor between each wire and ground.

For further information regarding L1 bus termination, please refer to *Honeywell DeltaNet R7044 EXCEL PLUS CONTROLLER Application Guide 74-2548, Rev.2/93.*

6   BNA Bootloader

This chapter describes the functions of the BNA Bootloader software. Each BNA device is equipped with a Bootloader, which functions in the same way for all BNA device types.

NOTE: BNA Devices are not equipped with any application firmware. This must be loaded into the device prior to using it.

6.1   Startup Behavior

After resetting or power-on the BNA device, all LEDs on the front will be switched on. Immediately after that, the BNA Bootloader starts working.

When the BNA Bootloader is active, the heartbeat LED on the BNA front panel flashes **RED**.

In contrast, any running application firmware indicates its execution with a **GREEN** flashing heartbeat LED.

The Flowchart depicted in *Figure 6-1* explains the BNA execution sequence. It is necessary that the user understand this in order to be able to react to or influence the behavior of the BNA device. Furthermore, it helps in understanding the current device state to look at the LEDs on the front panel of the BNA.

Start

Initialize Hardware
Heartbeat LED Blinks
RED

In case of any error
heardbeat blinking stops and
LED will be permanently on
for 5 Seconds. Then BNA
restarts.

New Download? — Yes

Download new
Firmware to
Flash Memory

No

Mode Button pressed? — Yes

Stay in Bootloader?

No ◄— No

Firmware in Flash? — Yes

Start Firmware

No

Very First Run? — Yes

Ask for root password

No

Yes
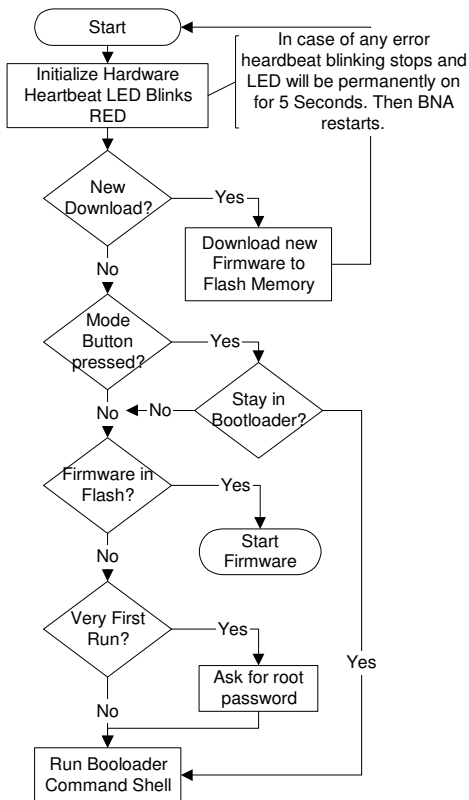
Run Booloader
Command Shell

Figure 6-1: BNA Bootloader Execution

6.2   Operating Modes

The BNA Bootloader provides two different operating modes:

- *Normal Mode*   *(default)*
- *Stay in Bootloader Mode*

Normal Mode is the default, which directly starts an application firmware found in Flash memory. If no firmware could be found, then the bootloader command shell is started by the BNA (*Figure 6-1*). This execution flow can be influenced only by pressing the Mode Button and changing the mode to *Stay in Bootloader Mode*.

Stay in Bootloader Mode interrupts the default bootloader startup sequence and tells the bootloader not to start an possible existing application firmware in the Flash memory.

6.3   Switching the Operating Mode

In order to switch the Bootloader operating mode, a pointed object, like an unfolded paper clip or a sharp pen, is required.

For changing the operating modes, there is a time window of about 3 seconds after reset. The following steps must be performed to successfully change the bootloader mode (Refer also to *Figure 6-2: Switching BNA Operating Mode*):

1.   Press the Reset Button

2. Wait until the heartbeat LED starts flashing RED, then press the Mode Button.

3. The heartbeat flashing immediately stops and the LED is permanently on. The operating modes are displayed using the LAN status LEDs Lnk, Tx, Rx. The *Normal Mode* is represented via the Lnk LED.

4. Now push the Mode Button again and the Tx LED will also be switched on. Two LEDs on means *Stay in Bootloader Mode* is selected.

5. To accept one of the modes, push the Mode Button again and hold it for about 1 second. The BNA Bootloader feedback that the mode has been accepted is indicated with all Mode LEDs and the heartbeat LED flashing four times.

If there is no need to change the mode after the mode button has been pressed, then just stop pressing the mode button. The BNA device will continue with its normal work after a few seconds.
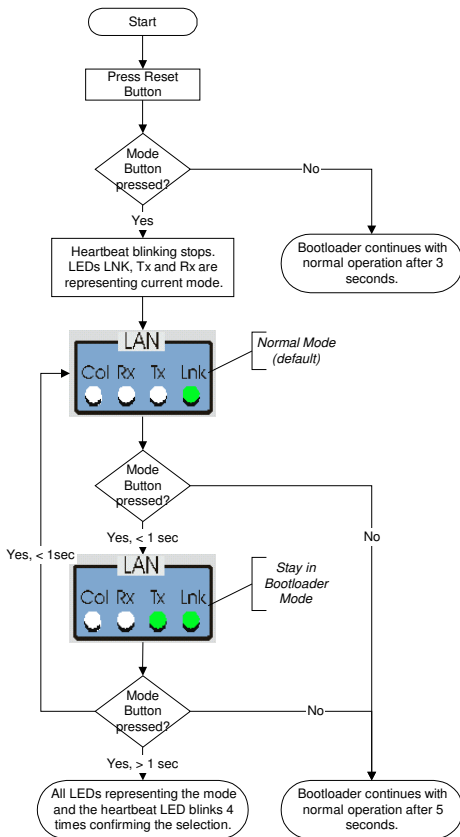
Figure 6-2: Switching BNA Operating Mode

6.4   Device Setup

In order to setup the BNA device properly, the following connections are necessary:

- *DB9F Null-Modem cable connected to a PC running a VT100 terminal emulation program or a VT100 compatible terminal (refer to Table 6-1: Terminal settings)*
- *LAN connection via UTP (RJ45 connector).*
- *Power connection.*
- *An active FTP-Server machine on the LAN*

Terminal type:	VT100
Bits per second:	115200
Data bits:	8
Parity:	none
Stop bits:	1
Flow control:	none

Table 6-1: Terminal settings

After having connected all necessary cables to the BNA, press the Reset button. If the terminal settings are all Ok, the Copyright notice of the BNA device will be displayed.

If this is the very first run of the device, then the Copyright notice is followed by the query for the

root user password. At the `Old password:` prompt, just hit the Enter-Key.

Once a password has been defined the BNA prints the information `User 'root' logged in.` for all future startups.

The *root user* is the administration user with unlimited access rights. The *root user* will be logged in automatically without any login procedure when connecting to the BNA device via the serial link (RS232). Any connection to the BNA via LAN is password protected!

If the device already contains an application firmware, then it is necessary to put the device into the *Stay in Bootloader Mode* prior to the setup activity (refer to chapter *6.3 Switching the Operating Mode* on *Page 25* how this can be done).

To prepare the BNA device to operate on the LAN and to load the application firmware into the device, the following mandatory commands must be executed in the order they are listed (for a detailed command description, refer to chapter *6.5 Command Description* on *Page 31*):

np   *Basic network parameters*
Definition of IP address, network mask and default gateway. These definitions are required to allow the BNA device to operate on the LAN.

> **C A U T I O N :**
>
> **Using unallowed IP-Addresses could cause interference on the network.**
>
> **Please contact your network administrator to retrieve a unique IP-Address. If you want to connect the BNA to a customer network, make sure to get in touch with the customers IT manager to retrieve this IP-Address information.**

dc   *Download configuration*
         Definition of FTP server, path to firmware and user account on FTP server. This is necessary for loading the application firmware into the BNA device.

load   *Load executable from FTP server*
         This command finally loads the application firmware (executable) into the BNA device. After successful download, the application firmware is moved into the Flash memory.

This is the minimum command sequence for setting up a BNA device.

After that the application firmware can be invoked by entering the command *run* or by pushing the Reset button. When the Reset button is pushed, the BNA Bootloader behaves as depicted in *Figure 6-1* on *Page 24*.

As mentioned above, the three commands are the minimum required commands for setting up a BNA device. We recommend also performing some user definitions (see command *um*) for different user roles. Doing so prevents unfamiliar users from performing accidental redefinition of important settings. Furthermore, user definitions can also be referenced by the application firmware.

6.5   Command Description

The BNA Bootloader provides a command shell allowing input of several commands. Some of the commands provide sub-shells which themselves provide another set of commands to enter.

This chapter describes all BNA Bootloader commands in detail. The order of the command descriptions in this chapter follows the order of the commands displayed by the BNA Bootloader shell except for the command *help*. This has been placed at the front because it is necessary to get the list of commands displayed.

The following notational conventions apply to this chapter unless otherwise noted:

cmd   Bootloader command

<key>   A key that has to be pressed, like *<Enter>*.

Text   Text written with this font shows terminal output.

NOTE: All BNA Bootloader commands are case-sensitive!

6.5.1   *Help* or *?*

Entering *help* or *?* at the BNA bootloader> prompt followed by <*Enter*> displays all available BNA Bootloader commands.

In each sub-shell *help* or *?* can also be used to view the existing commands.

All command lists can vary between different users. The lists don't show any commands which a user is not allowed to execute.

6.5.2   *np* - **Basic network parameters**

The basic network parameters command *np* is used to define the IP address, the network mask, and the default gateway of the BNA device. This information is normally provided by the local IS department.

np is not a direct command; instead, it provides a sub-shell with the following commands:

display   displays current basic network settings.

modify   changes basic network settings. After entering this command, each basic network parameter will be queried individually. After having entered all requested information, it will be asked

whether to take over the new settings. If this is denied, the old settings will be restored. Otherwise, the new settings are stored to the Flash memory and the system needs to be restarted to activate the new settings.

delete   deletes basic network settings. Please note that after this operation the BNA device will not operate on the LAN anymore. After commanding *delete*, new basic network parameters must be entered via *modify*.

altmac   definition of an alternative MAC-address. This command is available only for the sake of completeness. Each BNA already comes with a unique Ethernet address (MAC address). So there will be no need to define a new MAC address. It is recommended to not use this command unless advised to do so by the **Honeywell** Technical Assistance Center.

exit   exits the sub-shell and returns to the main shell.

6.5.3 *dc* - Download configuration

The download configuration command *dc* is used to have a predefined way of retrieving new application firmware versions when an update of the same becomes necessary.

Command *dc* defines the IP address of the FTP-Server, the path to the application firmware, a username on the FTP-Server and the user's password. This command must be invoked prior to using command *load.*

Prerequisite for downloading an application firmware is a running FTP-Server machine somewhere in the network that can be reached by the BNA device. The FTP-Server machine is responsible for storing the application firmware image to be loaded into the BNA device. The application firmware image for the BNA is delivered on the distribution media of the Building Management System currently in use.

The description of how to set up and invoke an FTP-Server on each specific operating system is not within the scope of this document. Please refer to the documentation set of the operating system used on the machine that has been selected for the role of the FTP-Server.

dc is not a direct command; instead, it provides the following commands in a sub-shell:

display   displays current download configuration.

modify   changes download configuration. After entering this command each download configuration item will be queried individually. After having entered all requested information, it will be asked whether to take over the new settings.

If this is denied the old settings will be restored. Otherwise, the new settings are stored to the Flash memory. These settings are immediately active.

delete   delete download configuration. After this operation command *load* can't be used anymore. New download configuration definitions must be entered using the command *modify*.

test   tests current download configuration. This command can be used to check whether the entered download configuration is valid or not.

With the command *test*, optional command-line parameters are allowed. Accepted parameters are *FTP-Server IP-Address* and/or a *filename* for checking existence. Given command-line parameters temporarily supercede the values in the actual download configuration.

NOTE: With some Windows NT based FTP-Servers, it has been observed that this command sometimes fails the first time. If so, we recommend retrying it. If it still fails, one of the parameters may be wrong.

exit   exits the sub-shell and returns to the main shell.

6.5.4   *load* - **Load executable**

The command *load* is a direct command which immediately starts downloading the application firmware image into the BNA based on the *download configuration* defined by the command *dc*.

After loading the image into local memory, the BNA Bootloader starts copying the image into the local Flash memory where it resides until updated the next time.

load accepts optional command-line parameters. Accepted command-line parameters are *FTP-Server IP-Address* and/or *filename*. Command-line parameters supersede the current download configuration for these elements. Command-line parameters in the *load* command scope can be used to use an alternative FTP-Server for downloading or to download another application firmware image into the BNA device.

If *load* fails, then it needs to be checked whether the correct download configuration has been defined. In this case, the command *dc test* becomes useful.

6.5.5   *ping* - **ping**

Sends an ICMP Ping through TCP/IP to the FTP-Server defined in the download configuration or to the machine addressed by the IP-Address in the optional command-line parameter.

This command can be used to check whether the network connection is working properly.

6.5.6   *ver* - **Show installed software**

The command *ver* outputs a list of all installed software components on the current BNA device.

6.5.7   *run* - **Execute installed software**

The command *run* starts a previously-installed application firmware.

If no application firmware could be found, then the information `No executable found` is printed out. In this case, use *load* to download an application firmware.

6.5.8   *um* - **User management**

The user management command *um* allows the definition of users, different access rights per user and user individual password settings.

User definitions are necessary to provide a secure device on an open TCP/IP network. Furthermore it may not be desired that every user will be allowed to do everything with a BNA device.

These user accounts are required only for set-up, configuration and diagnostic applications if available. The communication protocols allowing the communication between BNA and its building management system are protected at the protocol level depending on the type of application firmware.

It is recommended to define several user roles because also an application firmware may use these user definitions to behave different in potentially provided user interfaces depending on the user who is currently logged in.

A BNA device allows up to 5 user definitions with different access rights. The *root user* already occupies one of these five definitions. Thus, four additional users or, more accurately, user roles can be defined.

A user definition consists of three elements. These are a username or role name, a group membership and finally a password.

Usernames and password are freely definable. Both have a maximum length of 8 character. Whereas the group definitions are predefined, each has specific characteristics.

Table 6-2 gives an overview of the available user groups and their properties.

user	View only rights.
	Users who are member of this group are not allowed to change or delete any existing definition.
priv	Privileged rights.
	Users of the privileged group are allowed to change several definitions like network parameters but they are not allowed to perform delete operations. Furthermore, privileged users have no right to perform any user management.
admin	Administrative users.
	Administrative users have full rights. The *root user* belongs to the admin group.

Table 6-2: BNA user groups

The user management command *um* is an indirect command and provides the following commands in its sub-shell:

display   display current user definitions.

add   add new user. Optionally, the username can be passed directly on the command-line.

delete   deletes existing user. Optionally, the username can be passed directly on the command-line. Furthermore, an option *–all* is available that deletes all user definitions except the one for the *root user*. The *root user* account can't be deleted.

setpass   set other user's password. This command is helpful when a user has forgotten his password. Optionally, the username can be passed directly on the command-line.

passwd   set own password. Every user can use this command to change his own password.

exit   exits the sub-shell and returns to the main shell.

6.5.9   *whoami* - Who am I

whoami prints username and group of the user currently logged in.

6.5.10   *login* - Login as different user

The command *login* allows users to change their role while they are connected a BNA device.

This command is not that much useful while connected via the RS232 port because in this case the *root user* is logged in per default. When using

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bootloader functionality via a network which can be provided by the application firmware, this command becomes more interesting.

7   Cables and Connectors

7.1   DB9F Null Modem Cable

Figure 7-1: Serial connectors

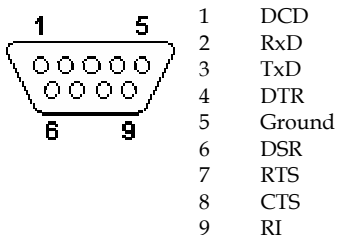The female connector is numbered as shown below:

1	DCD
2	RxD
3	TxD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI

Figure 7-2 shows how to configure a Null Modem Cable DB9F.
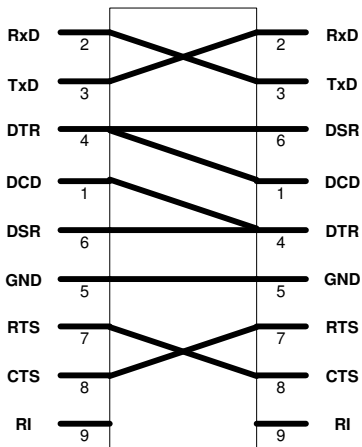
Figure 7-2: Signal connections for DB9F Null Modem Cable

7.2   Ethernet Connectors
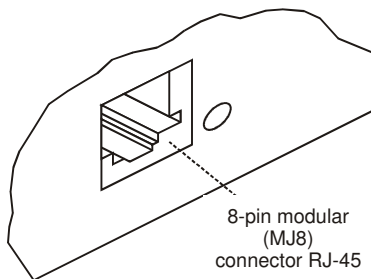
8-pin modular
(MJ8)
connector RJ-45

Figure 7-3: BNA Ethernet connection

The BNA provides an RJ45 10BaseT connector to bring the device online on the LAN. This chapter describes the pin layout of this connector and shows how the cables must be configured for connecting via 10BaseT (RJ45).

7.2.1   RJ45 Connector

A lot of Ethernet local area networks use 10BaseT twisted pair wiring. 10BaseT networks are physically laid out in a star topology, where each piece of equipment on the network is connected to a central hub. The wiring is connected to devices using a plug that resembles a phone jack, called RJ45.

Pin Number	Signal Name
1	Transmit (TX) +
2	Transmit (TX) -
3	Receive (RCV) +
4	Reserved
5	Reserved
6	Receive (RCV) -
7	Reserved
8	Reserved

Table 7-1: RJ45 signals

7.2.1.1 Connecting a BNA to a Hub

For connecting a BNA device to a LAN via an Ethernet Hub the required cable should be configured as shown in *Figure 7-4*.
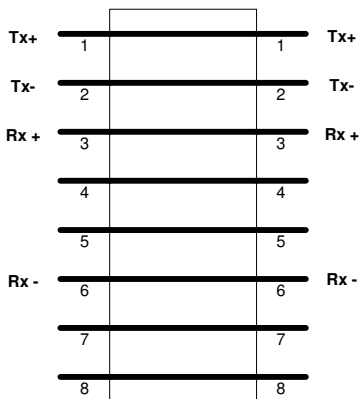
Figure 7-4: Straight through pinning for BNA to Ethernet Hub connections

7.2.1.2 Connecting a BNA to a Workstation

When a BNA should be directly connected to a workstation without having an Ethernet Hub in between a special cable, called crossover cable, is required.

Figure 7-5 shows how the different signals need to be connected in this case.
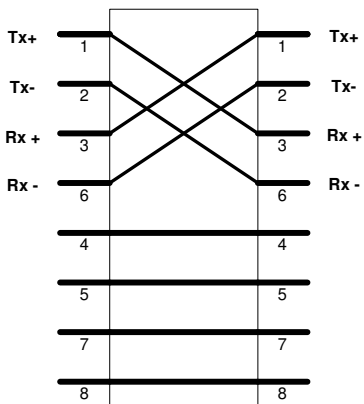
Figure 7-5: Crossover pinning for BNA to workstation direct-
connections

Tips & Tricks

Tip 1   To simplify downloading, we recommend reducing (renaming) the application firmware image name to the base name of the image in the FTP-Server publication directory, e.g. rename *bna_susi_server_v1.0.0.bin* to *bna_susi_server.bin*.

This has the advantage that even when updates or upgrades of the application firmware are delivered, no change is necessary in each BNA download configuration.

Tip 2   The BNA Bootloader command shell is able to execute commands in a sub-shell directly. For example, it is possible to invoke the command *display* in sub-command shell *np* directly from the BNA Bootloader prompt. Just call:

```
BNA bootloader> np display
```
followed by *<Enter>*.

Tip 3   The BNA Bootloader command shell allows execution of more than one command by using a "*;*" between two commands, e.g.: *np display; dc display* *<Enter>*. When one of the commands fails, execution is stopped at this point.

FAQs

1. Which terminal type can be used for connecting to the BNA Bootloader?

For connecting to the BNA Bootloader, any VT100 compatible terminal or VT100 compatible terminal emulation program can be used. For the proper terminal settings, please refer to chapter *6.4 Device Setup* on *Page 28*.

2. After power-on or reset, the BNA device does not show the BNA bootloader menu on my terminal. How do I get the correct display?

One reason could be that the terminal settings are not correct. Please verify the actual terminal settings. For the proper terminal settings please refer to chapter *6.4 Device Setup* on *Page 28*.

A second reason could be that an application firmware is already running in your BNA. As described in chapter *6.1 Startup Behavior* on *Page 23* BNA will start an application firmware automatically after power-on or reset. To access bootloader mode, you must switch the operating mode to force the BNA to *Stay in Bootloader Mode*. Please refer to chapter *6.3 Switching the Operating Mode* on *Page 25* for further information.

Glossary

10BaseT   10 = 10Mbps,
Base = baseband,
T = twisted pair.

Application firmware
An application firmware is a software that is needed to operate the BNA device in a way the Building Management System requires it. An example for an application firmware is the BNA SUSI Server software.

BNA   Building Network Adapter

EOLR   End of Line Resistor

FTP   File Transfer Protocol

ICMP   Internet Control Message Protocol

IP   Internet Protocol

IRC   Individual Room Control

LAN   Local Area Network

Mbps   mega bit per second

MC   Multi Controller

SUSI   Subsystem Services Interface

TCP   Transmission Control Protocol

WAN   Wide Area Network

XD505   C-Bus piggyback type of XL500 controllers.
            Compatible with EXCEL IRC devices on the same bus.

XD508   C-Bus piggyback type of XL500 controllers. This piggyback type allows C-Bus communication transfer rates up to 76.8 kbps. This piggyback type allows C-Bus wiring with XL500 controllers only.

XLCL   EXCEL Classic

Honeywell