



INSTRUCTION MANUAL

NXR-ZGW-PRO

NXR-ZRP-PRO

NETLINX ZIGBEE PRO GATEWAY/REPEATER



IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. DO NOT defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.



12. USE ONLY with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
16. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
17. Where the mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.
18. DO NOT overload wall outlets or extension cords beyond their rated capacity as this can cause electric shock or fire.



The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.



ESD Warning: The icon to the left indicates text regarding potential danger associated with the discharge of static electricity from an outside source (such as human hands) into an integrated circuit, often resulting in damage to the circuit.

- WARNING:** To reduce the risk of fire or electrical shock, do not expose this apparatus to rain or moisture.
- WARNING:** No naked flame sources - such as lighted candles - should be placed on the product.
- WARNING:** Equipment shall be connected to a MAINS socket outlet with a protective earthing connection.
- WARNING:** To reduce the risk of electric shock, grounding of the center pin of this plug must be maintained.

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Table of Contents

Overview	6
NXR-ZGW-PRO NetLinx ZigBee Pro Gateway	6
NXR-ZRP-PRO NetLinx ZigBee Pro Repeater	8
How ZigBee works	9
Network Structure	9
Security	9
Personal Area Network - Limitations	9
Mesh Network Arrangements.....	10
Single Gateway Installations	10
Multiple Gateway Installations	10
Patents.....	11
FCC Warning Statement	11
Installation	12
Overview	12
Location and Antenna Direction	12
Connecting the Optional Accessory Antennas.....	12
Connecting Power to the NXR-ZGW-PRO and NXR-ZRP-PRO	12
Determining the Power Source.....	12
Preparing Captive Wires for the 2-pin 3.5mm Captive Wire PWR Connector	13
Using the PSN NetLinx connector for power	13
Connecting the NXR-ZGW-PRO to a LAN	13
Table-Top Installation.....	13
Rack-Mount Installation.....	13
Setting up a network	14
Overview	14
Entering Devices Onto a Network.....	15
NXR-ZGW-PRO Configuration Pages	16
Overview	16
Configuration Manager	16
Summary of Gateway Settings	17
Checking the Firmware Version.....	18
Checking the ZigBee Firmware Version.....	18
Determining the IP Settings of the NXR-ZGW-PRO.....	18
Finding the ICSP Device Number of the NXR-ZGW-PRO	18
Determining the PAN Settings of the NXR-ZGW-PRO	18
Determining the ZigBee Stack Profile.....	18
Rebooting the NXR-ZGW-PRO.....	18

Configuration.....	18
Configuration - Network IP Settings tab	18
Bonjour Settings	19
Setting the IP Address.....	19
Setting the DNS Address	19
Configuration - NetLinX Settings tab	20
Editing NetLinX Settings	20
Setting Security Options.....	20
Configuration - User Settings tab.....	21
Setting a New Username and Password.....	21
Personal Area Network (PAN)	22
Personal Area Network (PAN) - Network tab	22
Enabling and Disabling the Wireless Network.....	23
Enabling and Disabling the Use of a User-Defined Preshared Key.....	23
Connecting an NXR-ZRP-PRO To the Network for the First Time	23
Setting the PAN Channel	23
Personal Area Network (PAN) - Connections tab.....	24
Finding a Device's EUI Address	24
Finding the Device's Description	24
Determining the Device Type.....	24
Determining a Device's Current Power Source	24
Determining the Device's Current Power Level	24
Checking the Device Link Status.....	24
Personal Area Network (PAN) - Commission Devices tab.....	25
Commissioning Devices to a PAN	25
Personal Area Network (PAN) - PAN Device Details Page	26
Changing the Extended PAN ID	26
Changing the AES Key	27
Utilities	27
Utilities - Device Firmware tab.....	27
Allowing Firmware Updates To Individual Devices	27
Allowing Firmware Updates To All Devices On a Network.....	27
Utilities - Connection Log tab	28
Determining the Connection Status of a Device	28
Finding a Device's EUI Address	28
Finding the Device's ICSP Number	28
Utilities - Traffic Log tab	29
Finding the Device's ICSP Number	29
Finding a Device's EUI Address	29
Finding the Device's Description	29
Determining the Device Type.....	29
Finding the Device Traffic	29
Programming the NXR-ZGW-PRO	30
Overview	30
SEND_COMMANDs	30
BUFF_DEVICE_SIZE	30
?VDEVs.....	30
?VDEVINFO EUI.....	30

Device Configuration	31
Changing the NXR-ZGW-PRO's Device Number	31
Sending Firmware to The NXR-ZGW-PRO.....	31
Before Upgrading Firmware	31
Cautionary Notes	31
Preparing the Master for Communication via IP	31
Verifying and Upgrading Device Firmware via IP	31

Overview

The NXR-ZGW-PRO NetLinx ZigBee Pro Gateway (**FG5791-11**) is an Ethernet to ZigBee wireless gateway, designed as the center of a ZigBee Pro network. The NXR-ZGW-PRO features a 10/100BaseT, auto-negotiating Ethernet port capable of Power over Ethernet (PoE), 16 Mbytes of Flash, 16 Mbytes of SDRAM, and a ZigBee Pro transceiver, and is controlled via a web server interface. The NXR-ZRP-PRO NetLinx ZigBee Pro Repeater (**FG5791-03**) is a ZigBee wireless repeater that features one megabit of external memory and a ZigBee Pro transceiver. Both use the 2007 ZigBee Pro standards.

NOTE: The NetLinx ZigBee Pro Gateway and Repeater are already enabled for ZigBee Pro wireless communication. Neither device can be used with a standard ZigBee 2004 or 2006 wireless network; either the other devices in the network will need to be updated to ZigBee Pro or the NXR-ZGW NetLinx Gateway (FG5791-01) and NXR-ZRP Repeater (FG5791-02) should be used instead.

NXR-ZGW-PRO NetLinx ZigBee Pro Gateway

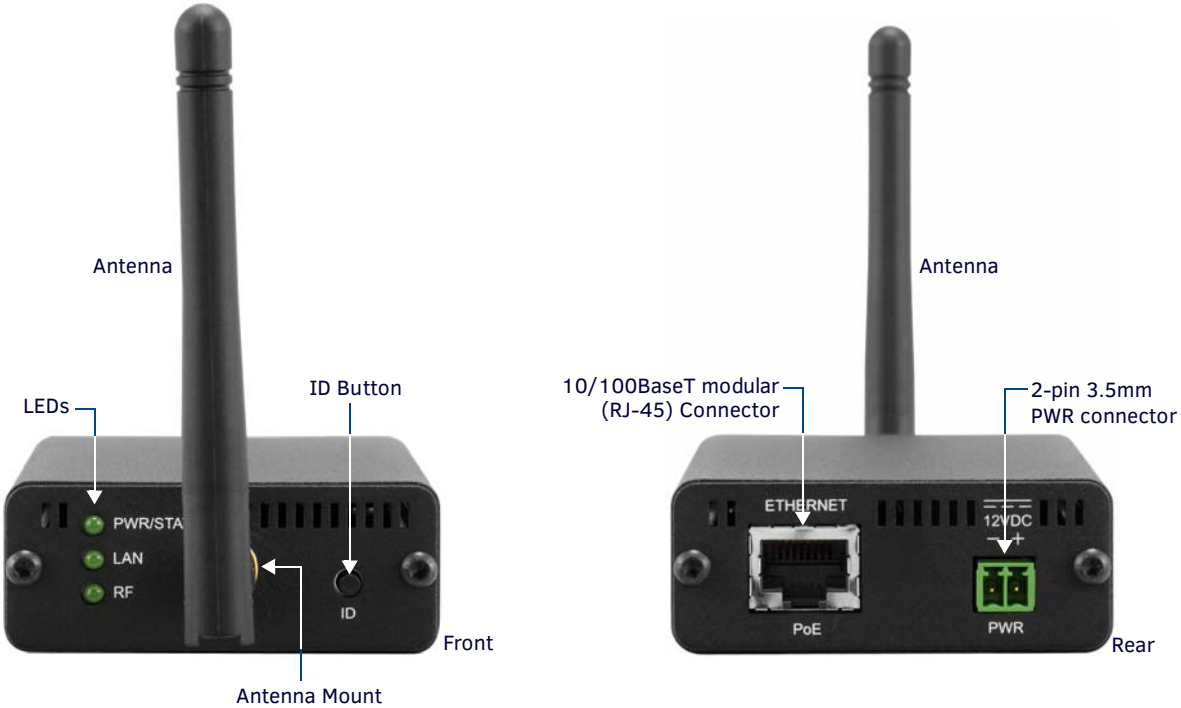


FIG. 1 NXR-ZGW-PRO, front and rear

NXR-ZGW-PRO Specifications	
Dimensions (HWD):	4.50" x 2.50" x 0.94" (114.30 mm x 63.50 mm x 23.81 mm) - Depth does not include antenna
Weight:	0.35 lbs (158.76 g) without antenna 0.40 lbs (181.44 g) with antenna
Power:	10.5 - 18 VDC; 13.5 (nominal operation voltage), or PoE Class 2
Memory:	16 Mbytes of Flash memory 16 Mbytes of SDRAM 128K of microcontroller Flash memory
Radio Specifications:	- Frequency: IEEE 802.15.4 - Operating channels: 1 - 26 - Modulation technique: DSS - Output power: Region/country specific - Coverage area (N America): 165 feet (50.2m)
IP Configuration:	Static IP or DHCP client - DHCP default: DHCP/ZeroConf - Static IP default: 169.254.1.2
Communications:	The NXR-ZGW-PRO communicates with a NetLinx master over TCP/IP encapsulating the ICSP protocol via a physical Ethernet connection. The ICSP device number can be set via the browser-based configuration pages (page 16).

NXR-ZGW-PRO Specifications (Cont.)

Front Components:

LEDs	• PWR/STATUS - A green LED that blinks every 5 seconds to indicate the device is installed and communicating properly with the Master. Power ON, but no Master connection, is indicated with a solid light; Power OFF is indicated with no light. • LAN - A green LED indicates an Ethernet connection is established. The LED blinks to indicate both sending and receiving information via Ethernet. • RF - The LED is solid when devices are connected; devices not connected is indicated with no LED light; the LED blinks to indicate activity.
Antenna Mount	A reverse SMA connection that supports a 2.4GHz antenna.
ID Button	When used in conjunction with NetLinX Studio, sets the device and system numbers for the NXR-ZGW-PRO. Press and hold for approximately 30 seconds to return the NXR-ZGW-PRO to factory default settings.

Rear Components:

Power connector	Two power options are available: • 2-pin 3.5mm captive-wire PWR connector • Power Over Ethernet (PoE) - powers the device through the CAT5 cable. Both Power and Data can be transmitted simultaneously through the CAT5 cable when using the appropriate equipment.
Ethernet port	10/100BaseT modular (RJ-45) connector - used to connect the NXR-ZGW-PRO to your LAN and/or to connect your third party device to the LAN when the NXR-ZGW-PRO is used as a gateway.
Certifications:	• FCC ID: CWU-NXRZGWPRO • IC: 5078B-ZGWPRO • CE • IEC-60950-1 • Japan Approval • ZigBee Certified
Operating/Storage Environments:	• Operating Temperature: -30°C (-22°F) to 70°C (158°F) • Relative Humidity: 5% to 85% non-condensing • Intended for indoor use only
Included Accessories:	• NXR-ZGW Installation Guide (93-5791-11) • 2.4GHZ, MONO, RSMA, 3.5IN, 2.0DBI Antenna (70-0012-SA) • Rubber feet • Velcro mounting strip • Power Supply (24-5791-SA)
Other AMX Products:	• Mio Modero R-3 Remote (FG148-03) • Mio Modero R-4 Remote (FG148-04) • NXR-ZRP-PRO NetLinX ZigBee Repeater (FG5791-03)

NXR-ZRP-PRO NetLinx ZigBee Pro Repeater



FIG. 2 NXR-ZRP-PRO, front and rear

NXR-ZRP-PRO Specifications	
Dimensions (HWD):	906 x 2.500 x 3.424 (23.01 mm x 63.50 mm x 86.96 mm) - Depth does not include antenna
Weight:	0.25 lbs (113.39g)
Power:	10.5 - 18 VDC; 13.5 (nominal operation voltage)
Memory:	1 Megabit external memory 128K microprocessor Flash memory
Radio Specifications:	- Frequency: IEEE 802.15.4 - Operating channels: 11 - 26 - Modulation technique: DSS - Output power: Region/country specific - Coverage area (N America): 165 feet (50.2m)
Communications	The NXR-ZRP-PRO communicates with a Netlinx master via a NXR-ZGW-PRO. The NXR-ZGW-PRO communicates with a Netlinx master over TCP/IP encapsulating the ICSP protocol via a physical Ethernet connection. The ICSP device number can be set via the browser-based management interface.
Front Components:	
LEDs	PWR/STATUS - A green LED that blinks to indicate the device is powered but not commissioned to a network. A solid light indicates a device powered up and commissioned; Power OFF is indicated with no light. ICSP - The LED is on when the device is connected to the gateway and off when not connected. RF - The LED blinks when RF is active and is off when RF is inactive.
Antenna Mount	A reverse SMA connection that supports a 2.4GHz antenna.
Reset Button	Press and hold for approximately 10 seconds to return the NXR-ZRP-PRO to factory default settings.
Rear Components:	
Power connector	2-pin 3.5mm captive-wire PWR connector
Certifications:	- FCC ID: CWU-ZRPPRO - IC: 5078B-ZRPPRO - CE - IEC/EN-60950 - ZigBee Certified Product
Operating/Storage Environments:	- Operating Temperature: -30°C (-22°F) to 70°C (158°F) - Relative Humidity: 5% to 85% non-condensing; intended for indoor use only

NXR-ZRP-PRO Specifications (Cont.)

Included Accessories:	• NXR-ZRP Installation Guide (93-5791-04) • 2.4GHZ, MONO, RSMA, 3.5IN, 2.0DBI Antenna (70-0012-SA) • Rubber feet • Velcro mounting strip • Power Supply (24-5791-SA)
Other AMX Products:	• Mio Modero R-3 Remote (FG148-03) • Mio Modern R-4 Remote (FG148-04) • NXR-ZGW-PRO NetLinx ZigBee Pro Gateway (FG5791-11) • NXA-WAP 2413A Mounting Bracket (FG2255-24)

NOTE: Connection to the Repeater device from either the NXR-ZGW-PRO or the Mio Modero® R-3 or R-4 requires download and installation to the repeater of the latest ZigBee Module firmware, available from www.amx.com.

How ZigBee works

The ZigBee wireless personal network technology protocol provides a framework for reliable, cost-effective, low-power, wireless networked, monitoring and control products based on an open global standard. (More information on the ZigBee standard is available at <http://www.zigbee.org>.) Many ZigBee-enabled devices use ZigBee exclusively as a communication and control interface, but not all: some have the option of switching between ZigBee, standard IR, or a combination of the two.

The NXR-ZGW-PRO, acting as a gateway, allows ZigBee-enabled devices to communicate both to and from an ICSP master. A device connects to the NXR-ZGW-PRO and is then represented to the master as an ICSP device. The master then communicates to the device through ICSP messages via a translation step at the NXR-ZGW-PRO level.

Network Structure

A ZigBee network is a Personal Area Network (PAN) consisting of one gateway, the option of one or more repeaters, and one or more devices.

A *gateway* initiates a ZigBee network and all devices linking to the PAN gateway do so through either direct links or through repeaters. The gateway's job is to establish the network's parameters, e.g., channel and Extended PAN ID. Within each PAN, a gateway or repeater can each have up to 8 associated devices, depending on the design of your system. Additional repeaters may be added to extend the range and reliability of your PAN. Care should be taken to understand the associated increases in bandwidth consumption and message latency.

A *repeater* like the NXR-ZRP-PRO is used to expand the coverage of NXR-ZGW-PRO gateways. Every device in the PAN has a parent (a device connecting it to the coordinator or gateway), and repeaters can have children (devices using them as a conduit to the master). Adding repeater devices to a network can reduce the number of hops a device needs to make to reach the gateway. Repeaters have the additional advantage of providing extra routing paths through the network, increasing reliability of the network. ZigBee Pro uses a mesh structure, to provide a self-healing capacity. Repeaters are useful because they make that self-healing possible. Adding repeaters also extends the coverage area for the entire network. Any device attached to a repeater NXR-ZRP-PRO appears attached to the gateway NXR-ZGW-PRO in the Browser-Based Configuration Manager pages.

A *device* will always connect to a repeater or gateway based on the least depth of the connection, and then the best quality. For instance, given a choice between connecting to a repeater with two hops to a gateway or directly to a gateway, a device will always connect first to the gateway, even if the repeater has a slightly better connection. Devices cannot have children. The use of the NXR-ZGW-PRO and NXR-ZRP-PRO allow ZigBee-type devices to roam seamlessly from repeater to repeater within the same Extended PAN ID.

Because of power saver options and other features, mobile devices tend to go into Standby mode frequently and thus enter and leave the network regularly. While sleeping, the device may be in a new physical location or the network may have changed channels. The device will seamlessly search for a new parent while sleeping and scan channels upon awakening.

NOTE: For more information on ZigBee network communication with other AMX products, refer to the "Getting the Most From Your Mio Modero R-4" chapter in the Mio Modero R-4 remote user manual or the ZigBee Tips Installation Guide, available at www.amx.com.

Security

The NXR-ZGW-PRO device provides two levels of security using AES. Besides offering encryption with all communication, AES encryption is always on. In addition, the gateway allows the use of 16-digit pre-shared user-defined keys between devices in a Personal Area Network. For more information, please refer to the *Setting Security Options* on page 20.

The NXR-ZGW-PRO ICSP security protocols allow one to use ICSP for authentication and encryption of Ethernet communication with the Master.

Personal Area Network - Limitations

Within each Personal Area Network (PAN), a particular gateway can have up to 8 remote devices directly accessing it. Each PAN may have limitations to the number of devices connected to a gateway, depending upon local conditions. For more information, please refer to the *How ZigBee works* on page 9.

NOTE: The IP configuration for the NXR-ZGW-PRO defaults to DHCP, but may be set to Static in the Browser-Based Configuration Manager Pages (for more information, please refer to the NXR-ZGW-PRO Configuration Pages on page 16). The default IP address is 169.254.1.2, but if that address is in use by another device on the network, the gateway will jump to a random address.

Mesh Network Arrangements

The following installations depend upon the criteria for the network. A small installation would perhaps only need one NXR-ZGW-PRO to handle the devices in its network, while a larger installation might require a NXR-ZGW-PRO and several NXR-ZRP-PROs to offer sufficient coverage.

NOTE: When adding a ZigBee network to a NetLinX master, an Ethernet switch or hub must be added to the master for proper function of the ZigBee network.

Single Gateway Installations

After you have installed the NXR-ZGW-PRO, you should consider the arrangement of devices. The following is an example where only one NXR-ZGW-PRO is in the installation. This means that the installer has only one Extended PAN ID with which to contend.

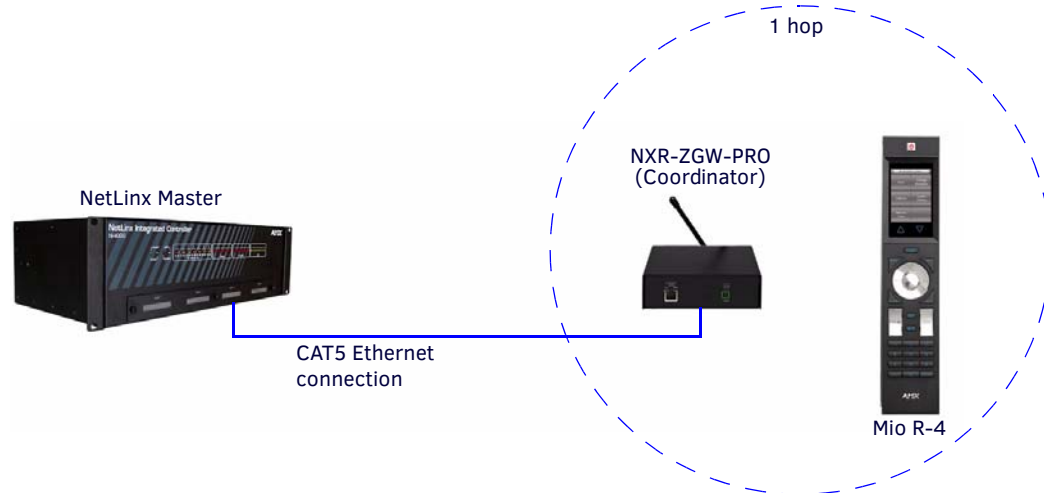


FIG. 3 Single Extended PAN ID Network

See *Setting up a network* section on page 14 for setting the Extended PAN ID and adding device EUI-64 Addresses.

Multiple Gateway Installations

A more commercial application of the NXR-ZGW-PRO is having multiple gateways and specific devices operating in close proximity of each other. Devices and repeaters of different networks can operate side-by-side without interference. In the case of multiple networks in an area, it is best to use different channels for each PAN, or to select a channel of "Any". "Any" will let a gateway spot other PANs in the area and choose the best available channel for operation.

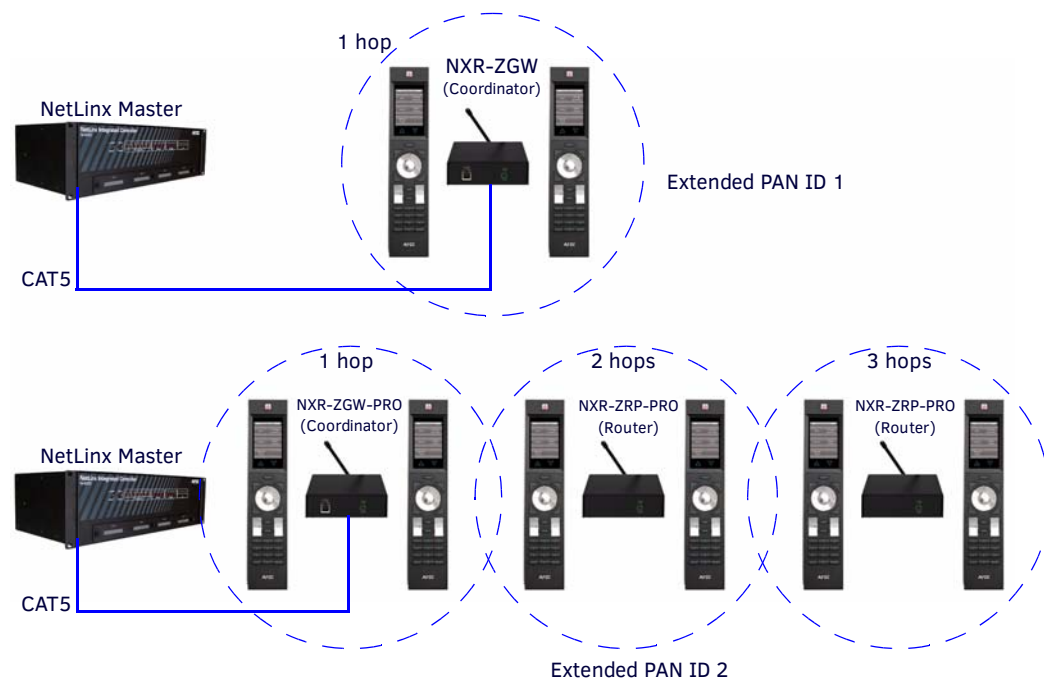


FIG. 4 Multiple Extended PAN ID Network

See *Setting up a network* section on page 14 for setting the Extended PAN ID and adding device EUI Addresses.

Patents

This product employs or practices certain features and/or methods of one or more of the following patents:

- SIPCO, LLC
- U.S. Patent No. 7,103,511
- U.S. Patent No. 6,914,893
- U.S. Patent No. 7,697,492

FCC Warning Statement

1. This equipment complies with Part 15 of the FCC rules. Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
2. This device complies with Part 15 of the FCC rules subject to the following two conditions:
 - a. This device may not cause harmful interference.
 - b. This device must accept all interference received, including interference that may cause undesired operation.

Installation

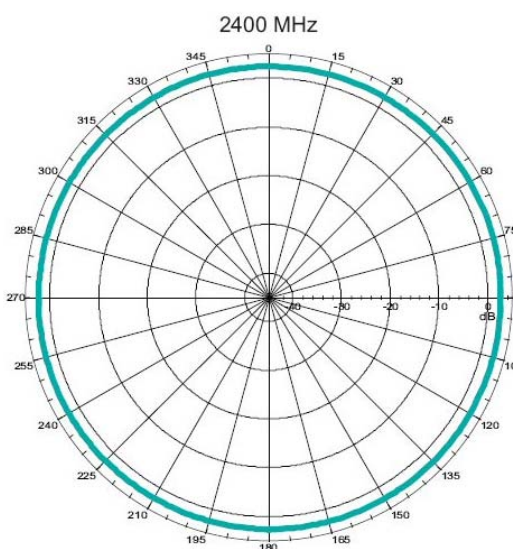
Overview

Several factors will help decide the best place to install NXR-ZGW-PRO and NXR-ZRP-PRO ZigBee Pro devices. Before installing, consider the following:

Location and Antenna Direction

- The best location for NXR-ZGW-PRO and NXR-ZRP-PRO devices are usually in the center of your wireless network, with line of sight to all of your mobile devices.
- Try placing the antenna in a position that can best cover your wireless network. Normally, the higher you place the antenna, the better the performance you receive.
- Try to place the gateway and repeater devices a reasonable distance away from each other to minimize antenna feedback.
- For minimal interference, try to keep any installed NXR-ZGW-PRO at least 10 feet (3.048m) from any WiFi access points.
- FIG. 5 displays the coverage for various positioning of the antenna.

Horizontal Position



Vertical Position

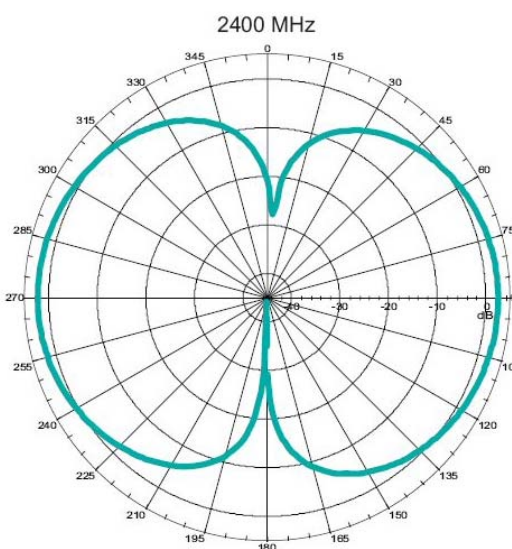


FIG. 5 Horizontal and Vertical Antenna Radiation

NOTE: Vertical radiation may vary slightly based on the selected channel.

Connecting the Optional Accessory Antennas

Several accessory 2.4GHz antennas are available for use with NXR-ZGW-PRO and NXR-ZRP-PRO. Each of these antennas is uniquely suited to meet a wide variety of installation requirements.

Connecting Power to the NXR-ZGW-PRO and NXR-ZRP-PRO

The NXR-ZGW-PRO receives power via either PoE or 2-pin 3.5 mm mini-captive wire connection, while the NXR-ZRP-PRO only utilizes the 2-pin 3.5 mm mini-captive wire connection.

NOTE: When connecting both Ethernet and mini-captive wire connections to the NXR-ZGW-PRO, PoE is overridden by the captive wire connection. PoE is only engaged if Ethernet is the only power source available to the device.

If PoE is used, the NXR-ZGW-PRO will draw power through the CAT5 Ethernet cable, thereby allowing it to be installed in areas without extra wiring for power (see *Determining the Power Source* section on page 12).

Determining the Power Source

The ability to choose a power supply option increases the availability of deployment locations. In addition, the NXR-ZGW-PRO facilitates installation into areas previously without power, as it is not necessary to run electrical wires to the device.

Based upon location and the availability of electricity, select one of the two following methods for power:

- **2-pin 3.5mm captive-wire connector** - Prepare the captive wire pair and insert it into the connector. See *Preparing Captive Wires for the 2-pin 3.5mm Captive Wire PWR Connector* section on page 13.

This is the only power option for the NXR-ZRP-PRO.

- **Power Over Ethernet (PoE) (NXD-ZGW-PRO only)** - If no electrical outlet is available, you can plug one end of the CAT5 Ethernet cable into the RJ-45 jack of the NXR-ZGW-PRO and plug the other end of the CAT5 cable into PoE supply equipment (*this unit must be 802.3af compliant*).

The NXR-ZGW is rated as a PoE Class 2 device that consumes about 2.5W, about 50mA to 60mA at 48V.

Preparing Captive Wires for the 2-pin 3.5mm Captive Wire PWR Connector

If the 2-pin 3.5 mm mini-captive wire is selected, the following steps are necessary:

You will need a wire stripper and flat-blade screwdriver to prepare and connect the captive wires.

1. Strip 0.25 inch (6.35 mm) of wire insulation off all wires.
2. Insert each wire into the appropriate opening on the connector according to the wiring diagrams and connector types described in this section.
3. Turn the screws clockwise to secure the wires in the connector. Do not over-torque the screws; doing so can bend the seating pins and damage the connector.

Using the PSN NetLinX connector for power

The PWR and GND cable from the 12 VDC power supply must be connected to the corresponding location on the 2-pin 3.5 mm mini-captive wire connector (FIG. 6).

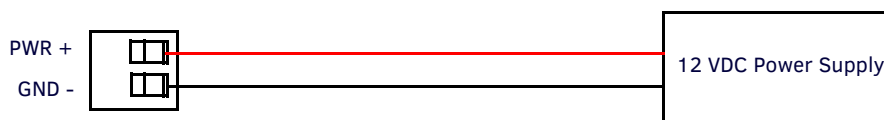


FIG. 6 12 VDC Power Connector Wiring Diagram

1. Insert the PWR and GND wires on the terminal end of a PSN 2-pin 3.5 mm mini-captive wire cable. Match the wiring locations of the +/- on both the power supply and the terminal connector.
2. Tighten the clamp to secure the two wires. Do not over-torque the screws, as doing so may strip the threads and damage the connector.
3. Verify the connection of the 2-pin 3.5 mm mini-captive wire to the power supply.

Connecting the NXR-ZGW-PRO to a LAN

Insert one end of the CAT5 Ethernet cable into the rear RJ-45 jack (see FIG. 1 on page 6) and connect the other end of the same cable to a master.

See *Mesh Network Arrangements* section on page 10 for possible network configurations.

Table-Top Installation

Using the provided rubber pads, place one in each bottom corner of the device. These will prevent scratches on the table surface from the device casing.

Rack-Mount Installation

Using the Velcro pad provided, remove the backing and adhere one side to the device.

Remove the backing of the other side of the Velcro and place it on your rack where you want the NXR-ZGW-PRO/ZRP-PRO mounted.

Before continuing, consult the *Setting up a network* on page 14.

Setting up a network

Overview

The NXR-ZGW-PRO and NXR-ZRP-PRO constitute the full Master-to-Device control solution via a ZigBee Pro wireless personal area network (PAN) using a mesh topology. A variety of individual devices that can be controlled or be the source of input to the system are supported. This diagram in FIG. 7 shows MIO-R3 and MIO-R4 remotes connecting to a network via a NXR-ZGW gateway and multiple NXR-ZRP repeaters.

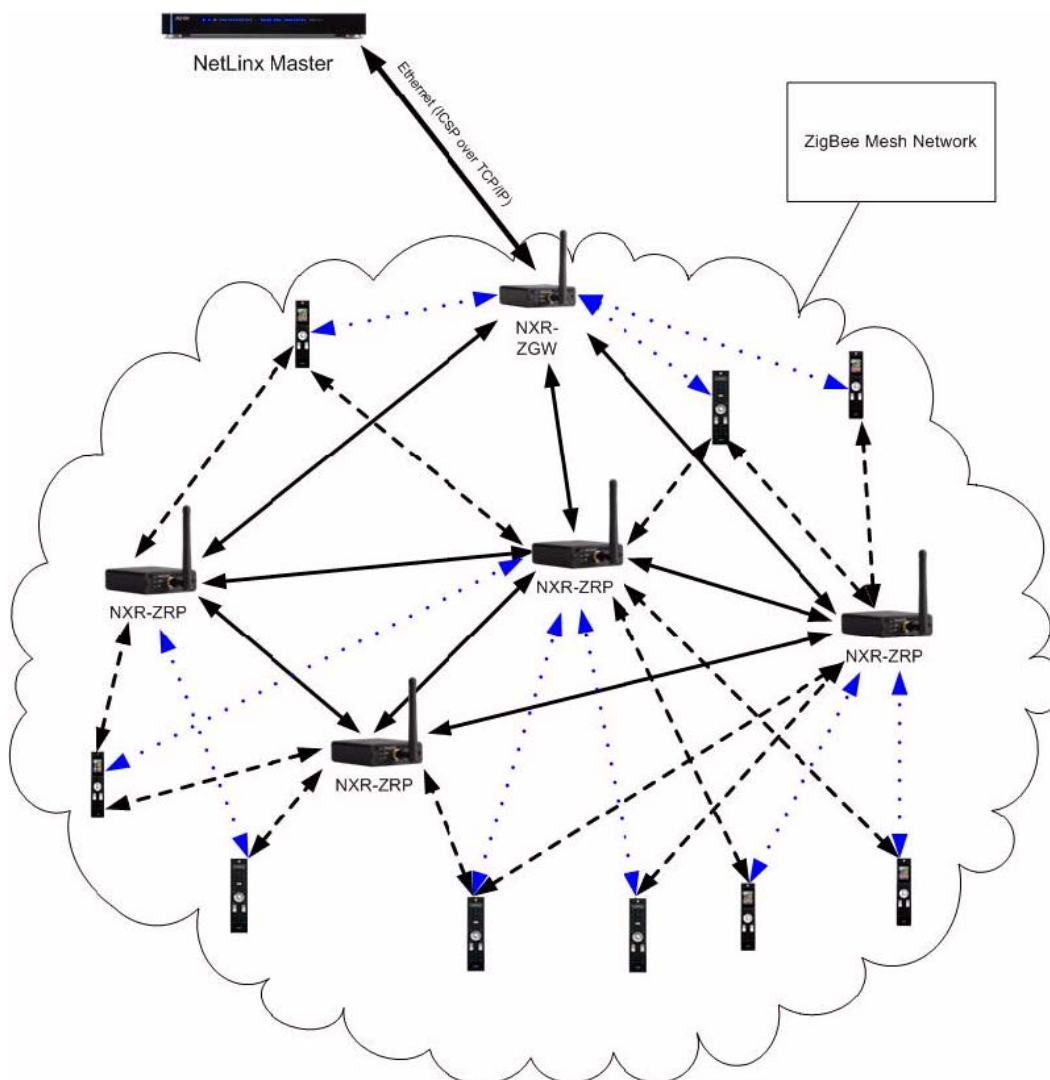


FIG. 7 NXR-ZGW-PRO and NXR-ZRP-PRO Deployment View

NOTE: When using ZigBee Pro firmware for a new or existing ZigBee network, you should ensure that the network's Master is upgraded to firmware version 3.41.422 or later.

ZigBee networks utilize a mesh topology, in that devices may interconnect, known as *roaming*, with different ZigBee transceivers in an effort to get the best possible signal. The transceivers are known as *parents*. A ZigBee network may contain at most one parent device that acts as a Coordinator.

With an AMX system, the AMX NXR-ZGW-PRO fills that role. Multiple routers may be contained in a ZigBee network, and the routers must have a reliable power source to keep the network assembled. ZigBee messages travel through the network, attempting to minimize the hops between source and destination. Routers, including the Coordinator, share routing information and establish paths through the network, which is illustrated by the solid lines in FIG. 7.

Devices may only have one parent, usually a single router. However, they may be within range of multiple routers, and choose to roam to a new parent based on signal strength, packet error rate, or some other measurable data. The possible connections between devices and the routers in range are illustrated by the dashed and dotted lines in FIG. 7.

Only one of these paths between a device and a router will be active until the device chooses to roam and find a new parent. The active path is illustrated by the dotted lines. The active path may not always be the path with the fewest hops through the network.

For example, if a device is moved behind a wall with sufficient RF absorption, the device may roam to a parent with a stronger signal.

Devices may be mobile and may go into Standby Mode. Due to the mobile nature, previously out-of-range routers may come within range and be roamed to as the device moves through the RF space. Due to the nature of a typical standby cycle, in order to save battery life, a device will control the rate of the data it receives based on its standby cycle.

Entering Devices Onto a Network

After establishing the location of the gateway (page 12), connecting it (page 13), providing power (page 12), and placing the device in either a rack (page 13) or wall installation (page 13), you can then begin configuring the NXR-ZGW-PRO and adding an NXR-ZRP-PRO and other ZigBee-compatible devices to the network.

1. Confirm that the NXR-ZGW-PRO is receiving power by checking the PWR LED on the front panel.
2. Using a PC connected to your NetLinX system, either open a web browser equipped with Zeroconf or NetLinX Studio.
 - The NXR-ZGW-PRO will show up in the Zeroconf list as *AMX NXR-ZGW SN# XXXX* (“XXXX” being the 16-digit serial number of the NXR-ZGW-PRO).
 - Double click on the device and the NXR-ZGW Browser-Based Configuration Manager will be brought up.
 - If Zeroconf is not available, open a telnet session with the master and use the command “show system” to obtain the IP address of the NXR-ZGW-PRO.
 - If more than one master is on the subnet, the NXR-ZGW-PRO will connect to the first one it senses, so having only one master is highly recommended.
3. Access the NXR-ZGW on-line Configuration pages - enter the IP address of the NXR-ZGW-PRO into your web browser (the default IP configuration for the NXR-ZGW-PRO is *DHCP/Zeroconf*).
4. Select the *NetLinX Settings* tab, and configure the NXR-ZGW-PRO to communicate with the master. See the *Configuration - NetLinX Settings tab* section on page 20 for details.
5. Go to the *PAN/Network* tab and enable the wireless network. See the *Personal Area Network (PAN) - Network tab* section on page 22 for details.
6. Turn on and/or configure ZigBee-compatible devices one at a time, e.g., Mio R-3 or Mio R-4. This ensures that they are fully booted up before attempting to join the network.
7. Go to the *Pan/Commissioning* tab and allow joining. This enables joining for one minute and may need to be repeated periodically. See the *Personal Area Network (PAN) - Commission Devices tab* section on page 25 for details.
8. Start a network scan and select the appropriate Extended PAN ID (*Mio R-3 and R-4 only*).
9. For devices that do not have displays, such as the NXR-ZRP-PRO, or ones that have an insufficient display to allow selection of the Extended PAN ID to join a network, place each device one at a time within range of the gateway, turn on one of the devices, and configure it using the gateway web pages before turning on the next one. With repeaters that have been on for some time, shut them down and reboot them. Use the gateway to lock the device to the desired Extended PAN ID.

NOTE: *If a repeater has been previously configured to a PAN, it must be reset to factory defaults before it can join a different PAN.*

This method may also be used if you do not want to go to each ZigBee compatible device to set the Extended PAN ID. However, once each device is set, the change must be made to the gateway itself. It may be necessary to cycle power on each device for them to come online.

10. Due to the wireless nature of the ZigBee network, temporary interference (such as leaving a room or large objects passing between a remote and its gateway device) may prevent a command from reaching the NetLinX master.

NOTE: *If this happens while increasing volume, the master may receive the command to increase the volume but not the command to stop increasing it.*

CAUTION: *With this in mind, programmers should consider setting safeguards for volume control, either through established volume limits or timeouts with the NetLinX master or more interactive adjustment from the remote (i.e., direct volume control), to prevent issues with lost commands.*

NOTE: *To optimize the user experience and prevent delays in commands being received and processed, limiting the number of “hops” between a ZigBee-enabled device and the NetLinX master to two or less is highly recommended. For more information, see both the How ZigBee works section on page 9, the “Getting the Most From Your Mio Modero R-4” chapter in the Mio Modero R-4 Remote Operation/Reference Manual, and the ZigBee Tips Installation Guide, all available at www.amx.com.*

NXR-ZGW-PRO Configuration Pages

Overview

To access the NXR-ZGW on-board Configuration pages, enter the IP address of the NXR-ZGW-PRO into your web browser; the default IP configuration for the NXR-ZGW-PRO is **DHCP/Zeroconf**. Zeroconf will broadcast its Web services and allow connection. This broadcast may be viewed with any Zeroconf-enabled browser, such as NetLinx Studio or via the Bonjour plug-in for Internet Explorer. When prompted, enter your username and password in the spaces provided.

NOTE: Upon accessing the Configuration Manager, the user must enter a username and password. The default entries are "Admin" and "1988", and passwords are always case sensitive. Changing the default password as soon as possible is highly recommended.

Configuration Manager

All pages in the Configuration Manager offer the same buttons at the top of the page (FIG. 8).



FIG. 8 NXR-ZGW-PRO Configuration Manager - Page Heading

Consequently, a user may refresh the currently viewed page or log out of the Configuration Manager at any time, and may access main categories from any other page.

NXR-ZGW-PRO Configuration Manager - Heading Options	
• Logout	Clicking this button logs the user out of the Configuration Manager page.
• Refresh	Clicking this button refreshes the page, updating any information changed since the page was last loaded in the browser.
• Summary	Clicking this button opens the <i>Summary of Gateway Settings</i> page (page 17).
• Configuration	Clicking this button gives access to the <i>Network IP Settings</i> (page 18), <i>NetLinx Settings</i> (page 20), and <i>User Settings</i> (page 21) pages.
• Pan	Clicking this button gives access to the <i>Personal Area Network (PAN)</i> (page 22) and <i>Connections</i> (page 24) pages.
• Utilities	Clicking this button gives access to the <i>Device Firmware</i> (page 27), <i>Connection Log</i> (page 28), and <i>Traffic Log</i> (page 29) pages.

Summary of Gateway Settings

Click the **Summary** button to access the *Summary of Gateway Settings* page. This page is also the initial access point for the Configuration Manager (FIG. 9).

Configuration Manager | Summary | Configuration | Pan | Utilities

Summary of Gateway Settings

View details at a glance

Version

Firmware: v3.00.00 Serial Number: 579101X4180048
ZigBee Firmware: v3.00.00

IP Settings

IP: Dynamic Subnet Mask: 255.255.252.0
Host: Gateway Gateway: 192.168.220.2
IP Address: 192.168.220.149 Mac Address: 00:60:9F:93:8D:A7

System Connection

Device ID: 0

Pan Settings

Wireless: Disabled Security: Disabled
Channel: 0 Access List: Disabled
Extended Pan ID: AZG80048 Pan ID: 0000
EUI: 00:0d:6f:00:00:16:2c:44 Zigbee Stack Profile: 2

Reboot

FIG. 9 Summary of Gateway Settings Page

This page provides a quick summary of the current Gateway settings:

Summary of Gateway Settings Options	
Version	
Firmware	The version of the software running on the device.
ZigBee Firmware	The version of ZigBee software running on the device.
Serial Number	The serial number of the device as issued by AMX.
IP Settings	
IP	The IP mode of the device (Static or Dynamic).
Host	The hostname of the device.
IP Address	The IP address of the device.
Subnet Mask	The subnet mask associated with IP addressing for the device.
Gateway	The IP gateway used by the device.
MacAddress	The MAC address of the device.
System Connection	
Device ID	The ICSP device number of the device.
Pan Settings	
Wireless	The state (Disabled/Enabled) of the wireless connection.
Channel	The ZigBee wireless channel used.
Extended Pan ID	The ZigBee personal area network ID used. Represented as "AZGXXXXX," where "XXXXX" are the last five numbers of the device's serial number.
EUI	The Extended Unique Identifier. This is the ZigBee equivalent of a MAC address, as it identifies the ZigBee hardware address for the gateway.
Preshared Key	The current use of a user-defined preshared key (Disabled/Enabled).
Access List	The current state of the Access List (Disabled/Enabled).
Pan ID	The number assigned to the device's PAN network.
ZigBee Stack Profile	The version of the ZigBee protocol running on the device. 1 = ZigBee 2004 2 = ZigBee 2007

Checking the Firmware Version

The firmware version is listed on the *Summary of Gateway Settings* page of the NXR-ZGW Browser-Based Configuration Manager.

Checking the ZigBee Firmware Version

The ZigBee firmware version is listed on the *Summary of Gateway Settings* page, at the bottom of the page.

Determining the IP Settings of the NXR-ZGW-PRO

The IP settings are listed in the *IP Settings* section.

Finding the ICSP Device Number of the NXR-ZGW-PRO

The ICSP device number is listed under the *System Connection, Device ID* section.

Determining the PAN Settings of the NXR-ZGW-PRO

The PAN settings are listed in the *PAN Settings* section.

Determining the ZigBee Stack Profile

The Zigbee Stack Profile lists the version of the ZigBee protocol currently running on the NXR-ZGW-PRO. This will always be "2".

Rebooting the NXR-ZGW-PRO

Click the **Reboot** button on the left bottom of the *Summary of Gateway Settings* page.

Configuration

Click the **Configuration** button (FIG. 10) to access the tabbed *Configuration* page.

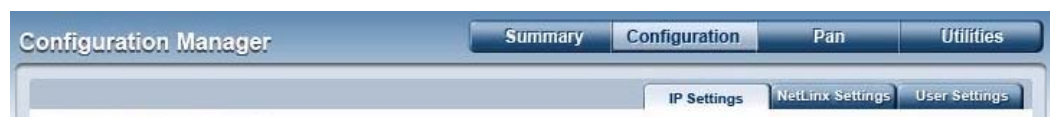


FIG. 10 Configuration Button

The tabs contained in the *Configuration* page are:

- **IP Settings** - Click to open the *Network IP Settings* tab (see the *Configuration - Network IP Settings tab* section on page 18)
- **NetLink Settings** - Click to open the *Network IP Settings* tab (see the *Configuration - NetLink Settings tab* section on page 20)
- **User Settings** - Click to open the *Network IP Settings* tab (see the *Configuration - User Settings tab* section on page 21)

Configuration - Network IP Settings tab

Click the **IP Settings** tab of the *Configuration* page to access the *Network IP Settings* options. The options in this tab are used to set IP and DNS addresses. The IP address can be either a static or dynamic assignment.

 The image shows the "Network IP Settings" page within the Configuration Manager. The page has a title bar "Configuration Manager" and tabs "Summary", "Configuration", "Pan", and "Utilities". The "Configuration" tab is selected, and within it, the "IP Settings" sub-tab is active. The main content area is titled "Network IP Settings" with a subtitle "View/Edit the network IP settings for this gateway". It contains three sections:

- IP Address**: Includes radio buttons for "Dynamic" (selected) and "Static". Fields for "Subnet Mask" (255.255.252.0), "Gateway" (192.168.220.2), and "IP Address" (192.168.220.149) are present. A "Host" dropdown menu is set to "Gateway".
- Bonjour Settings**: Includes radio buttons for "Enabled" (selected) and "Disabled". A "Name" field contains "SN# 579101X4180048".
- DNS Address**: Includes fields for "Domain Suffix" (amx.internal), "Primary DNS" (192.168.20.7), and "Secondary DNS" (192.168.20.9).

 At the bottom right, there are "Cancel" and "Accept" buttons.

FIG. 11 Network IP Settings Page

Configuration - Network IP Settings tab options

IP Address	
IP	• Dynamic: IP address and subnet mask are requested from the DHCP server. • Static: User provides IP address information.
Host	The hostname of the device.
IP Address	The IP address of the device.
Subnet Mask	The IP subnet mask of the device.
Gateway	The gateway used for IP routing.
Bonjour Settings	
Bonjour	The button allowing use of the Zeroconf plug-in for Internet Explorer or Safari (Enabled/Disabled).
Name	The name of the Zeroconf shortcut.

The DNS Address allows the IP addresses of domain name servers to be specified.

DNS Address	
Domain Suffix	The domain name.
Primary DNS - Secondary DNS	Domain Name System IP numbers associated to the domain suffix.

Bonjour Settings

The Bonjour plug-in for Microsoft Internet Explorer 7 allows selection of information for individual Gateway devices within a Web browser. Zeroconf, also known as zero-configuration networking, allows users to locate networked computers, printers, and other equipment without knowing their IP address settings and without special serial cables or product-specific PC software.

The **Bonjour** button on the *Network IP Settings* page allows one to enable or disable the Bonjour plug-in. The *Name* field allows one to enter a unique name for a Zeroconf device shortcut. Once a name has been selected for a particular device, the device's Configuration Manager pages may be accessed through the Bonjour plug-in.

Setting the IP Address

1. In the menu at the top of the NXR-ZGW Browser-Based Configuration Manager, select *IP Settings* under the section *Configuration*.
2. Click the radio button for either *Dynamic* or *Static*. If your network has a DHCP server, you may select *Dynamic*, and the gateway will request IP information from the server.
3. If configured for *Static*, type the IP address in the field provided.
4. If necessary, type the subnet mask and gateway in the fields provided.
5. Click **Accept**.
6. In the *The system will need to reboot for changes to take effect* window, click **OK**.

Setting the DNS Address

1. In the menu at the top of the NXR-ZGW Browser-Based Configuration Manager, select *IP Settings* under the section *Configuration*.
2. Click the **Static** radio button in the IP Address section.
3. Type the Domain Suffix in the field provided.
4. Type the necessary DNS IP numbers in the fields.
5. Click **Accept**.

NOTE: Any changes made to the network IP or Zeroconf settings will force the gateway to reboot.

Configuration - NetLinX Settings tab

Click the **NetLinX Settings** tab of the *Configuration* page to access the *NetLinX Settings* options. The options in this tab are used to view or edit the NetLinX settings for this gateway (FIG. 12):

The screenshot shows the 'Configuration Manager' window with the 'Configuration' tab selected. Within this tab, the 'NetLinX Settings' sub-tab is active. The settings are as follows:

- Connection: Offline
- Mode: TCP Auto (dropdown menu)
- System Number: 0
- Device Number: 0
- Master IP/URL: (empty text field)
- Master Port Number: 1319
- Security: None
- Username: (empty text field)
- Password: (empty text field)

At the bottom right, there are 'Cancel' and 'Accept' buttons.

FIG. 12 NetLinX Settings Page

Configuration - NetLinX Settings tab options	
Connection	The mode in which the connection to the master is being made. <i>Default: ID Mode.</i>
Mode	The NetLinX mode being used. Selected from: • TCP Auto • TCP URL • TCP Listen • UDP URL
System Number	The number for the NetLinX network
Device Number	The network number assigned to the device
Master IP/URL:	The IP address or URL assigned to the master
Master Port Number	The port used by the master
Security	The current selected security setting for the network: • None • Authenticated • Encrypted <i>Note: Security settings are determined by the master, and cannot be changed from this page. For more information, refer to the security setup information for the master.</i>
Username	The user name registered with the master
Password	The password registered with the master.

Editing NetLinX Settings

1. In the menu at the top of the NXR-ZGW Browser-Based Configuration Manager, select *NetLinX Settings* under the section *Configuration*.
2. The *Connection* field cannot be changed from this page.
3. Select between the choices in the *Mode* dropdown menu for the desired NetLinX mode.
4. Enter the network system number in the *System Number* field (Automode only).
5. Enter the device number in the *Device Number* field.
6. Enter the IP address or the URL for the network Master in the *IP/URL* field (TCP URL and UDP URL only).
7. If the port used by the Master for its network connection needs to be changed, enter the new port number in the *Master Port Number* field (TCP URL only).
8. If connecting to a Master with security enabled, enter your username and password.
9. Click **Accept** to save any changes.

Setting Security Options

The *NetLinX Settings* page has three potential security settings: None, Authenticated, and Encrypted. All three of these may not be adjusted through the Browser-Based Configuration Manager, as these are all set by the master running the network.

For more information on activating or changing the NetLinX security settings, please refer to the Operation Reference Guide for the master being used (available at www.amx.com).

Configuration - User Settings tab

Click the **User Settings** tab of the *Configuration* page to access the *User Settings* options. The options in this tab are used to set the username and password for access to the NXR-ZGW-PRO on-board Configuration pages.

FIG. 13 Configuration - User Settings page

Configuration - User Settings tab options	
New Username	Text field for new username.
New Password	Text field for new password.
Re-type Password	Text field to confirm new password.

Setting a New Username and Password

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *User Settings* under the section *Configuration*.
2. In the text field next to *New Username*, type the new name.
3. In the text field next to *New Password*, type the new password.
4. Confirm the password in the field *Re-type Password*.
5. Click **Accept** to save the changes.

NOTE: The default username and password are “Admin” and “1988”, respectively. Changing the password as soon as possible is highly recommended.

Personal Area Network (PAN)

Click the **Pan** button (FIG. 14) to access the tabbed *Personal Area Network (PAN)* page.

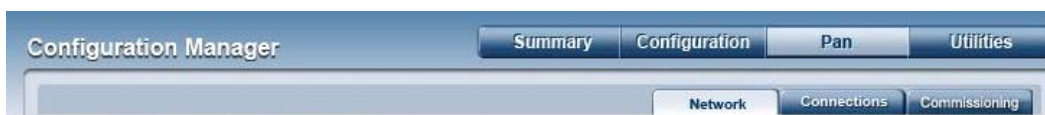


FIG. 14 Pan Button

The tabs contained in the *Pan* page are:

- **Network** - Click to open the *Network IP Settings* tab (see below)
- **Connections** - Click to open the *Network IP Settings* tab (see the *Personal Area Network (PAN) - Connections* tab section on page 24)
- **Commissioning** - Click to open the *Network IP Settings* tab (see the *Personal Area Network (PAN) - Commission Devices* tab section on page 25)

Personal Area Network (PAN) - Network tab

Click the **Network** tab of the *Personal Area Network (PAN)* page to access the *Network* tab. The options in this tab are used to view/modify the PAN settings for this gateway (FIG. 15).

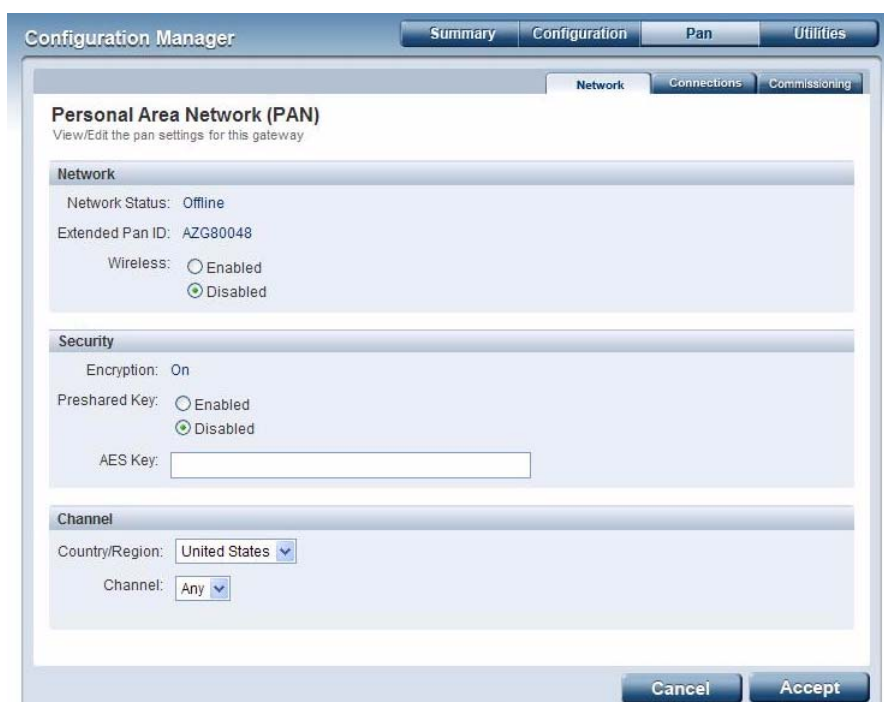


FIG. 15 Personal Area Network (PAN) - Network tab

Personal Area Network (PAN) Network tab options	
Network status	Lists whether the network is online, offline, or in Standby.
Extended PAN ID	The current Extended PAN ID number for the device. This is automatically provided by the device, and cannot be changed
Wireless	Enables or disables the ZigBee wireless networking.
Encryption	The encryption status of the network. Encryption is always on in a ZigBee network.
Preshared Key	When this parameter is enabled, all devices in the network must be commissioned to have the same preshared key to join the network.
AES Key	This is the user supplied preshared key value. It is a 32 digit hexadecimal key used for communications between the gateway and a device when the device is joining.
Country/Region	Drop down menu; sets ZigBee region (US, Europe, Japan).
Channel	Drop down menu; sets the ZigBee operating channel between 11 and 26. The default channel is "Any". "Any" will look for the channel with the least interference.

NOTE: The *Extended PAN ID* number is derived from the *NXD-ZGW's* serial number, and cannot be changed. If two devices in a network should somehow have the same extended PAN number, then return the device to AMX.

NOTE: If the PAN shows as "Offline" when the *NXR-ZGW-PRO* is in Standby Mode, update the Master's firmware.

Enabling and Disabling the Wireless Network

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Network* under the section *Pan*.
2. Click the radio button next to *Enabled* to enable the wireless network or select *Disabled* to disable the network.
3. Click **Accept**.

Enabling and Disabling the Use of a User-Defined Preshared Key

All devices in a PAN automatically have encryption of incoming and outgoing packets via a randomly generated network key. Clicking **Enabled** on the *Preshared Key* entry allows use of a key applied to all devices on the PAN.

The AES key is a 32-digit hexadecimal key with a colon (:) between each two digits. The numbers 0 through 9 and the letters A through F are valid for use in an AES key. This key may be generated by the user, or it can be provided by the network. If you enable the Preshared Key entry but do not enter a key, the system will generate a random key for you. Make sure to enter this AES key on every device within the PAN through the *Pan/Connections* page (see the *Personal Area Network (PAN) - Connections tab* section on page 24).

If a user defined preshared key is desired and that key does not have 32 digits or if all digits are zero, the system will recognize this as an invalid key and the user specified key will not be used.

If the network should become insecure, such as with a temporary power loss, then all unkeyed devices are lost to the network. When a device is lost, the Browser-based Configuration Manager may need as much as 50 seconds to reflect this. Keyed devices will attempt to reconnect to the PAN, or to the nearest available PAN if their chosen one is unavailable. Make sure to connect the gateway LAST.

NOTE: Any change to network settings from the Browser-based Configuration Manager will require formal joining of all network devices.

Connecting an NXR-ZRP-PRO To the Network for the First Time

When a NXR-ZRP is powered on for the first time, it will be set to factory defaults and will join the first AMX ZigBee Network that it detects with *Allow Joining* turned on. Once joined, it will appear on the list on the *Commission Devices* page (see the *Personal Area Network (PAN) - Commission Devices tab* section on page 25).

Clicking on the EUI-64 number of the device on the *Commission Devices* page will open the *PAN Device Details* page for that device (see the *Personal Area Network (PAN) - PAN Device Details Page* section on page 26).

It is suggested that only one gateway should set to allow joining when commissioning a network.

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Network* under the section *Pan*.
2. Click **Accept**.
3. Select the *Connections* tab; the repeater should appear on the gateway.
4. Click on the EUI-64 link to open the *Device Details* page.
5. In the *Extended PAN ID* field, enter the desired Extended PAN ID for the repeater within the network. This field defaults to the current network to which it is joined.
6. Click **Update Settings**.
7. Repeat steps 1-6 for each repeater to be added to the network.
8. Select the *Network* tab under the section *Pan* and enter the desired Extended PAN ID in the *PAN ID* field.
9. Click **Accept**.

Setting the PAN Channel

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Network* under the section *Pan*.
2. Click the radio button to *Disable* the wireless network. This activates the Country/Region and Channel dropdown menus.
3. Select your country or region of operation from the *Country/Region* drop down menu.
4. Select the Channel number from the *Channel* drop down menu. The selection of "Any" allows the radio to scan for the channel with the least interference and form the PAN on that channel.
5. Click **Accept**.

Personal Area Network (PAN) - Connections tab

Click the **Connections** tab of the *Personal Area Network (PAN)* page to access the *Connections* options. All devices connected to the NXR-ZGW-PRO are displayed on this page.



FIG. 16 Personal Area Network (PAN) - Connections tab

Personal Area Network (PAN) - Connections tab options	
No.	The Netlinx ID number.
EUI-64	The 64-bit ZigBee EUI address of the device.
Description	The device's description, supplied by the device. If none is entered, the description defaults to "Blank".
Type	The specific type of device being accessed.
Power Source	The source of power currently being used by the device. "Mains" means that the handheld device is in its charging cradle.
Power Level	The current charge on the handheld device's battery.
Status	The current status of the device: either "Active" or "Standby".

Finding a Device's EUI Address

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The EUI address is located in the *Connections* table under "EUI-64". Click on the EUI address to open the *PAN Device Details* page for this device. (See FIG. 18)

Finding the Device's Description

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The device's description is located in the table under "Description".

Determining the Device Type

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The device type is located in the table under "Type".

Determining a Device's Current Power Source

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The "Power Source" column lists the power sources of each device on the PAN. If a power source reads "Mains", this means that the device is a normally battery-powered device that is in its charging cradle and drawing power from the cradle, or is a non-battery device. Otherwise, the device will read "Rechargeable".

Determining the Device's Current Power Level

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The "Power Level" column lists the current power level of the device's battery. If a device is running in "Mains", the power level will read "100%".

Checking the Device Link Status

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connections* under the section *Pan*.
2. The status of the device is located in the table under the "Status" column. This status will either be "Active", "Standby", or "Offline".

Personal Area Network (PAN) - Commission Devices tab

Click the **Commissioning** tab of the *Personal Area Network (PAN)* page to access the *Commission Devices* options (FIG. 17). The options in this tab are used to bring up the network in an orderly fashion. Devices are allowed to join only when the gateway has the *Allow Joining* function turned on.



FIG. 17 Personal Area Network (PAN) - Commission Devices tab

Personal Area Network (PAN) - Commission Devices tab options	
Auto Refresh:	The current ability to automatically refresh the page to display new devices during the scanning period: either "On" or "Off".
Refresh List:	Manually refreshes the list of detected devices when pressed.
EUI-64:	The resource number of a particular detected device.
Device Type:	The type of device being commissioned. This information is provided by the device.
Description:	A detailed description of the device being commissioned. This information is designated by the user.
Status:	The current connection status of the device.
Allow Joining:	This button, when pressed, allows devices to join the network.

Commissioning Devices to a PAN

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Pan/Commissioning*.
2. If the device is not on the network and is set to factory defaults, make sure the device is powered and click the **Allow Joining** button.
3. Wait for the device to show up in the *Commissioning* tab.
4. Click on the *EUI-64* link to open the *Device Details* page (page 26).
5. In the *Extended PAN ID* field, enter the desired Extended PAN ID for the device within the network. This field will default to the current network.
6. Click **Update Settings**.
7. Repeat steps 1-6 for each device to be added to the network.

NOTE: When commissioning devices to a PAN, use only one gateway at a time. Allowing joins on multiple gateways simultaneously can give unpredictable results.

NOTE: If the existing ZigBee system contains a repeater and the user decides to form a new PAN (through channel changing or an AES key update), the repeater must be commissioned to the PAN first, before commissioning any devices. If you try to commission any device before commissioning repeaters, you will see duplicate entries for the same Extended PAN ID: one with "Join" status set to "no" from the repeaters and another one with "Join" status set to "yes" from the gateway.

When a NXR-ZRP is powered on for the first time, it will be set to factory defaults and will join the first AMX ZigBee Network that it detects with *Allow Joining* turned on. Once joined, it will appear on the list on the *Commission Devices* page. Clicking on the EUI-64 number of the device on the *Commission Devices* page will open the *PAN Device Details* page for that device.

- If the device is to remain on the network to which it is currently joined and no user defined AES key is required, click **Update Settings** to complete commissioning.
- If the device is to join a different network or a user defined AES key is required, enter the Extended Pan ID of the network to join in the *Extended Pan ID* block and/or the user defined AES key in the *AES Key* block and click **Update Settings** to complete commissioning.

NOTE: The PWR/STATUS LED (top LED) of the NXR-ZRP will remain on constantly when commissioning is complete.

Personal Area Network (PAN) - PAN Device Details Page

From the *Connections* or the *Commission Devices* pages, clicking on a device's **EUI-64** number opens the *Pan Device Details* page (FIG. 18).

Configuration Manager | Summary | Configuration | **Pan** | Utilities

Network | **Connections** | Commissioning

Pan Device Details

View Pan device details

Connected Device

Device Type: Mio R-3

Device Description:

Status: Active

ICSP Connection: Connected

Device Networking		Device Information	
EUI-64	00-0D-6F-00-00-0D-06-10	Power Sources	Mains , Rechargeable
Node ID	282A	Current Power	Mains
Link Quality	255	Power Level	100%
Traffic RX	28	Host F/W Version	v3.00
Traffic TX	4	Serial Number	0000000000000000
		Node Type	End Device

Zigbee Networking

Application Version: v3.00.00

Extended Pan ID:

AES Key:

Connection Log			
#	Connection	EUI-64	Device #
9	Zigbee Leave - Device Timeout	00-0D-6F-00-00-0D-06-10	10051
10	ICSP Leave - Device Connection Lost	00-0D-6F-00-00-0D-06-10	10051
11	ICSP Join - Master Connected	00-0D-6F-00-00-0D-06-10	0
12	Zigbee Join - Initial	00-0D-6F-00-00-0D-06-10	0
13	ICSP Join - Device Connected	00-0D-6F-00-00-0D-06-10	10051

FIG. 18 PAN Device Details Page

Personal Area Network (PAN) - Pan Device Details page options	
Leave Network	This button removes a device from its PAN if clicked.
Connected Device	Device Type: The type of network device. Device Description: The user-defined description of the device. Status: Active, Standby, or Offline ICSP Connection: Notes whether the device is connected via ICSP.
Device Networking	EUI-64: The 64-bit ZigBee EUI address of the device. Node ID: The 16-bit ZigBee short address of the device. Link Quality: The combination of signal strength and packet integrity of the device's connection (0-255). Traffic RX: The number of data packets sent to the device. Traffic TX: The number of data packets received by the device.
Device Information	Power Sources: All of the possible sources for power for the device, including mains electric power and rechargeable battery backup Current Power: Current power source being used by the device. Power Level: Amount of required power currently being received by the device. Host F/W Version: Latest firmware version installed in the device. Serial Number: The serial number of the device. Node Type: The ZigBee node designation. Including log details of that device only.
ZigBee Networking	Application Version: The version of the ZigBee application being used. Extended Pan ID: ID number for the device within the PAN. AES Key: The user-defined security key used by the ZigBee network.

Changing the Extended PAN ID

The Extended PAN ID for the device may be changed via the field on the *PAN Device Details* page. Changing this information will require joining to be allowed on the new network.

NOTE: If the Extended PAN ID for the device is changed, then any connection to an existing PAN will be lost. Changing the PAN ID will require having to reconnect the device to the PAN, or to another PAN in the same area.

Changing the AES Key

The 16-digit AES key for a particular device in a PAN may be changed from the *AES Key* field in the *ZigBee Networking* section of the *PAN Device Details* page. For more information on changing the AES Key for a PAN device, please refer to the *Enabling and Disabling the Use of a User-Defined Preshared Key* on page 23.

Utilities

Click the **Utilities** button (FIG. 19) to access the tabbed *Utilities* page.



FIG. 19 Utilities Button

Utilities - Device Firmware tab

Click the **Device Firmware** tab of the *Utilities* page to access the *Device Firmware* options (FIG. 20). This page shows all the information about the status of firmware on network devices.



FIG. 20 Utilities - Device Firmware tab

Utilities - Device Firmware tab options	
Auto Refresh	Automatically and regularly refreshes the Device Firmware Status list.
Refresh List	Manually refreshes the Device Firmware Status list.
Allow Updates	Selects all devices listed in the Device Firmware Status list and turns all permissions On or Off.
Updates	Sets permissions to allow firmware uploads to the selected device.
EUI-64	The 64-bit EUI address of the device.
Description	The user-provided description of the device.
Status	The current activity of the device, whether active, standby, or offline.
Version	The current version of the ZigBee firmware.
Upload Status	Displays the ability of the firmware to be uploaded with new firmware. Handheld devices will not receive uploads until they are placed in their charging cradles.

NOTE: Devices showing an Upload Status of "Place In Charger" will not receive firmware uploads until they are inserted into their charging cradles.

Allowing Firmware Updates To Individual Devices

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Device Firmware* under the section *Utilities*.
2. Choose the device to be updated by its EUI-64 number.
3. Click the button next to the device's EUI-64 number in the *Allow Updates* column. The page will automatically refresh, displaying the device's new status.
4. Some devices cannot have their firmware update status changed; these devices will continue to read **Off** even after selecting to allow new updates.

Allowing Firmware Updates To All Devices On a Network

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Device Firmware* under the section *Utilities*.
2. In the *Allow Updates* column, click **All On** or **All Off** to allow or block upgrades to all devices on the network. The page will automatically refresh, displaying the new status of all network devices.
3. Some devices cannot have their firmware update status changed; these devices will continue to read **Off** even after selecting to allow new updates.

NOTE: Clicking on the EUI-64 number in the Device Firmware page will open the device's PAN Device Details page (see FIG. 18).

Utilities - Connection Log tab

Click the **Connection Log** tab of the *Utilities* page to access the *Connection Log* (FIG. 20). The *Connection Log* is a list of all recent ZigBee device activity.



FIG. 21 Utilities - Connection Log tab

Utilities - Connection Log tab options	
Auto Refresh	Automatically and regularly refreshes the Connection Log listings.
Refresh List	Manually refreshes the Connection Log listings.
Clear List	Manually clears all entries in the Connection Log listings.
#	The device's log entry number
Time	The time the device last made or lost connection with the network.
Connection	Indicates the device and its latest connection status.
EUI-64	The 64-bit EUI address of the device.
Device #	The device's ICSP device number.

Determining the Connection Status of a Device

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The connection status of each device is located in the column *Connection*; the possible values are either *Connected* or *Disconnected*. The time in which the device either connected to the network or lost its connection is located under the column *Time*.

Finding a Device's EUI Address

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The EUI address of each device is located in the column *EUI-64*.

Finding the Device's ICSP Number

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The ICSP number of each device is located in the column *Device #*.

NOTE: Clicking on the EUI-64 number in the Connection Log page will open the device's PAN Device Details page (see FIG. 18).

Utilities - Traffic Log tab

Click the **Traffic Log** tab of the *Utilities* page to access the *Traffic Log* (FIG. 22). The traffic log shows traffic statistics for all ZigBee devices.



FIG. 22 Utilities - Traffic Log tab

Utilities - Traffic Log tab options	
Auto Refresh	Automatically and regularly refreshes the Traffic Log listings.
Refresh List	Manually refreshes the Traffic Log listings.
Clear List	Manually clears all entries in the Traffic Log listings.
Device #	The device's ICSP device number.
EUI-64	The 64-bit EUI address of the device.
Description	The device's description, supplied by the device.
Device Type	The type of device tracked by the Traffic Log.
RX	The total number of bytes received by the device since it connected.
TX	The total number of bytes transferred to the device since it connected.
Buffers	
Current	The current number of buffers being used on the device.
Threshold	The maximum number of buffers available for use on the device. Exceeding this number will cause the device to fall offline.
Max	The maximum number of buffers that have been used since the last time the traffic log was cleared.

Finding the Device's ICSP Number

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The ICSP number of each device is located in the column *Device #*.

Finding a Device's EUI Address

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The EUI address of each device is located in the column *EUI-64*.

Finding the Device's Description

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The description of each device is located in the column *Description*.

Determining the Device Type

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The type of each device is located in the column *Device Type*.

Finding the Device Traffic

1. In the menu on the top of the NXR-ZGW Browser-Based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The traffic byte count of each device is located within the columns RX and TX. RX lists received traffic, while TX lists transmitted traffic.

NOTE: Clicking on the EUI-64 number in the Traffic Log page will open the device's PAN Device Details page (FIG. 18).

Programming the NXR-ZGW-PRO

Overview

Some of the functionality of the NXR-ZGW-PRO may be handled using the application *TPDesign4*. Go to www.amx.com for the supporting documentation. The NXR-ZGW-PRO recognizes a select number of NetLinX Commands.

SEND_COMMANDS

Below is a list of SEND_COMMANDS accepted by the NXR-ZGW-PRO from NetLinX masters. To use these commands, establish a Telnet session from the PC to the NetLinX master. Additionally, you could use NetLinX Studio or the master's web page to send the commands.

Send Commands	
BUFF DEVICE SIZE	This command increases the buffer size for a specific DEVICE to SIZE. This change is temporary, and the buffer size will revert to its original size after 30 seconds.
?VDEVS	Returns a list of all ZigBee devices that are currently on the gateway. The devices will be returned to the master as send commands. Syntax: " ^VDEVS - X, EUI " • X = the index of the device • EUI = the device's unique ZigBee EUI Address
?VDEVINFO EUI	Returns a list of specific information about the device specified by the EUI. Syntax: " ^ZDEVINFO - EUI, X, Info " • EUI = the device's unique ZigBee EUI Address • X = integer that identifies the type of information being returned value: 0 for ICSP Device Number 1 for Device Class (typically ZIG for ZigBee) 2 for Device Name (The name given to the device on the web pages) 255 for End of data. • INFO = actual information Note: Querying a device that does not exist, results in an End of Data message (with nothing else).

NOTE: All text is based on a Unicode index.

Device Configuration

Changing the NXR-ZGW-PRO's Device Number

Use the NetLinx Studio application (available from www.amx.com) to change the device address on a NetLinx device. NetLinx Studio supports changing the Device Address information manually, or via ID Mode.

- Refer to the NetLinx Studio on-line help ("NetLinx Device Addressing" section) for instructions.

Sending Firmware to The NXR-ZGW-PRO

Use the NetLinx Studio application (available from www.amx.com) to transfer firmware files to AMX devices.

Before Upgrading Firmware

- Set up and configure your NetLinx Master. Refer to your particular NetLinx Master instruction manual for detailed setup procedures.
- Prepare the communication on the NXR-ZGW-PRO for use. Refer to the *Setting up a network* section on page 14.
- Refer to the NetLinx Studio on-line Help file for information on uploading firmware files via Ethernet.

Cautionary Notes

- If power or connection fails during a firmware upgrade, the file system may become corrupted.
- A NXR-ZGW-PRO which is not using a valid username and password will not communicate with a secured Master. If you are updating the firmware on a keypad which is not using a username or password field, you must first remove the Master Security feature to establish an unsecured connection.
- When upgrading the devices on a Personal Area Network via the NXR-ZGW-PRO, note that only two firmware files may be uploaded to the network at any time. To save bandwidth on large networks, verify the position of the gateway, and do not upgrade all of the devices on a network at once.

Preparing the Master for Communication via IP

Use the NetLinx Studio application (available from www.amx.com) to establish communications with a target NetLinx Master. Obtain the IP Address of the target NetLinx Master (noting the IP Address and Gateway information) from your System Administrator (or use NetLinx Studio to determine the IP information).

- Refer to the NetLinx Studio on-line help ("NetLinx Network Setup" section) for instructions on connecting to a NetLinx Master.

Verifying and Upgrading Device Firmware via IP

Upgrading firmware to the NXR-ZRP-PRO repeaters in a network, as well as any other ZigBee devices in a network, is done through the *Browser-Based Configuration Manager* pages accessed through the NXR-ZGW-PRO.

For more information, refer to the *Allowing Firmware Updates To Individual Devices* on page 27 and the *Allowing Firmware Updates To All Devices On a Network* on page 27.



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3000 RESEARCH DRIVE, RICHARDSON, TX 75082 AMX.com | 800.222.0193 | 469.624.8000 | +1.469.624.7400 | fax 469.624.7153
AMX (UK) LTD, AMX by HARMAN - Unit C, Auster Road, Clifton Moor, York, YO30 4GD United Kingdom • +44 1904-343-100 • www.amx.com/eu/

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