



INSTRUCTION MANUAL

NOVARA ETHERNET KEYPADS

SP-08-E-US



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 candles - should be placed on the product.
- WARNING:** Equipment shall be connected to a MAINS socket outlet with a protective earthing connection.

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ESD WARNING

	<p>To avoid ESD (Electrostatic Discharge) damage to sensitive components, make sure you are properly grounded before touching any internal materials.</p> <p>When working with any equipment manufactured with electronic devices, proper ESD grounding procedures must be followed to make sure people, products, and tools are as free of static charges as possible. Grounding straps, conductive smocks, and conductive work mats are specifically designed for this purpose. These items should not be manufactured locally, since they are generally composed of highly resistive conductive materials to safely drain static discharges, without increasing an electrocution risk in the event of an accident.</p> <p>Anyone performing field maintenance on AMX equipment should use an appropriate ESD field service kit complete with at least a dissipative work mat with a ground cord and a UL listed adjustable wrist strap with another ground cord</p>
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  <p>CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN</p>	<p>WARNING: Do Not Open! Risk of Electrical Shock. Voltages in this equipment are hazardous to life. No user-serviceable parts inside. Refer all servicing to qualified service personnel.</p> <p>Place the equipment near a main power supply outlet and make sure that you can easily access the power breaker switch.</p>
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WARNING: This product is intended to be operated ONLY from the voltages listed on the back panel or the recommended, or included, power supply of the product. Operation from other voltages other than those indicated may cause irreversible damage to the product and void the products warranty. The use of AC Plug Adapters is cautioned because it can allow the product to be plugged into voltages in which the product was not designed to operate. If the product is equipped with a detachable power cord, use only the type provided with your product or by your local distributor and/or retailer. If you are unsure of the correct operational voltage, please contact your local distributor and/or retailer.

FCC AND CANADA EMC COMPLIANCE INFORMATION:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Approved under the verification provision of FCC Part 15 as a Class B Digital Device.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this device.

CAN ICES-3 (B)/NMB-3(B)

EU COMPLIANCE INFORMATION:

Eligible to bear the CE mark; Conforms to European Union Low Voltage Directive 2006/95/EC; European Union EMC Directive 2004/108/EC; European Union Restriction of Hazardous Substances Recast (RoHS2) Directive 2011/65/EU; European Union WEEE (recast) Directive 2012/19/EU; European Union Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Directive 2006/121/EC.

You may obtain a free copy of the Declaration of Conformity by visiting <http://www.amx.com/techcenter/certifications.asp>.

WEEE NOTICE:

	<p>This appliance is labeled in accordance with European Directive 2012/19/EU concerning waste of electrical and electronic equipment (WEEE). This label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.</p>
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Novara Ethernet Keypads

Overview

Novara Ethernet KeyPads feature an 8-button layout, integrated Ethernet interface and fit standard 1-gang US back box sizes. The 8-button Novara Ethernet Keypad (FIG. 1) interfaces over Ethernet and receive power via any Power-over-Ethernet (PoE) injector or switch which conforms to the 802.3af standard.

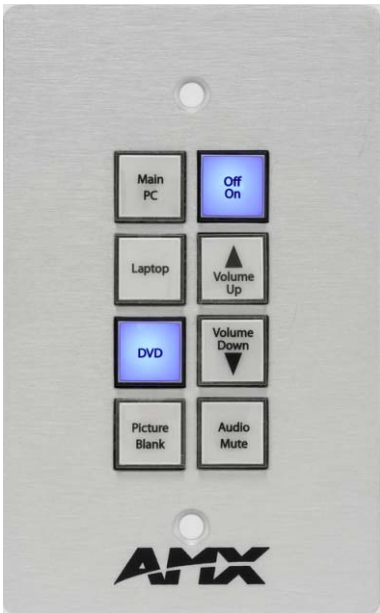


FIG. 1 Novara 8-Button Ethernet Keypad

Novara Ethernet Keypads include:

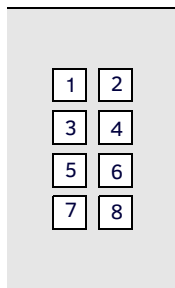
Novara Ethernet Keypads		
Name	Description	Colors/FG#s
SP-08-E-US 8-Button Keypad	Fits standard single-gang US conduit boxes. See Mounting Specifications for details.	<ul style="list-style-type: none">• Brushed Aluminum: FG1312-08-SA• Black: FG1312-08-SB• White: FG1312-08-SW

Product Specifications

Novara Ethernet Keypads	
System Requirements:	Novara Ethernet Keypads are only compatible with AMX NetLinx Central Controllers.
Power:	<ul style="list-style-type: none"> PoE: PoE (Power over Ethernet), 802.3af, class 0 Power Connector: (1) RJ-45 Ethernet Connector, 10/100
Button Layout:	8 buttons; blue, backlit buttons with controllable feedback
Rear Panel Connector:	Ethernet: RJ-45 Ethernet Connector, 10/100
Dimensions:	SP-08-E-US: 4 11/16" x 2 15/16" x 1 1/16" (11.9 cm x 7.4 cm x 2.62 cm)
Weight:	SP-08-E-US: 4.8 oz (136 grams)
Included Accessories:	<ul style="list-style-type: none"> Button Kit - includes acetate sheet with 50 pre-cut button label inserts and clear plastic Key Caps
Other AMX Equipment:	<ul style="list-style-type: none"> PS-POE-AF-TC, PoE Injector, 802.3af Compliant (FG423-83)
Certifications:	<ul style="list-style-type: none"> IEC 60950 FCC/CE RoHS compliant

Button Layout

FIG. 2 indicates the button layout for 8-button Keypads:



8-button US style

FIG. 2 Keypads Button Layout

8-button Keypads can be configured for button numbers 1-8, 9-16, 17-24, or 25-32.

Mounting Specifications - 8-Button Keypads

NOTE: Novara Ethernet Keypads are designed to fit in NEC-Compliant wall boxes only. These devices will not fit properly in non-NEC-Compliant wall boxes.

SP-08-E-US

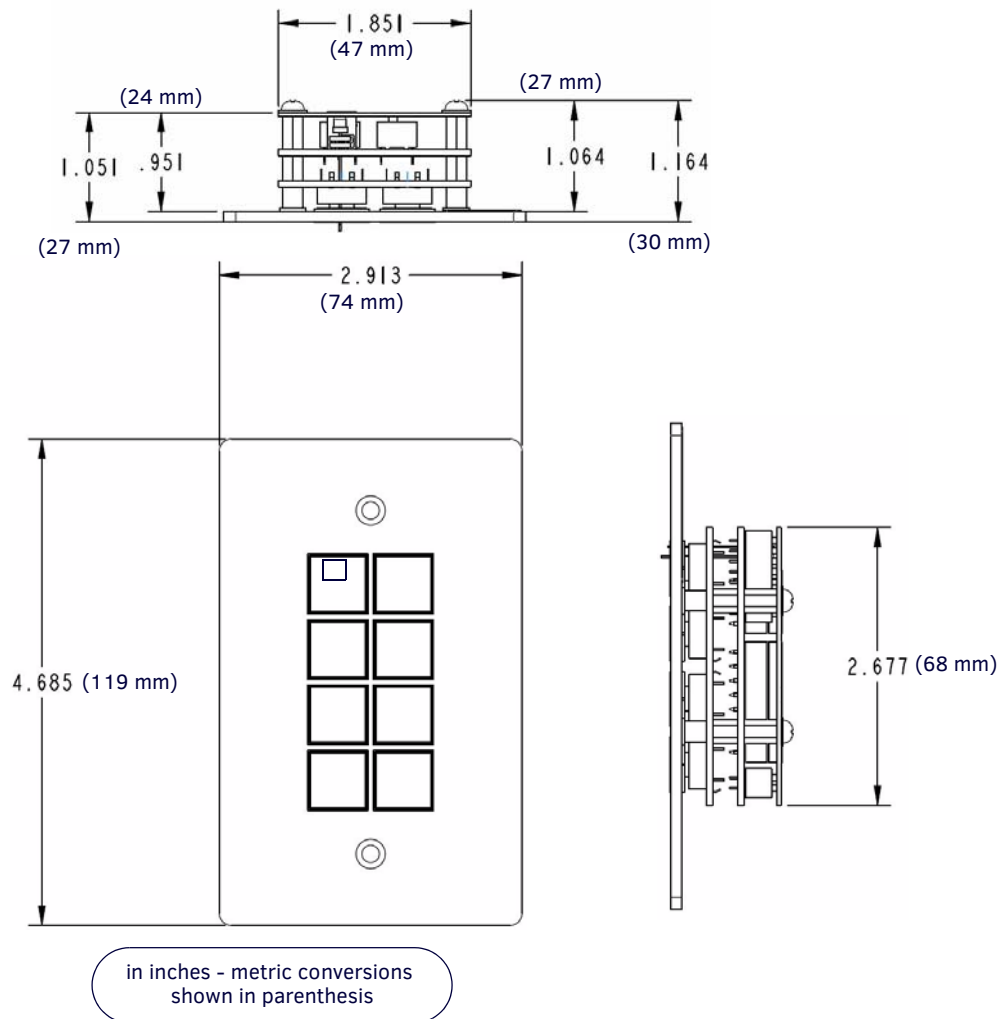


FIG. 3 Mounting Specifications - SSP-08-E-US

Minimum Internal Clearance for 1-Gang US Conduit Boxes

To ensure a proper fit with sufficient clearance, US-style Novara Keypads require the following minimum internal dimensions within the conduit box:

US 1-Gang (HWD): 2.9" x 2.1" x 1.6" (74 mm x 53 mm x 41 mm)

These minimum interior dimensions will maintain a minimum .050" (1.27 mm) clearance.

Wiring and Device Connections

Overview

This section describes the device connectors and ports available on Novara Ethernet Keypads. Here you can find wiring and electrical capacities for each type of connector.

LAN (RJ-45)

The LAN RJ-45 port provides 10/100 Mbps communication via Cat5/5e/6 network cable. The LAN port automatically negotiates the connection speed (10 Mbps or 100 Mbps), and whether to use half duplex or full duplex mode. The LAN port is best used for connecting to a network switch. This is an Auto MDI/MDI-X enabled port, which allows you to use either straight-through or crossover Ethernet cables. The port LEDs show communication activity, connection status, speeds, and mode information.

The LAN port also receives its power via the LAN port and Power-over-Ethernet (PoE) when you connect this port to a PoE switch which conforms to the 802.3af standard. See the *Applying Power* section on page 9 for information on PoE setup.

NOTE: For mounting space considerations, do not use category cabling with overmold with the SP-08-E-US.

FIG. 4 displays the LAN port.

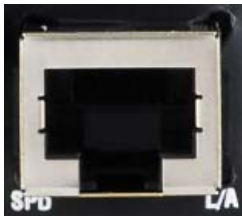


FIG. 4 LAN port

FIG. 5 provides the pinouts and signals for the LAN connector and cable.

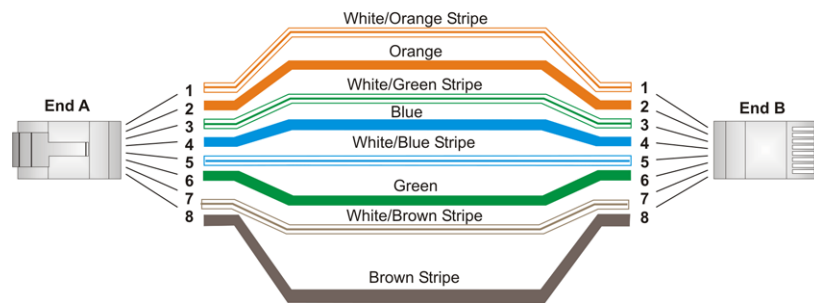


FIG. 5 RJ-45 wiring diagram

NOTE: If Ethernet connectivity is lost on any ControlPad, and then re-established, connectivity may take some time to resume. You will be unable to program the ControlPad until it is fully online.

Applying Power

Applying power to Novara Ethernet Keypads requires category cable and a PoE injector, such as the PS-POE-AF-TC (FG423-83) available from AMX, or a PoE-capable Ethernet switch which conforms to the 802.3af standard. The network must be connected through the PoE injector to send power to the Keypad.

1. Connect the PoE injector to an AC outlet (~100-240V) using a standard power cord.
2. Connect the switch category cable to the Data In port on the PoE injector (FIG. 6).

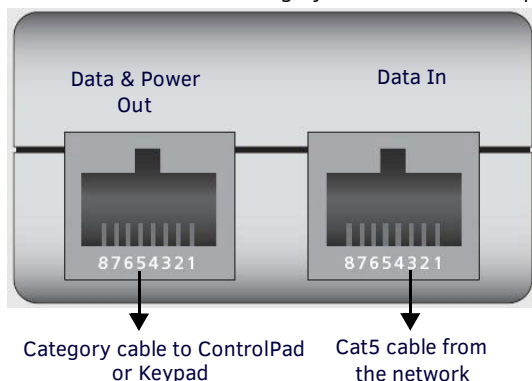


FIG. 6 Connecting to a PoE Injector

3. Using a separate category cable, connect the Data & Power Out port on the PoE injector to LAN Port on the Keypad.

Installation

Overview

This chapter describes installing Novara Ethernet Keypads. The SP-08-E-US mounts onto standard 1 gang US, UK, or EU back box.

NOTE: Before touching the device, discharge the static electricity from your body by touching a grounded metal object.

NOTE: It is best to install button labels before mounting the device. Doing so keeps you from disassembling the ControlPad after mounting it. For instructions on installing button labels, see the Button Labeling section on page 13.

Mounting the Keypad

AMX recommends mounting the keypad in standard a conduit box per NEC specs section 370.

NOTE: Before installing and mounting the device, you should test it to see that it can receive power. See the Applying Power section on page 9 for more information.

Minimum Internal Clearance for US Conduit Boxes

To ensure a proper fit with sufficient clearance, US-style Novara Keypads require the following minimum internal dimensions within the conduit box:

US 1-Gang (HWD): 2.9" x 2.1" x 2.5" (74 mm x 53 mm x 64 mm)

These minimum interior dimensions will maintain a minimum .050" (1.27 mm) clearance.

Wallbox Mounting

Perform these steps to mount the device into a back box:

1. Use the cutout dimension for the wallbox to cutout the install surface. Install the back box into the surface of the desired location for the device. Be sure to thread any appropriate wiring through the back box.

NOTE: Use care when feeding excess cabling through the wallbox before mounting. Do not let the cable kink or tightly bunch inside the wallbox.

CAUTION: If you have connected category cable to the keypad to test whether it receives power, be sure to unplug the category cable from the PoE injector or the network switch so the keypad is not receiving power during mounting.

2. Connect category cable to the LAN port on the rear of the keypad.
3. Place the keypad on the back box. Align the screw holes with the mounting holes and fasten the keypad to the back box using the supplied screws.

Configuring Novara Ethernet Keypads

Overview

This chapter provides instructions on accessing and configuring the Novara Ethernet Keypads. To configure the keypad, you must have it powered by PoE.

Locating the IP Address of the Keypad

Novara Ethernet Keypads are configured for DHCP addressing by default. The keypads use link local addressing as a backup in case the DHCP server is inaccessible. See the *Toggling Between IP Addressing Modes: DHCP and Static IP* section on page 12 for information on setting a static IP address. Verify there is an active LAN connection on the controller's LAN port before beginning this procedure.

1. Using category cable, connect the LAN port on the keypad to your external network.
2. In NetLinX Studio, select the OnLine Tree tab. You should see the Novara Ethernet Keypad listed among the Unbound Devices.
3. Right-click the Novara Ethernet Keypad and select **Network Bind/Unbind Device** from the menu that appears. The Bind/Unbind Device dialog opens.
4. By default, the selected keypad appears in the Device to Bind/Unbind menu at the top of the dialog. If there is more than one Unbound device in the system, click the down arrow to select which device you want to bind.
5. Select the check box next to the Master to which you want to bind the keypad. If there is more than one Master in the system, check the specific Master to which you want to bind the keypad.
6. Click **OK** to save changes and close this dialog.
7. Select **Refresh System** (in the Online Tree context menu). The device should now appear in the Bound Devices folder.

Simulating the ID Pushbutton

You can press buttons 1 and 2 simultaneously on the keypads to simulate the functions of a NetLinX device's ID pushbutton (see FIG. 7). You can also simultaneously press buttons 4, 5, and 6 to power cycle the device. Press all three buttons simultaneously and hold them for approximately 20 seconds to power cycle the device.

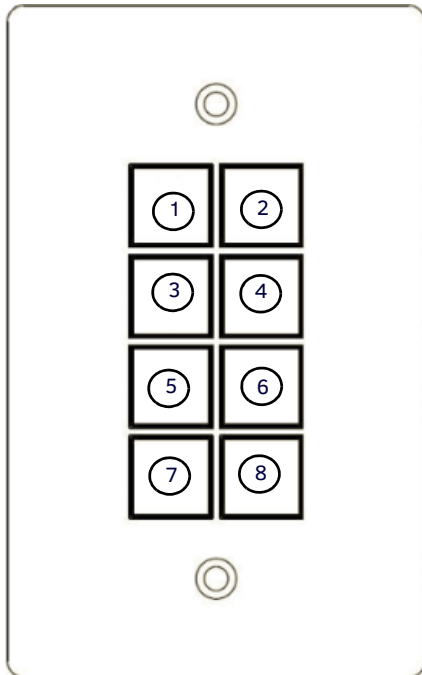


FIG. 7 SP-08-E-US Button Layout

Toggling Between IP Addressing Modes: DHCP and Static IP

Novara Ethernet Keypads support both DHCP and static IP addresses. You can use a static IP address which you can set via a Telnet command (SET IP), or you can use the factory default static IP address (192.168.1.2).

With the keypad powered and booted up (or in ID Mode), you can toggle between the DHCP and Static IP modes by pressing and holding buttons 1 and 2. The LEDs on buttons 1 and 2 blink while you keep them pressed. Hold them until the LEDs begin blinking at double the rate (approximately 10 seconds), then release the buttons.

When you release the buttons, the keypad toggles either from static to dynamic (DHCP) IP addressing or vice versa and remains in that mode until you use the buttons to toggle the IP mode again or you perform a factory reset. The keypad automatically reboots to complete the process.

NOTE: *You must wait until the keypad is finished booting before toggling the IP address. Pressing the buttons while booting will cause the keypad to restore its factory default settings.*

Assigning a Device ID to a Keypad

When used in conjunction with the ID Mode feature in NetLinx Studio, you can momentarily press buttons 1 and 2 on the keypad to assign a device address to the keypad. See the NetLinx Studio Instruction Manual or consult the online help tool in NetLinx Studio for more information.

Resetting the Keypad

To perform a factory reset of the Keypad, press and hold buttons 1 and 2 for 10 seconds **during the boot process**. The LEDs on buttons 1 and 2 blink while you keep them pressed. Hold them until the LEDs begin blinking at double the rate (approximately 10 seconds.) Release the buttons and the keypad will reset. During factory reset, the backlight turns off for all buttons, but all buttons should be back online after 1-2 minutes. If you do not hold in the reset button until the LEDs begin blinking faster, the reset does not occur. (There is no soft reboot with the Reset button, but you can perform a soft reboot from the web pages.)

NOTE: *When you reset a keypad, the keypad is restored to the factory default, so you will lose all configuration data as the defaults are restored.*

Restoring the Factory Image on the Keypad

To restore the factory image on the keypad, press and hold buttons 1 and 2 for approximately 20 seconds **during the boot process**. The LEDs on buttons 1 and 2 blink while you keep them pressed. Hold them until the LEDs begin blinking at double the rate (approximately 20 seconds.) While pressing the buttons, disconnect and reconnect the cable from the LAN port on the rear panel of the device to restore the factory image firmware on the keypad.

Button Labeling

Overview

Novara Ethernet Keypads come with a set of clear plastic Key Caps, which are designed to fit tightly over the pushbuttons, and allow you to place a label on each button according to the requirements of your particular installation.

Novara Ethernet Keypads also come with a pre-printed acetate sheet with a range of 50 (pre-cut) button label inserts. The button labels provided will accommodate most installations, but it is also possible to print your own button labels on acetate for custom button labeling.

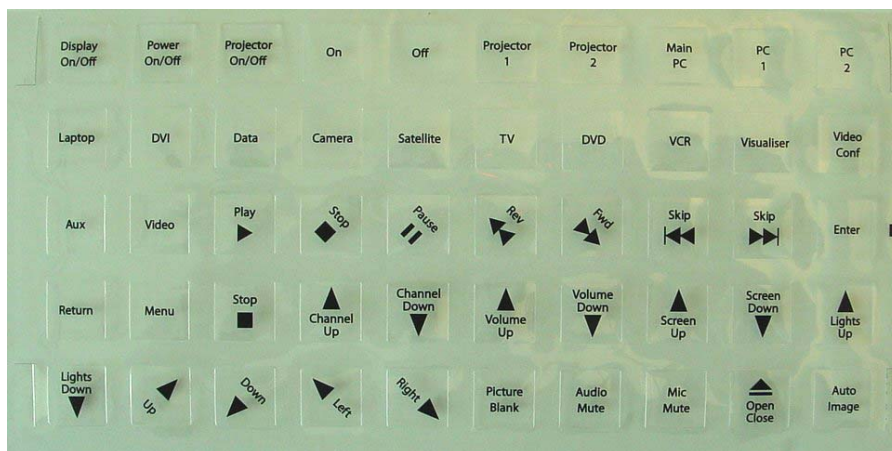


FIG. 8 Acetate Button Labels and plastic Key Caps

Removing/Replacing Button Labels

The button labels on Novara Ethernet Keypads are acetate inserts that fit inside the key caps installed on the pushbuttons. To change the inserts, you must remove the key caps. Removing the key caps on Novara Ethernet Keypads requires disassembling the keypad, so that you can access the key caps through the rear of the faceplate.

Disassembling the Novara Ethernet Keypad

IMPORTANT: Remove power from the keypad, and discharge any static electricity from your body by touching a grounded metal object before performing the following steps.

This procedure requires a Phillips-head screwdriver.

1. Use a Phillips-head screwdriver to remove the three screws that secure the circuit board to the faceplate (see FIG. 9).

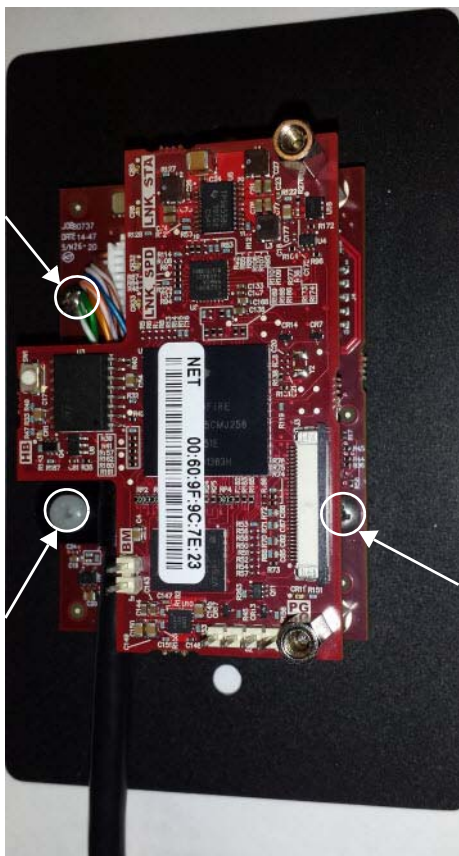


FIG. 9 Remove the three screws using a Phillips-head screwdriver

2. Carefully pull the top circuit board straight up and off the standoffs. Note the orientation of the circuit board. You must replace it with the circuit board oriented in the same direction.

Installing Acetate Button Labels and Key Caps - READ THIS FIRST!

1. Punch out the desired Button Label from the included acetate sheet.
If you have printed your own custom button labels on acetate, cut each button label to fit inside the Key Caps.
 - Custom button labels must be cut to a **0.472" (12 mm) square** to fit securely inside the Key Caps.
 - The thickness of the acetate used must not exceed **.004" (0.10 mm)**.
2. Place the Key Cap face-down, and insert the Button Label into the bottom of the Key Cap (FIG. 10).

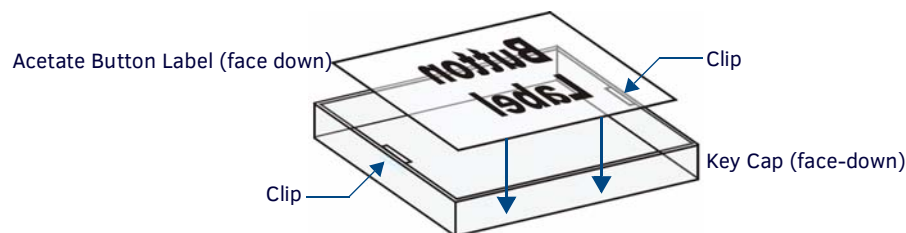


FIG. 10 Placing a Button Label inside a Key Cap

- Orient the Button Label inside the Key Cap so that the two clips are located on the left and right sides of the readable text on the Button Label, as indicated in FIG. 10.
- Be sure to place the Button Label face-down inside the Key Cap (see FIG. 10), otherwise the label will be seen in reverse once the Key Cap is installed.

3. Install the Key Cap on the pushbutton (FIG. 11):

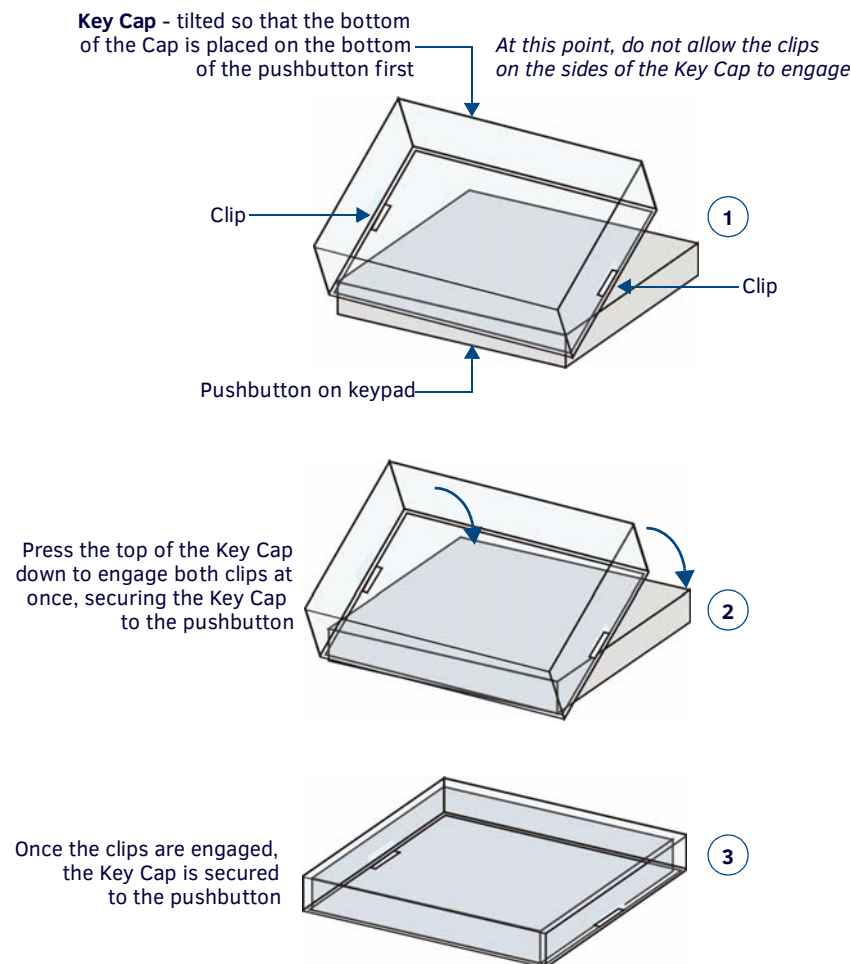


FIG. 11 Placing a Button Label inside a Key Cap

Note: Verify that the vertical orientation of the Button Label is correct relative to the keypad.

- a. Gently press the bottom of the Key Cap (no clip) onto the pushbutton.
Do not allow the clips on either side to engage.
- b. With the bottom of the Key Cap secured, gently press the top of the Key Cap. This action will engage both clips simultaneously, and the Key Cap will snap into place on the push button.

NOTE: Be careful to follow these procedures closely - the bottom of the Key Cap must be installed on the pushbutton before the Key Cap clips engage, or there is a risk of the button being misaligned. Also note that removing the Key Caps requires additional steps - see the Removing/Replacing Button Labels section on page 13 for details.

Replacing Key Caps/Button Labels

Once the circuit board has been removed, you have full access to the pushbuttons with Key Caps installed.

1. Carefully pry the Key Cap off of each pushbutton that you need to re-label.
2. Remove the existing acetate Button Label and insert the replacement label in each Key Cap. Be sure to place the Button Label face-down inside the Key Cap, otherwise the label will be seen in reverse once the Key Cap is installed.
3. Gently replace the Key Cap on the pushbutton:

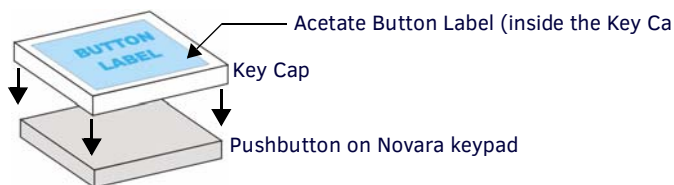


FIG. 12 Placing a Button Label inside a Key Cap

- Verify that the vertical orientation of the Button Label is correct relative to the Novara keypad.
- Align the Key Cap with the target pushbutton, and gently push the Key Cap down over the pushbutton.
- Once seated properly on the pushbutton, the Key Cap will snap into place.

Re-Assembling the Keypad

Follow the steps in reverse to re-assemble the keypad. Take care of the following:

- Be certain that the circuit boards are oriented correctly
- Use the three screws to secure the circuit board onto the faceplate.

Upgrading Firmware

Before You Start

1. Verify you have the latest version of the NetLinX Studio application installed on your PC.
NetLinX Studio is available to download from www.amx.com. Login to download the latest version. Alternatively, if it is already installed, use the **Web Update** option in NetLinX Studio's Help menu to obtain the latest version.
The default location for the NetLinX Studio application is **Start > Programs > AMX Control Disc > NetLinX Studio > NetLinX Studio**.
2. Verify that a LAN cable is connected from the controller to the LAN Hub.
3. Verify that the controller is powered on.
4. Connect to the controller via IP address.
5. Establish what version of firmware is currently loaded on the controller (see *Verifying the Current Firmware Version* below).

Verifying the Current Firmware Version

Use the OnLine Tree in NetLinX Studio to verify which version of each firmware file is currently installed.

*Note: These steps assume that you have already established a connection with the target Keypad (see the *Locating the IP Address of the Keypad* section on page 11 for details).*

1. In NetLinX Studio, click on the **OnLine Tree** tab (in the Workspace Bar) to view the devices on the System.
2. Click **Display** and select **Refresh System** from the context menu. This establishes a new connection to the System and populates the device tree with devices on that system.
3. After the *Communication Verification* dialog indicates active communication between the PC and the Central Controller, verify the Central Controller and associated devices are listed in the OnLine Tree.
4. Check the appropriate product page on www.amx.com for the latest firmware files for the keypad.

If necessary, follow the procedures outlined in the following sections to obtain these firmware (*.kit) files from www.amx.com and then transfer the new firmware files to the device.

Downloading the Latest Firmware Files from www.amx.com

Visit the Keypads product page on www.amx.com for the latest firmware (*.kit) file for your Novara Ethernet Keypad. Firmware file links are available along the right-side of the catalog page.

Firmware files are bundled in a ZIP file, along with a Readme.TXT file that provides details on this firmware release.

1. Accept the *AMX Licensing Agreement*.
2. Download the ZIP file and unzip the contents to a known location.

NOTE: Always read the *Readme.TXT* file included with the firmware file for any special instructions.

Sending Firmware to Novara Ethernet Keypads

The basic process of upgrading firmware on Novara Ethernet Keypads with Ethernet involves downloading the latest firmware files from www.amx.com and using NetLinX Studio to transfer the files to a target keypad.

NOTE: *These steps assume that you have already established a connection with the target keypad in NetLinX Studio.*

1. In NetLinX Studio, click on the **OnLine Tree** tab (in the Workspace Bar) to view the devices on the System.
2. In the OnLine Tree tab, click **Display** and select **Refresh System** from the context menu. Doing so establishes a new connection to the System and populates the device tree with devices on that system.
3. After the *Communication Verification* dialog indicates active communication between the PC and the Central Controller, verify the Master and associated devices (including the *Device Controller*) are listed in the OnLine Tree.
4. In NetLinX Studio, select **Tools > Firmware Transfers > Send to NetLinX Device** (FIG. 13):

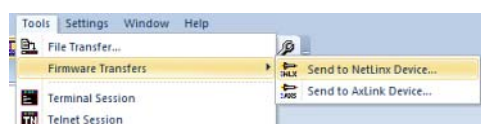


FIG. 13 NetLinX Studio - Tools > Firmware Transfers > Send to NetLinX Device

The *Send to NetLinX Device* dialog opens.

5. Click the *Browse* button (...) to locate and select the firmware (*.kit) file that will be transferred, in the *Browse for Folders* dialog (FIG. 14):

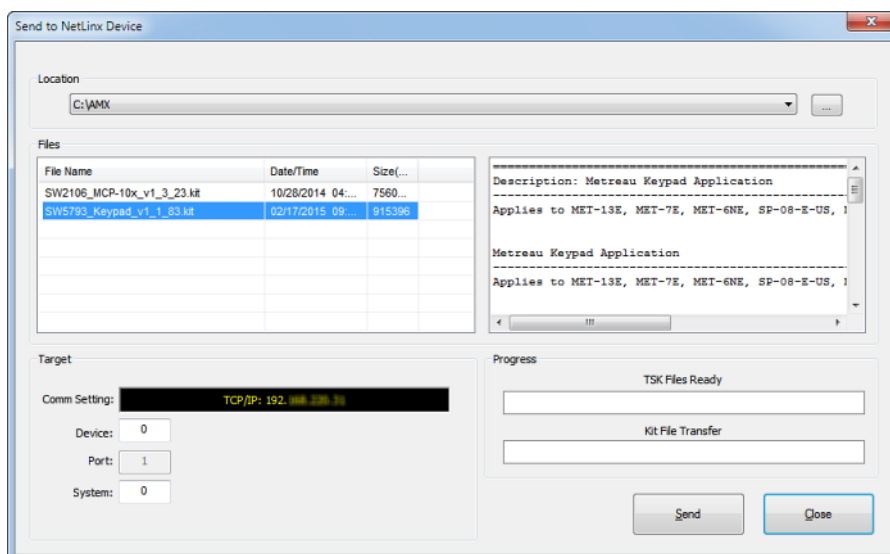


FIG. 14 Send to NetLinX Device dialog

The selected file is indicated in the *Files* window.

6. Verify the target's *System* number matches the value listed within the active System folder in the OnLine Tree.
 - The *Device* number is always **0** for the Master.
 - Note that the *Port* field is disabled.
7. Click **Send** to begin the transfer. The file transfer progress is indicated in the *Progress* section of the dialog. The keypad reboots when the file transfer is complete.
8. Click **Close** once the keypad is finished rebooting.
9. In the OnLine Tree, right-click on the Master and select **Refresh System**. This establishes a new connection and refreshes the device list and their firmware versions in your system.

Resetting the Factory Default System and Device Values

1. In NetLinX Studio, access the *Device Addressing* dialog:
 - Right-click on any system device listed in the Workspace and select **Device Addressing**.
 - Select **Diagnostics > Device Addressing** from the Main menu.
2. Click the **Set Device/System to Factory Default** button (FIG. 15):

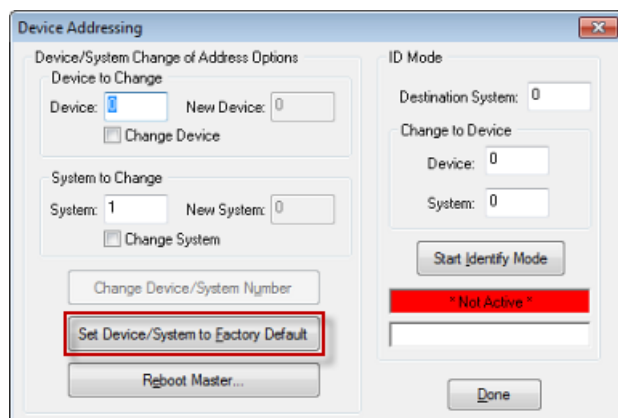


FIG. 15 Device Addressing dialog

This resets both the system value and device addresses (for definable devices) to their factory default settings. The system information (in the **OnLine Tree** tab of the Workspace window) refreshes and then displays the new information.

3. Click **Done** to close the *Device Addressing* dialog.
4. Click **Reboot** (from the *Tools > Reboot the Master Controller* dialog) and wait for the System Master to reboot.

NOTE: The *STATUS* and *OUTPUT* LEDs should begin to alternately blink during the incorporation. Wait until the *STATUS* LED is the only LED to blink.

5. Press **Done** once until the *Master Reboot Status* field reads **Reboot of System Complete**.
6. Click the **OnLine Tree** tab in the Workspace window to view the devices on the System.
7. Right-click the associated System number (or anywhere within the tab itself) and select **Refresh System**. This establishes a new connection to the specified System and populates the list with devices on that system.
8. Use **Ctrl+S** to save these changes to your NetLinX Project.

Programming Ethernet Keypads

Programming the Novara Ethernet Keypads

This chapter provides information on programming Novara Ethernet Keypads, including NetLinux and Telnet commands.

Button Layouts

The following illustrations indicate the button numbers for the Novara Ethernet Keypads (SP-08-E-US):

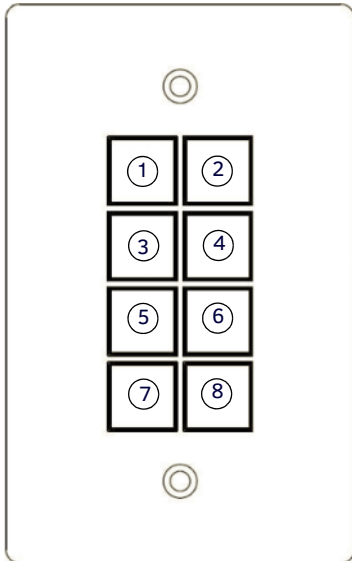


FIG. 16 Button Layout - Novara Ethernet Keypads

Channels

Channels on Novara Ethernet Keypads correspond to the button numbers on each keypad as indicated in FIG. 16.

Port Numbers and Levels

Novara Ethernet Keypads reside on port 1.

Supported SEND_COMMANDS

Novara Keypads support a number of NetLinX SEND_COMMANDS, described in the following section. To use these commands, establish a Telnet session from the PC to the NetLinX master (see the *Establishing a Terminal Connection via Telnet* section on page 22 for more information.)

NOTE: All text is based on a Unicode index.

SEND_COMMANDS	
Command	Description
@BRT	<p>Set Brightness level for all LEDs (pushbuttons and levels indicator bar) for both On and Off states.</p> <p>Syntax:</p> <pre>@BRT-<on brightness (0-32)>,<off brightness (0-32)></pre> <p>Variables:</p> <ul style="list-style-type: none"> on brightness = LED On brightness; ranges from 0 (off) to 32 (max). off brightness = LED Off level brightness; ranges from 0 (off) to 32 (max). <p>Example:</p> <pre>SEND_COMMAND keypad, '@BRT-32,0'</pre> <p>Sets the LEDs to max brightness in the On state (32), and minimum brightness (no illumination) in the Off state (0).</p>
?EXPANSION	<p>Allows NetLinX code to query the keypad to determine whether any expansion keypads are attached to it.</p> <p>Syntax:</p> <pre>?EXPANSION</pre> <p>Example:</p> <pre>SEND_COMMAND DEVICE_1, "'?EXPANSION' "</pre> <p>Response Syntax:</p> <pre>"Expansion-<index>,<count>,<port>,<type>,<description>"</pre> <p>Variables:</p> <ul style="list-style-type: none"> Index - response index, starting with 1 Count - total number of response strings (i.e. max # of expansion keypads allowed, currently 2) Port - Port associated with the expansion keypad Type - Expansion keypad type (either MET-7X or MET-13X) Description - Product description <p>Example Response Strings when a single expansion keypad is present:</p> <pre>"Expansion.Device-1,2,2,MET-7X,Metreau 7-Button Expansion Keypad" "Expansion.Device-2,2,3,NONE,NONE"</pre>
LED-DIS	<p>Disable LEDs on the keypad.</p> <p>Syntax:</p> <pre>LED-DIS</pre> <p>Example:</p> <pre>SEND_COMMAND DEVICE_1, "'LED-DIS' "</pre> <p>Disables LEDs on DEVICE_1.</p> <p>NOTE: This parameter does not get stored in non-volatile memory. LEDs are enabled by default at each power-up.</p>
LED-EN	<p>Enable LEDs on the keypad. LEDs are enabled by default.</p> <p>Syntax:</p> <pre>LED-EN</pre> <p>Example:</p> <pre>SEND_COMMAND DEVICE_1, "'LED-EN' "</pre> <p>Enables LEDs on DEVICE_1.</p>
REBOOT	<p>Reboot the keypad.</p> <p>Syntax:</p> <pre>REBOOT</pre> <p>Example:</p> <pre>SEND_COMMAND DEVICE_1, "'REBOOT' "</pre> <p>Reboots DEVICE_1.</p>

SEND_COMMANDS (Cont.)	
Command	Description
SET_NDX_DESC	<p>Set Friendly name and location for NDP.</p> <p>Syntax:</p> <pre>SET_NDX_DESC-friendly name:location</pre> <p>Max of 25 characters for <i>friendly name</i> and max of 25 characters for <i>location</i>. If more than 25 characters are sent for either friendly name or location, they will be truncated to a max of 25 characters.</p> <p>Neither the friendly name nor the location should contain a ":" character, as that character is used as a delimiter.</p> <p>NOTE: <i>This command requires a reboot to enable new settings.</i></p>

Terminal (Telnet) Commands

Telnet terminal communication can be accessed remotely via TCP/IP.

Establishing a Terminal Connection via Telnet

1. In your Windows task bar, go to **Start > Run** to open the Run dialog.
2. Type **cmd** in the *Open* field and click **OK** to open an instance of the Windows command interpreter - "Cmd.exe" (FIG. 17):

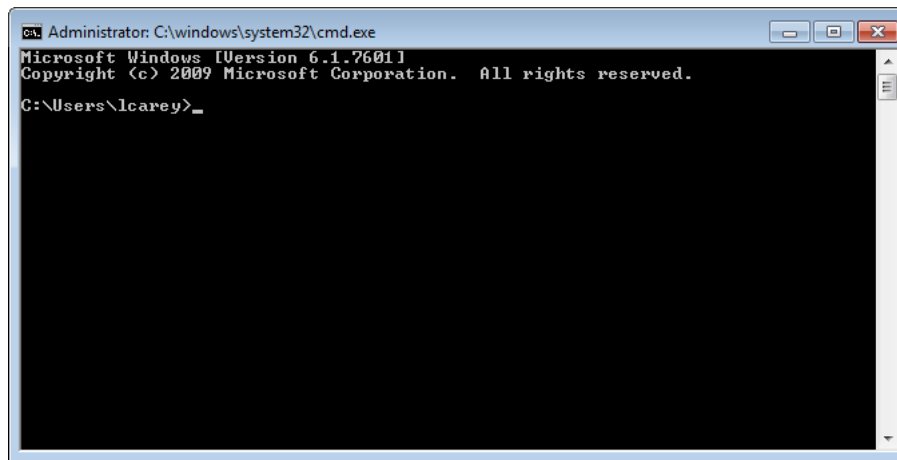


FIG. 17 Windows command interpreter (Cmd.exe)

3. Type **"telnet"** followed by a space and the keypad's IP address:

```
>telnet XXX.XXX.XXX.XXX
```
4. Press <Enter>.
 - Without a Telnet password set, a session will begin with a welcome banner similar to the following:

```
Welcome to SP-08-E-US v1.0.44 Copyright AMX LLC
>
```
 - If a Telnet password is set, then user credentials are required:

```
Enter username:
Enter protected password:
Welcome to SP-08-E-US v1.0.44 Copyright AMX LLC
>
```

Telnet User Name and Password

There are two Telnet commands that set the Telnet user name and password:

- Set Telnet Username (see page 27)
- Set Telnet Password (see page 27)

By default, both the user name and password are blank (empty string). Performing a factory reset on the device will return these values to that default. See the *Simulating the ID Pushbutton* section on page 11 for details.

- Setting the *User Name* will have no effect if the password remains blank (empty string). That is, defining the user name alone will not result in Telnet prompting for user login.
- Setting the *Password* will cause Telnet to prompt for user login, whether the user name has been defined or not. If the user name has been defined, this value must be entered.

However, since the password can be set independently of the user name, it's possible to have a password defined, but the user name still at its default (blank, empty string).

In this case, do not enter anything for the user name when prompted. Simply press <Enter>, which will then present the password prompt. Here, the defined password must be entered, in order to successfully open the Telnet session.

Additional Notes

- Both the Telnet user name and password are case-sensitive.
- Three consecutive, unsuccessful attempts to log in to Telnet will cause the Telnet window to close. Re-launching Telnet will again present the login prompt, with a fresh "batch" of login attempts.
- If Telnet login fails because of an incorrect user name, you will receive the "Invalid Password" message (as opposed to an "Invalid Username" message).

Setting a Telnet User Name and Password

To set a Telnet user name and password:

1. Establish a terminal connection via Telnet.
2. Type **Set Telnet Username**, and press <Enter>. The program will prompt you to enter a new Telnet user name.
3. Enter a user name and press <Enter>. The program will indicate that the user name is being stored.
4. Type **Set Telnet Password**, and press <Enter>.

NOTE: Press <Enter> twice when asked to enter the password to clear both the telnet user name and password.

5. The program will prompt you to enter a password. Enter a password and press <Enter>.
6. The program will prompt you to re-enter the Telnet password. Re-enter the password and press <Enter>. The program will indicate that the password is being stored.

Telnet Commands

The commands listed in the following table can be sent directly to the Keypad via a Telnet terminal session.

In your terminal program, type "**Help**" or a question mark (" ? ") and <Enter> to access the Help Menu, and display the Program port commands described below:

Terminal Commands	
Command	Description
? or Help	Display this list of commands.
DEVICE STATUS	Display device status of a specified device, port, system (<D:P:S>). Example: <pre>>device status 14021:1:1 Device Status ----- Device 14021 AMX LLC,SP-08-E-US,v1.0.25 contains 1 Ports. Port 1 - Channels:8 Levels:1 MaxStringLen=64 Types=8 bit MaxCommandLen=64 Types=8 bit The following input channels are on:1,2,3,4 The following output channels are on:None Level 1=0 Supported data types=UByte,UInt ></pre>
EXIT	Exit the telnet session
FACTORYFWIMAGE	Reset unit to factory firmware image and reboots the Module.

Terminal Commands (Cont.)	
Command	Description
GET CONFIG	<p>Display the current connection settings.</p> <p>Example:</p> <pre>>get config Device number: 10001 Connection Settings ----- ICSNet/Ethernet: Ethernet Mode: URL System Number: 1 Master IP/URL: 192.168.1.211 Master Port: 1319 Username: Password: IP Settings ----- HostName: localhost Type: DHCP IP Address: 192.168.1.53 Subnet Mask: 255.255.255.0 Gateway IP: 192.168.1.1 MAC Address: 00:60:9f:94:2d:4f DNS Servers ----- Domain suffix: amx.internal Entry 1: 192.168.20.7 Entry 2: 192.168.20.9</pre> <p>NOTE: The system number and IP addressing information displayed is reflective of actual operating values, not stored parameters.</p>
GET CONNECTION	<p>Show the Module connection information.</p> <p>Example:</p> <pre>>get connection Connection Settings ----- ICSNet/Ethernet: Ethernet Mode: URL/TCP System Number: 1 Master IP/URL: 192.168.1.211 Master Port: 1319 Username: Password:</pre>
GET DEVICE	Display the device number.
GET DNS	<p>Get list of DNS entries.</p> <p>Example:</p> <pre>>get dns DNS Servers ----- Domain suffix: amx.internal Entry 1: 192.168.20.7 Entry 2: 192.168.20.9</pre> <p>NOTE: When the module is in DHCP mode, these are active values, NOT the stored values that only apply to static mode.</p>
GET ETHERNET MODE	<p>Display the current LAN configuration setting.</p> <p>Settings are either "auto" in which the LAN driver will discover it's settings based on the network it is connected to OR <speed> and <duplex> where speed is either 10 or 100 and duplex is either full or half.</p> <p>Example:</p> <pre>>GET ETHERNET MODE Ethernet mode is auto.</pre> <p>NOTE: See the <i>SET ETHERNET MODE</i> command on page 26.</p>
GET FRIENDLY <name>	Displays the Module's friendly name (for NDP).

Terminal Commands (Cont.)	
Command	Description
GET IP	<p>Displays the IP configuration of a device.</p> <p>The device displays its D:P:S, host name, type (<i>DHCP</i> or <i>Static</i>), IP address, subnet mask, gateway IP, and MAC address.</p> <p>Example:</p> <pre>>GET IP HostName MLK-INSTRUCTOR Type DHCP IP Address 192.168.21.101 Subnet Mask 255.255.255.0 Gateway IP 192.168.21.2 MAC Address 00:60:9f:90:0d:39</pre>
GET LOCATION	Displays the location parameter for NDP (set by the <i>SET LOCATION</i> command on page 27).
GET SN	Returns the device's serial number
INFO	Provides at-a-glance information about the keypad including any expansion keypads that are attached to it.
MSG [ON OFF]	<p>Enables/Disables extended diagnostic messages.</p> <ul style="list-style-type: none"> MSG On [error warning info debug] sets the terminal program to display log messages generated by the Master. <p>The level of log printed to the terminal window depends both on the level used when sending the message and the output level selected with "msg on."</p> <p>For example if log output is enabled via "msg on warning" then logs produced at levels AMX_ERROR and AMX_WARNING will be displayed, but not logs produced at levels AMX_INFO or AMX_DEBUG.</p> <p>The order of severity from highest to lowest is ERROR, WARNING, INFO, DEBUG.</p> <p>If no severity is supplied with "msg on", the default setting is WARNING.</p> <ul style="list-style-type: none"> MSG OFF disables the display. <p>Example:</p> <pre>> MSG ON Extended diagnostic information messages turned on. > MSG OFF Extended diagnostic information messages turned off.</pre>
NDP UNBIND	Clears the NDP binding to a master (takes effect after next boot).
PING [ADDRESS]	<p>Pings an address (IP or URL), to test network connectivity to and confirms the presence of another networked device.</p> <p>The syntax matches the PING application in Windows or Linux.</p> <p>Example:</p> <pre>>ping 192.168.29.209 192.168.29.209 is alive.</pre>
REBOOT	<p>Reboots the keypad.</p> <p>Example:</p> <pre>>REBOOT Rebooting...</pre>
RENEW DHCP	<p>Renews/Releases the current DHCP lease for the keypad.</p> <p>Example:</p> <pre>>RENEW DHCP</pre>
RESET FACTORY	<p>Resets the device's stored parameters to factory default state including removal of all security settings, resetting to DHCP.</p> <p>This command will cause an automatic reboot.</p> <p>NOTE: <i>This command does not reset the device to the factory software image.</i></p>
SET CONNECTION	<p>Set the master connection settings interactively, allowing the user to specify the mode.</p> <ul style="list-style-type: none"> If mode is TCP or UDP, the master URL and port number can be specified as well. If AUTO is selected, the System number can be specified. After all data is entered, if the parameters have changed, the Module will disconnect from the Master, and begin trying to connect with the new settings. <p>NOTE: <i>These changes do not require a reboot to take effect.</i></p>

Terminal Commands (Cont.)	
Command	Description
SET DEVICE	<p>Set the device number, and store in non-volatile memory.</p> <p>Syntax:</p> <pre>SET DEVICE <num></pre> <p>The valid range of device numbers is 0-31999.</p> <ul style="list-style-type: none"> • If the user enters a number outside that range, then no change will be made and the Module will issue an error message. • A Device Number of '0' means that the Module will accept the auto-assigned device number from the Master. • If the new device number is different from the old device number, the Module will disconnect from the Master, and begin trying to connect with the new settings. <p>NOTE: <i>These changes do not require a reboot to take effect.</i></p>
SET DNS	<p>Set the DNS configuration of the EXB Module, only as applied to Static IP addressing mode (DNS settings in DHCP mode are received from the DHCP server).</p> <p>Syntax:</p> <pre>SET DNS <D:P:S></pre> <p>This command prompts you to enter a Domain Name, DNS IP #1, DNS IP #2, and DNS IP #3.</p> <ul style="list-style-type: none"> • Enter Y (yes) to approve/store the information in the Master. • Enter N (no) cancels the operation. <p>NOTE: <i>The device must be rebooted to enable new settings.</i></p> <p>Example:</p> <pre>>SET DNS [0:1:0] -- Enter New Values or just hit Enter to keep current settings -- Enter Domain Suffix: amx.com Enter DNS Entry 1 : 192.168.20.5 Enter DNS Entry 2 : 12.18.110.8 Enter DNS Entry 3 : 12.18.110.7 You have entered: Domain Name: amx.com DNS Entry 1: 192.168.20.5 DNS Entry 2: 12.18.110.8 DNS Entry 3: 12.18.110.7 Is this correct? Type Y or N and Enter -> Y Settings written. Device must be rebooted to enable new settings</pre>
SET ETHERNET MODE	<p>This command sets the current LAN configuration settings per new mode.</p> <p>Syntax:</p> <pre>SET ETHERNET MODE <newmode></pre> <p>Values for <i>newmode</i> are:</p> <pre>auto - or - 10 100 full half</pre> <p>NOTE: <i>This command requires a reboot to enable new settings.</i></p> <p>Examples :</p> <pre>set ethernet mode auto set ethernet mode 100 full</pre> <p>NOTE: <i>See the GET ETHERNET MODE command on page 24.</i></p>
SET FRIENDLY	<p>Set the device's friendly name for NDP to <name>.</p> <p>Syntax:</p> <pre>SET FRIENDLY <name></pre> <ul style="list-style-type: none"> • Maximum length = 25 characters. If the name entered exceeds 25 characters, it will be truncated. • The value is stored in non-volatile memory. • If no value specified, an automatic name consisting of AMX, the product name, and serial number will be used. <p>NOTE: <i>This command requires a reboot to enable new settings.</i></p>

Terminal Commands (Cont.)	
Command	Description
SET IP	<p>Sets the IP configuration of a specified device. Enter a host name, type (<i>DHCP</i> or <i>Fixed</i>), IP address, subnet mask, and gateway IP address.</p> <p>NOTE: “<i>DHCP</i>” implies “<i>DHCP with link-local fallback</i>”.</p> <p>NOTE: For NetLinx Masters, the “Host Name” can only consist of alphanumeric characters.</p> <ul style="list-style-type: none"> • Enter Y (yes) to approve/store the information into the Master. • Enter N (no) to cancel the operation. <p>NOTE: This command requires a reboot to enable new settings.</p> <p>Example:</p> <pre>>SET IP --- Enter New Values or just hit Enter to keep current settings --- Enter Host Name: MLK_INSTRUCTOR Enter IP type. Type D for DHCP or S for Static IP and then Enter: DHCP Enter Gateway IP: 192.168.21.2 You have entered: Host Name MLK_INSTRUCTOR Type DHCP Gateway IP 192.168.21.2 Is this correct? Type Y or N and Enter -> y Settings written. Device must be rebooted to enable new settings.</pre> <p>NOTE: Novara keypads can also be set to Static IP or DHCP Mode by using the ID Pushbutton. See the <i>Toggleing Between IP Addressing Modes: DHCP and Static IP</i> section on page 12 for details.</p>
SET LOCATION	<p>Sets the location parameter for NDP.</p> <p>Syntax:</p> <pre>SET LOCATION <location></pre> <ul style="list-style-type: none"> • Maximum length = 25 characters. If the name entered exceeds 25 characters, it will be truncated. <p>NOTE: This command requires a reboot to enable new settings.</p>
SET TELNET PORT	<p>Sets the device's IP port listened to for Telnet connections.</p> <p>Example:</p> <pre>>SET TELNET PORT Current telnet port number = 23 Enter new telnet port number (Usually 23)(0=disable Telnet): Once you enter a value and press <Enter>, you get the following message: Setting telnet port number to 23 New telnet port number set, reboot the device for the change to take effect.</pre> <p>NOTE: This command requires a reboot to enable new settings.</p> <p>See the <i>Enabling/Disabling Telnet on the Keypad</i> section on page 28 for additional information.</p>
SET TELNET USERNAME	<p>Set the user name for a secure Telnet session.</p> <ul style="list-style-type: none"> • Default = blank (no user name required) • See the <i>Setting a Telnet User Name and Password</i> section on page 23 for details.
SET TELNET PASSWORD	<p>Set the Password for a secure Telnet session.</p> <ul style="list-style-type: none"> • Default = blank (no password required) • See the <i>Setting a Telnet User Name and Password</i> section on page 23 for details.
SHOW CONNECTION LOG	Show the master connection log for the device
SHOW CONNECTION STATS	<p>Show the connection statistics for the device.</p> <p>Output similar to the following example:</p> <pre>>show connection stats Connection Statistics Total Last 15 Minutes ===== ICSP Messages: 10039 received 333 received 10038 transmitted 333 transmitted Blink Messages: 5014 received 166 received IP Statistics: RX packets:29298 errors:0 discarded:0 TX packets:15286 errors:0 discarded:0</pre>

Terminal Commands (Cont.)	
Command	Description
SHOW LOG	Display the message log. Syntax: SHOW LOG <start> <ul style="list-style-type: none"> • Use <start> to specify the message number to start displaying • Use <all> to display all messages.

Notes on Specific Telnet Clients

Telnet and terminal clients will have different behaviors in some situations. This section states some of the known anomalies.

Windows Client Programs

Anomalies occur when using a Windows™ client if you are not typing standard ASCII characters (i.e. using the keypad and the ALT key to enter decimal codes). Most programs will allow you to enter specific decimal codes by holding ALT and using keypad numbers.

For example, hold ALT, hit the keypad 1, then hit keypad 0, then release ALT. The standard line feed code is entered (decimal 10). Windows will perform an ANSI to OEM conversion on some codes entered this way because of the way Windows handles languages and code pages.

The following codes are known to be altered, but others may be affected depending on the computer's setup.

Characters **15**, **21**, **22**, and **any characters above 127**.

This affects both Windows Telnet and Terminal programs.

Linux Telnet Client

The Linux Telnet client has three anomalies that are known at this time:

- A null (\00) character is sent after a carriage return.
- If an ALT 255 is entered, two 255 characters are sent (per the Telnet RAFT).
- If the code to go back to command mode is entered (ALT 29 which is ^]), the character is not sent, but Telnet command mode is entered.

Enabling/Disabling Telnet on the Keypad

By default, Telnet is enabled on all Novara keypads. The default Telnet port is **23**.

You can change the Telnet port by using the SET TELNET PORT command (see page 27). Setting the Telnet port to zero disables Telnet access.

The SET TELNET PORT command requires a reboot to enable new settings.

NOTE: The only way to re-enable Telnet once it has been disabled is to reset the unit to the factory default firmware image. See the *Simulating the ID Pushbutton* section on page 11 for details.



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