

FX40 Installation Instructions

LP-FX4020A-0, LP-FX4021A-0, LP-FX4022A-0
LP-FX4023A-0

Document Introduction

This document covers the mounting and wiring of the FX40 controller. This document also covers the FX40 software setup.



Figure 1: FX40

Default Communication and Login Properties

The new FX40 series controller is pre-configured with default properties as defined in Table 1.

Table 1: FX40 Default Properties

Name	Default Property
Internet Protocol (IP) Address	192.168.1.149
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
Remote User Name	jci
Remote Password	explorer

North American Emissions Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Industry Canada (IC)

This Class (A) digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Preparation

Unpack the FX40 and inspect the contents of the package for damaged or missing components. If damaged, notify the appropriate carrier and return any damaged components for repair or replacement.

Included in this package are the following items:

- FX40
- *FX40 Installation Instructions*
- hardware bag containing the following items:
 - 499 ohm resistors (quantity 6)
 - 6-position Input/Output (I/O) screw terminal connector plugs (quantity 4)
 - 3-position RS-485 screw terminal connector plug (quantity 1)
 - wire nuts (quantity 2)
 - 2-position screw terminal connector plug
- optional items (if ordered):
 - factory installed modem

Tools Required

You may require the following tools for installation:

- 1/4-inch (7 mm) nut driver: used to remove the transformer shield
- small flat-blade screwdriver: used for I/O, RS-485, and LONWORKS® connectors. If you remove or install the circuit board from the enclosure, a 1/4-inch thin-walled socket is required (do not use a nut driver). See *Replacing the FX40 Circuit Board*.

Safety Precautions

The following information relates to the installation and startup of the FX40 controller.



Warning: Risk of Electric Shock.

Disconnect power supply before making electrical connections. Contact with components carrying hazardous voltage can cause electric shock and may result in injury or death.

Important

Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the FX40 electrical ratings.

Important

Do not install or use the FX40 in or near environments where corrosive substances or vapor could be present. Exposure of the FX40 to corrosive environments may damage the device's internal components, and will void the warranty.

Important Use this FX40 only as an operating control. Where failure or malfunction of the FX40 could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed in the control system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the FX40.

Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within an FX40 controller are sensitive to static discharge.

Important Work in a static-free area. Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object. Do not handle the Printed Circuit Board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs. Secure the wrist strap clamp to earth ground.

Mounting

Mount the FX40 controller in a location that allows clearance for wiring, servicing, and module removal. For mounting details refer to Figure 2.

Follow these recommendations and precautions when mounting and installing the unit.

- Use this controller for indoor use only. Do not expose the unit to ambient conditions outside the range of 0 to 50°C (32 to 122°F) and relative humidity outside the range of non-condensing 5 to 95% (Pollution Degree 1).
- For a controller mounted inside an enclosure, ensure that the enclosure is designed to keep the unit within its required operating range (considering a 20-watt dissipation by the controller). This is especially important if the controller is mounted inside an enclosure with other heat producing equipment.
- Provide a minimum 0.2 inch clearance from the wall where the unit is mounted (provided by the dimpled mounting feet). Ensure that this space is not compromised and that airflow is not blocked behind the unit.
- Do not mount the unit:
 - in an area where excessive moisture, corrosive fumes, or explosive vapors are present
 - where vibration or shock is likely to occur
 - in a location subject to electrical noise. This includes the proximity of large electrical contactors, electrical machinery, welding equipment, and spark igniters.
- Mount the controller on a wall with the battery situated towards the bottom of the unit. For proper airflow at temperature extremes, do not mount the unit oriented in any other way.

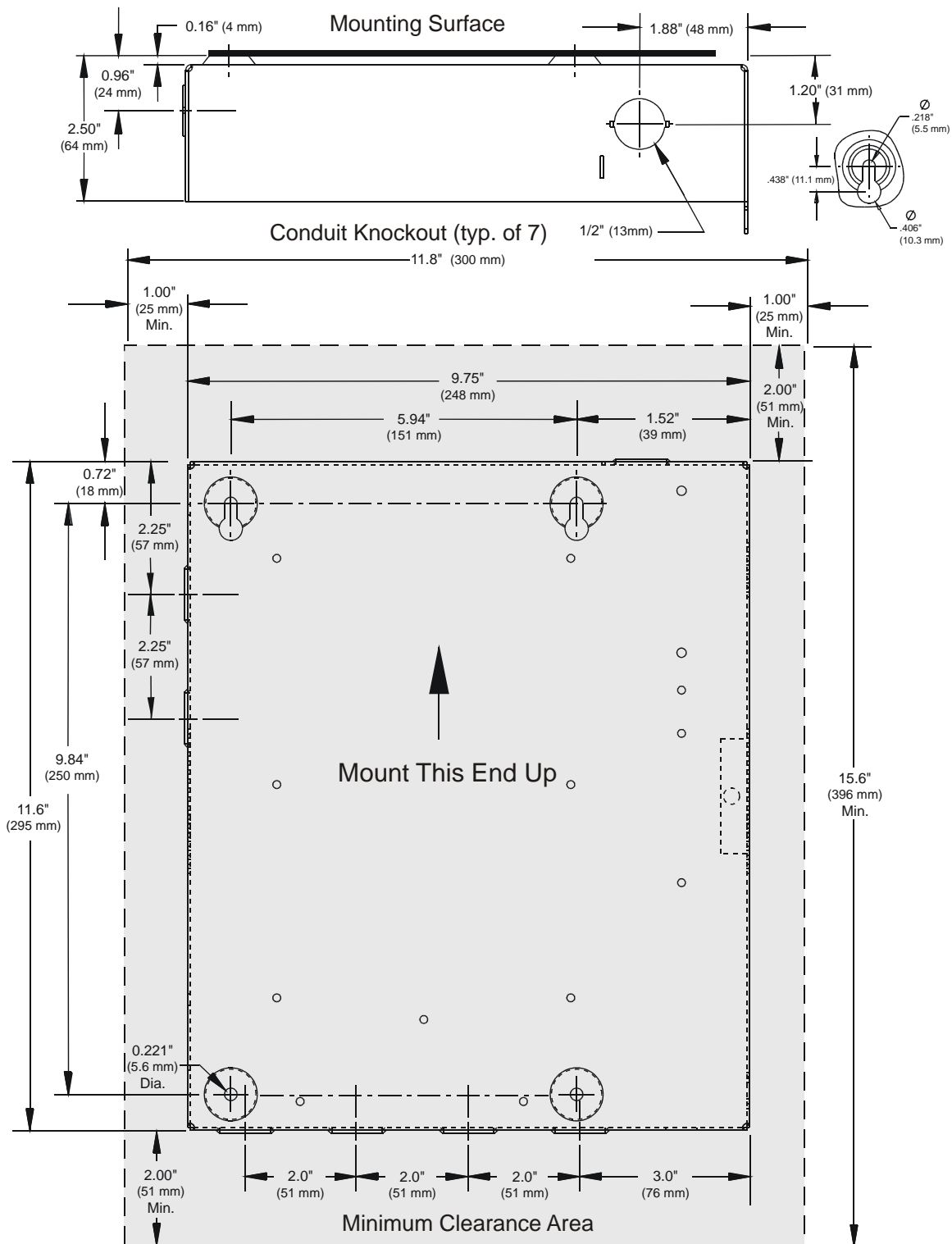


Figure 2: Mounting Details

Removing and Replacing the Cover

The FX40 cover is removable. The cover is secured in place with a knurled-edge, slotted-head screw.

If you need a more secure installation for the cover, use a padlock through the security tab that protrudes through the cover.

Removing the Cover of an FX40

1. Loosen the cover screw and open the cover. You may need a flat-blade screwdriver to loosen the cover screw.
2. On the inside of the door, loosen and remove the nut and locking washer that secures the green grounding strap to the cover.
3. Pull the grounding strap off the screw post.
4. Replace the locking washer and then replace the nut on the screw post. Tighten.
5. Close the door about half way.
6. Slide the cover toward the top of the unit until the tops of the hinge tabs on the cover hit the top of the hinge slots on the left wall of the metal enclosure.
7. Slide the hinge tabs out of the slots.

Replacing the Cover of an FX40

1. Align the hinge tabs on the cover with the hinge slots on the left wall of the metal casing.
2. Slide the hinge tabs into the slots.
3. Slide the door toward the bottom of the unit until the bottom of the hinge tabs hit the bottom of the slots.
4. Loosen and remove the nut and locking washer on the grounding strap post on the door.
5. Slide the ground strap onto the screw post and replace the locking washer and then the nut. Tighten.
6. Close the door and tighten the security screw.

Board Layout

See Figure 3 for location of communication ports, Light-Emitting Diodes (LEDs), and other features of the FX40.

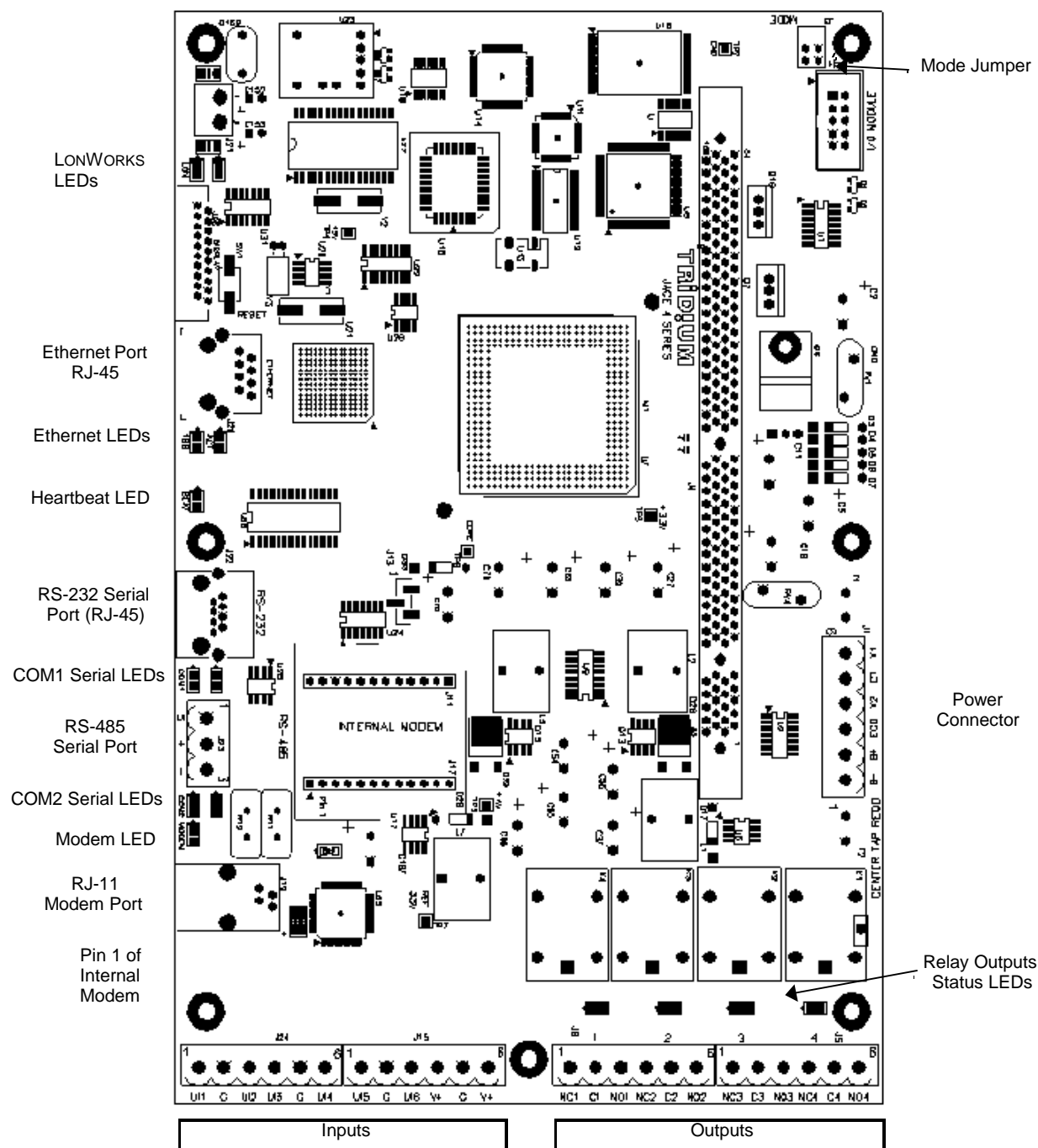


Figure 3: FX40 Board Layout Details

Wiring Details

See Figure 3 to locate connectors and other components on the FX40 controller.

Make connections to the FX40 in the following order.

1. With the 6-position power connector disconnected from the board, wire the power to the transformer. See [Power Wiring](#).
2. Connect communications cables. See [Communication Wiring](#).
3. Connect the Input Output (I/O) wiring. See [I/O Wiring](#).
4. Apply power to the unit. See [Power Up and Initial Checkout](#).

Power Wiring

Building power is wired directly to the transformer supplied with the FX40. There is no disconnect switch in the unit; therefore you should wire the FX40 to an external switch or breaker. Some local codes require the switch to be in sight of the unit. The switch must be capable of 120 VAC plus sufficient capacity for test equipment.

About the Transformer

The FX40 ships with a 120 VAC, 50/60 Hz transformer and 12 V battery.

The transformer provides power to the controller in a 14-CT-14 configuration (28 VAC center tapped). The power connector has been disconnected for shipping.

Important Do not power other devices from the transformer of the FX40. The transformer should be dedicated to running the FX40. Powering other devices from the transformer could cause improper operation of the FX40.

Important Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the FX40 electrical ratings.

Important Do not attempt to use any other power source or otherwise defeat the isolation provided by the integral transformer. A two-wire power source, including a 24 V transformer, can cause permanent damage or greatly shorten the life of the unit.

Important Verify that the secondary side of the transformer is not grounded or connected to building neutral. Connecting the secondary side of the transformer to ground or building neutral may cause improper operation of the system.

Making the Power Connection to the Transformer

With the 6-position power connector disconnected from the PCB, unscrew the nut and locking washer and remove the metal enclosure of the transformer.

Note: As required by code, high voltage Class 1 wiring must be confined behind the transformer's enclosure divider. Make sure to replace this barrier after you complete the wiring. Do not pinch wires underneath the barrier when you reinstall the barrier.

Using the provided wire nuts, connect 120 VAC 60 Hz power to the transformer and power connector using the information in Table 2.

Table 2: US Models - Building Power Terminations

Type of Wire	Typical Color of Wire	Termination Point
Ungrounded-Hot	Black	Either wire of the 120 V transformer
Grounded-Neutral	White	Other wire of the 120 V transformer
Grounding-Ground (Earth)	Green or bare copper	Grounding stud

Communication Wiring

All communications wiring is made through knockouts adjacent to the communication ports. Before you connect cables, ensure that the grommet bushing has been installed for each knockout. Employ strain relief on the communication wiring to prevent damage to the controller.

Ethernet

A single, female 10/100 Mbit Ethernet connection is provided on the controller. This connection is capable of running at either 10 Mbps or 100 Mbps; it automatically adjusts to either speed. This means the FX40 can exist on the same network with a mixture of 10BaseT and 100BaseTX hardware connected to a smart 10/100 hub capable of adjusting to the devices it supports.

Connection is made via a standard male RJ-45 (8-wire) connector. Using a Category 5 Unshielded Twisted Pair (UTP) cable, connect one end of the cable through the knockout adjacent to the RJ-45 connector on the FX40. Connect the other end to a hub on the Ethernet Local Area Network (LAN).

The maximum end-to-end distance from the controller to the hub is 328 feet (100m).

Serial

There are two serial ports on the FX40 (see Figure 3). The top serial port is an RS-232 port using an RJ-45 connector. The serial port beneath the RS-232 port is a two-wire with shield, non-isolated RS-485 port.

RS-485 multi-point connections are made to the 3-position, screw terminal connector on the board. Wire to this connector with shielded 18-22 AWG wiring (refer to the TIA/EIA-485 standard). The screw terminals (from top to bottom) are shield, plus (+), and minus (–).

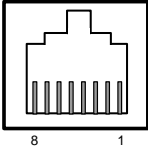
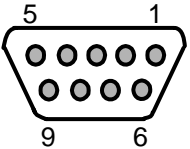
An RS-232 serial port connection can be made to the female (socket) RJ-45 connector using an 8-conductor flat silver satin stranded cable with standard male (plug) RJ-45 connectors. Connect the flat satin cable (maximum distance 50 feet) through the enclosure knockout nearest the port. This straight-through cable is then connected to a socket-to-socket type RJ-45 to DB-9 adapter.

The FX40 is a serial Data Terminal Equipment (DTE) device. Other DTE devices (computer, for example) require a null modem adapter (part number LP-KIT408A-0, optional item). If you connect the FX40 to a Data Communications Equipment (DCE) device (modem, for example), a straight-through adapter is used. Table 3 provides pinouts for both types of RJ-45 to DB-9 adapters.

Note: Silver satin cables are not standard Ethernet UTP cable, in which the pairs are twisted around each other. The twisting of the pairs may cause undesirable effects on the serial communication. We recommend the use of flat silver satin cable instead.

Note: Flat silver satin cables are unshielded. If you install this cable in a noisy electrical environment, run the cable through conduit, **with no other wires in that conduit.**

Table 3: RJ-45 to DB-9 Adapter Pinouts

RJ-45 and DB-9 Pinout References	Type of Adapter	RJ-45 Socket Pin	Signal		DB-9 Socket Pin
RJ-45 Socket (female) 	Null Modem (for connecting to another DTE device) Part number LP-KIT408A-0	5	DCD	Data carrier detect	1
		3	TXD	Transmit data	2
		6	RXD	Receive data	3
		8	DSR	Data set ready	4
		4	GND	Ground	5
		1	DTR	Data terminal ready	6
		7	CTS	Clear to send	7
		2	RTS	Request to send	8
		—	not used on the FX40		9
DB-9 Socket (female) 	Straight-through (for connecting to a DCE device)	5	DCD	Data carrier detect	1
		6	RXD	Receive data	2
		3	TXD	Transmit data	3
		1	DTR	Data terminal ready	4
		4	GND	Ground	5
		8	DSR	Data set ready	6
		2	RTS	Request to send	7
		7	CTS	Clear to send	8
		—	not used on the FX40		9

LONWORKS Connection

A single, two-pin, male LONWORKS FTT-10A Weidmuller connection is provided on the controller. This connection supports twisted pair, unshielded, polarity-insensitive, peer-to-peer communications at 78 Kbps.

Refer to the *LONWORKS FTT-10A Free Topology Transceiver User's Guide* (078-0156-01F) for technical guidelines associated with free topology restrictions. Refer to the *Junction Box and Wiring Guidelines for Twisted Pair LONWORKS Networks* (005-0023-01) for more detailed information on wiring specifications. These documents are available on the Echelon® Web site (www.echelon.com).

Modem (Optional)

The female RJ-11 connection for the modem is located below the RS-485 port. Connect one end of a standard flat satin telephone cable (4-conductor) through the adjacent knockout to the modem's RJ-11 connector. Connect the other end to an analog telephone port.

This modem is approved for US use only, and must be tested for use in other countries.

I/O Wiring

The FX40 provides six (6) universal inputs supporting analog inputs (temperature, resistance, voltage, and current) and digital inputs (contact closure, pulse count), as well as four (4) form-C Single-pole double-throw (SPDT) relay outputs.

See Figure 3 for the location of these inputs and outputs.

Inputs

Thermistor

The inputs support Type 3 10K Thermistor temperature sensors with a sensor range of 10 to 135°F (23.3 to 57.2°C), using the appropriate Niagara object. Input accuracy is in the range of ±1% of span. Figure 4 shows the wiring diagram.

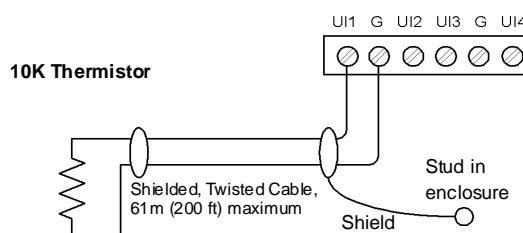


Figure 4: Thermistor Wiring

Note: Universal inputs are optimized to provide the best resolution around the 10K ohm range. For a sensor with a range far from 10K ohms (such as a 100-ohm or 1000-ohm type), resolution is poor. If you use this sensor, we recommend that you install a transmitter that produces a Vdc or mA signal, and then wire the transmitter to the User Interface (UI) according to the 0–10 Vdc or 4–20 mA.

Resistive

The inputs support resistance inputs with a range of 0–100K ohms. Input accuracy is in the range of $\pm 1\%$ of span.

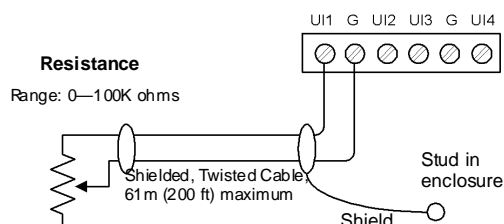
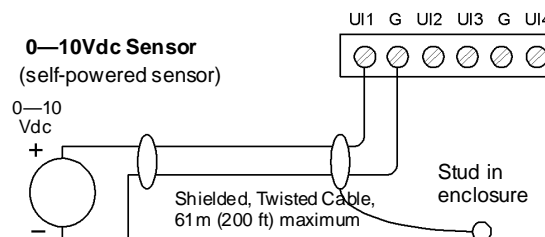


Figure 5: Resistive Wiring

0–10 Vdc

The inputs support self-powered 0–10 Vdc sensors. Input impedance must be greater than 5K ohms. 0–10 volt accuracy is $\pm 2\%$ of span without user calibration. Figure 6 shows the wiring diagram



Range: 0–10 Vdc Input Impedance > 5K ohms

Figure 6: 0-10Vdc Wiring

4–20 mA

The inputs support self-powered or controller-powered 4–20 mA sensors. For controller-powered sensors, the controller's two V+ terminals supply 20 Vdc, at up to 80 mA combined. Input accuracy is $\pm 2\%$ of span without user calibration. The input requires an external 499-ohm resistor for current input (six are supplied with the unit). Figure 7 shows wiring used for a self-powered sensor (top) and a 2-wire controller-powered sensor (bottom).

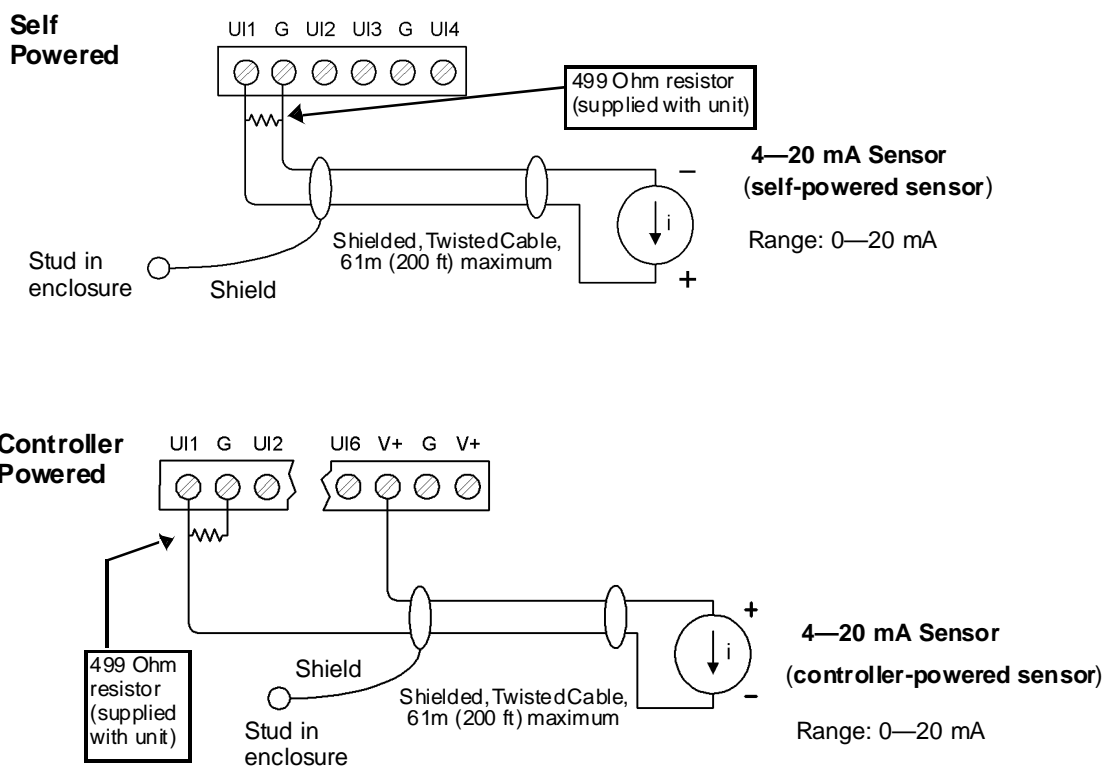


Figure 7: 4-20 mA Wiring

Binary Input

The inputs support both pulse contacts and normal dry (equipment status) contacts. Figure 8 shows the wiring diagram.

- Pulse contacts may have a change-of-state (COS) frequency of up to 20 Hz with a 50% duty cycle.

Note: The minimum dwell time must be > 25ms.

- Standard dry contacts must have a 1 Hz. (or less) COS frequency, with minimum dwell time > 500ms.

Both types of dry contacts support 3.3 Vdc open circuits or 330 μ A short-circuit current.

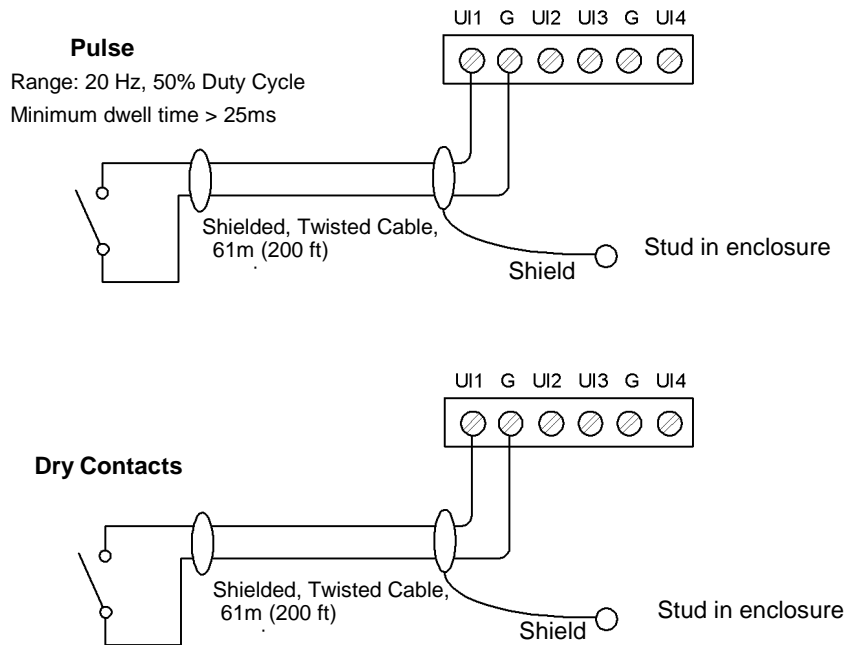


Figure 8: Binary Input Wiring

Outputs

Four (4) form-C relay outputs provide isolated dry-contact control of 24 VAC/DC loads at up to 2A resistive. An LED indicator for each relay is located between the relay and the wiring connection point (see [Relay Output Status](#)). Figure 9 shows example wiring diagrams.

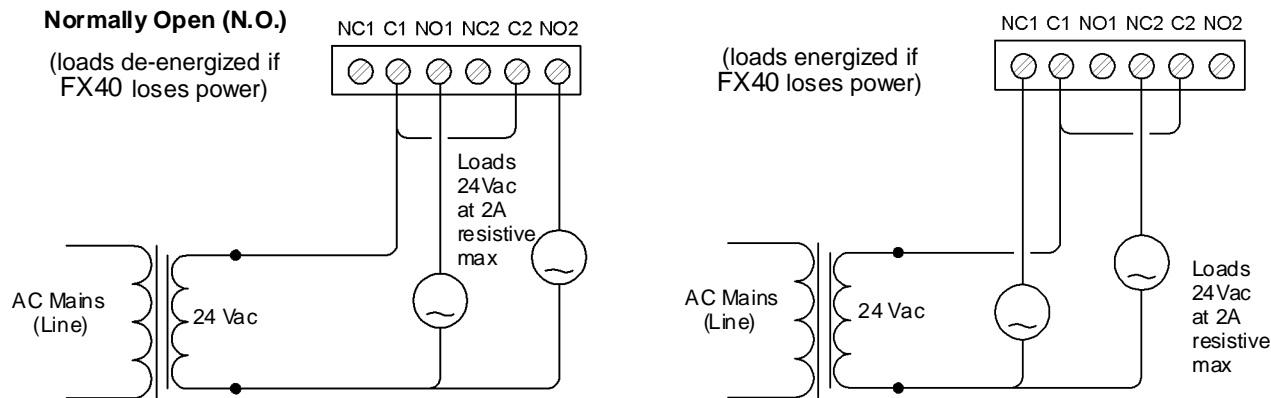


Figure 9: Example Relay Output (RO) Wiring

Power Up and Initial Checkout

Ensure that power wiring to the transformer is complete before you proceed (see [Power Wiring](#)). The FX40 controller does not include an On/Off switch. To apply power, insert the 6-position power connector to the board. See Figure 3 for the locations of the power connector and status LEDs on the FX40 controller.

Checking the Heartbeat LED

When you first supply power to the controller, the red heartbeat LED comes on solid for about 10 seconds and begins to blink. The blink pattern of the heartbeat LED under normal operation differs for each installation (depending on station activity). But, in general, the LED should blink about once per second. The rate is slower when the control engine executes the station database and as more objects are added.

After you apply power to the controller, if the heartbeat LED comes on and stays lit longer than two minutes, contact a Facility Explorer technical support resource. See also [Using Status LEDs](#).

About the Battery

The FX40 comes with a sealed lead acid battery that is nearly charged. Therefore, the FX40 has battery backup protection immediately upon installation. If battery trouble messages appear upon power up, contact a Facility Explorer technical support resource.

For more information about the use and replacement of the battery, see [Required Battery Maintenance](#).

Using Status LEDs

The FX40 controller includes a series of LEDs that indicate power and communication status. You can locate them on the circuit board. See Figure 3 for the exact locations of status LEDs on the FX40 controller.

LONWORKS Port

Two LEDs are located below the LONWORKS port.

- The yellow transmit LED (TxD) indicates that the FX40 is transmitting a message on the LONWORKS trunk.
- The green receive LED (RxD) indicates that another LONWORKS device is transmitting a message.

Ethernet Port

The Ethernet port has two green LEDs, located below the Ethernet connector.

- The LED marked 100 indicates whether the FX40 is operating at 10 Mbps (Ethernet) or 100 Mbps (Fast Ethernet). If the 100 LED is on, the network connection is operating at 100 Mbps. Otherwise, the port is communicating at 10 Mbps.
- The ACT LED indicates activity on the port as follows:
 - **Off**—No Ethernet link is made.
 - **On**—Ethernet link is present, but there is no activity on the LAN.
 - **Blinking**—Ethernet link is present with data activity on the LAN.

Heartbeat

The BEAT LED is located below the Ethernet status LEDs, and is red. Under normal operation, this LED should blink about once per second. Blink patterns differ as station activity varies, but any pulse rate from once per second to 10 blinks per minute usually indicates normal operation. If the heartbeat LED stays on constantly, does not light, or blinks very fast (more than once per second), contact a Facility Explorer technical support resource.

Serial Ports

The status LEDs for the serial ports are located below the respective RS-232 and RS-485 ports. They are marked COM1 and COM2 and correspond to the software configuration on the COM ports. They show the **transmit** and **receive** information for the serial ports and optional modem.

- The yellow **transmit** LED indicates that the FX40 is sending data out the serial port over a communications line to a connected device.
- The green **receive** LED indicates that the FX40 is receiving data from a connected device.

These LEDs are driven by pulse detectors that provide a fixed on-time when data is detected on the port. If these LEDs are on constantly, this indicates a problem with the communications channel (for example, a shorted wire or reversed wiring).

Modem

The modem LED is located directly above the RJ-11 connector for the modem, and is green. When lit, it indicates that the modem is connected to another modem (a carrier is detected). In this case, the serial port LEDs for COM2 should indicate **transmit** and **receive** activity—see [Serial Ports](#).

Relay Output Status

There are four (4) relay output status LEDs. These are yellow LEDs, with each one located below the associated form-C relay (just above the screw terminals for each output's wiring).

Under normal operation, a relay status LED indicates activity as follows:

- **Off**—Relay coil is not energized.
- **On**—Relay coil is energized.

Therefore, for a circuit with a normally open contact, an On status indicates that the contact is closed. For a circuit with a normally closed contact, an On status indicates that the contact is open.

Maintaining the FX40

Cleaning

If dust or metal filings are present inside the unit, clean with vacuum or compressed air. Otherwise, no cleaning inside the unit is required. Optionally, if the outside of the metal enclosure becomes dirty, you can wipe it with a damp cloth and mild detergent.

Required Battery Maintenance

Battery life expectancy is a function of its discharge cycles (the number of discharges and their depth) and the ambient temperature of the battery during normal operation. In most applications, the battery should see relatively few discharges. Therefore, ambient temperature has more to do with determining the life expectancy of the battery than any other factor. If the FX40 is installed in a conditioned space, the battery should provide dependable service for approximately 3 years. In an environment where the operating temperature is higher (50°C or 122°F), you should only expect the battery to last approximately 1 year.

The sealed lead acid battery in the FX40 controller is nearly fully charged before shipping. The battery is automatically float-charged during normal operation (while power is applied to the unit). The FX40 monitors the battery and periodically loads the battery to test its ability to maintain battery-backed functions. You should investigate any battery trouble message. Check the voltage level and its connections to the unit. Replace the battery as required.

To order a new battery, see [Standard Replacement Parts](#).

Replacing the Battery

Important Maintain proper polarity when replacing the battery of the unit. Although the FX40 is fully protected against shorted battery terminals, the battery itself is not internally protected. Use extreme care to not short circuit the battery. A shorted battery may overheat rapidly and damage the harness or cause other physical harm to the hardware.

Replacing an FX40 Battery

To replace the battery, do the following:

1. Unplug the 6-position power connector. Do not remove the male connector from the wiring harness.
2. Using a 7 mm (1/4-inch) nut driver, unscrew the lock nut from the bracket that is holding the battery.
3. Hold the battery in place while you remove the bracket that secures it to the bottom of the unit.
4. Disconnect the two quick connect terminals on the battery.

Note: The FX40 will lose its time and date settings if it is disconnected from both battery and AC power for more than one hour.

5. Remove the old battery and recycle as defined by your regional codes. For recycling within the US, see the labeling on the battery.
6. Connect the quick connect terminals to the new battery. Make sure the RED (+) wire is connected to the positive terminal of the battery and the BLACK (–) wire is connected to the negative terminal.
7. Secure the new battery to the bottom of the unit with the bracket and tighten the lock nut.
8. Plug the power connector in and verify normal operation.

NiagaraAX Software Installation

As shipped from the factory, FX40 controllers are pre-configured with a Niagara build, license, and three Johnson Controls® specific Java® Archive (JAR) files. With those components in place, you should only have to change login credentials and Internet Protocol (IP) settings (per network requirements) to set up the FX40 controller. This document provides step-by-step instructions for these tasks.

The most straightforward way to set up an FX40 controller (and to upgrade to a newer Niagara build at a later date) is to use the administrative tools available under the Tools Menu in the FX Workbench.

Note: If upgrading JAR files with patches at a later date, use the Update Remote Site menu item. If upgrading to a newer Niagara build, use the Upgrade Remote Software Version menu item. If changing login credentials, use the Change Remote Login Credentials menu item.

Preparing for Setup

Providing Power and Connectivity

Perform the initial startup of an FX40 in your office, before physically mounting it in place at a job site.

After you complete the commissioning process, mount and wire the FX40 controller at the job site, making permanent mounting and wiring connections.

For this initial Ethernet connection, you can use one of the following:

- a crossover cable connected directly between your computer and the FX40
- a normal Local Area Network (LAN) connection, meaning that both your computer and the FX40 are physically connected to the same Ethernet hub or switch.

IP Address

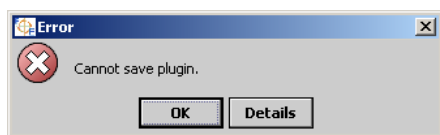
When shipped, a new FX40 series controller is pre-configured with an IP address of 192.168.1.149 with a default subnet mask of 255.255.255.0.

To change the IP settings, perform the following steps:

1. Use the Windows Network Connections utility on your workstation to configure your Transmission Control Protocol/Internal Protocol (TCP/IP) settings with an IP Address of 192.168.1.100 and Subnet Mask of 255.255.255.0.
2. Make an Ethernet connection to the FX40 as indicated in [Providing Power and Connectivity](#).
3. Run the FX Workbench application.
4. Under the File Menu, select the Open Remote Station menu item. When prompted, enter the Remote Site Address (i.e. 192.168.1.149), the Remote Username (i.e. **jci**), the Remote Password (i.e. **explorer**) and click OK. When the Authentication dialog appears, enter the Username (i.e. **admin**), leave the Password field empty, and click OK.

5. The station running on the FX40 opens up in the FX Workbench application, which has a Navigation Tree on the left and a Display Window on the right. Click the IP Config tab above the Display Window to access the TCP/IP Configuration screen.
6. On the TCP/IP Configuration screen, make sure the Interfaces field is expanded so that the IP Address and Subnet Mask fields appear. Modify the Gateway, IP Address, and Subnet Mask fields, and click Save. When prompted to Reboot Now, click Yes. Give the FX40 a couple minutes to reboot and restart the station that is installed.

Note: If the following message appears, just click OK. The changes are saved anyway.



Platform Daemon Credentials

An FX40 series controller is shipped with the following platform daemon (administrator) credentials: username **jci** and password **explorer**.

Initially, you use these default credentials to open a platform connection (log in) to the FX40. Like the factory-assigned IP address, default credentials are intended to be temporary. You should change these credentials to be something unique, and **guard them closely**.

To change the Platform Daemon credentials, perform the following steps:

1. Run the FX Workbench application.
2. Under the File Menu, select the Open Remote Station menu item. When prompted, enter the Remote Site Address (e.g. 192.168.1.149), the Remote Username (i.e. **jci**), the Remote Password (i.e. **explorer**) and click OK. When the Authentication dialog appears, enter the Username (i.e. **admin**), and leave the password field empty, and click OK.
3. In the Login Credentials dialog, enter the new Username, Password, the Confirm Password field, and click OK. The next time you log into the FX40, use these new credentials.

Restoring a Backed Up Station

If the FX40 ever gets into an erroneous condition where you cannot fix a station, you can restore a previously backed up station by using the Restore Backed Up Station menu item under the Tools menu.

To restore a backed up station, perform the following steps:

1. Run the FX Workbench application.
2. Under the File Menu, select the Open Remote Station menu item. When prompted, enter the Remote Site Address (for example, 192.168.1.149), the Remote Username, the Remote Password and click OK. When the Authentication dialog appears, enter the Username, Password (optional), and click OK.
3. In the Restore Backed Up Station dialog, enter the Remote Site IP Address, Remote Username, Remote Password, select the .dist (station backup) file, and click OK. This reboots the FX40 automatically.

Note: You can back up a station by using the Backup Station menu item from the station node's popup menu in the Navigation Tree. We recommend that you back up a station daily to minimize the chance of information loss.

Replacement Parts

Servicing the FX40 may call for replacement parts.

Non-Replaceable Parts

Other than the parts listed in the replacement parts sections, there are no serviceable components on the base assembly.

Memory

No addition, modification, or replacement of memory components is allowed.

Fuses

The FX40 has two 250V, 2.5A delay (series 372) fuses on the printed circuit board. These fuses are Wickman F015-2.5A250V fuses. However, on-board power circuit protection is not user-serviceable.

Standard Replacement Parts

Standard replacement parts are listed in Table 4.

Table 4: Standard Replacement Parts

Part Number	Description
LP-KIT402A-0	Battery, 12 Vdc, 1.2 AH (see <i>Replacing the Battery</i> .)
LP-KIT403A-0	FX40 hardware accessory package which includes: <ul style="list-style-type: none"> • 499 ohm, 1%, six 0.6w resistors • four 6-position I/O screw terminal connector plugs • 3-position RS-485 screw terminal connector plug • two wire nuts • LONWORKS 2-position screw terminal connector plug
LP-KIT407A-0	Battery/ground harness (also includes 6-position power connector)
LP-KIT408A-0	Adapter, RJ-45 to DB-9 null modem, for serial port to connect to DTE device
LP-KIT409A-0	Silver satin patch cable, 4 feet (used between adapter and serial port)
LP-KIT410A-0	Silver satin patch cable, 10 feet (used between adapter and serial port)
LP-KIT411A-0	Silver satin patch cable, 25 feet (used between adapter and serial port)
LP-KIT401A-0	On-board auto dial/auto answer 56k modem
LP-KIT400-700	Replacement FX40 circuit board

Replacing the Modem

Important Work in a static-free area. Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object. Do not handle the Printed Circuit Board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs. Secure the wrist strap clamp to earth ground.

To replace the modem, proceed as follows:

1. Open the cover of the unit.
2. Unplug the 6-position power connector. Do not remove the male connector from the wiring harness.
3. Unplug the RJ-11 telephone wire from the modem's RJ-11 connector.
4. Remove the old modem as follows:
 - a. Locate the on-board modem (see Figure 3) and note the following:
Orientation of the sockets for the pins on the modem - the sockets are two parallel lines. The socket for Pin 1 (noted on Figure 3) is the left-most pin on the bottom line.

Orientation of the writing on the modem. Writing on the replacement modem will be the same.
- b. Place the blade of a flat-blade screwdriver under the left end of the modem between the pin sockets.
- c. Gently pry the modem up about 3 mm (1/8th inch).
Note: Do not try to completely remove the modem with this step. Doing so may damage the pins.
- d. Place the blade of the screwdriver under the right end of the modem and gently pry the modem up about 3 mm (1/8th inch).
- e. Repeat Steps b-d until the modem is out of its socket.
5. Insert a new modem as follows:
 - a. Locate Pin 1 on the modem. If you are reading the writing on the modem, Pin 1 is the first pin in the lower left corner. It is marked with a small black dot on the top of the modem.
 - b. Locate the socket for Pin 1 on the board (see Figure 3).
 - c. Orient the modem so that Pin 1 of the modem is over the socket for Pin 1.

Note: Use the white trace lines on the board to help align the modem. When the modem is correctly aligned, the trace lines outline the modem completely.

- d. Push the modem into the sockets using your thumbs. All pins should be properly inserted.
6. Plug the RJ-11 telephone wire into the modem's RJ-11 connector.
7. Plug the power connector in and verify normal operation.

Replacing the FX40 Circuit Board

Important The surface-mounted components on the circuit board are small. Improper handling may cause the components to break or become damaged during the removal or replacement of the circuit board.

Important Do not use a nut driver to replace the FX40 circuit board. A nut driver causes board damage to adjacent components. Use a 1/4" (7mm) thin-walled socket instead. Carefully loosen or tighten the nuts that secure the FX40 board to the seven mounting studs.

Important Use only the spacers that are supplied with the FX40. Using other spacers may cause damage to the FX40 and will void the warranty.

Important Work in a static-free area. Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object. Do not handle the Printed Circuit Board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs. Secure the wrist strap clamp to earth ground.

To replace the FX40 circuit board, proceed as follows:

1. Using FX Workbench, back up the station database to your personal computer.
2. Open the cover of the unit.
3. If any of your I/O points have voltage, turn the devices off or disconnect power to them.
4. Turn off building power to the unit. The unit should power down automatically.
5. Unplug the 6-position power connector from the board.
6. Note positions of all communications and I/O connectors going to the circuit board. If necessary, label connectors to avoid misconnection later (after circuit board is replaced).

Note: The software that runs on the unit expects the terminal positions to be the same to collect data from or to control the attached devices.

7. Unplug all Ethernet, serial, I/O, modem, and LONWORKS connectors from the circuit board.
8. Using a 1/4" socket, carefully remove and retain the seven 1/4" nuts securing the circuit board. Be mindful of small surface-mount components located near board mounting points.
9. Remove the old circuit board. Make sure that metal spacers (behind the board) remain on the seven mounting studs.
10. Replace the new circuit board on the mounting studs and spacers, carefully securing with the seven 1/4" nuts. Again, be mindful of small surface-mount components located near board mounting points.
11. Turn on building power to the unit.
12. Plug the 6-position power connector in and verify normal operation.
13. Reconnect any Ethernet, serial, modem, and LONWORKS connectors.
14. Reconnect all I/O connectors.

15. If any of your I/O points have voltage, turn the devices back on, or reconnect power.
16. Using FX Workbench, re-commission the FX40:
 - a. Install the correct Niagara release and set the date and time.
 - b. Install the new license file.
 - c. Restore the station database and start the station.



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