

FX22/FX62 Supervisory Controllers

Installation Instructions

LP-FX2211T-0, LP-FX2213T-0, LP-FX6211T-0,
LP-FX6213T-0 LP-FX2221T-0, LP-FX2223T-0
LP-FX6221T-0, LP-FX6223T-0

Part No. 24-10564-9, Rev. B

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Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

Applications

The FX22/FX62 is a Web-based supervisory controller designed specifically for commercial Heating, Ventilating, Air Conditioning, and Refrigeration (HVACR) applications.

The FX22/FX62 manages networks of field controllers using open communication protocols, such as N2, LONWORKS®, and BACnet® protocols. The FX22/FX62 supports a full set of building automation features, such as scheduling, alarming, histories, data sharing, energy management, totalization, and customized control routines, which are specifically designed for commercial facilities.



Figure 1: FX22/FX62 Supervisory Controller

For information on software installation and configuration required for a supervisory controller, refer to the *FX Workbench User's Guide (LIT-12011149)*.

North American Emissions Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the 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 is required to correct the interference at his/her own expense.

Canada

This Class (A) digital apparatus meets all the 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.

Installation

Observe these guidelines when installing the FX22/FX62:

- Transport the FX22/FX62 in its original container to minimize vibration and shock damage.
- Do not drop the FX22/FX62, or subject it to physical shock.

Parts Included

Unpack the FX22/FX62. 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:

- The FX22/FX62, with both cover halves fastened.
- This *FX22/FX62 Supervisory Controllers Installation Instructions (Part No. 24-10564-9)*.
- A hardware bag containing the following items:
 - Two 7-position screw terminal blocks, for UIs.
 - Three 6-position screw terminal blocks: one for AOs; one for DOs; one for RS-485/15 V power to optional remote modules (three RS-485 terminals, three for power).
 - One 2-position screw terminal block for external 12 V Sealed Lead Acid (SLA) battery (battery not provided).

- For LP-FXn213T-0 model supervisory controllers, a GSM/GPRS coax-mounted stub antenna and a SIM card provisioned by the Wyless Group.

Materials and Special Tools Needed

The following materials and tools are typically needed for installation:

- #1 Phillips screwdriver: used to remove and replace cover screws.
- #2 Phillips screwdriver: used to install optional communications card.
- Small flat-blade screwdriver: used for making wiring connections to removable screw terminal plugs.
- To power the FX22/FX62, use either **one** of the following:
 - Underwriters Laboratories (UL) listed, Class 2, 24 VAC transformer, rated at minimum of 40 VA. Note that a dedicated transformer is required (a transformer that does not also power additional equipment).
 - 24 VDC power supply, capable of supplying a minimum of 1.5 A (36 W).
- (Optional) One or two 12 V SLA rechargeable backup batteries, with wire harness for connecting to the 2-position connector on the FX22/FX62 Supervisory Controller (sized as required by the system). See *External 12 V Backup Battery* on page 17.

Safety Precautions



CAUTION: Risk of Electric Shock.

Disconnect the power supply before making electrical connections to avoid electric shock.

Mise En Garde: Risque de décharge électrique. Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

IMPORTANT: Use copper conductors only. Make all wiring in accordance with local, national, and regional regulations. Do not exceed the FX22/FX62 Supervisory Controller's electrical ratings.

IMPORTANT: To reduce the risk of fire or electrical shock, install in a controlled environment relatively free of contaminants.

IMPORTANT: Use this FX22/FX62 Supervisory Controller only as an operating control. Where failure or malfunction of the FX22/FX62 could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into 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 FX22/FX62.

NiMH Battery Precautions

IMPORTANT: Overcharging, short circuiting, reverse charging, mutilation, or incineration of the cells and the batteries must be avoided to prevent one or more of the following occurrences: Release of toxic materials, release of hydrogen and/or oxygen gas, rise in surface temperature.

IMPORTANT: If a cell or battery has leaked or vented, replace it immediately using protective gloves.

IMPORTANT: If and when necessary, these cells or batteries must be replaced with identical new ones from the same manufacturer. If a cell or a battery to be replaced is connected with other cells or batteries in series, it is recommended that the other cells or batteries be replaced with new ones at the same time.

IMPORTANT: Reverse polarity installation of the cell or the battery in the end product must be avoided.

Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within the FX22/FX62 is 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.

Accessories

Standard accessories for the FX22/FX62 are listed in Table 1. See [About Option Cards](#) on page 9 for information on custom option cards.

Table 1: Standard Accessories for FX22/FX62 Supervisory Controllers

Part Number	Description
LP-FXGPRSE-0	6.56 ft (2 m) SMA-type coax extension cable, with mounting bracket. See Figure 8 and Figure 9.
LP-KITFX2DB-0	Adapter, RJ-45 to DB-9 null modem, for onboard RS-232 serial port to connect to DTE device.

Mounting

Perform these actions before mounting the FX22/FX62 Supervisory Controller:

- Remove any wiring knockouts needed. See [Locate and Remove the Chassis Knockouts](#) on page 6.
- Install the SIM card for the integral GPRS modem (if applicable). See [Insert the SIM Card and Attach the GPRS Antenna](#) on page 7.
- Install any option card (if applicable). See [About Option Cards](#) on page 9.

Mount the FX22/FX62 Supervisory Controller in a location that allows clearance for wiring, servicing, and removal of covers.

For proper cooling, mount the FX22/FX62 Supervisory Controller vertically, with the two screw mounting tabs at the bottom of the unit. It is not necessary to remove the covers before mounting.

Location Considerations

This product is intended for indoor use only. Do not expose the FX22/FX62 Supervisory Controller to ambient conditions outside the range of 0 to 50°C (32 to 122°F), or relative humidity outside the range of 5 to 90% at 25°C (77°F), noncondensing.

If mounting inside an enclosure, the enclosure should be designed to keep the FX22/FX62 Supervisory Controller within its required operating range considering a 20-watt dissipation by the FX22/FX62 Supervisory Controller, plus dissipation from any other devices installed in the same enclosure. Maintaining the proper operating ambient conditions is especially important if the FX22/FX62 Supervisory Controller is mounted inside an enclosure with other heat-producing equipment.

Do not mount the FX22/FX62 Supervisory Controller:

- 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 contractors, electrical machinery, welding equipment, spark igniters, and variable frequency drives.

Physical Mounting

For proper cooling, mount the FX22/FX62 Supervisory Controller **vertically**, with the two screw mounting tabs at the bottom of the unit. It is not necessary to remove the covers before mounting.

Dimensions of the rear keyhole slot and lower mounting tabs are shown in Figure 2 and Figure 3, along with a step-by-step wall-mounting procedure.

Install one panhead screw (intended for the rear keyhole slot) into the wall first, then hang the supervisory controller on that screw. Then use screws in the two lower tabs to secure the supervisory controller to the wall (see Figure 2 and Figure 3).

1. For the rear center keyhole slot, install a pan head screw into the wall. Do not tighten completely—leave the back of the screw head about 3/32 in. (2.4 mm) from the wall (see 1b in Figure 3).

2. Position the FX22/FX62 Supervisory Controller over the screw, so the screw head enters the keyhole slot in the back of the supervisory controller. Press the supervisory controller against the wall, and slide the supervisory controller down so the screw is captured by the slot (see 2b in Figure 3).
3. Level the unit, and install a screw into each of the two lower mounting tabs (see 3 in Figure 3).

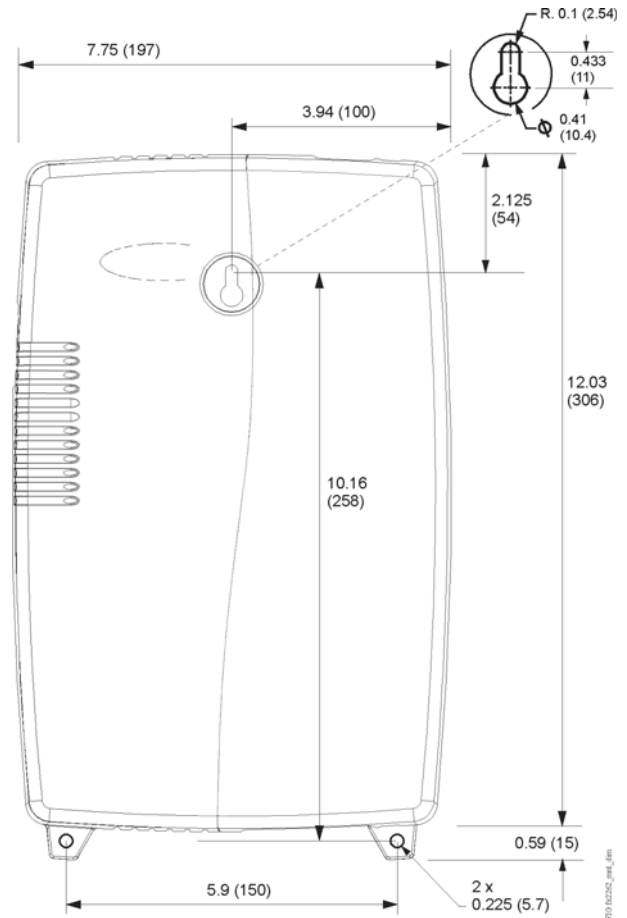


Figure 2: FX22/FX62 Mounting Dimensions, in. (mm)

4. Lift the left cover away from the supervisory controller, and set aside. Replace by reversing this procedure.

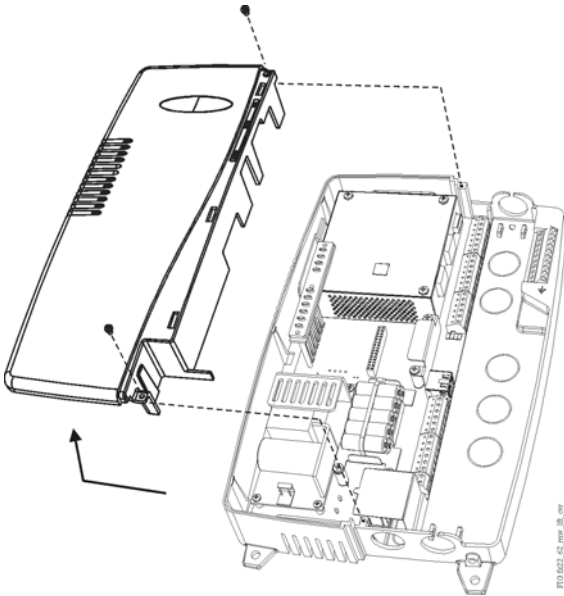


Figure 5: Remove the Left Cover

Locate and Remove the Chassis Knockouts

The FX22/FX62 has six wiring knockouts on the back of the plastic chassis (see Figure 6):

- Five round knockouts for general wiring of supervisory controller terminals and I/O points (0.945 in. [24 mm] diameter).
- One oval knockout for wiring 24 V input power and ground (0.46 in. x 1.25 in. [31.7 mm x 11.7 mm]).

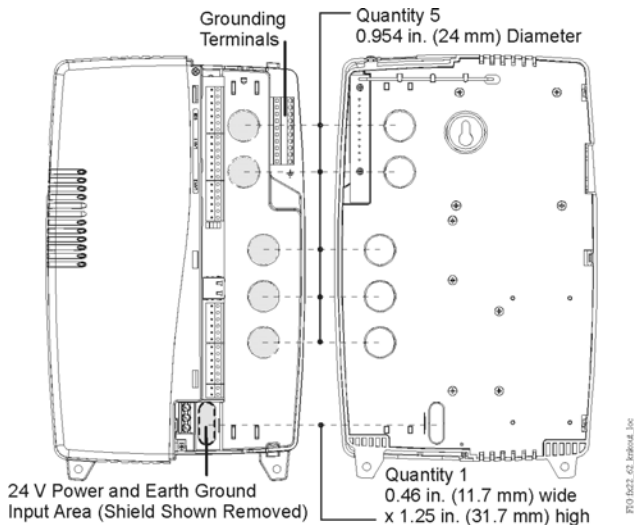


Figure 6: Chassis Knockout Locations

Note: In addition to the chassis knockouts, there are two wiring holes for general wiring, 0.845 in. (21.5 mm). One hole is on the top, and one hole is on the bottom. The top hole has an associated U-shaped knockout on top of the right cover. An additional wiring hole is at the bottom, 0.865 in. (22 mm), available for wiring 24 V input power and ground. Usage of wiring knockouts and holes vary depending on your installation.

Remove the appropriate knockouts, as needed, before mounting to the wall. Note that the shielded 24 V power input wiring area has a hole on the bottom side, as well as an oval-shaped knockout on the rear of the chassis. If necessary, install any conduit or cable clamps to the knockout holes.

To remove a rear knockout:

1. Hold the supervisory controller with its knockout side on a flat work surface (see 1a in Figure 7).
2. From the back, wedge a straight-blade screwdriver into the knockout edge and pry open the knockout (see 1b in Figure 7).
3. Remove the right-side cover (see [Removing and Replacing the Covers](#) on page 5). Press up each opened knockout with your finger and thumb (see 2 in Figure 7), then twist and remove.

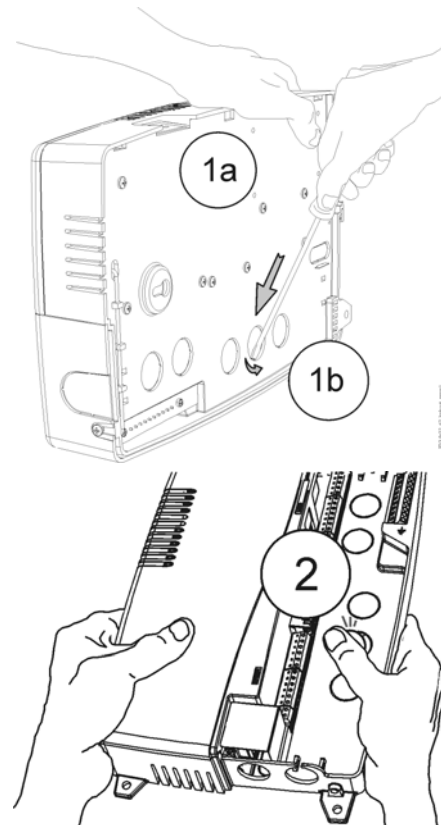


Figure 7: Remove Chassis Knockouts

Insert the SIM Card and Attach the GPRS Antenna

For FX22/FX62 ordered with the integral GPRS modem, you must insert a SIM card in its SIM card socket for GPRS operation. You must remove both covers to access the socket. Insert the SIM card before mounting the supervisory controller.

For information on configuring and installing the GPRS modem, refer to the *FX GPRS Modem Technical Bulletin (LIT-12011639)* and the *FX GPRS Modem Installation Instructions (Part No. 24-10564-25)*.

Note: FX22/FX62 ordered without the integral GPRS modem do not have the circuit board with the SIM card socket installed in the supervisory controller. In this case, the small circuit board in the included hardware bag is not used. If the small circuit board is not used, you may safely discard the board and skip the rest of this section.

Note: The lower antenna jack is for the integral GPRS modem, where the antenna attaches using a standard SubMiniature version A (SMA) coax connector. The GPRS antenna is **not** interchangeable with the upper antenna jack (future use), which uses a reverse polarity SMA connector.

1. Remove both covers (see [Removing and Replacing the Covers](#) on page 5).
2. Locate the SIM card socket near the upper left corner of the supervisory controller, above the LEDs (Figure 8).
3. Orient the SIM card with its angled corner up, foil connectors facing the socket, writing side towards the metal shield (as shown in Figure 8), and slide the card down into the socket connector.

4. Replace the left cover, then the right cover (see [Removing and Replacing the Covers](#) on page 5).

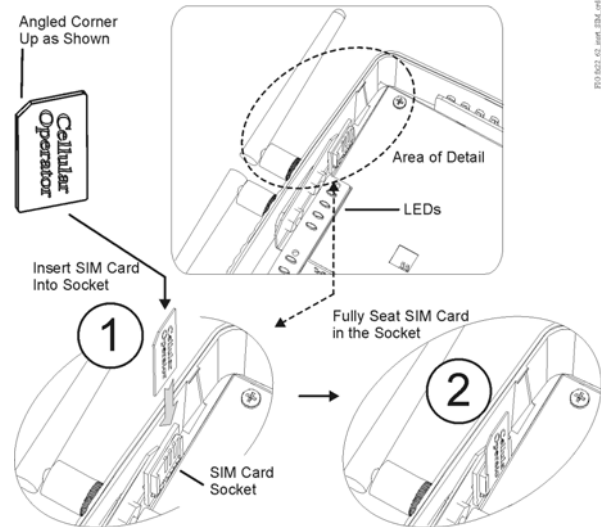


Figure 8: Insert SIM Card

5. Insert the GPRS antenna into the SMA coax jack on the left side (lower jack) and finger tighten the knurled nut (Figure 9).

Note: You can order an optional GPRS antenna extension kit (LP-FXGPRSE-0, includes cable and antenna bracket) that allows you to mount the GPRS antenna up to 6.5 ft (2 m) away from the supervisory controller.

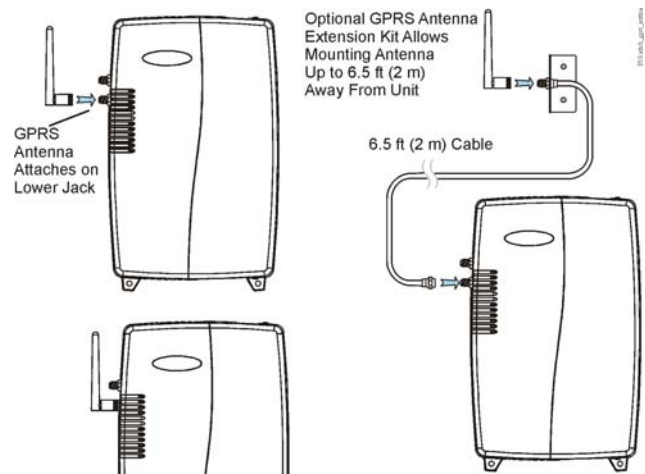


Figure 9: Attach GPRS Antenna

Figure 10 shows the location of the option card slot, LEDs, I/O terminals, communications ports, and other supervisory controller features. For a side view of communications ports and other features, see Figure 19.



About Expansion Options

The FX22/FX62 provides for field-installable expansion with these options:

- Option card—Install the options card on connectors inside the supervisory controller's base unit. See [About Option Cards](#) on page 9.
- Remote I/O modules—Remote I/O modules are wired to the supervisory controller's 6-pin RS-485/Power connector. See [About Remote I/O Modules](#) on page 10.

About Option Cards

The FX22/FX62 has one available option slot to accept a custom option card, from among the FX22/FX62 Series options cards (30-pin, 2-row connector). See Figure 10. We recommend you install an option card before mounting the controller. See [Installing an Option Card](#) on page 10.

See Table 2 for a list of supported models of communications option cards for the FX22/FX62.

Table 2: FX22/FX62 Supervisory Controller Option Cards

Order Codes	Description	Notes
LP-FXLONFTT-1	FTT-10A LONWORKS adapter with a 2-position removable screw-terminal connector plug.	Port operates in the hosted station as LON1 .
LP-FXRS485-0	Dual, optically-isolated, RS-485 adapter with two 3-position removable screw-terminal connector plugs.	Ports operate in the hosted station as COM7 and COM8 .
LP-FXRS232-0	Single port RS-232 adapter, with a DB-9M connector. Uses its own onboard Universal Asynchronous Receiver/Transmitter (UART). Supports baud rates up to 115,200.	Port operates in the hosted station as COM7 .
LP-FXMDM-0	56 Kbps Auto-dial/Auto-answer Modem with one RJ-11 connector for phone line. Note: This option is not supported if the supervisory controller has the integral GPRS modem.	Operates as COM1 . This disables the RS-232 base serial port (RJ-45 connector) on the FX22/FX62 Supervisory Controller during normal operation. Note: If the dialup modem option card (LP-FXMDM-0) is installed, and the mode jumper (see Figure 10) is put in Serial Shell position, the supervisory controller's base RS-232 port becomes active immediately following a reboot. This allows an RS-232 connection to the serial shell for debugging purposes. To re-enable the modem, you must put the mode jumper back in the Normal position, and reboot the supervisory controller.
LP-FXGPRSU-0	GSM cellular modem card using GPRS with onboard socket for SIM card, and a Wyleless™ SIM. Kit includes a coax cable and an external antenna with bracket. Note: This option is not supported if the unit has the integral GPRS modem.	In general, we recommend that you order a LP-FX2213T-0 or LP-FX6213T-0 with the onboard GPRS modem over installing this GPRS modem option card kit.
LP-FXWTC-0	Wireless TEC Option Card includes option card, mounting bracket, and direct-mount antenna.	Operates as COM1, thus disabling the internal RS-232 port. You may need a TEC20-RA-1, remote antenna.
LP-FXSED-0	Sedona Framework™ option card with both wireless IPv6 over LoW Power Wireless Area Networks (6LoWPAN) and wired RS-485 port, based on the Jennic JN5139 wireless microcontroller. Includes stub antenna.	Port operates in the hosted station as COM7 .

Installing an Option Card

For complete details, see the mounting and wiring instructions document that accompany the specific option card. The following procedure provides a basic set of steps.

IMPORTANT: Power to the supervisory controller must be OFF, and all LEDs not illuminated when installing or removing an option card, or else damage occurs. Be sure to properly align pins when plugging an option card into the connector.

1. Remove power from the supervisory controller and wait for all LEDs to turn off.
2. Remove both covers. See *Removing and Replacing the Covers* on page 5.
3. Locate and remove the blanking plate for the option slot (see Figure 10). Retain the blanking plate in case you remove the option card at a later date.
4. Carefully insert the pins of the option card into the socket headers of the option card slot. Be sure the mounting holes on the option board line up with the standoffs on the base board. Press the option card into the option slot until the card is completely seated.
5. Place the custom end plate that came with the option card over the connector(s) of the option card.

6. With the mounting holes aligned with the standoffs, place the two screws through the end plate, and into the standoffs on the supervisory controller's base board. Use a screwdriver to hand tighten these screws.
7. Replace both covers on the supervisory controller.

About Remote I/O Modules

The FX22/FX62 has an integral 6-pin connector to support remote I/O modules. The connector provides both 15 VDC power and RS-485 communications to modules on a connected trunk, and is located below the 6-position Digital Output I/O connector (see Figure 10).

Each remote I/O module has a DIN-mount base, and provides two 6-pin connectors that allow you to chain multiple modules together into one assembly. See Table 3 for a list of currently available modules.

Note: The maximum number of FXRIO16 modules supported by the FX22/FX62 are:

- FX22—3 maximum FXRIO16 modules
- FX62—15 maximum FXRIO16 modules

Note: The actual maximum number of supported FXRIO16 modules may be less, as resource usage varies with each application database.

For more information on installing remote I/O modules, refer to the *FX RIO16 Input/Output Module Installation Instructions* (Part No. 24-10564-41).

Table 3: Remote I/O Modules Compatible with the FX22/FX62 Supervisory Controllers

Model	Description	Point Types
LP-FXRIO16-0	Remote I/O RS-485 Module DIN-mountable RS-485 comm module that provides 16 points I/O.	Provides the following I/O points: <ul style="list-style-type: none">• 8 - Universal Inputs (UIs).• 4 - Digital Outputs (DOs), Single-Pole, Single-Throw (SPST) relay type.• 4 - Analog Outputs (AOs), 0–10 VDC type. Wiring is covered in a separate document. Refer to the <i>FX RIO16 Input/Output Module Installation Instructions</i> (Part No. 24-10564-41).

Wiring

See Figure 10 to locate connectors and other components on the supervisory controller.

Make connections to the supervisory controller in the following order.

1. Install any option card (LONWORKS, RS-485, RS-232) in the available option card slot. See [Installing an Option Card](#) on page 10 for general procedures. For complete details, refer to the specific documentation that accompanied the option card.
2. If applicable, insert the SIM card for the supervisory controller's GPRS modem, and attach the GPRS antenna, if not already attached (see [Insert the SIM Card and Attach the GPRS Antenna](#) on page 7).
3. Mount the supervisory controller and wire earth ground and 24 V power (circuit de-energized). See [Earth Ground and 24 V Input Power](#) on page 11.
4. Wire I/O points to the supervisory controller's I/O terminals and earth ground terminal strip (for cable shield wires). See [I/O Wiring](#) on page 12.
5. Connect communications cables. See [Communications Wiring](#) on page 15 for communication ports. For ports on any installed option board (LONWORKS, RS-485, RS-232, modem), see the specific mounting and wiring guide for any additional details.
6. Apply power to the unit. See [Powerup and Initial Checkout](#) on page 18.

Earth Ground and 24 V Input Power

After mounting the supervisory controller, wire earth ground and 24 VAC or 24 VDC to the terminals under the power input shield.

Note: If powering from a 24 V transformer, do not power any other equipment with the transformer. Doing so may cause conducted noise problems. Also, do not ground either side of the transformer's 24 V secondary.



CAUTION: Risk of Electric Shock.

Disconnect the power supply before making electrical connections to avoid electric shock.

Note: This device has no power on switch. See [Powerup and Initial Checkout](#) on page 18.

1. If not already removed, remove the right cover. See [Removing and Replacing the Covers](#) on page 5.
2. Remove the shield over the 3-position terminal block (see Figure 11, left side) and carefully set the shield aside.
3. Route 24 V power and ground wiring through the rear (oval) knockout, **or** through the hole directly below the 3-position terminal block.
 - a. Wire nearby earth ground to the **G** (ground) terminal, using 14 AWG or larger wire.
 - b. Wire 24 V power to the **N** (neutral) and **L** (line) terminals.
4. Replace the shield over the 3-position terminal block. If wiring is through the back oval knockout, install an end plug into the hole below the terminal block.
5. Replace the right cover when finished with all wiring.

Note: After connecting earth ground to the **G** terminal, earth ground is available on the 10-position grounding terminal strip, located near the top of the wiring area (see Figure 10). Use this 10-position strip for terminating the shield (drain) wire on shielded cables that connect I/O sensors and remote communications ports.

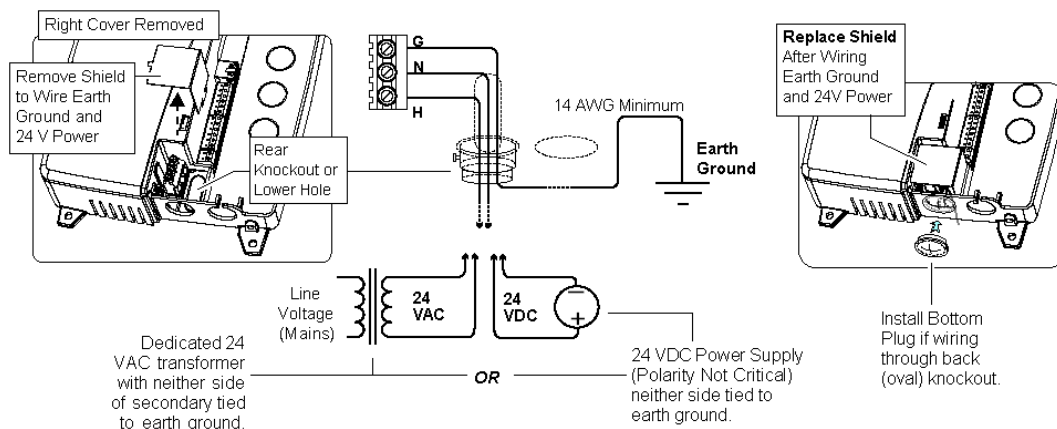


Figure 11: Earth Ground and 24 V Input Power Wiring

I/O Wiring

The FX22/FX62 has 16 on-board I/O points that include:

- Eight Universal Inputs that support analog inputs (temperature, resistance, voltage, and current) and digital inputs (contact closure, pulse count).

- Eight Outputs that include:

- four analog outputs (0–10 VDC)
- four relay digital outputs (24 VAC/VDC, 0.5 A maximum)

See Figure 12 for location of I/O terminals.

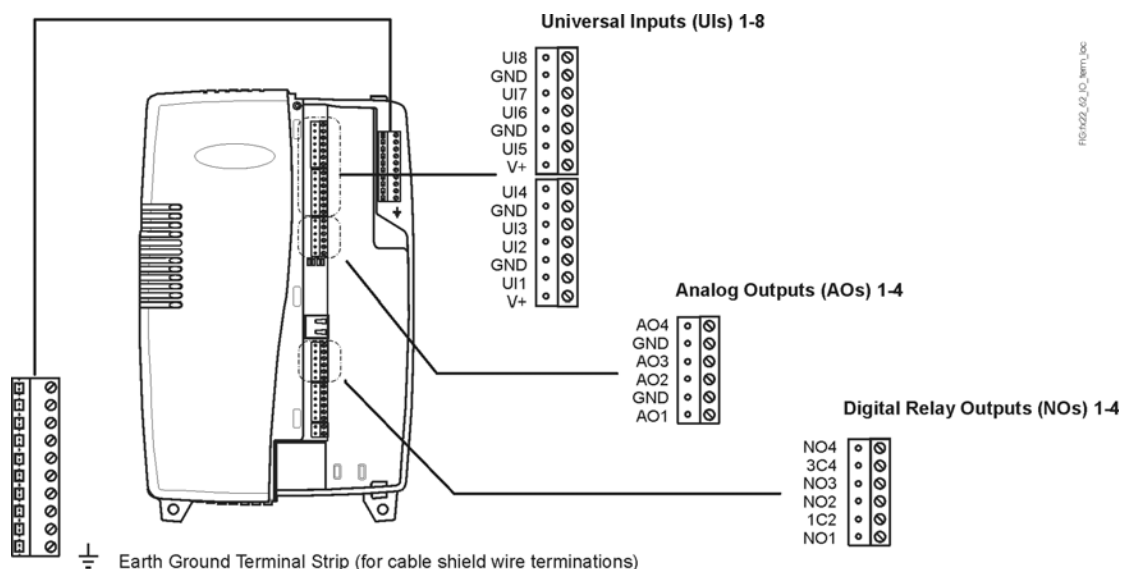


Figure 12: I/O Terminal Locations

Inputs

Each of the eight Universal Inputs (UIs) can support any one of the following input types:

- Type-3 10k ohm Thermistor (also see the Important statement for Resistive 0–100k Ohms)
- Resistive 0–100k ohms

- 0–10 VDC
- 4–20 mA
- Binary Input (BI) (Contacts or Pulse)

Thermistor

Inputs support 10k Thermistor temperature sensors. Input accuracy is $\pm 1\%$ of span. By default, conversion is for a standard Type 3 thermistor sensor, with a sensor range of -10 to 135°F (23.3 to 57.2°C). Use a conversion type of Tabular Thermistor to specify a different thermistor response curve, by importing a thermistor curve .xml file. Currently, the **kitlo** module contains an xml folder with thermistor curves for various thermistor temperature sensors. You can also edit and export (for reuse) customized thermistor curve xml files. Refer to the *Niagara^{AX} NRIO Guide* for details (in the docs folder in FX Workbench).

Figure 13 shows the wiring diagram for a Thermistor sensor.

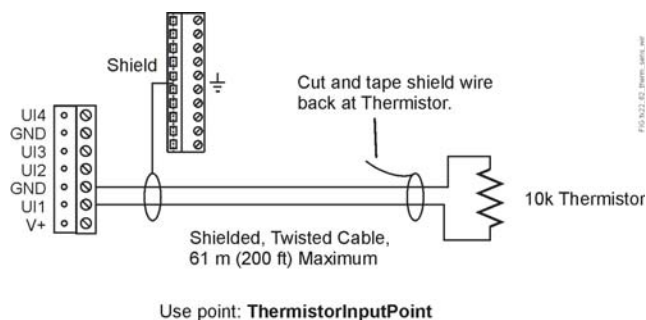


Figure 13: Thermistor Sensor Wiring

Resistive 0–100k Ohms

Inputs can read a resistive signal within a range from 0 to 100,000 ohms. Wiring is the same as shown for a Thermistor temperature sensor (Figure 13). Resistive signals require a **ResistiveInputPoint**.

IMPORTANT: UI inputs provide optimum resistive-to-temperature resolution in the 10k ohm range. For a sensor with a range far from 10k ohms (such as a 100-ohm or 1000-ohm sensor), resolution is unusable. To successfully use such a sensor, install a transmitter that produces a VDC or mA signal, and then wire the transmitter to the UI according to the 0–10 VDC or 4–20 mA instructions.

0–10 VDC

Inputs support self-powered 0–10 VDC sensors. Input impedance is greater than 5k ohms. 0–10 V accuracy is $\pm 2\%$ of span, without user calibration. Figure 14 shows the wiring diagram for a 0–10 VDC sensor.

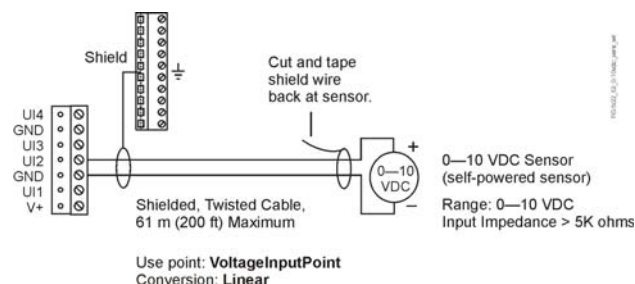


Figure 14: 0–10 VDC Sensor Wiring

4–20 mA

Inputs support self-powered or supervisory controller-powered 4–20 mA sensors. The input requires an external 499-ohm resistor for current input (four resistors are supplied). For supervisory controller-powered sensors, the supervisory controller's two V+ terminals supply 24 VDC, at up to 80 mA combined. Input accuracy is $\pm 2\%$ of span, without user calibration.

Figure 15 shows wiring used for a 4–20 mA self-powered sensor (top) and a 2-wire supervisory controller-powered sensor (bottom).

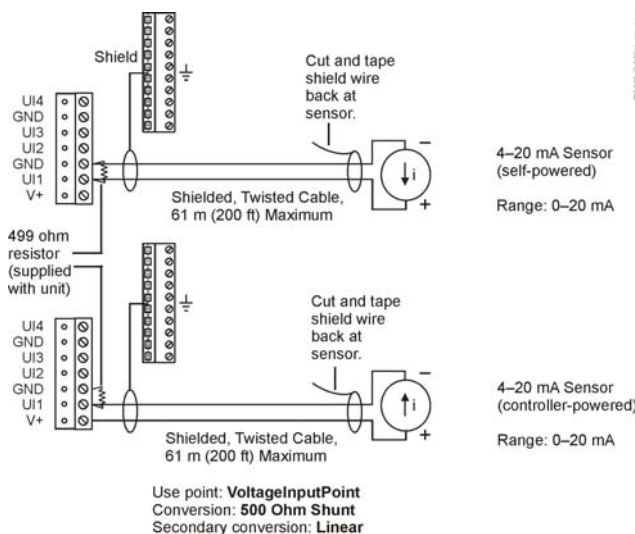


Figure 15: 4 to 20 mA Sensor Wiring

Note: A 4–20 mA sensor requires a **VoltageInputPoint**, using conversion type **500 Ohm Shunt**, and secondary conversion type **Linear**.

Binary Input

Inputs support both pulse contacts and normal dry (equipment status) contacts.

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

Note: Minimum dwell time must be > 25 ms. (Contacts must remain open at least 25 ms and be closed at least 25 ms.)

- **Standard Dry contacts** must have a 1 Hz (or less) COS frequency, with minimum dwell time > 500 ms. (Contacts must remain open at least 500 ms and be closed at least 500 ms.)

Note: Both types of dry contacts support 3.3 VDC open circuits or 330 μ A short circuit current.

Figure 16 shows the wiring diagram for binary input wiring.

- For a pulse contact, use the **CounterInputPoint** in the station database.
- For other dry contacts, use the **BooleanInputPoint**.

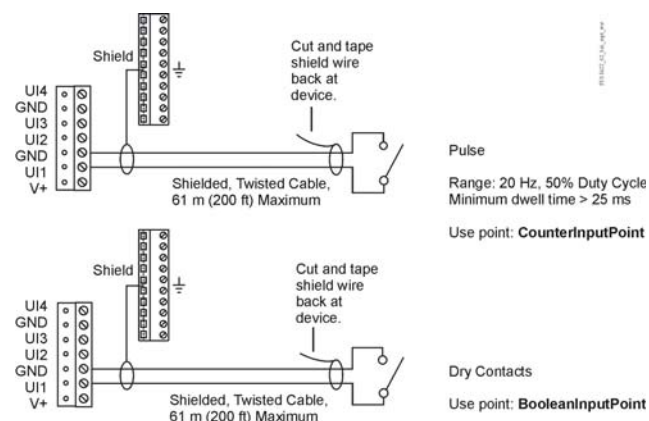


Figure 16: Binary Input Wiring

Outputs

The FX22/FX62 has four 0–10 V Analog Outputs and four digital Relay Outputs. See Figure 12 for location of the output terminals.

Analog Outputs

Analog Outputs (AOs) are referenced by the terminals labeled **An** and **GND** (ground). Each AO can supply a maximum of 4 mA over the entire 0 to 10 VDC range. The minimum input impedance of a device controlled by an AO must be greater than 2,500 ohms. Typical wiring for an AO is shown in Figure 17.

For each AO, use **VoltageOutputWritable** in the station database.

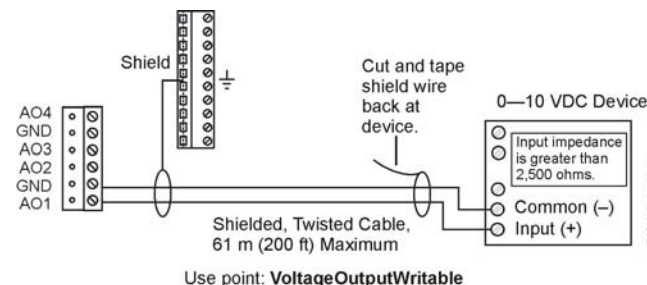


Figure 17: Analog Output Wiring

Relay Outputs

Each relay output is rated at 24 VAC or VDC at 0.5 A. Relay outputs have Metal Oxide Varistor (MOV) suppressors to support inductive type loads such as heavy duty relay coils.



CAUTION: Risk of Property Damage.

Ensure that the power source conforms to the requirements of the equipment. Failure to use a correct power source may result in permanent damage to the equipment.

IMPORTANT: Relays are not rated for AC mains (line level) powered loads—instead, 24 V at 0.5 A is the maximum. Use an external 24 V transformer or a 24 VDC power supply to power loads.

Use a **RelayOutputWritable** in the station for each output. Figure 18 shows an example Relay Output wiring diagram.

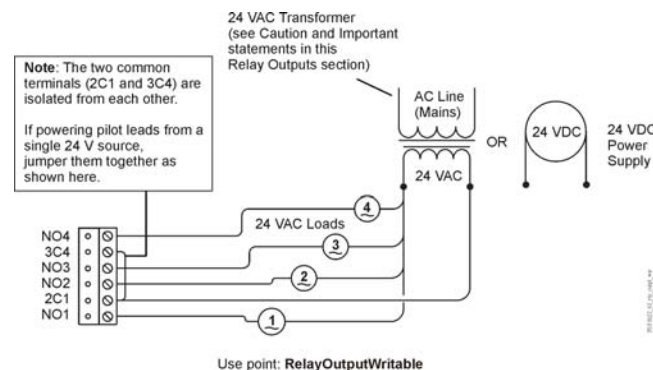


Figure 18: Relay Output Wiring

Note: The two common DO terminals (2C1, 3C4) are isolated from each other. This is useful when loads 1 and 2 are powered from a different circuit/source than loads 3 and 4.

An LED status indicator for each relay output (K1–K4) is visible on the left cover, and also on the board. Under normal operation, an On status indicates that the load is powered. See [About LEDs](#) on page 20 for more details.

Nrio16Module (Software) Representation

In the station interface to the LP-FX22xx and LP-FX62xx, the FX22/FX62 supervisory controller's onboard I/O is modeled in the station's **M2mIoNetwork** (copied from the **nrio** palette), under a child **Nrio16Module** device level component. This **Nrio16Module** has a default name of **LocalIo16**.

If there are no remote I/O modules (LP-FXRIO16-0), this is the only Nrio network needed in the station.

The **M2mIoNetwork** has a fixed Port Name property of COM3, and a Trunk property of 1.

If any remote I/O modules are connected to the FX22/FX62 RS-485 port, the station needs an additional NrioNetwork, with a Port Name property of COM2, and Trunk property of 2. For more details, refer to the *Niagara^{AX} NRIO Guide* (in the docs folder in FX Workbench). For wiring details, see [Wiring to Remote I/O Modules](#) on page 18. Note that a maximum of three LP-FXRIO16-0 modules is recommended, due to platform resource considerations.

After remote I/O modules are discovered and added to the station under this separate NrioNetwork (each one as an **Nrio16Module**), the serial status LEDs for the supervisory controller's RS-485 port (S2TX, S2RX) continually flash, reflecting polling activity. See [About LEDs](#) on page 20 for more details. Also, the STATUS LED on each remote I/O module lights solid green.

Note: Any time a remote I/O module's status LED is not lit solid green, all of its outputs are in failsafe state (all relay outputs OFF, and all AOs are at a 0-volt level). Blinking of a remote I/O module's status LED occurs for two reasons, shown at different rates:

- Rapid flash (low duty cycle), meaning the unit is unconfigured. Discovery and addition to the station database is required.
- Equal time on and off (50% duty cycle), meaning the unit is configured, but currently offline with the FX22/FX62. Check RS-485 wiring between the controller and remote I/O module.

For both local and remote I/O, each input or output used requires a special Niagara Remote Input/Output (Nrio) point to be added in the station database. These components act as the station interface to the physical I/O points. The Nrio points you need for each input or output type are noted in previous wiring sections in boldface.

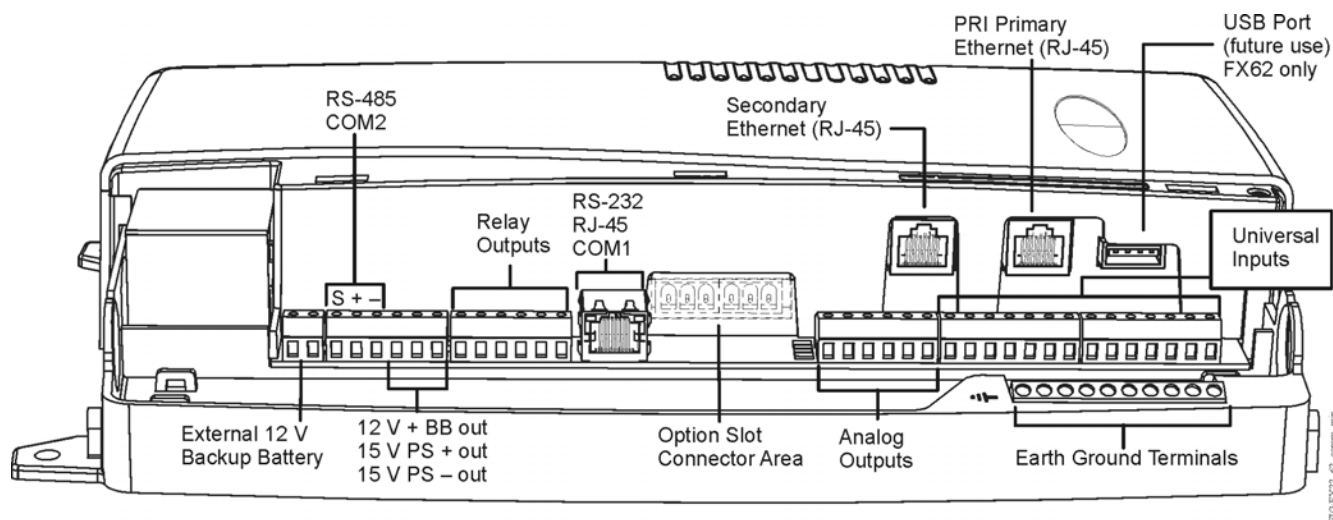
For Nrio software details, see the *Niagara^{AX} NRIO Guide* in Workbench online *Help*, or the PDF in the docs folder in FX Workbench.

Communications Wiring

Communications ports on the supervisory controller board, accessible with the right cover removed (Figure 19). Communications port types include:

- Ethernet
- Serial

Note: Prior to connecting cables, provide strain relief to prevent damage to the supervisory controller.



**Figure 19: Communications Wiring
(Right Side Cover Removed)**

Ethernet

Two female 10/100 mega bits per second (Mbps) Ethernet connections are provided on the supervisory controller. These Ethernet connections are RJ-45 connectors labeled **PRI** and **SEC**. Use a standard Ethernet patch cable for connecting to a hub or Ethernet switch.

The supervisory controller's factory default Internet Protocol (IP) address for PRI (LAN1) is **192.168.1.149**, and the subnet mask is 255.255.255.0.

By default, SEC (LAN2) on the supervisory controller is disabled.

IMPORTANT: Typically, you only use PRI (primary port), unless you have a specific application for isolating a driver's network traffic to a separate LAN, using SEC. Do not use SEC as the primary port.

Serial

There are two RS serial ports on the FX22/FX62 base board. Each has a UART capable of operation up to 115,200 baud.

- An RS-232 port uses an RJ-45 socket connector, and operates as COM1.
- An isolated RS-485 port is on three terminals of a 6-position screw-terminal connector, and operates as COM2 (by default).

Note: An additional serial port may be added with an option card in Option Slot 1, such as an LP-FXRS232-0 card (port operates as COM7) or LP-FXRS485-0. This option adds two serial ports, which operate in the supervisory controller as COM7 and COM8.

Note: If a dialup modem option card (LP-FXMDM-0) is installed in the FX22/FX62, the onboard RS-232 port is disabled, and the modem operates as COM1. This option card is not supported if the FX22/FX62 is equipped with the onboard GPRS modem.

RS-232

You can make RS-232 serial port connections to the female (socket) RJ-45 connectors using an 8-conductor flat silver satin stranded cable with standard male (plug) RJ-45 connectors. Connect the flat satin cable (maximum distance 50 ft [15.24 m]) 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.

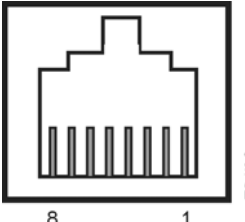
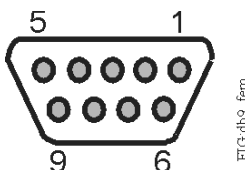
The supervisory controller is a serial Data Terminal Equipment (DTE) device; another DTE device (a computer, for example) requires a null modem adapter (LP-KITFX2DB-0, optional item). If connecting the supervisory controller to a Data Circuit Terminating Equipment (DCE) device (a modem, for example), you can use a straight through adapter. Table 4 provides pinouts for both types of RJ-45 to DB-9 adapters.

Note: Silver satin cable is not standard Ethernet Unshielded Twisted Pair (UTP) cable, in which the pairs are twisted around each other. The twisting of the pairs may cause undesirable effects on serial communications; therefore, we recommend the use of flat silver satin cable instead. Flat silver satin cable is unshielded. If installing flat silver satin cable in a noisy electrical environment, run the cable through conduit.

Note: If you need a temporary serial shell connection from your computer to the supervisory controller, and you have the necessary RJ-45 to DB-9 null modem adapter (LP-KITFX2DB-0), but you have no silver satin cable, you can substitute an ordinary Ethernet patch cable. However, using silver satin cable is recommended for any permanent RS-232 connection.

Note: If the supervisory controller reboots with the mode jumper in the Serial Shell position (see Figure 10), the RS-232 port provides system shell access. If a dialup modem option card (LP-FXMDM-0) is installed, this modem is disabled during this serial shell access. LP-FXMDM-0 operation resumes only after putting the mode jumper back to the Normal position, and then rebooting the supervisory controller.

Table 4: 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-KITFX2DB-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 supervisory controller		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 supervisory controller		9

RS-485

An RS-485, optically isolated port is available on three pins of a 6-position connector, and operates by default as COM2. As shown in Figure 19, the screw terminals are minus (–), plus (+), and shield. Wire in a continuous multidrop fashion to other RS-485 devices, meaning minus-to-minus, plus-to-plus, and shield-to-shield. Connect the shield-to-earth ground at one end only, such as at the FX22/FX62 Supervisory Controller. For wiring to one or more remote I/O modules (LP-FXRIO16-0), see [Wiring to Remote I/O Modules](#) on page 18.

External 12 V Backup Battery

The FX22/FX62 Supervisory Controller provides a 2-position connector for support of an external 12 V Sealed Lead Acid (SLA) rechargeable battery. Usage is optional. For more details, see [Battery Backup](#) on page 19.

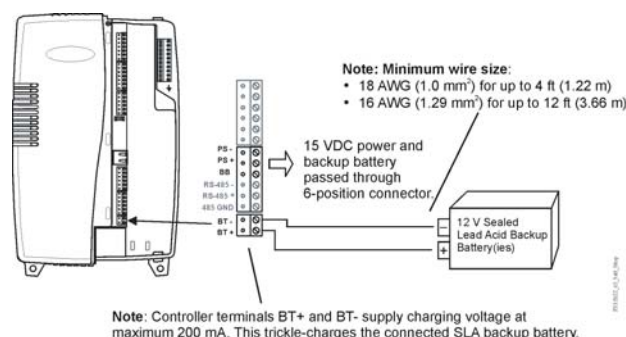


Figure 20: External 12 V Battery Backup

Wiring to Remote I/O Modules

Wiring to remote I/O modules (LP-FXRIO16-0) typically provides both 15 VDC power and 12 V battery backup to the modules, along with RS-485 communications (Figure 21).

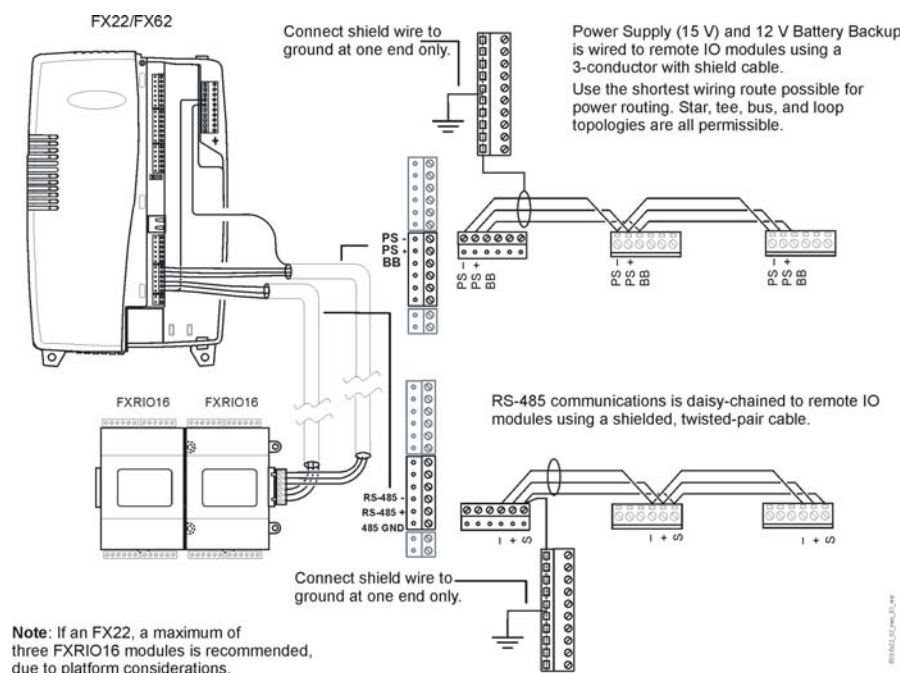


Figure 21: Wiring to Remote I/O Modules

Setup and Adjustments

Default Communication and Login Properties

The new FX22/FX62 is preconfigured with default properties as defined in Table 5.

Table 5: FX70 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

Operation

Powerup and Initial Checkout

Complete all mounting and wiring procedures (I/O Wiring, Communications Wiring, External 12 V Backup Battery, Wiring to Remote I/O Modules), then perform the following:

- Apply power.

- Check status LEDs.

Note: Also see [About the Backup Batteries](#) on page 19.

Apply Power



CAUTION: Risk of Property Damage.

Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

IMPORTANT: The FX22/FX62 Supervisory Controllers do not include an on/off switch. To apply power, energize the 24 VAC transformer (or 24 VDC power supply) wired to its 3-position power input terminals.

If remote I/O modules are wired to the unit, they are also typically powered by the controller as well.

Check the Status LEDs

See Figure 22 for a description of the status LEDs.

When power is applied, the green STATUS LED lights (top LED). The STATUS LED indicates that the system is OK and that power is applied. Once the supervisory controller boots, the yellow BEAT (heartbeat) LED begins a steady blink, with a typical rate of about once per second (1 Hz). The BEAT LED begins blinking within 30 seconds after power is applied.

If after applying power, and the STATUS LED goes out, or if the yellow BEAT LED comes on (steady) and stays lit longer than 2 minutes, contact your technical support representative for assistance. See [About LEDs](#) on page 20 for more information about the LEDs.

About the Backup Batteries

The FX22/FX62 can have two different backup batteries:

- The standard onboard NiMH battery pack.
- An optional, external, sealed lead acid rechargeable backup battery (or batteries).

For continuous system operation during loss of primary AC power (unless power is lost for only a few seconds), both backup batteries should be installed. Station alarms are generated if either battery is uncharged or unable to hold a sufficient charge, as well as whenever primary power is lost. Always investigate any alarm related to backup batteries.

NiMH Battery Pack

Note: See the [NiMH Battery Precautions](#) on page 21.

A custom 10-cell NiMH battery pack is mounted inside the FX22/FX62, under the cover, on top of a metal shield plate (see Figure 2). This battery allows the supervisory controller to continue station operation (only) through very short power interruptions (a few seconds in duration). If a longer outage occurs, the NiMH battery provides enough run time for the supervisory controller to backup data, and then shutdown. Typically, this process takes about 1 minute. Shutdown occurs automatically, after data is backed up to the onboard flash memory.

Upon startup (boot), a test of the NiMH battery is performed. A system alarm is generated if the NiMH battery voltage level is found to be bad. A charge is also initiated upon startup, which lasts from 3 hours minimum, and up to 18 hours if the battery is completely discharged.

During this NiMH battery charge period, neither the NiMH battery or the external backup battery (if installed) is tested. After the startup NiMH charge period, a periodic test occurs of the NiMH battery (and the backup battery, if the supervisory controller platform is so configured). The appropriate battery alarm is generated if either battery is found to be bad.

Note: If the last NiMH battery test was bad, upon loss of primary power, the FX22/FX62 performs an immediate shutdown, backing up data and powering off (including attached expansion modules).

Note: A NiMH battery characteristic is to lose charge if not left in charge mode (trickle charge). Leaving the battery unconnected, or in the unit powered off causes the battery to fully discharge in a matter of weeks. Note that in the case of a new FX22/FX62, it ships from the factory with a completely discharged battery. Therefore, allow at least 18 hours for the battery to charge if it has not been in a powered unit.

Replace the NiMH battery pack every three years, or more often if the supervisory controller is in a high temperature environment. For more information on the use and replacement of the battery, refer to [Required NiMH Battery Maintenance](#) on page 21.

Battery Backup

The optional sealed lead acid backup battery is an external, 12 V, rechargeable battery (or multiple batteries) sized to operate the system during loss of primary power for an extended duration of time. The backup battery includes power to the FX22/FX62, as well as any attached remote I/O expansion modules.

Connect the backup battery to the supervisory controller using a 2-position connector (Figure 20). Whenever primary powered, the supervisory controller supplies a constant trickle charge to this battery, at 200 mA, maximum.

Note: Commonly used 12 V batteries for this application include 7 Ampere hour rechargeable (7Ahr) types, such as the Yuasa NP7-12 or Panasonic® LC-R127R2P1, or equivalents.

Providing the FX22/FX62 platform is so configured, at startup (boot), a test of the backup battery is performed, as well as a periodic test. (The periodic test is always performed. The startup test is selectable.) A system alarm is generated if a battery test finds the backup battery is bad. If the backup battery has a successful test, upon loss of primary power, the system operates from this backup battery power until the charge level of the onboard NiMH battery pack reaches 0. Note that both batteries discharge in parallel; however, as the sealed lead acid backup battery capacity is much greater, the NiMH battery pack discharges much slower than if these backup batteries were bad or not present.

Note: If the backup battery test was bad, upon loss of primary power, the FX22/FX62 performs an immediate shutdown, back up data and power off (including attached readers, expansion modules).

Replace the sealed lead acid backup batteries approximately every 3 years, or more often if the supervisory controller is in a high temperature environment.

About LEDs

The FX22/FX62 has a variety of LEDs, most of which are visible on the left cover. Figure 22 provides the LED locations and descriptions.

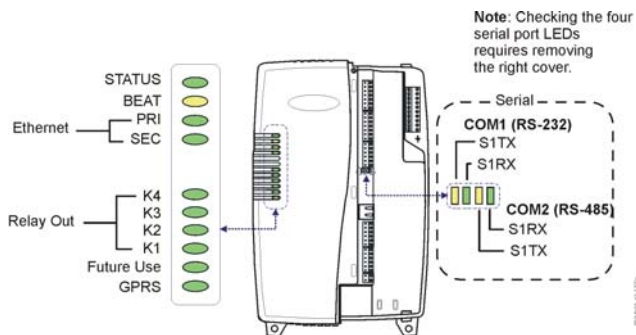


Figure 22: FX22/FX62 LED Descriptions

Status

The green STATUS LED is located on the cover. The status LED remains lit when the supervisory controller is powered, and blinks during the boot sequence. If the status LED does not light while power is applied, contact your technical support representative for assistance.

Beat

The yellow heartbeat BEAT LED is located on the cover. Following bootup, the heartbeat LED blinks about once per second. If the heartbeat LED stays on constantly, does not light, or blinks very fast (more than once per second), contact your technical support representative for assistance.

Ethernet

A green activity LED for each of the two Local Area Network (LAN) ports (**PR**imary for LAN1, **SEC**ondary for LAN2) is located on the cover under the STATUS and BEAT LEDs, and operate as follows.

- **Off**—No Ethernet link is made
- **On**—Ethernet link is made, but no data activity on the LAN
- **Blinking**—Ethernet link is made with data activity on the LAN

Relay Out

Each of the four relay outputs has an associated green LED on the cover, K4 to K1 (from top to bottom). Under normal operation, each digital status LED indicates activity as follows:

- **Off**—relay open/no current flows
- **On**—relay closed/load current flows

An **On** status indicates that the load is powered.

Future Use

This LED remains Off, without activity.

GPRS

The GPRS LED provides status of the onboard GPRS modem (for supervisory controller models so equipped), and is visible on the cover. It flashes various LED patterns based on the state of the modem. This LED is directly under control of the modem itself, not the Niagara^{AX} software.

Upon initial powerup, the GPRS LED pattern is typically 600 ms On/600 ms Off, and may change depending on various modem state changes. If the supervisory controller does not have the integral GPRS modem, this LED remains Off without activity.

Serial

LEDs for the two serial ports are located on the supervisory controller's main board, near the Analog Output terminals (Figure 22). Board markings **S1** and **S2** correspond to the software configuration of the COM1 and COM2 ports. LEDs show the transmit (TX) and receive (RX) activity for the two serial ports.

Remove the right cover to see the serial port LEDs. See [Removing and Replacing the Covers](#) on page 5.

- The yellow TX (transmit) LED indicates that the supervisory controller is sending data out the serial port over a communications line to a connected device.
- The green RX (receive) LED indicates that the supervisory controller is receiving data from a connected device.

These LEDs are on only when data is detected on the port. If the receive LED is on constantly, this indicates a problem with the communications channel, such as a shorted wire or reversed wiring.

Note: If the RS-485 port is connected to configured remote I/O modules (LP-FXRIO16-0), during normal operation the COM2 LEDs both continuously flash about three times a second, indicating ongoing polling.

Maintaining the FX22/FX62 Supervisory Controllers

Cleaning

If dust or metal filings are present inside the supervisory controller, clean with a vacuum or compressed air. Otherwise, no cleaning inside the supervisory controller is required. If the covers become dirty, wipe them with a damp cloth and mild detergent.

Required NiMH Battery Maintenance

NiMH Battery Precautions

See [NiMH Battery Precautions](#) on page 3.

Battery life expectancy depends on its discharge cycles (the number of discharges and their depth) and the ambient temperature of the battery during normal operation. In most applications, the NiMH battery should see few discharges. Therefore, ambient temperature determines the life expectancy of the battery more than other factors. If the supervisory controller is installed in a conditioned space, this battery should provide dependable service for approximately 3 years (average). In an environment where the operating temperature is higher ($> 50^{\circ}\text{C}$ [122°F]), the battery lasts approximately 1 year.

The NiMH battery in the supervisory controller is fully discharged when factory shipped. Additionally, NiMH batteries lose charge over time if not kept trickle-charged (see [NiMH Battery Pack](#) on page 19). Therefore, even a new supervisory controller (or replacement battery) requires up to 18 hours of powered operation before the battery can provide reliable backup power (before the battery is at full charge).

The supervisory controller monitors the NiMH battery and periodically loads the battery to test its ability to maintain battery backed functions. Investigate any battery trouble message, and check the battery connections to the supervisory controller. Replace the battery as required. To order a new battery, see [Standard Replacement Parts](#) on page 22.

See [Replacing the NiMH Battery](#) on page 21 for the battery replacement procedure.

Replacing the NiMH Battery

The replacement NiMH battery is a custom battery pack assembly mounted on a bracket with an attached cable and connector plug (Figure 23). To replace the battery, remove power to the unit and remove both covers.

IMPORTANT: Only use the NiMH battery pack approved for use with the FX22/FX62 Supervisory Controllers, part LP-KITFX2BAT-0.

1. Backup the supervisory controller's configuration to your computer using FX Workbench.
2. Remove all power from the FX22/FX62, including disconnecting any sealed lead acid batteries. Wait for LED activity to stop—after a couple of minutes, all LEDs on the supervisory controller should be off.
3. Remove both covers. See [Removing and Replacing the Covers](#) on page 5. At this point you have access to the NiMH battery assembly (Figure 23).

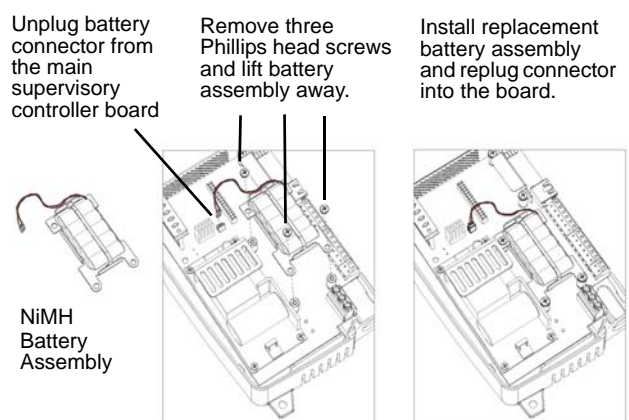


Figure 23: NiMH Battery Replacement

4. Unplug the NiMH battery from the main board connector (see Figure 23).
5. Remove the three Phillips head screws fastening the battery bracket, and set aside.
6. Remove the NiMH battery assembly.

7. Plug the battery connector plug of the replacement battery assembly into the NiMH battery connector on the supervisory controller's main board. The connector is keyed; you cannot plug the battery in reversed position.
8. Set the replacement battery/bracket assembly in place with the three mounting holes aligned with the standoffs on the supervisory controller board.
9. Place the three screws through the holes in the bracket and into the standoffs. Use a Phillips head screwdriver to hand tighten these screws.
10. Replace the covers.
11. Restore power to the FX22/FX62 and verify normal operation.

Battery Disposal

IMPORTANT: Do not incinerate or mutilate the battery, as this may cause the battery to burst or release toxic materials.

Note: Batteries removed from this device must be recycled or disposed of in accordance with local, national, and regional regulations. Only certified technicians or qualified building maintenance personnel should service Johnson Controls® products.

Repair Information

Replacement Parts

There are three categories of replacement parts for the FX22/FX62:

Non-Replaceable Parts

The FX22/FX62 contains a non-replaceable fuse, soldered on the main circuit board. This fuse provides protection from internal shorts or connection to incorrect power supplies. If the fuse circuitry is suspect, contact your technical support representative for assistance.

Standard Replacement Parts

Standard replacement parts appear in Table 6 and you can order these parts from stock. Standard replacement parts cannot be returned for credit and should be disposed of in an appropriate manner.

Table 6: Standard Replacement Parts for FX22/FX62 Supervisory Controllers

Part Number	Description
LP-KITFX2BAT-0	NiMH Battery Pack Assembly — see <i>Replacing the NiMH Battery</i> on page 21.
LP-KITFX2HW-0	Hardware Bag for FX22/FX62 Supervisory Controllers, containing removable screw terminal connector blocks (two 7-position, three 6-position, one 2-position).

New Replacement Unit

To replace a faulty FX22/FX62, order a new one. To ensure proper credit for FX22/FX62 still under warranty, contact customer service for return authorization.

Replacing the FX22/FX62 Supervisory Controller



CAUTION: Risk of Electric Shock.
Disconnect the power supply before making electrical connections to avoid electric shock.

IMPORTANT: Before replacing, turn the power to the controller OFF. Make sure that all LED activity is stopped (LEDs off). In addition, remove power to any I/O devices wired back to the controller.

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 an FX22/FX62 Supervisory Controller with a new replacement supervisory controller, proceed as follows:

1. Use FX Workbench to back up the FX22/FX62 configuration to your computer.

2. Disconnect power to the supervisory controller, including the disconnection of an external 12 V battery, if used. The supervisory controller should power down automatically. Wait for all LEDs to remain off.
 3. Disconnect all power to any I/O devices wired to the supervisory controller.
Note: Typically, if I/O wiring is routed through rear knockouts, you must remove it from the controller's screw terminal blocks, so that the wiring can pass through the knockouts. In this case, it is extremely important to remove all related power sources, in order to prevent electrical shock and equipment damage.
 4. Remove both covers. See [Removing and Replacing the Covers](#) on page 5.
 5. Note positions of all communications and other wiring cables going to the supervisory controller. Label cables and wires to avoid misconnection later.
 6. Unplug all Ethernet, serial, LONWORKS, and I/O connectors from the supervisory controller. If needed, remove wiring from I/O terminal blocks, carefully labeling conductors for proper termination.
 7. Remove all cable shield wire terminations to the earth grounding terminal strip.
 8. Remove the AC line and neutral (mains) and earth ground terminations from the 3-position screw terminal block.
 9. Loosen any conduit clamps to the unit.
 10. Remove the two mounting screws in the lower mounting tabs.
 11. Slide the supervisory controller up so the top mounting screw clears the keyhole slot, and move the supervisory controller away from the wall, working the cables and wiring out through the wiring holes and knockouts. Free the supervisory controller from all wiring and place on a flat work surface.
 12. If applicable, remove any option card installed in the old FX22/FX62, and install the card into the replacement supervisory controller. See [Installing an Option Card](#) on page 10 for more details.
 13. Reroute the removed power, communications, and I/O wiring through the knockouts and wiring holes in the replacement FX22/FX62 (as done previously), and position the supervisory controller in place on the wall.

Place the supervisory controller over the top mounting screw and slide down to hook into the keyhole slot.
 14. Replace the two mounting screws in the lower mounting tabs.
 15. Tighten any conduit clamps on the supervisory controller.
 16. Reconnect the earth ground wire and the AC line and neutral wires (mains) to the 3-position terminal block in the supervisory controller.
 17. Replace the left cover and metal shield over the AC/earth ground terminals.
 18. As needed, reconnect any I/O wiring to terminal blocks, and replug I/O terminal blocks onto the replacement supervisory controller board.
 19. Reconnect all Ethernet, serial, and LONWORKS wiring to the supervisory controller.
 20. Reconnect all cable shield wire terminations to the earth grounding terminal strip.
 21. If power was disconnected to remote I/O devices wired to the supervisory controller, restore that power.
 22. Restore power to the supervisory controller. It should boot up as a new unit (see [Check the Status LEDs](#) on page 18).
 23. Replace the right cover. See [Removing and Replacing the Covers](#) on page 5.
- Note:** Recommission the FX22/FX62, and install the saved station database. For more details, refer to the *FX Workbench User's Guide (LIT-12011149)*.

Table 7: COM Slot Assignments for the FX22/FX62 Supervisory Controller (Part 1 of 2)

Option Slot	Onboard RS-232	Onboard RS485	Onboard GPRS
None	COM1	COM2	COM5, COM6
RS-232 = COM7	COM1	COM2	COM5, COM6
RS-485 = COM7, COM8	COM1	COM2	COM5, COM6

Table 7: COM Slot Assignments for the FX22/FX62 Supervisory Controller (Continued) (Part 2 of 2)

Option Slot	Onboard RS-232	Onboard RS485	Onboard GPRS
LON = LON1	COM1	COM2	COM5, COM6
Wireless TEC = COM1	Disabled	COM2	COM5, COM6
Sedona =-COM7	COM1	COM2	COM5, COM6
Modem = COM1	Disabled	COM2	Not allowed
GPRS = COM7, COM8	COM1	COM2	Not allowed



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