Installation Instructions for LONWORKS® TP/XF-78 and FT-10 Network Router Kits 300–4919–00, 300–4919–01, and 300–4919–02

GENERAL INFORMATION

This kit contains a router module, power supply, network terminators (as required), and two batteries; all mounted in an enclosure. See Figure 1 for an outline drawing of the LONWORKS Router enclosure. Figure 2 shows the inside of the enclosure. Details on the router module are shown in Figure 3.

A router connects two LONWORKS communications channels and routes messages between them. This instruction sheet describes installation of the following router kits.

KIT	CHANNEL CONNECTIONS
300–4919–00	TP/XF-78 to TP/XF-78
300–4919–01	TP/XF-78 to FT-10
300–4919–02	FT-10 to FT-10

The following items are included in this kit.

- Network Router Assembly
- 3 Amp Fuses (2)
- Terminators (2)

A router can be used in a PowerCommand™ Network to extend the physical length a single channel network beyond the distance and node limits.

Each free topology FT-10 segment has a maximum total wire length of 1640 feet (500 meters) and 64 nodes. An FT-10 channel includes two or more segments, has a maximum length of 8858 feet (2700 meters), and can contain up to 128 nodes.

Each TP/XF-78 channel has a maximum length of 4600 feet (1402 meters) and a limit of 44 nodes.

A router can also be used in three ways to connect channels using different transceivers. The three ways routers can be commissioned are:

- Configured – This type of router sends signals on only if devices are on the other channel. It includes a table of devices located on each channel.

- Learning – This type of router starts out as a repeater; it learns which devices are on each channel and ends up as a configured router.

- Repeater – This type of router is used to extend the segment/channel length from 500 to 2700 meters.
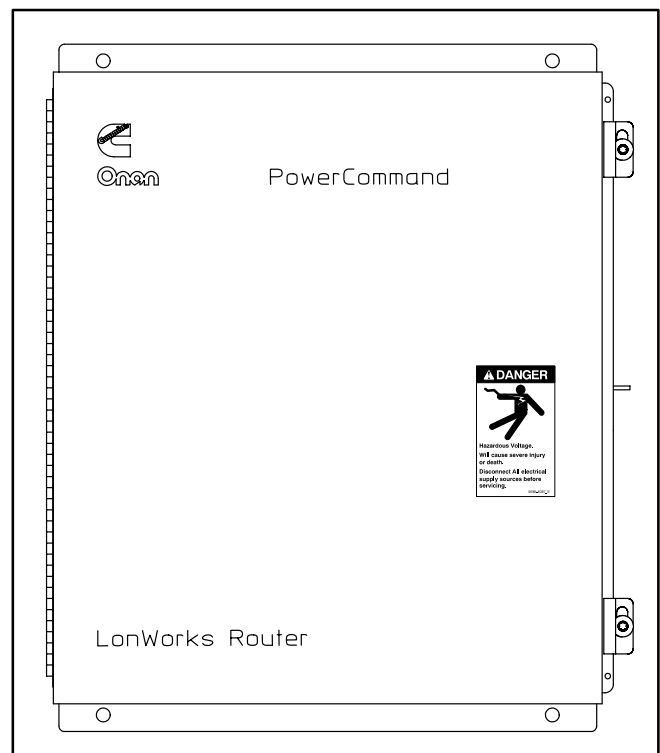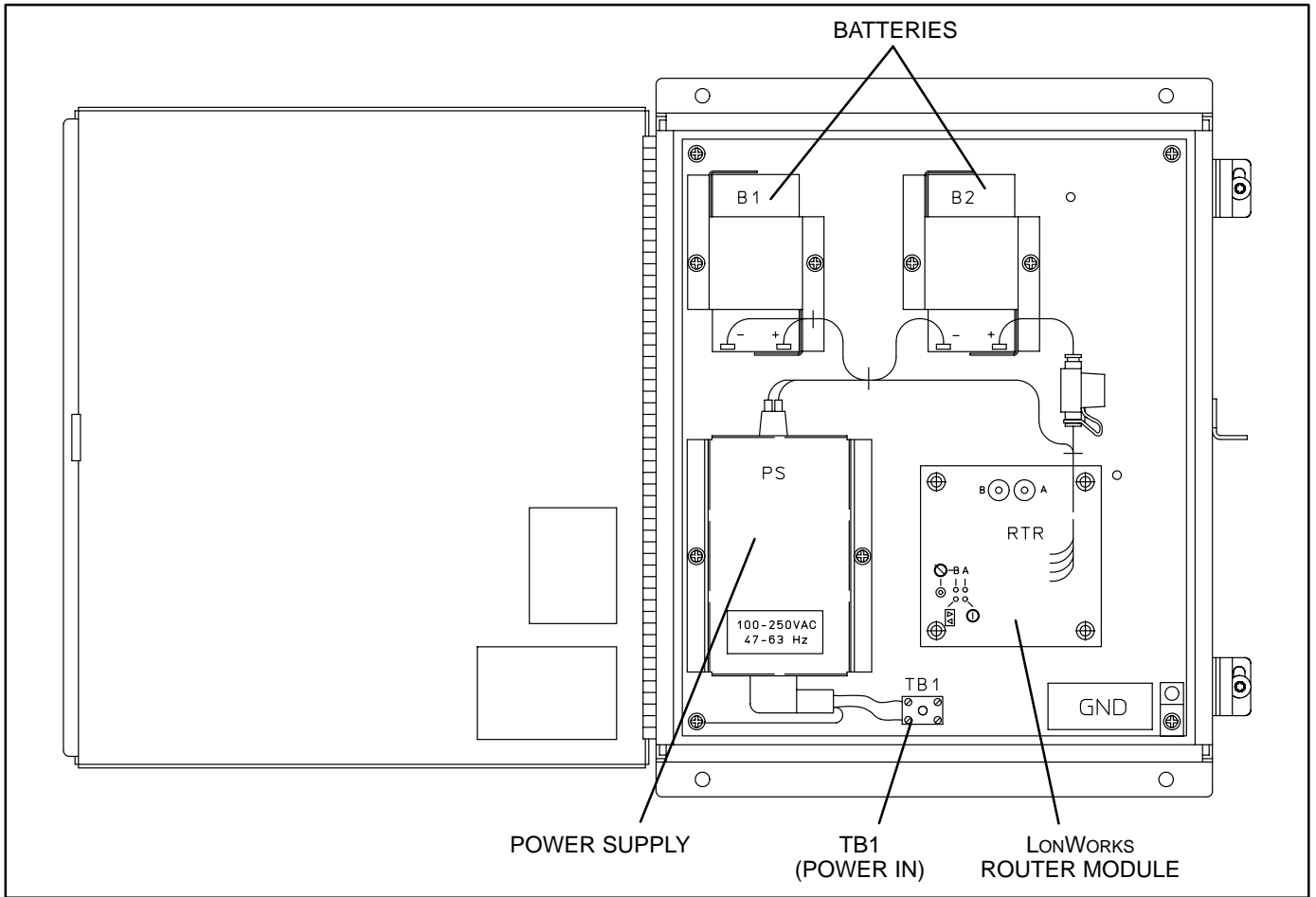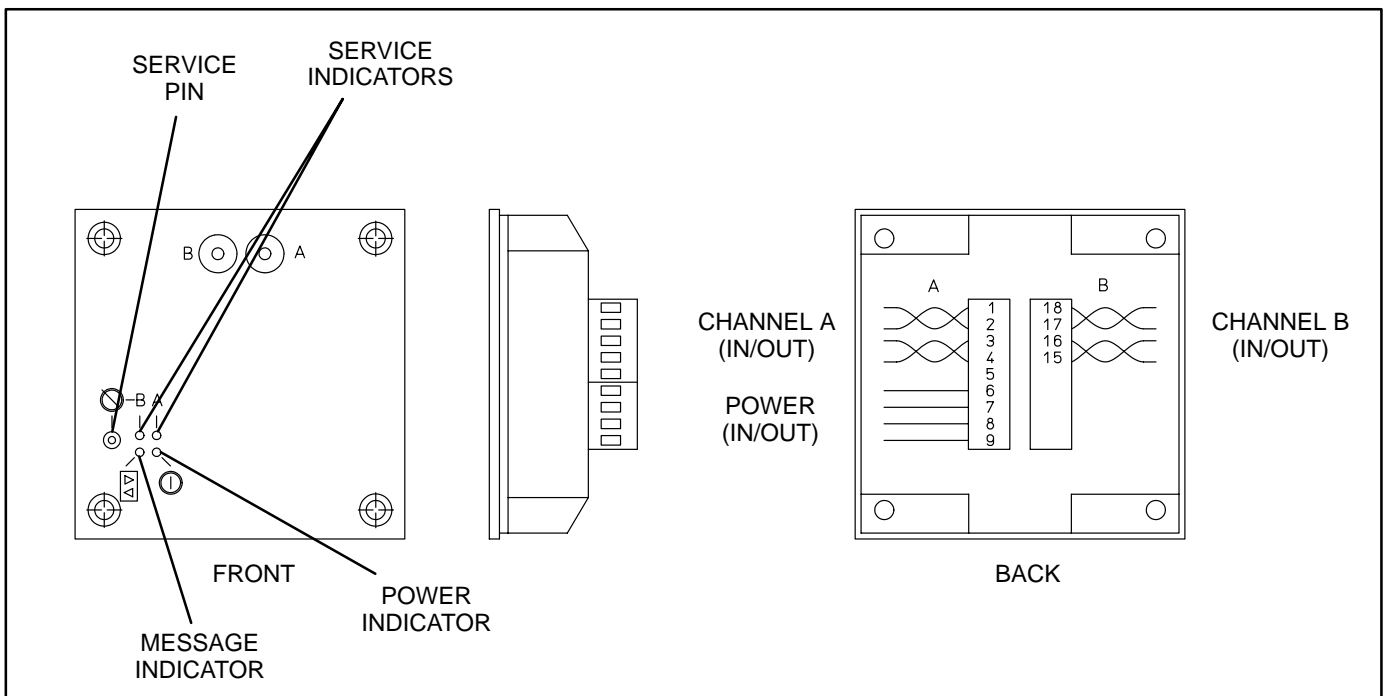

FIGURE 1. LONWORKS ROUTER

FIGURE 2. LonWorks ROUTER OUTLINE DRAWING

FIGURE 3. LonWorks ROUTER MODULE DETAIL

INSTALLATION

⚠ CAUTION *Improper router and network terminator installation causes unreliable network operation and equipment failure. Each TP/XF-78 network channel requires one network terminator at each physical end. An FT-10 network requires a single termination. Routers may be installed anywhere in a network.*

Installing a router in an existing network requires another channel and separate physical bus. Each channel requires proper termination. (An FT-10 channel requires a single termination. A TP/XF-78 channel must be terminated at each end of the bus.) Each additional router requires one more channel with its own bus. A router may be installed anywhere within the network. See Figure 4 for a typical installation when the router connects two channels.

Refer to the *PowerCommand Network Installation and Operation Manual* (900–0529 for FT-10 networks and 900–0366 for TP/XF-78 networks) for information on network topology, wiring, and software installation. Refer to the *LonMaker™ Installation Tool Users Guide* (provided with LonMaker software) for logical installation information.
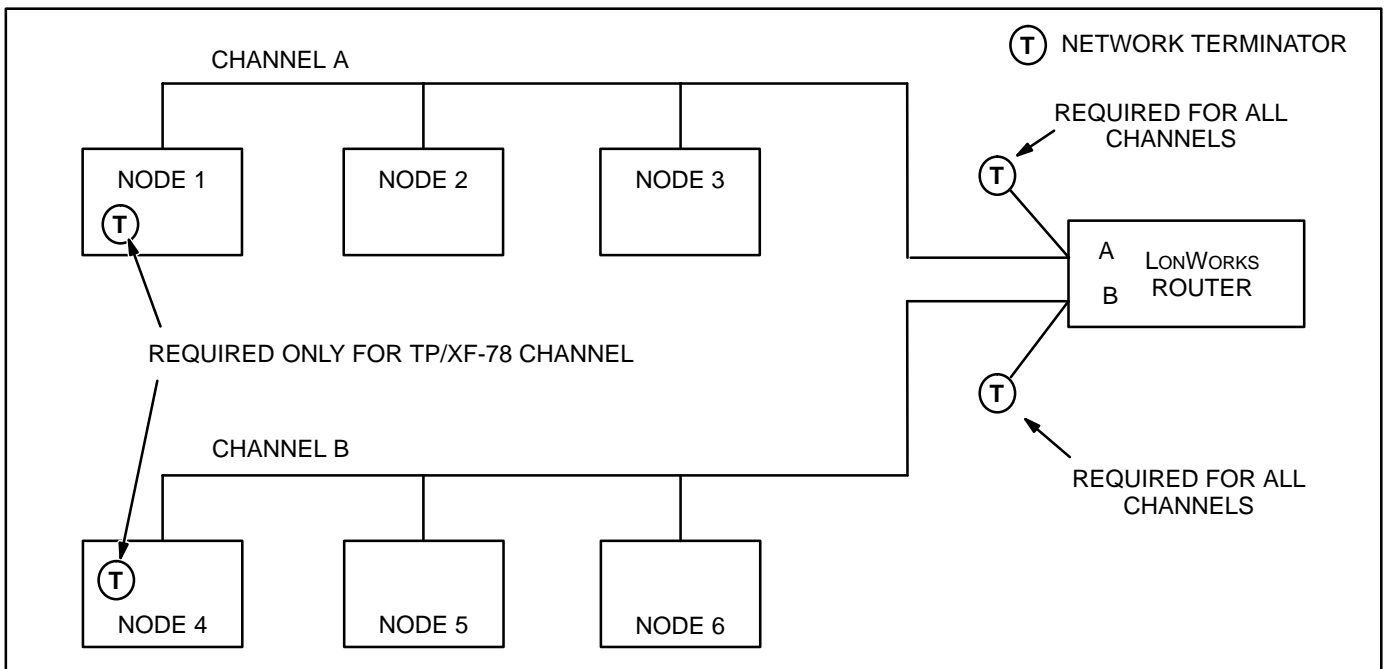
FIGURE 4. ROUTER USED TO NETWORK CHANNELS A AND B

LOCATION

Refer to the site network installation drawing for the router location. If an installation drawing is not available, refer to the *PowerCommand Network Installation and Operation Manual* (900–0529 for FT-10 networks and 900–0366 for TP/XF-78 networks) for network topology and maximum network length. **All wiring must follow a specific network topology and must fall within distance limits.**

Choose a clean, vibration-free mounting surface. Avoid locations that are hot, damp or dusty. The temperature range must not exceed 32 to 122°F (0°C to 50°C).

MOUNTING

Figure 5 shows the router outline dimensions and mounting hole locations. The router can be mounted to a wall or other flat surface.

⚠ CAUTION *Make sure that no wires, plumbing, gas, or exhaust lines run behind the mounting area before drilling the mounting holes.*
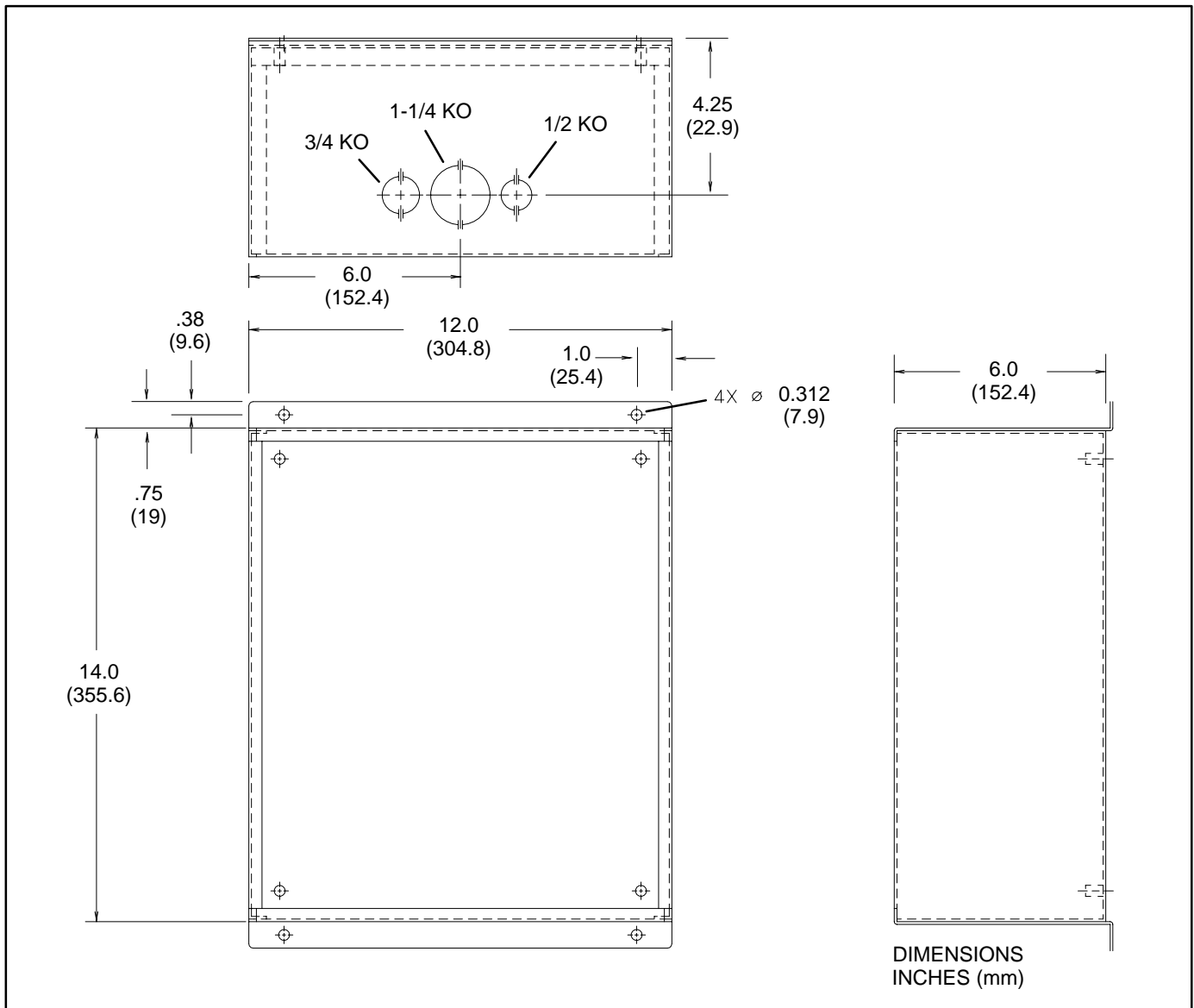
FIGURE 5. ROUTER MOUNTING DETAILS

WIRING

Figure 4 shows a typical router installation. Each additional router requires another channel with its own bus. Each FT-10 segment requires one terminator circuit. Each FT-10 segment has a maximum total wire length of 1640 feet (500 meters) and 64 nodes. Each TP/XF-78 channel requires two terminator circuits (one at each physical end of the bus). Each TP/XF-78 channel has a maximum bus length of 4600 feet (1402 meters) and a maximum of 44 nodes. Refer to the *PowerCommand Network Installation and Operation Manual* (900–0529 for FT-10 networks and 900–0366 for TP/XF-78 networks) for more information on wiring.

Routers do not include a terminator circuit. Two network terminators are included with this kit. TP/XF-78 channels must be terminated at each end of the bus. FT-10 channels require one termination. Refer to Figure 2 for the router connection points.

Because FT-10 and TP/XF-78 channels require different termination circuits, make sure the proper terminator is selected for the circuit. Look at the Echelon sticker to differentiate the two terminators. The FT-10 terminator is Echelon P/N 44100 (Onan P/N 300–5669). The TP/XF-78 terminator is Echelon P/N 44200 (Onan P/N 300–5252).

⚠ CAUTION *Do not route wires over hot, sharp, or abrasive surfaces.*

Power

1. Install a three amp fuse in the fuse holder (see Figure 2).
2. Connect AC power to TB1. Input power can be 100 to 250 VAC (47 to 63 Hz). The power supply furnishes power to the router module and charges the 12V batteries. The batteries supply power for at least 12 hours when AC power is removed.

Network Connection

The channel may be terminated at the Ethernet Router with the network terminator that is included with this kit. One device on each network segment must be terminated.

To terminate a network segment, connect the network terminator and the network twisted-pair cable in the two-position network connector. The network terminator has three leads: two data and one ground. The ground lead (green/yellow) is not used and should be clipped.

Use NEMA Level IV (or greater) stranded twisted-pair cable to connect the router to the network bus. Each segment of the network must be terminated. If the router is to be the termination point for this segment, a terminator is provided.

Network data lines and terminator leads are polarity insensitive. Connect one stranded twisted-pair lead with one terminator lead and the other stranded twisted-pair lead with the other terminator lead.

Network Stranded Twisted Pair Wiring

Connect the network stranded twisted pair to the router.

1. Remove the two screws that hold the router in the enclosure.
2. Carefully pull the router from the enclosure.
3. Route the network stranded twisted pair cable through the enclosure and electrical box (bottom left).
4. Connect the stranded twisted pair to the appropriate router channel terminals. See Figure 3. If the router is not at the end of the bus, connect each stranded twisted pair cable (from the previous device and to the next device) to the router.
5. Connect a network terminator to the router if the router is to be terminated.
6. Replace the router in the electrical box and replace the screws.
7. Connect the ground wire to the grounding lug in the lower right.

BATTERY REPLACEMENT

The router includes two 12V lead acid batteries (Onan P/N 416–1032). Replace the batteries every two years.

1. Disconnect the AC power.
2. Remove the fuse from the fuse holder.
3. Disconnect the leads to the batteries.
4. Remove the two screws holding each battery cover.
5. Remove the batteries.
6. Replace the batteries.
7. Replace the batteries in the battery covers and the battery covers.
8. Replace the fuse and connect the AC power.

Verify that the batteries are operational by removing AC power and verifying that the green LED on router module stays lit.

LOGICAL INSTALLATION

The following describes the steps required to logically install a router on the network. For more detailed information, refer to the *LonMaker User's Guide*.

1. On the LonMaker network drawing, either create the two channels that you want the router to connect or confirm that they already exist on the drawing. To create a channel, drag a channel shape onto the drawing from the LonMaker Basic Shapes stencil, give it a name, and select the transceiver type.

2. Drag a router shape from the LonMaker stencil to the drawing. The New Router Wizard is displayed.

3. Enter a name for the router in the Router Name text box.

4. Select the Commission Device check box if you wish to commission the device when the definition is complete.

5. Select Next to proceed to the next window.

6. For each of the two channels, select the transceiver type and channel name. Select Next to proceed to the next channel.

7. *Optional:* Enter a location of up to six characters. This description is not used by LonMaker but may be useful in network recovery if you lose your LonMaker drawing and database.

8. Although a Ping Interval can be specified, it is recommended that it be left at "Never" (the default). Refer to the *LonMaker User's Guide* for more information.

9. *Optional:* Enter a router description. this is for documentation purposes only.

10. Select Next to proceed.

11. In the Router Type drop-down box, select "Configured." Refer to the *LonMaker User's Guide* for more information.

12. Set Authentication to "False" and Priority for both channels to "Disabled." Refer to the *LonMaker User's Guid*e for more information.

13. Select Finish. If you chose to commission the device, the Commission dialog box will be displayed. Commission the router the same way all other devices in the network are commissioned. Refer to the *LonMaker User's Guide* or the P*owerCommand Networks Operator and Installation Manual* (900–0529 for FT-10 networks and 900–0366 for TP/XF-78 networks) for more information.