

**INSTALLATION INSTRUCTIONS FOR LONTALK MODULE KIT
 (11W28) USED WITH LG/LC/LH & SG/SC AND ENERGENGE™ ROOFTOP UNITS**

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NOTE - Disregard shipping and packing list and installation sections when module is factory-installed.

Shipping and Packing List

Package 1 of 1 contains:

- 1- LonTalk module
- 4- #6 - 32 X 7/8" Screws
- 1- Mounting plate (used on 090-300S units only)
- 2- #10 - 16 X 5/8" Sheet metal screws (used on 090-300S units only)
- 1- 3-ft. length SYSBUS cable
- 1- 3 ft. length thermostat wire
- 1- Wiring diagram

Technical Assistance

For assistance contact Lennox Technical Support at 800-453-6669.

Version Required

This module requires a rooftop unit IMC M1-7 (version 5.02 or higher), M1-8, or M2 Unit Controller. An IMC upgrade kit

is available for earlier M1-7 versions. M1-6 and earlier IMC versions cannot be upgraded for use with the LonTalk module. M1-8 displays version when powered up in the scrolling text (may need to clear error codes). For displaying version on M1-7:

1. Locate IMC board in compressor area. Refer to IMC manual provided with rooftop unit.
2. Set the MODE DIP "UNIT TEST" and "RECALL" switches to "ON" (see figure 2).
3. The IMC LEDs will display the current IMC version (see figure 1).
4. Be certain to return the "UNIT TEST" and "RECALL" switches to "OFF" after viewing the version number. Communication to the IMC is interrupted while these MODE DIP switches are "ON".

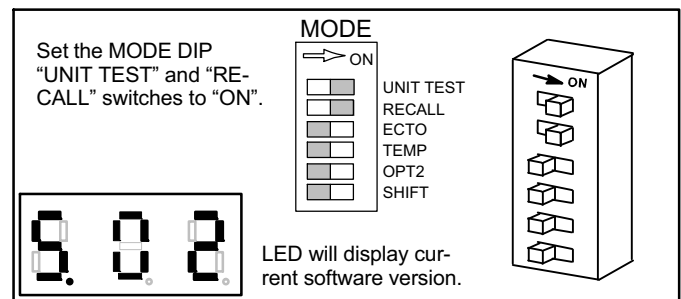


Figure 1. Check M1-7, M1-8 Software Version and Address

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.



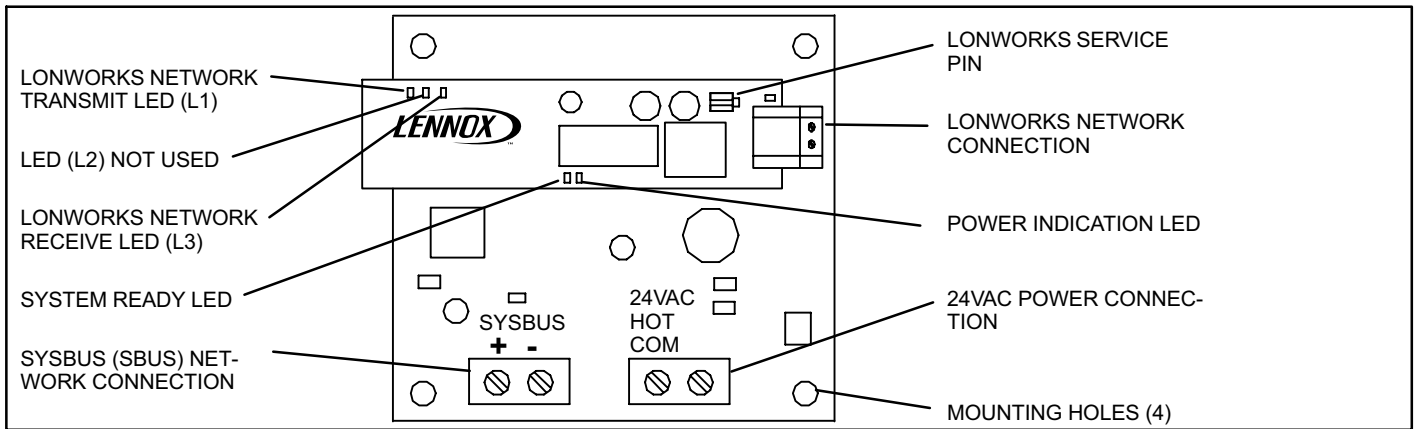


Figure 2. LonTalk® Module

Application

The LonTalk module allows communication between the Lennox unit controller and a LonWorks® network. The module translates input and output variables between Lennox L Connection® protocol and the LonWorks network.

The LonTalk® Module has been developed to communicate with building automation systems. The functional profiles are proprietary in content and will require the integrator to use the datapoint information included in the service manual.

Either a Lennox zone sensor or a LonTalk network zone sensor is required to send the zone temperature to the unit controller.

⚠ WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

Installation

⚠ CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

1. Disconnect all electrical power to unit.

2. Open compressor section access doors.
3. Begin installation depending on unit size as follows:
 - A Box (036-060 units)**—Position the LonTalk module in the compressor section as shown in figure 3. Secure with four #6 screws.
 - B, C, & D Box (150/360 units)**—Position the mounting plate in the location shown in figure 5. Secure with 7/8" screws. Install the LonTalk module on the mounting plate and secure with #6 screws.
 - E Box (420/600 units)**—Position the mounting plate beneath the IMC board as shown in figure 4. Secure with four #6 screws.
4. Route the SYSBUS network cable to the IMC SYSBUS terminal block. Secure network cable away from all power cables. Connect the cable shield drain wire to the "G" terminal on the controller. Do not connect the cable shield drain wire to the LonTalk module (see figure 6).
5. **For M1-7, M1-8**—Locate the thermostat wire provided in this kit. Connect one wire between the LonTalk module 24v. hot and the rooftop unit TB1 terminal 6. Connect the other wire between the LonTalk module common and the rooftop unit TB1 terminal 7. See wiring diagram provided in this kit or on the inside of the compressor access panel.
5. **For M2**—Connect power leads to gray COM (24VAC return) and the red 24VAC service wire terminals.
6. If module is field-installed, locate the temperature control wiring diagram sticker on the inside of the compressor access panel. Affix the C68 temperature control wiring diagram (provided in this kit) over the existing diagram.

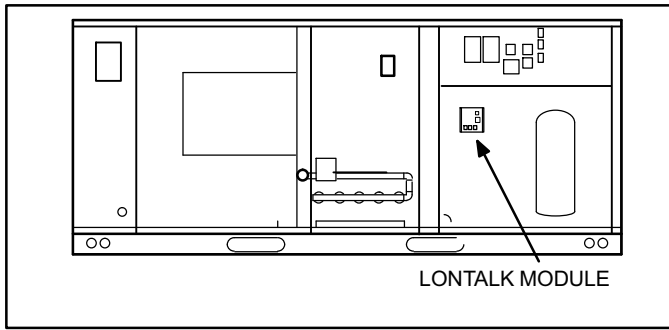


Figure 3. LonTalk Module (036-060 units, A box)

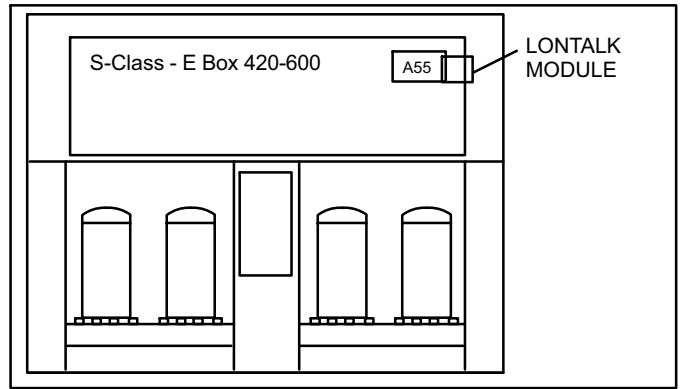


Figure 4. LonTalk Module (420/600 units, E Box)

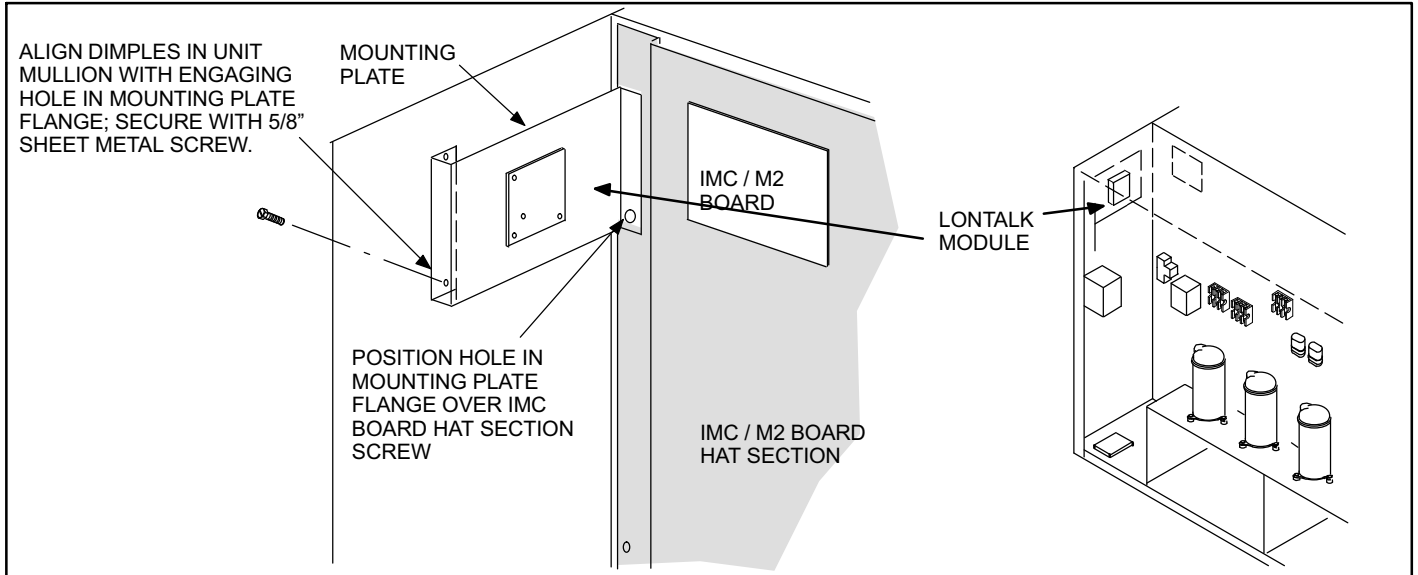


Figure 5. LonTalk Module (150/360 units (B, C, & D box))

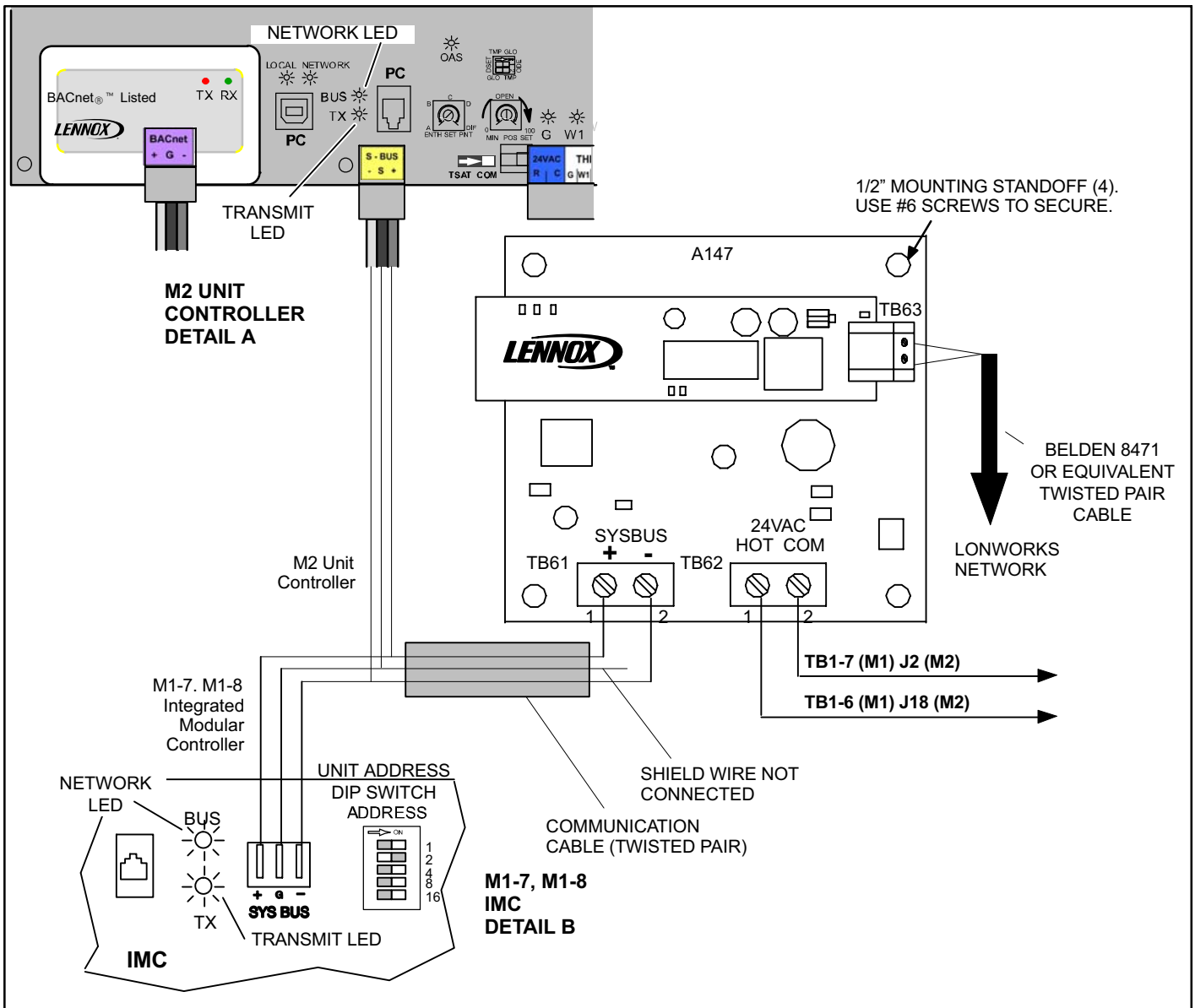


Figure 6. LonTALK Module Wiring

Zone Sensor Installation

The unit controller is factory set in local thermostat system mode. In this mode the unit will respond to standard 24 VAC thermostat signals that are hardwired to the unit TB1 field wiring terminal block (M1) or SmartWire™ connections (M2). For LonWorks network installations the unit controller uses a local zone sensor or a remote LonTalk thermostat zone sensor to operate the unit instead of a local thermostat.

Install the sensor according to manufacturer's instructions.

NOTE - Lennox zone sensor requires twisted pair shielded cable.

NOTE - LonTalk zone sensor must be commissioned according to manufacturer's instructions.

Configuring the Unit Controller

Settings: M1 Controllers

Use the IMC pushbutton and DIP switches to manually adjust the following control parameters (see IMC manual). A PC can also be used with Unit Controller software and a PC converter.

Lennox Zone Sensor Installed:

1. Set ECTO 6.01 to option 3 (zone sensor system mode with return air sensor back-up).
2. Set ECTO 6.17 to option 1 (continuous blower during occupied).
3. Set ECTO 6.02-6.05 as specified (back-up occupied and unoccupied heating and cooling setpoints).

LonTalk Zone Sensor Installed:

1. Set ECTO 6.01 to option 3 (zone sensor system mode with return air temperature back-up).
2. Set ECTO 6.17 to option 1 (continuous blower during occupied).
3. Set ECTO 5.27 to option 2 (network zone sensor option).

IMC Settings:

1. Be sure the occupied 24 VAC input is energized by adding a jumper wire between TB1-8 and 9. In the event that communication is lost between the LonTalk module and the IMC, the IMC will operate in the occupied mode and use the occupied backup setpoints.
2. Change IMC UNIT ADDRESS DIP switch to 2 (see figure 7).

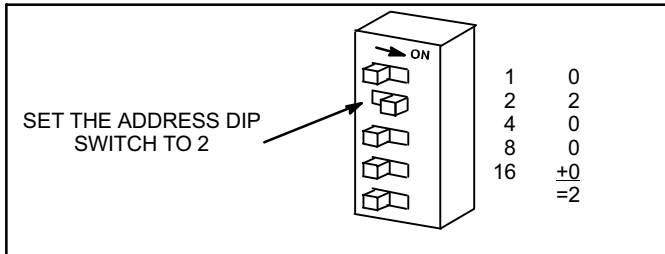
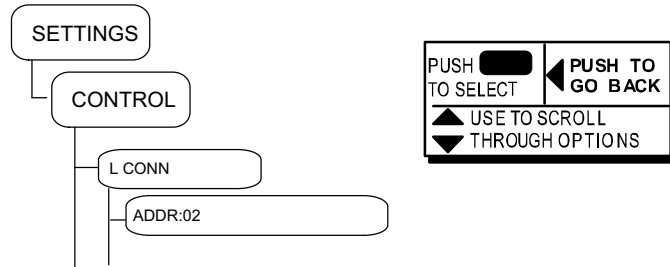


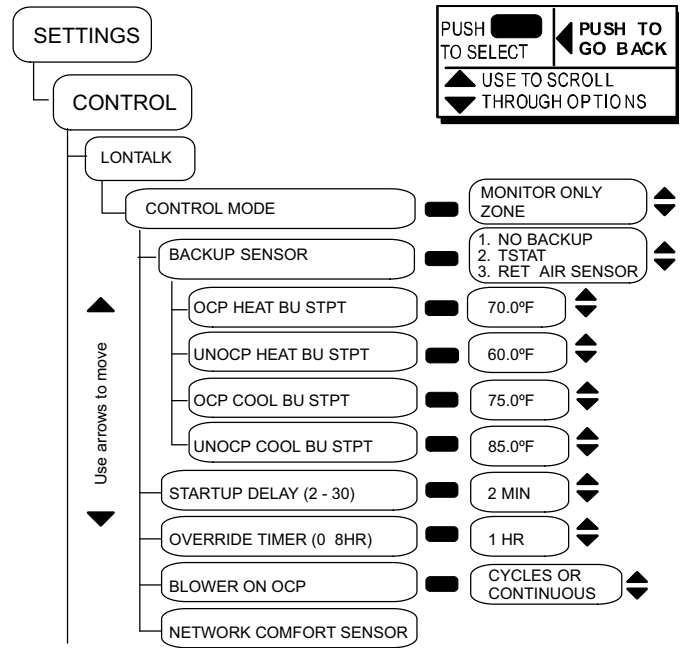
Figure 7. Address DIP Switch

Settings: M2 Controllers

On the M2 Unit Controller, select SETTINGS > CONTROL > L CONN as shown in the following diagram; default setting for ADDR (address) is 2. Confirm the address and change if necessary.



On the M2 Unit Controller, select SETTINGS > CONTROL > LONTALK as shown in the following diagram; default settings will be used. You may adjust those settings to suit the building's requirements. The following diagram shows the LONTALK menu's structure and how to make changes.



Communication Check-Out

LonTalk Module Communication

Use the following table as a guide once the controller and LonTalk Module are connected and powered (LEDs are shown in Details A and B in figure 6).

LED	Action
BUS and XMIT LEDs flash.	None. Indicates normal communication.
BUS and XMIT LEDs are off.	1-Check cable connection between the modules. 2-Reverse polarity of the cable between the and LonTalk Module. 3-Check 24VAC power to LonTalk module.
BUS LED flashes but XMIT LED is off.	1-Make sure unit address is set to 2. 2-Make sure MODE DIP RECALL switch is OFF. (M1 controllers only) 3-Make sure MODE DIP ECTO switch is OFF. (M1 controllers only) 4-Make sure MODE DIP UNIT TEST switch is OFF. (M1 controllers only)

LonWorks Network Communication

Use the following table as a guide once the LonWorks network is set up and operating.

LED	Action
LonWorks communication LEDs L1 & L3 flash.	None. Indicates normal communication.
LonWorks communication LED L1 & L3 are off.	1-Check LonWorks network connections. 2-Make sure LonWorks network is commissioned. 3-Make sure 24 volts is connected to the LonWorks module.

LonWorks Network Connection

The LonTalk module has an FTT-10A Free Topology Transceiver for network communication. The FTT-10A transceiver network supports free topology wiring and will accommodate bus, star, loop, or any combination of these topologies. The module can be located at any point along the network wiring. This capability simplifies system installation and makes it easier to add nodes when required.

LonWorks Network Cable

The LonWorks TP/FT-10 network requires Echelon qualified twisted-pair communication cables such as Belden 8471 or NEMA Level 4 cables. Other Echelon approved equivalent cables may also be used depending on the application. The Belden 8471 or NEMA Level 4 cables are rated for plenum use.

The network cable should be routed using best practices to avoid induced noise. Do not route alongside power lines, or in proximity to high voltage or high frequency devices, such as ignition controls and variable frequency drives. The average temperature of the wire must not exceed 131°F (55°C).

Network Limits (Free Topology)

The LonWorks TP/FT-10 free topology network is limited

to a maximum of 64 nodes per segment. The maximum total bus length and the maximum node-to-node length is 1640 ft. (500m) for Belden 8471 or NEMA Level 4. Maximum lengths are less for other smaller wire size cables.

Only one termination circuit module is required at any location along the network. Refer to Echelon LonWorks FTT-10 Transceiver User's Guide for additional details.

Free Topology Networks

Free topology segments require a termination circuit for proper performance. Only one termination circuit module is required at any location along the network (see figure 8).

Network Limits (Doubly-Terminated Topology)

The LonWorks TP/FT-10 Doubly-Terminated topology network is limited to a maximum of 64 nodes per segment. The maximum total bus length is 5000 ft. (1524m) for Belden 8471 or NEMA Level 4. Maximum bus lengths are less for other smaller wire size cables.

The maximum stub length is 9.8 ft. (3m). In many cases this bus network is connected in a daisy chain manner where the bus is wired directly to each node, so stub length is zero.

Two termination circuit modules (37X75) are required for each segment. One must be located at each end of the network (see figure 9).

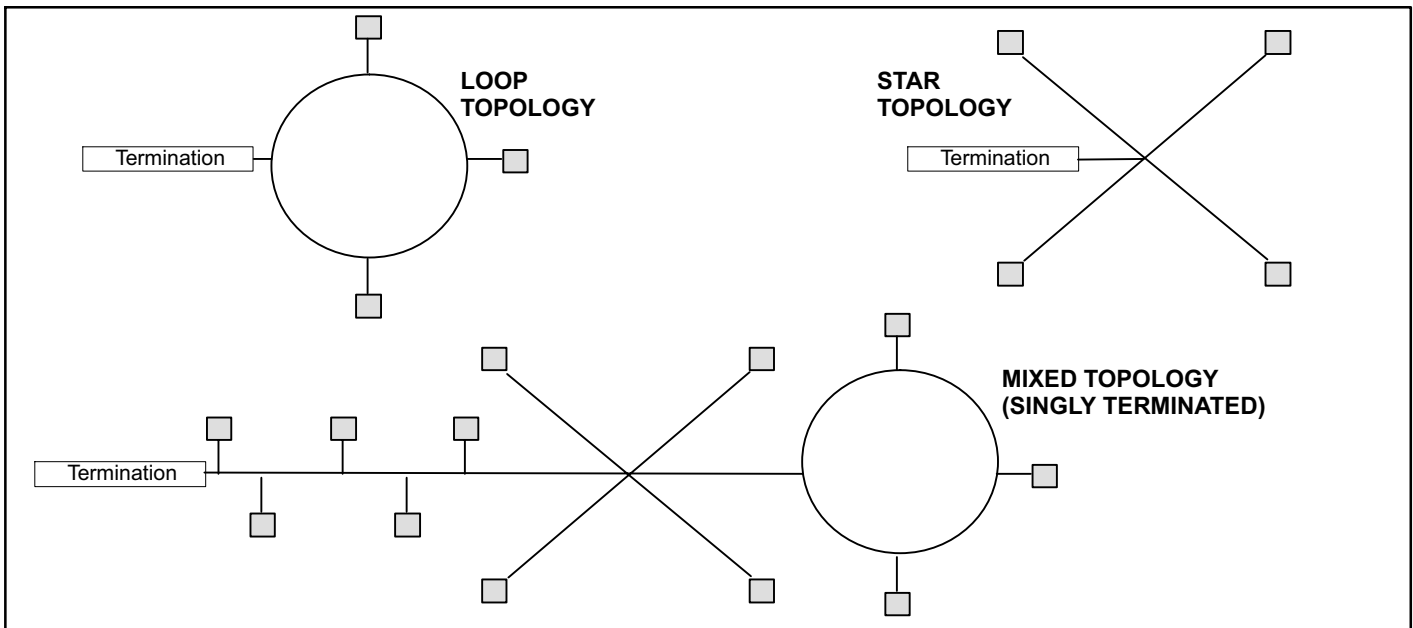


Figure 8. Free Topology Networks

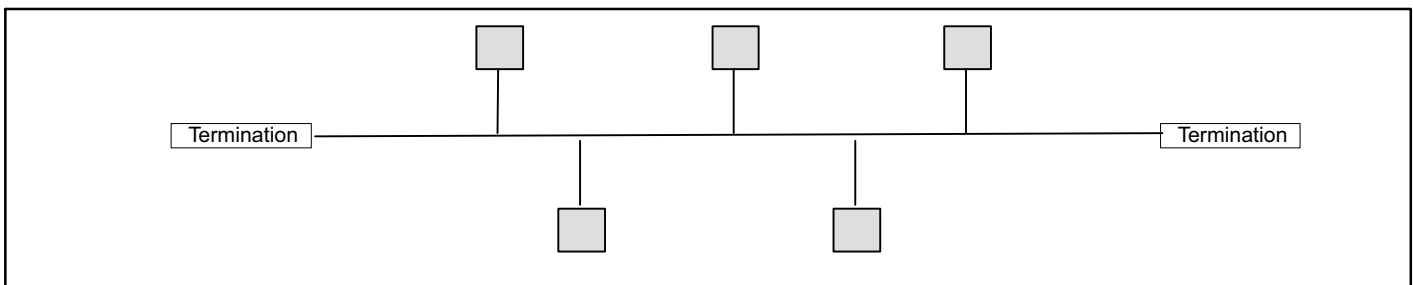


Figure 9. Doubly-Terminated Topology

Network Integration

A network configuring tool such as LonMaker® is required to commission the LonWorks network. Press the service button on the LonTalk module to generate a service message that contains the Neuron ID and all information required to connect it to a system and to configure the module.

Other commissioning methods may be used. The Neuron address is located on the Lontalk module.

An external Interface File (XIF) is available for configuration prior to installation.

The Lontalk module only supports service type 'acknowledged service'. For Tridium/JACE integration, this is equivalent to 'critical binding' on all variables.

Data Update Rate

If a LonTalk Zone Sensor is installed (ECTO 5.27 for M1 controllers), the nviSpaceTemp point must be updated periodically. If nviSpaceTemp is not updated for a period of 5 minutes, the IMC will go into the back-up modes described in the "Lontalk Connection Failure" section:

It is highly recommended that the nviSpaceTemp variable, if it is used, be updated at least every 2 minutes.

Start-Up Operation (Before LonWorks Network is Commissioned)

Lennox Zone Sensor Installed—Prior to commissioning, no LonWorks setpoint is available. The unit will be off.

Two minutes after power-up (ECTO 5.25), the IMC will operate the unit based on the IMC ECTO unoccupied backup setpoints (heating = 60°F, cooling = 85°F) and current zone temperature read by the Lennox zone sensor.

LonTalk Zone Sensor Installed—Prior to commissioning, neither LonWorks setpoint nor sensor data are available. The unit will be off.

Five minutes after power-up, the controller will operate the unit based on the unoccupied backup setpoints (heating = 60°F, cooling = 85°F) and the current zone temperature read by an additional Lennox zone sensor if installed. If the Lennox zone sensor is not installed, the return air temperature sensor is used as backup (ECTO 6.01).

Normal Operation (After LonWorks Network is Commissioned)

The occupancy of the space can be determined using any combination of the following control points:

- LonWorks Network scheduling
- Manual override
- Space occupancy sensor

Lennox Zone Sensor Installed—The unit is off for up to two minutes after power-up (ECTO 5.25) unless the LonWorks Network sends a setpoint. The unit will operate based on this setpoint and the temperature from the Lennox zone sensor.

In addition to control points, space occupancy can be manually overridden using a Lennox zone sensor equipped with an optional after hours switch.

LonTalk Zone Sensor Installed—The unit is off for up to five minutes after power-up unless the LonWorks Network sends a setpoint and LonTalk zone sensor data. The unit will operate based on this setpoint and temperature data.

Zone Sensor Setpoints

The unit controller typically uses four setpoints and the zone temperature to operate the unit when a zone sensor is installed.

Because the LonTalk network provides a single setpoint input, the unit controller will use the zone temperature and deadband setpoint (ECTO 6.15) to determine the setpoint in the occupied mode. During the unoccupied mode, the unit controller will use the zone temperature and the difference between unoccupied heating and cooling setpoints. See figure 10 for an example of setpoints when the unit controller is operating in default mode.

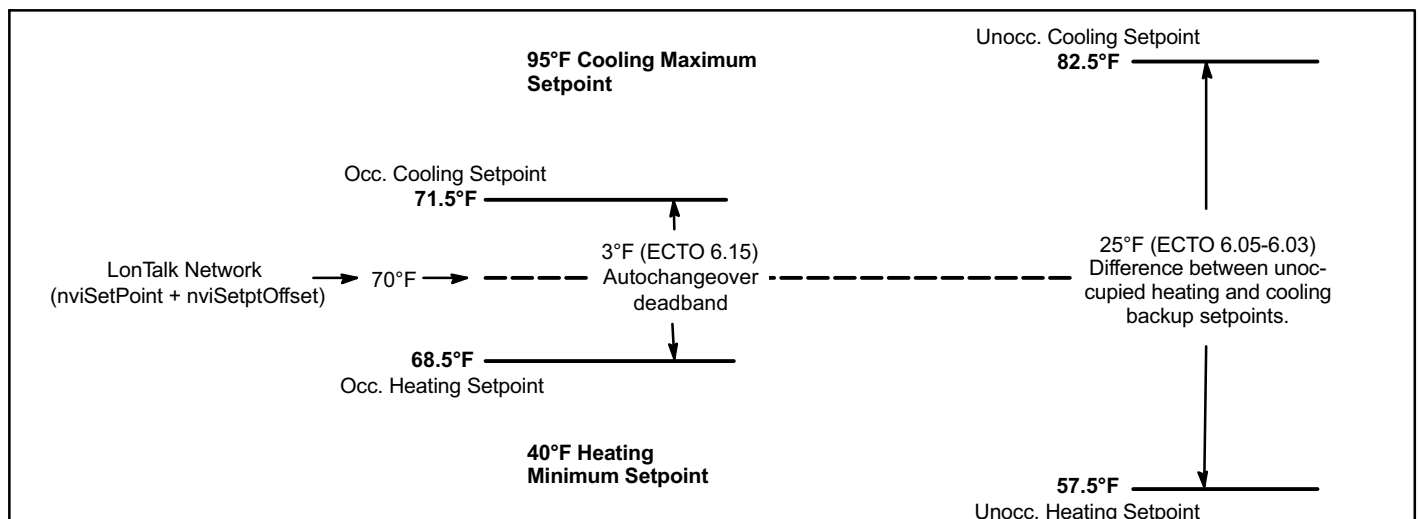


Figure 10. Unit Controller Default Setpoint Example (Zone Sensor Installed)

Connection Failure

Control following a connection failure depends on where the failure occurs, and which input device has been used.

	Between Unit Controller and LonTalk Module	LonWorks Network
Lennox Zone Sensor	<ol style="list-style-type: none"> 1- During the 5 minutes following a failure, the unit controller cycles on last setpoint. 2- Unit controller resets. No heating or cooling during 2 minutes (ECTO 5.25) following reset. 3- Unit controller cycles based on ECTO backup setpoints. 4- Occupancy is determined by hardware input at TB1 (for M1), or Prodigy setup (for M2). 	<ol style="list-style-type: none"> 1- Unit controller cycles on last setpoint. 2 - Last occupancy input is used.
LonTalk Zone Sensor	<ol style="list-style-type: none"> 1- During 5 minutes following failure, the unit controller continues current operation: heat, cool, or off. 2- Unit controller resets. No heating or cooling during 5 minutes following reset. 3- Unit controller uses ECTO backup setpoints. 4- Unit controller attempts to use Lennox zone sensor as backup. If this fails, Unit controller uses return air sensor backup. 5- Occupancy is determined by hardware input at TB1 (for M1), or Prodigy setup (for M2). 	<ol style="list-style-type: none"> 1- During 5 minutes following failure, Unit controller continues current operation: heat, cool, or off. 2- Unit controller uses ECTO backup setpoints. 3- Unit controller attempts to use Lennox zone sensor as backup. If this fails, Unit controller uses return-air-sensor backup. 4 - Last occupancy input is used.

Network Variables - See BACnet Module Service Literature.

Alarm Codes See the Unit Controller user guide for a list of alarm codes.