MicroTech II™
Chiller Unit Controller
LonWorks® Communication Module

Chiller Functional Profile

- Centrifugal Chillers
- Screw Chillers
- Global Chillers

NOTICE

Use this manual to physically install the communications module into the unit and connect the unit to your network. You also need the appropriate McQuay Engineering Data Sheet known as the Protocol Data Packet to integrate the unit into your network. The Protocol Data Packet contains addressing details, BACnet® and LonWorks® protocol information, and a list of the data points available to the network. See the Reference Documents section of this document for part numbers of Protocol Data Packets. These documents are available from your local McQuay International representative and for downloading at the McQuay International web site: www.mcquay.com.
Contents

Figures ............................................................................................................................ 2
Revision History ........................................................................................................... 3
Reference Documents .................................................................................................. 3

General Information .................................................................................................. 4
Description ................................................................................................................. 4
Application .................................................................................................................. 5
Component Data ......................................................................................................... 5
Service Pin .................................................................................................................... 6
Light Emitting Diodes (LEDs) ....................................................................................... 6
LonWorks Network Connector .................................................................................... 6
8-Pin Header ................................................................................................................ 6
LonMark Profile Software ........................................................................................... 7
Neuron .......................................................................................................................... 7
Transceiver .................................................................................................................. 7
Specifications ............................................................................................................ 7

Installation ................................................................................................................. 8
Mounting ...................................................................................................................... 8
Mounting a MicroTech II LonWorks Communications Module ................................ 8
Replacing an Existing MicroTech II LonWorks Communications Module ............... 11
Unit Setup for Network Control .................................................................................. 11

Integration .................................................................................................................. 12
Connecting to the Network ......................................................................................... 12
Network Topology ....................................................................................................... 12
Physical Network ......................................................................................................... 14
Addressing and Establishing Communications ........................................................... 15
LonWorks Network Addressing .................................................................................. 15
Commissioning the Network ...................................................................................... 15
External Interface File (XIF) ......................................................................................... 15
Configuring the Unit Controller .................................................................................. 15

Service Information .................................................................................................. 16
Test Procedures .......................................................................................................... 16
Replaceable Parts List ................................................................................................. 16
Network Connection Plug ........................................................................................... 16
Replacement Kit .......................................................................................................... 16

Figures

Figure 1. MicroTech II LonWorks Communications Module (Component Side) .......... 4
Figure 2. Building Automation System ....................................................................... 5
Figure 3. MicroTech II LonWorks Communications Module Major Components ....... 6
Figure 4. Serial Card Slot Location on Unit Controller ............................................... 9
Figure 5. Serial Card Slot Detail .................................................................................. 9
Figure 6. Network Cable Routing and Connections ..................................................... 10
Figure 7. Network Connection Detail ......................................................................... 10
Figure 8. Singly Terminated Free Topology Networks ............................................... 12
Figure 9. Combining Network Segments With a Repeater ......................................... 13
Figure 10. Doubly Terminated Network Topology ....................................................... 13
Revision History

IM 736-0  January 2, 2003  Initial release

Reference Documents

<table>
<thead>
<tr>
<th>Number</th>
<th>Company</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>078-0014-01E</td>
<td>LonMark® Interoperability Association</td>
<td>LonMark Layers 1-6 Interoperability Guidelines, Version 3.0</td>
</tr>
<tr>
<td>078-0120-01E</td>
<td>LonMark Interoperability Association</td>
<td>LonMark Application Layer Interoperability Guidelines, Version 3.2</td>
</tr>
<tr>
<td>078-0156-01G</td>
<td>Echelon® Corporation</td>
<td>LonWorks FTT-10A Free Topology Transceiver Users Guide</td>
</tr>
<tr>
<td>8040_10</td>
<td>LonMark Interoperability Association</td>
<td>LonMark Functional Profile: Chiller, Version 1.0</td>
</tr>
<tr>
<td>ED15062</td>
<td>McQuay International</td>
<td>MicroTech II Protocol Information Data for McQuay International Chiller Unit Controllers</td>
</tr>
<tr>
<td>IMM AGS-1</td>
<td>McQuay International</td>
<td>MicroTech II Air-Cooled Screw Chiller Installation and Maintenance Manual</td>
</tr>
<tr>
<td>IOMM ACZ/AGZ-3</td>
<td>McQuay International</td>
<td>MicroTech II Air-Cooled Condensing Unit Installation, Operation, and Maintenance Manual</td>
</tr>
<tr>
<td>IOMM ACZ1</td>
<td>McQuay International</td>
<td>MicroTech II Air-Cooled Condensing Unit Installation, Operation, and Maintenance Manual</td>
</tr>
<tr>
<td>IOMM WGCZ-1</td>
<td>McQuay International</td>
<td>MicroTech II Water-Cooled Scroll Chiller Installation Manual</td>
</tr>
<tr>
<td>IOMM WPV</td>
<td>McQuay International</td>
<td>MicroTech II Centrifugal Chiller Installation, Operation, and Maintenance Manual</td>
</tr>
<tr>
<td>IOMM WSCWDC-2</td>
<td>McQuay International</td>
<td>MicroTech II Chiller Unit Controller Installation, Operation, and Maintenance Manual</td>
</tr>
<tr>
<td>OM AGS-1</td>
<td>McQuay International</td>
<td>MicroTech II Controller for AGS Chillers Operating Manual</td>
</tr>
<tr>
<td>OM CentriMicro II</td>
<td>McQuay International</td>
<td>MicroTech II Unit Controller for Centrifugal Chillers and Templiers Operating Manual</td>
</tr>
</tbody>
</table>

Notice

Copyright © 2003 McQuay International, Minneapolis MN. All rights reserved throughout the world.

McQuay International reserves the right to change any information contained herein without prior notice. The user is responsible for determining whether this product is appropriate for his or her application.

BACnet is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Echelon, LONWORKS, LonMark, LonTalk, and Neuron are registered trademarks of Echelon Corporation. Windows is a registered trademark of Microsoft Corporation. McQuay registered is a trademark and MicroTech II is a trademark of McQuay International.
General Information

This manual contains the information you need to install the MicroTech II LonWorks® Communication Modules and integrate them into the network.

⚠️ WARNING

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Connections and service to the MicroTech II control panel must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

⚠️ CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

NOTICE

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It 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 the equipment is operated in a commercial environment. 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 or her own expense. McQuay International disclaims any liability resulting from any interference or for the correction thereof.

Description

A MicroTech II LonWorks Communications Module provides the interface between a MicroTech II unit controller and a LonWorks Local Operating Network (LON). It translates the LonTalk variables used on the network to the variables used in the unit controller and vice versa. It translates in accordance with the LonMark® Chiller Functional Profile. Profiles are interpreted in loaded programs (firmware).

The MicroTech II LonWorks Communications Module is a printed circuit board that plugs into the MicroTech II Chiller Unit Controller. Figure 1 is an outline drawing of the printed circuit board.

Figure 1. MicroTech II LonWorks Communications Module (Component Side)
Application

A MicroTech II LonWorks Communications Module connects the MicroTech II Unit Controller to the Building Automation System (BAS) on a LonWorks network. It is the interface adapter for the exchange of LonTalk variables between the network and the unit controller. The MicroTech II LonWorks Communications Module translates the LonWorks variables of the profile into the native information of the unit controller. Figure 2 shows the MicroTech II LonWorks Communications Module and Unit Controller integrated into a BAS. Refer to the appropriate Unit Operation manual for keypad details. See Reference Documents for part numbers.

Figure 2. Building Automation System

Component Data

Figure 3 shows the location of the major components of the MicroTech II LonWorks Communications Module.
Service Pin

The service pin generates a service-pin message, which contains the Neuron® ID and the program code identification of the node. A service-pin message is a network message that is generated by a node and broadcast on the network. It can be used to commission the LonWorks network.

The service pin consists of two terminals next to the network connector that protrude below the cover on the serial card port of the unit controller. To activate the service pin, short the two pins together for an instant with the tip of a screwdriver or similar tool.

Light Emitting Diodes (LEDs)

The communications module has two LEDs to indicate communication activity and status of the communication module. These indicators cannot be seen when the module is installed in the controller.

<table>
<thead>
<tr>
<th>LED</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service (Green)</td>
<td>• Lights when the service-pin is shorted</td>
</tr>
<tr>
<td></td>
<td>• Flashes (1 second) during a Wink command</td>
</tr>
<tr>
<td></td>
<td>• Flashes (1/2 second) during commissioning</td>
</tr>
<tr>
<td></td>
<td>• Blinking when the node is not commissioned</td>
</tr>
<tr>
<td></td>
<td>• Flashes (1 second) when the node has no</td>
</tr>
<tr>
<td></td>
<td>application program</td>
</tr>
<tr>
<td>Anomaly (Red)</td>
<td>• Lights when there is a problem with the</td>
</tr>
<tr>
<td></td>
<td>module</td>
</tr>
</tbody>
</table>

LonWorks Network Connector

The P8 connector connects the MicroTech II LonWorks Communications Module to the LonWorks FTT-10A bus.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Connection</td>
</tr>
<tr>
<td>2</td>
<td>FTT-10A</td>
</tr>
<tr>
<td>3</td>
<td>FTT-10B</td>
</tr>
</tbody>
</table>

8-Pin Header

The 8-pin header connects the unit controller to the communications module.
LonMark Profile Software
The MicroTech II LonWorks Communications Module software translates the Standard Network Variable Types (SNVTs) and Standard Network Configuration Parameter Types (SCPTs) in accordance with the LonMark profiles used on the LonWorks network into the variables and parameters used in the MicroTech II Chiller Unit Controller and conversely.

Neuron
The basis of the communications module is an Echelon® Neuron® integrated circuit. Each Neuron chip contains a globally (i.e., worldwide) unique, 48-bit serial-number called the Neuron ID. The Neuron ID can be used to address the device on the LonWorks network.

Transceiver
The Echelon Corporation Free Topology Transceiver (FTT-10A) is used to communicate on the LonWorks network. The network topology may consist of a: star, daisy-chain, or other topology. Data transmission rate on the network is 78 kbps (baud).

Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Topology</td>
<td>Flexible Free Topology</td>
</tr>
<tr>
<td>Neuron Chip Processor</td>
<td>3150</td>
</tr>
<tr>
<td>Free Topology Transceiver (FTT-10A)</td>
<td>50051</td>
</tr>
<tr>
<td>Cable Types</td>
<td>TIA Category 5 (recommended)</td>
</tr>
<tr>
<td>Maximum Bus Length</td>
<td>1476 ft (450) meters per segment</td>
</tr>
<tr>
<td>Maximum Node Separation</td>
<td>820 ft (250 meters)</td>
</tr>
<tr>
<td>Data Transmission</td>
<td>Two-wire, half duplex</td>
</tr>
<tr>
<td>Data Transmission Rate</td>
<td>78 kbps (baud)</td>
</tr>
</tbody>
</table>
Installation

The MicroTech II LonWorks Communications Module can be installed in the field or it can be installed in the factory. The module mounts on connector pins in the unit controller.

Mounting

The MicroTech II LonWorks Communications Module is included in a kit (Part number 350147401) and this manual.

CAUTION

Electrostatic discharge hazard.

Can cause equipment damage.

This equipment contains sensitive electronic components that may be damaged by electrostatic discharge from your hands. Before you handle a communications module, touch a grounded object, such as the metal enclosure, in order to discharge the electrostatic potential in your body.

Mounting a MicroTech II LonWorks Communications Module

To mount a MicroTech II LonWorks Communications Module

1. Remove power from the unit controller.
2. Locate the Serial Card slot on the unit controller. See Figure 4.
3. Remove the cover from the Serial Card slot if it hasn’t already been removed. Use a small screwdriver to pry the cover off from one end.
4. Remove the plastic knock-out in the cover.
5. Figure 5 shows a detail of the Serial Card slot showing the 8-pin plug that mates to the receptacle on the communications module.
6. Grasp the communications module, with the network connector on the underside. The 8-pin receptacle on the card must mate to the 8-pin plug in the unit controller. The plug has a guide on each end to direct the card into the mating guide on the receptacle.

Note: This operation relies more on feeling the card into the connector than seeing the connectors mate.

7. Insert the card, pointing up, into the slot, rolling the card into a level position as you move it into the slot.
8. Keeping the card level, move the card in the slot until you feel the connectors line up. The correct position seems to be level, toward the left side of the slot, and down slightly from the top.
9. When you feel the connectors align, press the communications module into the connector. Ensure that the card is firmly seated in the connector.
10. Replace the cover on the Serial Card slot. Slip the cover over the network connector plug.
11. Route the network cable through the third knockout from the left and over to the communications module.
12. Connect the MicroTech II LonWorks Communications Module to the network. See Figure 6. Figure 7 shows a detail of the network connector plug.
   a. Connect one wire of the network cable to Pin 2 of the connector plug.
   b. Connect the other wire to Pin 3 of the connector plug.
   c. No wire is connected to the remaining pin.
Figure 4. Serial Card Slot Location on Unit Controller

Figure 5. Serial Card Slot Detail.
Figure 6. Network Cable Routing and Connections

Figure 7. Network Connection Detail
Replacing an Existing MicroTech II LonWorks Communications Module

To replace a MicroTech II LonWorks Communications Module
1. Remove power from the Main Control Board.
2. Locate the Serial Card slot on the unit controller. See Figure 4.
3. Pull the network cable connector from the communications module.
4. Remove the cover from the Serial Card slot. Use a small screwdriver to pry it off from one end.
5. Grasp the communications module and carefully pull it from the controller.
6. Install the new communications module:
7. Figure 5 shows a detail of the Serial Card slot showing the 8-pin plug that mates to the receptacle on the communications module.
8. Grasp the communications module, with the network connector on the underside. The 8-pin receptacle on the card must mate to the 8-pin plug in the unit controller. The plug has a guide on each end to direct the card into the mating guide on the receptacle.

Note: This operation relies more on feeling the card into the connector than seeing the connectors mate.

9. Insert the card, pointing up, into the slot, rolling the card into a level position as you move it into the slot.
10. Keeping the card level, move the card in the slot until you feel the connectors line up. The correct position seems to be level, toward the left side of the slot, and down slightly from the top.
11. When you feel the connectors align, press the communications module into the connector. Ensure that the card is firmly seated in the connector.
12. Replace the cover on the Serial Card slot. Slip the cover over the network connector plug.
13. Insert the network cable connector into the communications module.

Unit Setup for Network Control

To setup the MicroTech II Unit Controller for network control
1. Disable the chiller. The chiller should not be operating while performing this setup.
2. At the unit controller keypad,
   a. In the SET UNIT SPs (1) screen, set the setpoint “Source” equal to “Local.” Use the Operator Password of “100.”
   b. In the SET UNIT SPs (1) screen, set the “Enable” setting equal to “Off.”
   c. In the SET UNIT SPs (13 or 14) screen, set the protocol parameter equal to “LonWorks.” Use the Manager Password of “2001.”
3. Verify with the chiller technician that the chiller is operational.
4. At the unit controller keypad,
   a. In the SET UNIT SPs (1) screen, set the setpoint “Source” equal to “BAS”. Use the Operator Password of “100.”
Integrating the MicroTech II LonWorks Communications Module into a BAS involves three steps:
- Connecting the unit (node) to the network,
- Addressing and establishing communications with the unit, and
- Configuring the unit to the building.

**Connecting to the Network**

After you have installed the MicroTech II LonWorks Communications Module in the unit, you must connect it into the LonWorks network.

**Network Topology**

Each MicroTech II LonWorks Communications Module is equipped with an FTT-10A transceiver for network communications. This transceiver allows for (1) free topology network wiring schemes using twisted pair (unshielded) cable and (2) polarity insensitive connections at each node. These features greatly simplify installation and reduce network commissioning problems. Additional nodes may be added with little regard to existing cable routing.

**Free Topology Networks**

A LonWorks “free topology network” means that devices (nodes) can be connected to the network in a variety of geometric configurations. For example, devices can be daisy-chained from one device to the next, connected with stub cables branching off from a main cable, connected using a tree or star topology, or any of these configurations can be mixed on the same network. As shown in Figure 8.

Free topology segments require termination for proper transmission performance. Only one termination is required. It may be placed anywhere along the segment. Refer to Echelon LonWorks FTT-10A Transceiver User’s Guide for details. See Reference Documents for part number.

Free topology networks may take on the following topologies:
- Bus
- Ring
- Star
- Mixed - Any combination of Bus, Ring, and Star

**Note:** Limitations to wire lengths apply and must be observed.

**Figure 8. Singly Terminated Free Topology Networks**
A network segment is any part of the free topology network in which each conductor is electrically continuous. Each of the four diagrams is an illustration of a network segment. Some applications may require two or more segments; see “Free Topology Restrictions.” If necessary, segments can be joined with FTT-10A-to-FTT-10A physical layer repeaters. See Figure 9. Refer to Echelon LonWorks FTT-10A Transceiver User’s Guide for details. See Reference Documents for part number.

*Figure 9. Combining Network Segments With a Repeater*

**Free Topology Restrictions**

Although free topology wiring is very flexible, there are restrictions. A summary follows, refer to the Echelon FTT-10A User’s Guide for details. See Reference Documents for part number.

1. The maximum number of nodes per segment is 64.
2. The maximum total bus length depends on the wire size (see “Qualified Cables” for details):

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Maximum Node-to-Node Length</th>
<th>Maximum Cable Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 AWG</td>
<td>820 ft (250 m)</td>
<td>1476 ft (450 m)</td>
</tr>
<tr>
<td>22 AWG</td>
<td>1312 ft (400 m)</td>
<td>1640 ft (500 m)</td>
</tr>
<tr>
<td>16 AWG</td>
<td>1640 ft (500 m)</td>
<td>1640 ft (500 m)</td>
</tr>
</tbody>
</table>

   The longest cable path between any possible pair of nodes on a segment must not exceed the maximum node-to-node distance. If two or more paths exist between a pair of nodes (e.g., a loop topology), the longest path should be considered. Note that in a bus topology, the longest node-to-node distance is equal to the total cable length.

   **Note:** The total length of all cable in a segment must not exceed the maximum total cable length.

3. One termination is required in each segment. It may be located anywhere along the segment.

**Doubly Terminated Networks**

You can extend the maximum total cable length without using a repeater by using doubly-terminated network topology. See Figure 10. The trade-offs are (1) this network topology must be rigorously followed during the installation and subsequent retrofits and (2) two terminations must be installed at the ends of the bus for proper transmission performance. Refer to Echelon LonWorks FTT-10A Transceiver User’s Guide for details. See Reference Documents for part number.

   **Note:** Limitations to wire lengths apply and must be observed.

*Figure 10. Doubly Terminated Network Topology*

**Doubly Terminated Topology Restrictions**

The restrictions on doubly-terminated bus topology are as follows:
1. The maximum number of nodes per segment is 64.
2. The maximum total bus length depends on the wire size (see “Qualified Cables” for details):

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Maximum Cable Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 AWG</td>
<td>2952 ft (900 m)</td>
</tr>
<tr>
<td>22 AWG</td>
<td>4590 ft (1400 m)</td>
</tr>
<tr>
<td>16 AWG</td>
<td>8855 ft (2700 m)</td>
</tr>
</tbody>
</table>

3. The maximum stub length is 9.8 ft (3 m).
   A stub is a piece of cable that is wired between the node and the bus. Note that if the bus is wired directly to the node, there is no stub, and thus the stub length is zero. If you are wiring to a field terminal strip on a unit, be sure to account for any factory wiring between the terminal strip and the controller. This wiring is considered part of the stub.

4. Two terminations are required in each segment. One must be located at each end of the bus.

**Physical Network**

**Qualified Cables**

Echelon has qualified three twisted-pair network communications cables that are available from a large number of different sources. Refer to Echelon LonWorks FTT-10A Free Topology Transceiver Users Guide for details. See Reference Documents for part number. Some local codes or applications may require the use of plenum-rated cable. The following cables meet this specification.

1. TIA568A Category 5 cable (24AWG/0.51mm)
2. NEMA Level IV cable (22AWG/0.65mm)
3. Generic 16AWG (1.3mm) (similar to Belden 85102)

Do not install the cable in the same conduit with power wiring. The temperature of the cable must not exceed 131°F (55°C).

**Note:** Ideally, you should connect two controllers with one continuous piece of cable in order to reduce the risk of communications errors. If you must splice the cable, use crimp-type butt connectors (good) or solder (best). Do not use wire nuts.

**Network Cable Termination**

Addressing and Establishing Communications

LonWorks Network Addressing

Every Neuron Chip has a unique 48-bit Neuron ID or physical address. This address is generally used only at initial installation or for diagnostic purposes. For normal network operation, a device address is used.

Device addresses are defined at the time of network configuration. All device addresses have three parts. The first part is the Domain ID, designating the domain. Devices must be in the same domain in order to communicate with each other. The second part is the Subnet ID that specifies a collection of up to 127 devices that are on a single channel or a set of channels connected by repeaters. There may be up to 255 subnets in a domain. The third part is the Node ID that identifies an individual device within the subnet.

A group is a logical collection of devices within a domain. Groups are assembled with regard for their physical location in the domain. There may be up to 256 groups in a domain. A group address is the address that identifies all devices of the group. There may be any number of devices in a group when unacknowledged messaging is used. Groups are limited to 64 devices if acknowledged messaging is used.

A broadcast address identifies all devices within a subnet or domain.

Commissioning the Network

Pressing the service pin generates a service-pin message, which contains the Neuron ID and the program code identification of the node. A service-pin message is a network message that is generated by a node and broadcast on the network. It can be used to commission the LonWorks network.

A network configuration tool maps device Neuron IDs to the domain/subnet/node logical addressing scheme when it creates the network image, the logical network addresses and connection information for all devices (nodes) on the network.

External Interface File (XIF)

LonMark guidelines specify exact documentation rules so that proprietary configuration tools are not required to commission and configure LonWorks devices. The MicroTech II LonWorks Chiller Communications Module is self-documenting so that any network management tool can obtain all the information needed over the network to connect it into the system and to configure and manage it. An external interface file (a specially formatted PC text file with the extension .XIF) is also available so that any network tool can design and configure it prior to installation. For a copy of the XIF file, contact your local McQuay International representative.

Configuring the Unit Controller

The MicroTech II Chiller Controller LonWorks Communications Module is configured at the factory as a chiller unit controller in accordance with the LonMark Chiller functional profile. The unit is ready to operate with the default values of the various parameters set at the factory. Default values may be changed via the network. See the appropriate operation manual for default values and keypad operation and see the MicroTech II Chiller Protocol Information for descriptions of the network variables. See Reference Documents for part numbers.
Service Information

Test Procedures

If you can control the unit from its keypad, but you are unable to communicate with it via the network:

- Check the network wiring
- Check that the Control Source setpoint is set to Local. See Unit Setup for Network Control on page 11.
- Check that the Protocol setpoint is set to LonWorks. See Unit Setup for Network Control on page 11.
- Check addressing
  - Activate the Service Pin on the communications module to send the service message to the network.
  - The service-pin message contains the Neuron ID and the program code identification of the node.

If the MicroTech II Chiller LonWorks Communications Module still does not respond, replace the communications module.

Replaceable Parts List

Network Connection Plug

Generic Replacement Parts

If you lose this terminal block you can replace it with a standard block from a manufacturer. The list below contains manufacturers part numbers for equivalent parts.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Telephone</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix Contact</td>
<td>(800) 888-7388</td>
<td>17 57 02 2</td>
</tr>
<tr>
<td>Altech Corp</td>
<td>(908) 806-9400</td>
<td>37.003</td>
</tr>
</tbody>
</table>

Replacement Kit

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit, Chiller</td>
<td>Installation Kit for LonMark Communications Module</td>
<td>350147401</td>
</tr>
</tbody>
</table>