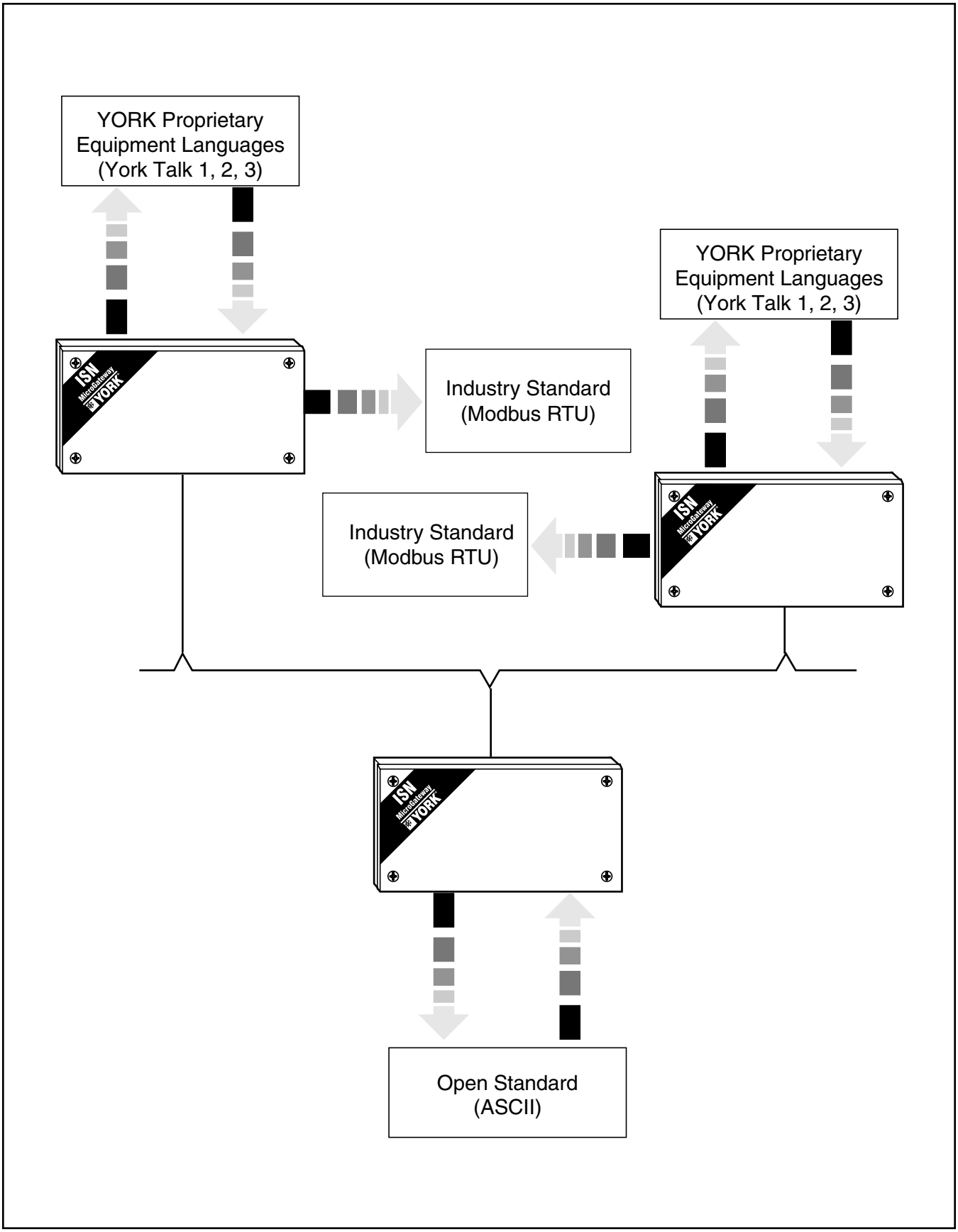
ASCII MICROGATEWAY

INSTALLATION MANUAL | Supersedes 450.20-N15 (1203) | Form 450.20-N15 (905)



IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

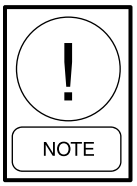
SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to areas of potential hazard:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



NOTE is used to highlight additional information which may be helpful to you.

CHANGEABILITY OF THIS DOCUMENT

In complying with YORK's policy for continuous product improvement, the information contained in this document is subject to change without notice. While YORK makes no commitment to update or provide current information automatically to the manual owner, that information, if applicable, can be obtained by contacting the nearest YORK Engineered Systems Group office.

It is the responsibility of operating/service personnel as to the applicability of these documents. If there is any question in the mind of operating/service personnel as to the applicability of these documents, then, prior to working on the equipment, they should verify with the owner whether the equipment has been modified and if current documentation is available.

SUMMARY OF CHANGES

601 Original Release

1203 Included information from Literature Supplements, including terminal label fixes and additional Quick Start information.
Included third port option and additional part numbers.

905 Corrected 3rd Party Connection on Figures 7, 13 through 23
Updated Table 3 – Cable Requirements

REFERENCE INSTRUCTIONS

DESCRIPTION	FORM NO.
ASCII MicroGateway Specification	450.20-S21
ASCII MicroGateway Operation	450.20-O03
Renewal Parts List	450.00-RP1

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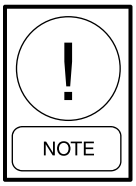
SECTION 1

GENERAL INFORMATION

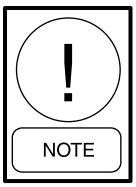
Overview

The ASCII MicroGateway is a communications device that translates between the York Talk protocols, ISN and ASCII code. Using a combination of ASCII MicroGateways, one or more YORK chillers can communicate to a third-party control system through an ASCII-capable device. There are several variations of the ASCII MicroGateway, depending upon the number of ports, type of input voltage, and the chiller with which it will be connected to.

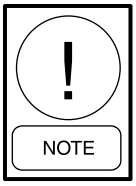
MicroGateways with Quick Start are available with two or three ports. Port 2 connects to the chiller panel or ASCII device and Port 1 connects multiple MicroGateways together using the ISN protocol. Port 3, located on a daughter board, is used for monitoring only and does not allow any control.



NOTE: If the third port is desired, the MicroGateway must be replaced as a unit. The CLIP is not field installable.



NOTE: Throughout this manual, the CLIP refers to the daughter board with the third port. Reference to the MicroGateway always refers to the 031-02039-xxx circuit board and may or may not include the CLIP and power supply.



NOTE: When communicating to an ASCII device, the MicroGateway replaces the function of an XL Translator.

For chillers using the OptiView micro panel, the MicroGateway consists of a single circuit board which is attached to four studs inside the micro panel. The 12 volt DC input power is drawn directly from the OptiView panel, eliminating the need for an external power supply.

For other types of chillers, the MicroGateway comes with its own enclosure. In addition to the MicroGateway circuit board, a 12 VDC power supply is included with the enclosure to convert input AC power (115 or 230 volts) to 12 volt DC power.

A series of LEDs provide information about the MicroGateway's communication and operating status. Each port has a red transmission LED (TX) and a green receiving LED (RX). Between the two sets of port LED's is a STATUS LED. A STATUS LED provides information regarding the associated board to verify proper setup selection, as well as indications of normal operation versus error modes.

Table 1 – MicroGateway Options

PN	INPUT VOLTAGE	TYPE
371-03609-004*	12 VDC	2-Port OptiView Kit
371-03609-014*	12 VDC	3-Port OptiView Kit
371-02592-104	115 VAC	2-Port in Enclosure
371-02592-114	115 VAC	3-Port in Enclosure
371-02592-204	230 VAC	2-Port in Enclosure
371-02592-224	230 VAC	3-Port in Enclosure

** Includes MicroGateway board, power cable, chiller interface cable and OptiView mounting hardware.*

This document is designed to provide quick and easy instructions to help in the installation and commissioning of a MicroGateway. Mounting and wiring of the unit is covered for all types of chillers, as well as some standard setup configurations. Additional information can be found in the *Operation Manual*.

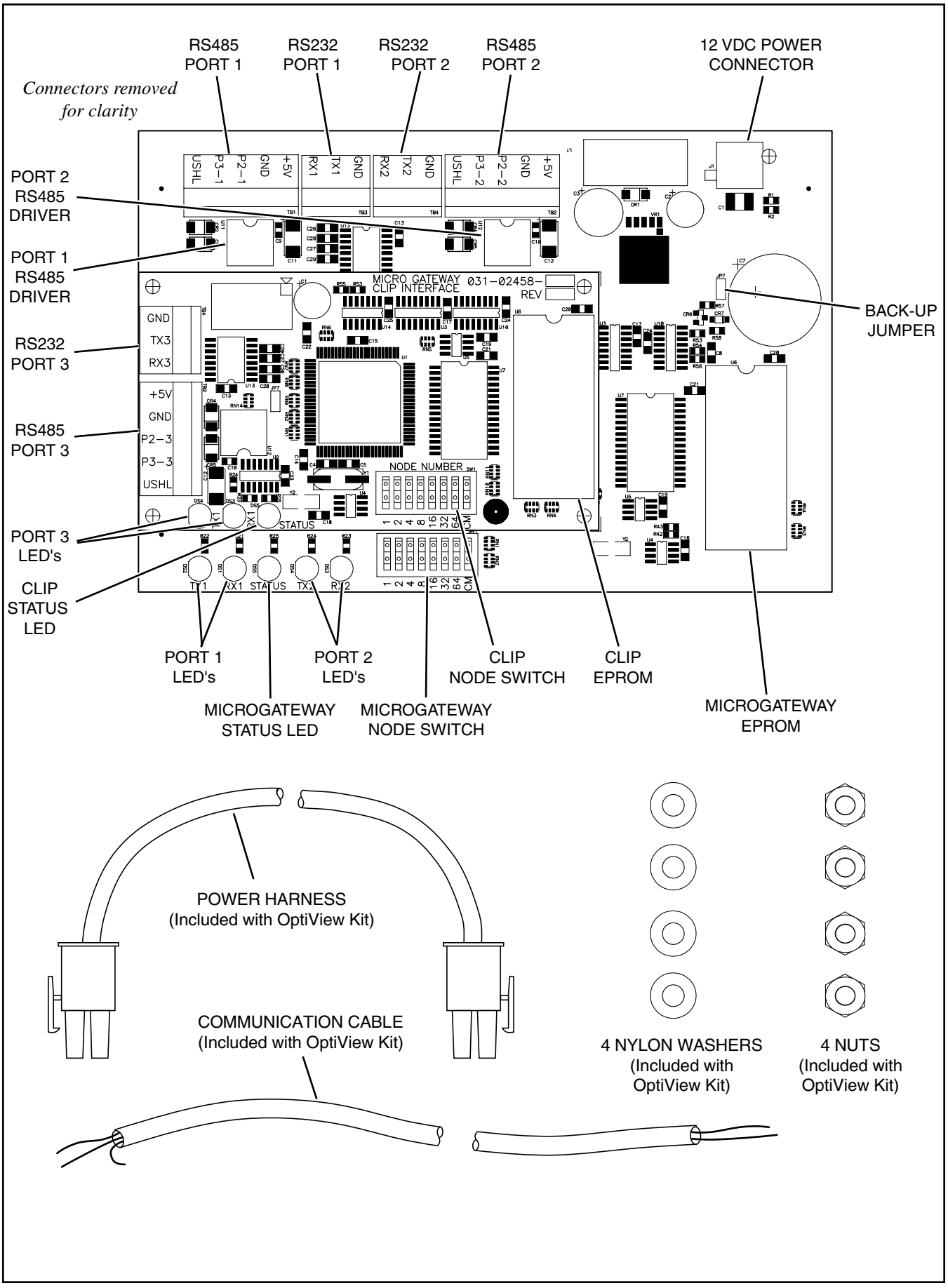


Figure 1. MicroGateway OptiView Kit Components

Quick Start

This manual provides instructions for setup of an ASCII MicroGateway using the Quick Start feature only. The Quick Start feature can be used when connecting to YORK chillers using York Talk 1, 2 or 3 protocols. York Talk is the protocol available at the control panel.

- York Talk 3 – Used with OptiView panels.
- York Talk 2 – Used on micro panels after 1991.
- York Talk 1 – Used on micro panels between 1985 and 1991. Early micro panels were not capable of communications. Contact the YORK Service Group to upgrade the processor board, if necessary.

Any deviations from these standard models requires the use of more advanced techniques, a portable computer, reference to the *Operation Manual* as well as a good understanding of the communications protocols used with YORK chiller controllers. A list of the circuit board numbers and York Talk protocol is available on the YORK Controls Group website at

http://intranet.york.com/web0147/

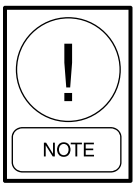
The Quick Start feature uses the node switch on the MicroGateway to select the appropriate configuration for the given type of chiller based on a standard set of parameters. (Any of these parameters may be changed at the discretion of the technician. Refer to the *Operation Manual*.) This allows simple setup without the use of a portable computer and knowledge of the ISN programming language.

The Quick Start feature also provides the ability for some auxiliary functions, such as changing the OptiView micro panel's engineering units to either imperial or metric, selecting a terminal (text) interface, and performing a basic communications "loop back" test.

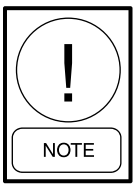
CLIP

MicroGateways can be ordered in two or three port configurations. The CLIP provides a third port, allowing any MicroGateway to operate as a Modbus Server, provided it uses a standard Quick Start setup.

CAUTION: The procedure for configuring Port 3 requires the use of the Quick Starts. If the MicroGateway is intended for customized programming beyond the scope of the Quick Start features, the Modbus Server functionality of Port 3 is overridden.



NOTE: The CLIP board cannot be field-installed on any MicroGateway. Installation requires replacement of the MicroGateway and CLIP as an assembly.



NOTE: Information regarding the collection of Modbus RTU data is a function of the remote monitoring system and is outside the scope of this manual.

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SECTION 2

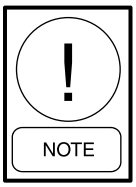
NETWORK TOPOLOGY

The MicroGateway essentially consists of two or three serial communication ports. All ports have connectors for RS232 and RS485 operation. A connection to the appropriate set of terminals is used to make this selection (refer to Table 2).

Port 1 of the ASCII MicroGateway always communicates using the ISN protocol. Port 2 uses either a York Talk protocol or ASCII code. When linking several YORK chillers to a third-party device, each chiller requires a MicroGateway to translate the native York Talk to ISN. An additional MicroGateway then translates the ISN from all the connected chillers to the ASCII code. Port 3 provides Modbus RTU read-only capability for the monitoring of chiller data.

Table 2 – MicroGateway Communication Ports

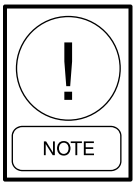
LABEL	PORT	PROTOCOL
TB1	1	RS485
TB2	2	RS485
TB3	1	RS232
TB4	2	RS232
TB2 (CLIP)	3	RS485
TB4 (CLIP)	3	RS232



NOTE: Port 3 monitoring capability is only valid on a MicroGateway connected to the chiller. It will not function on a Point-of-Connection device.

The RS485 standard limits networks to 4000 ft. (1.2 km) and 32 nodes without a repeater. York always recommends using a termination resistors.

There is always a one-to-one relationship between the MicroGateway and a chiller panel. Each MicroGateway can communicate to one, and only one, micro panel. Two chillers require two MicroGateways, etc. Only one MicroGateway may be configured as a point-of-connection to a third-party system (using ASCII) per network.



NOTE: Only one MicroGateway is required on chillers that make use of a master/slave panel arrangement.

The following illustrations show how the ASCII MicroGateway can be incorporated into a network to allow translation from a York chiller to an ISN network. An additional MicroGateway can be connected to the ISN network to translate to an ASCII translator device and a third-party control system.

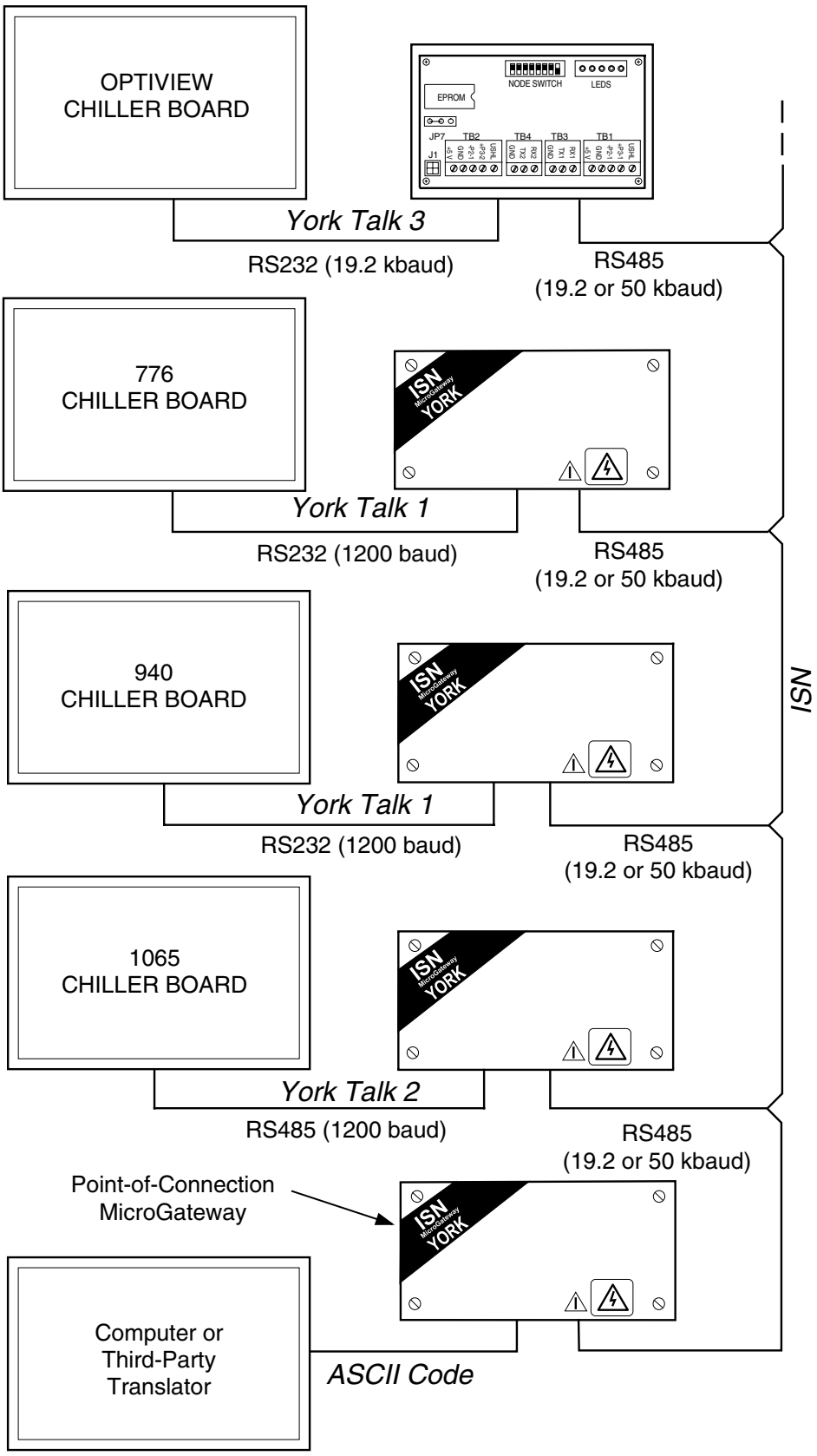


Figure 2. Typical Board Topology

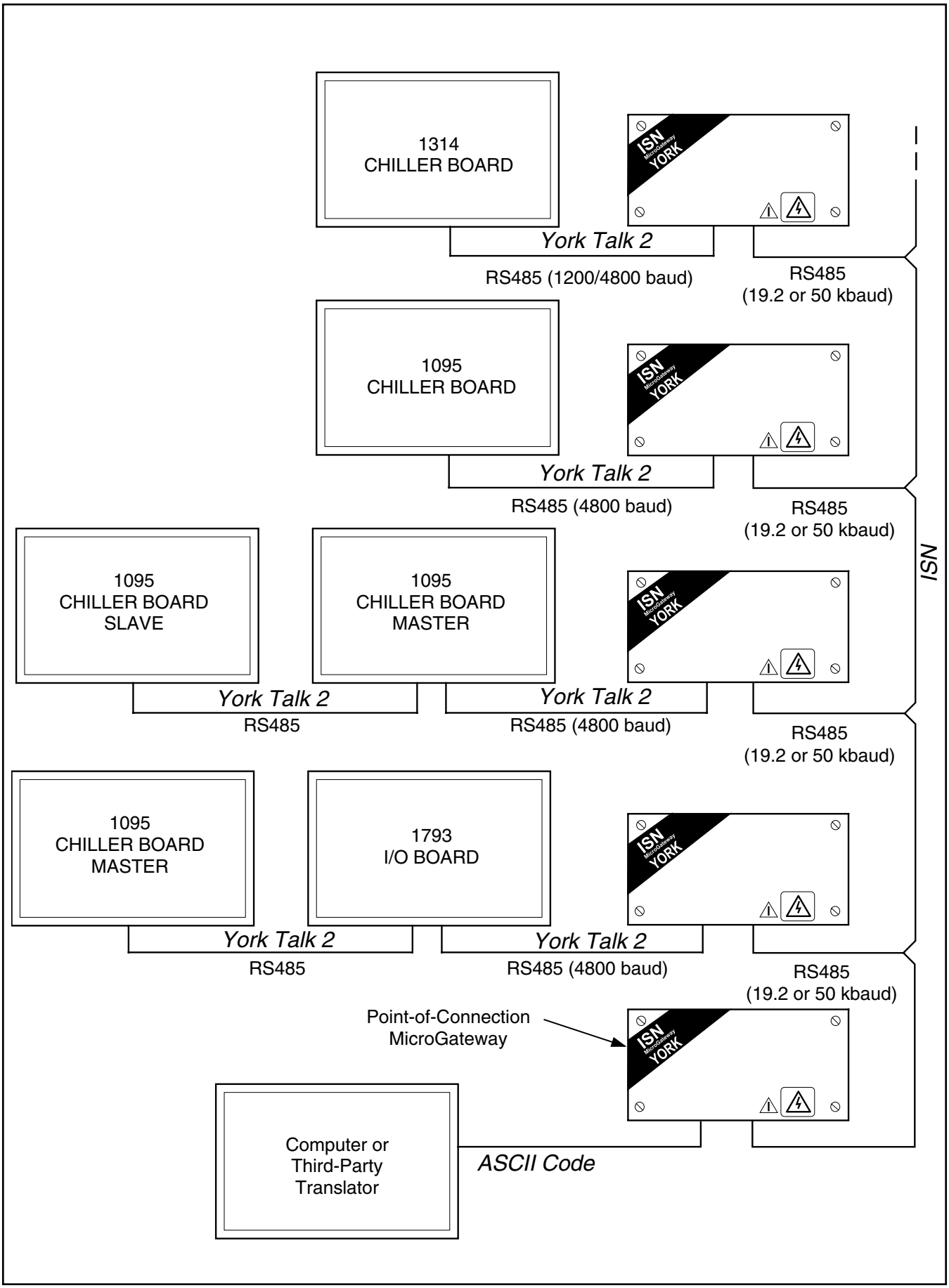


Figure 3. Typical Board Topology

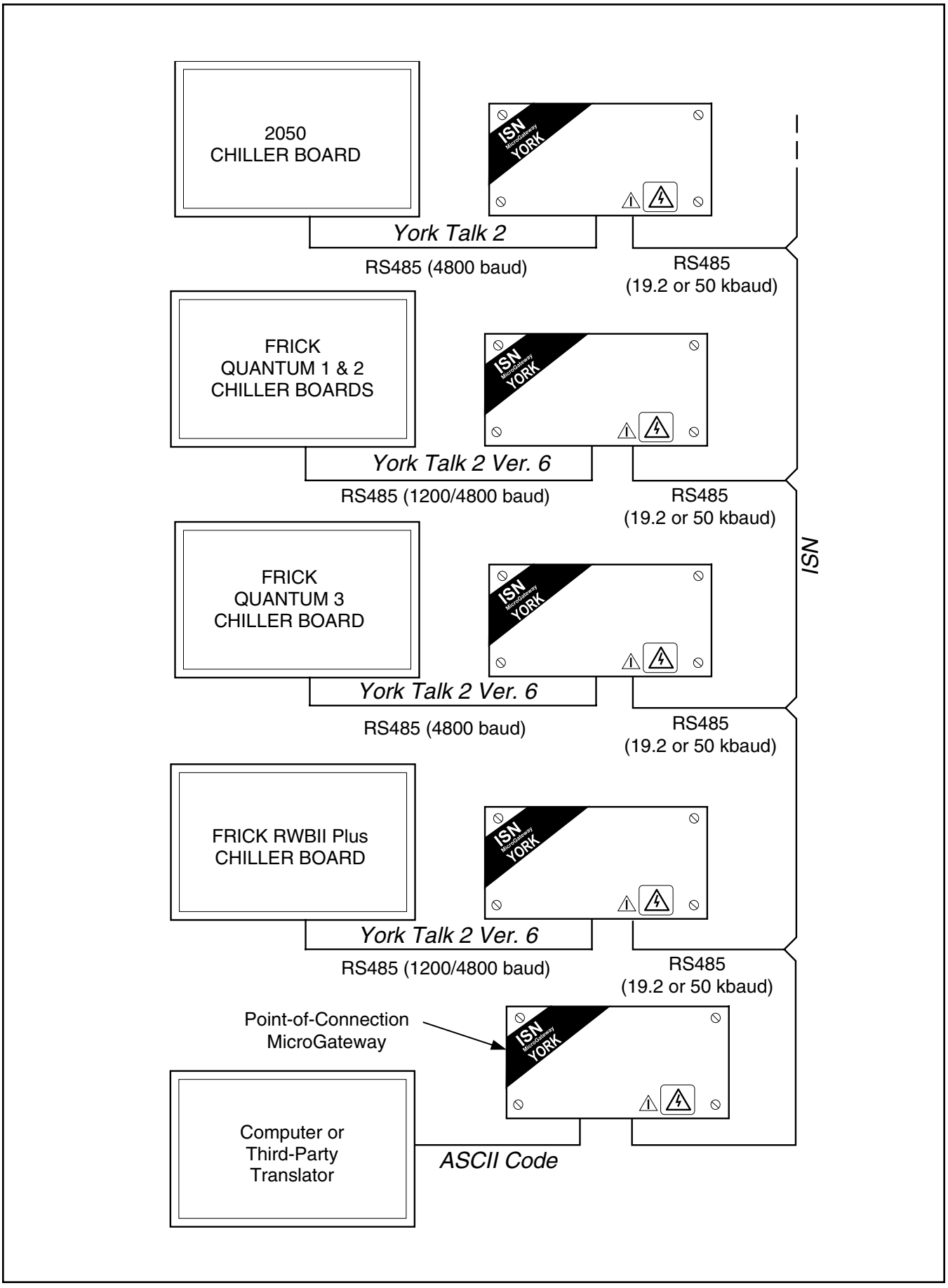


Figure 4. Typical Board Topology

SECTION 3

INSTALLATION

Installation Guidelines

This manual assumes the installer is competent in environments with moving machinery, and is able to recognize and protect against any inherent hazards, such as, but not limited to, refrigerants, oil, materials under pressure, rotating parts, and both high and low voltages. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death.

It is the obligation and responsibility of the operating/service personnel to identify and recognize inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment, as well as severe personal injury or death. In addition to following standard local, state and country codes and procedures, it is recommended that a lockout procedure be used to prevent inadvertent start up of equipment during installation and maintenance procedures.

All wiring should be carried out in a safe and neat manner and should always comply in all respects to the latest edition of any local, state or country codes that may be applicable. The wiring should be installed in a manner that does not cause a hazard and is protected against electrical and mechanical damage.

Environment

The MicroGateway must be installed in an environment that is protected from the direct influence of the elements and is within the following:

Temperature: 32 to 122° F (0 to 50° C).

Humidity: 0% to 95% non-condensing.

The MicroGateway should never be mounted outside the confines of a building. If this cannot be avoided, it may be mounted inside an enclosure rated at IP65/NEMA 4X or greater. In addition to protection against the elements, the enclosure must be capable of maintaining the circuit boards at the required temperature and humidity. This may require the addition of a fan or heater to maintain the temperature and humidity inside the enclosure.

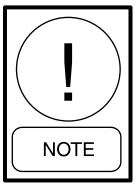
Some micro panels, such as the OptiView, provide a mounting location for the MicroGateway circuit board. These micro panels also provide a power supply for the MicroGateway and utilize a different part number, which does not include a separate power supply. Refer to the documentation included with the chiller.

Care should be taken when mounting the MicroGateway so as not to impede access to other equipment within the vicinity.

Power

The MicroGateway circuit board is powered from a 12 volt DC supply. When used with an OptiView, this voltage is obtained directly from the micro panel through a power harness supplied with the kit.

If the MicroGateway circuit board is installed in its own enclosure, a power supply board is included in the enclosure. Line voltage may be supplied using an external power source or drawn from the input voltage terminal strip inside the chiller micro panel, which is recommended. On all 115 VAC micro panels, the line wire is connected to terminal L and the neutral wire connected to terminal 2. A ground strip or ground points are also located within the micro panel to ensure a common ground. For other micro panels, refer to the chiller documentation.



NOTE: The CLIP board is powered via the connection to the base MicroGateway board.

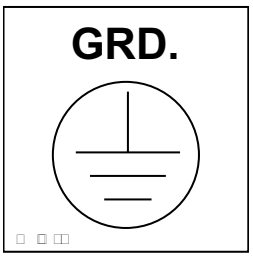
Be sure the VA capacity of the line supplying the chiller micro panel is rated sufficiently for the additional power required by the MicroGateway.

Use a suitably-sized wire (refer to the table titled "Recommended Cable Specifications") to connect the line voltage feed to the MicroGateway. The line voltage power source should be "clean", separately fused (for either 115 or 230 VAC), and isolated, (using a control transformer) from other equipment in the plant room that may generate EMI interference.

All high voltage wiring (>75 volts) must be run in conduit and kept separate from low voltage communications wiring. This will greatly reduce network communication problems.

Grounding

For the enclosure style of MicroGateway a ground wire must be connected directly to the chassis at the point of entry. This ensures that the enclosure remains grounded when the power plug is removed.



There is a small label that identifies the ground point. This should be connected through a continuous ground circuit to the incoming ground at the source transformer.

High Noise Environments

Electrical equipment which employs high speed switching circuits (variable speed drives, solid state starters and computing equipment) generate Electro-Magnetic Noise (EMI) and Radio Frequency Interference (RFI). When excessive, this noise can effect the way electronics behave and, ultimately communication.

Noisy environments often show up as varying ground potentials, i.e. the electrical reference points at different nodes are different. This is referred to as “common mode” noise. The RS485 circuitry is designed to withstand a certain defference between varying ground sources. However, if this difference becomes too great and exceeds certain voltage limits, the RS485 circuitry can be permanently damaged and require replacement.

To combat these possible problems follow good wiring practices:

- Care should be taken to ensure that the micro panel and MicroGateway are powered from a source with true earth ground.
- The communication cable should be shielded with the shield terminated at one end only.
- Communication cables should not be run in close proximity to or parallel with power cables.

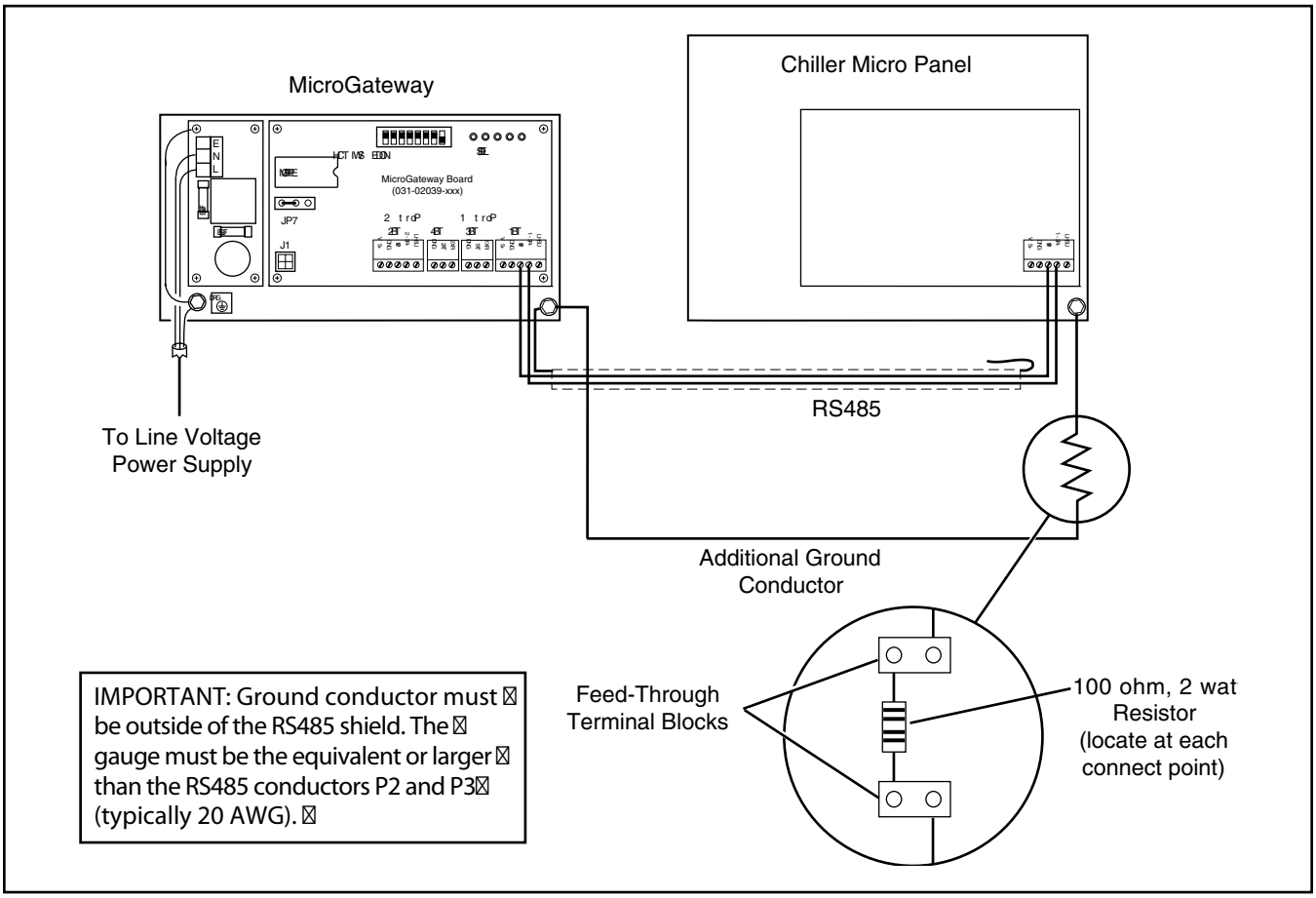


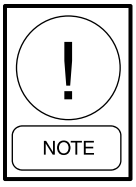
Figure 5. Additional Ground Conductor

The pathways for noise, and therefore the likelihood of common mode noise, are greatly reduced if the MicroGateway is close-coupled to the micro panel (as shown in Figure 10). Close-coupling requires that the MicroGateway and micro panel share the same line voltage power source and are physically close to one another. Typically the MicroGateway is mounted on the micro panel enclosure. This ensures a short communication cable which is usually protected entirely within the two enclosures.

The RS485 standard requires three conductors when connecting network nodes together; 2 signal wires and a signal return path. YORK has typically used a twisted-pair cable for the signal wires with the building infrastructure (ground) functioning as the return path.

When an application requires the MicroGateway to be mounted remotely from the micro panel and the line voltage power supply obtained from a different location, the building ground may be affected by noise and the signal lost along the return path. In these situations, a separate conductor (outside the shielding) should always be run alongside the standard twisted-pair cable in case there are communication problems. This avoids future installation costs should an additional conductor be required to address communication problems. If communication problems do occur, the additional conductor can be connected to equalize the ground potential. If communication operates as expected, the additional conductor is not connected and the building infrastructure operates as the signal return path.

CAUTION: Do not connect the additional conductor unless communication problems have been verified.



NOTE: The initial purchase and installation cost of an additional conductor is minimal compared to the cost of installation at a later date. The additional conductor is recommended due to the frequency of communication problems experienced with remotely mounted equipment.

When connecting the conductor to the ground, a small resistor (approximately 100 ohm, 2 watt) should be installed at one end to reduce the magnitude of current flow in the conductor.

Termination

On an ISN network (between MicroGateways) a Terminator Module (Part Number 031-01488-000) is required at each network end device. (An end of LAN device can be identified as one that has only one set of ISN LAN wires connected to it.) This provides biasing of the network and assists in returning the signal to a normal state in the event of voltage transients.

Protection of Communication Ports

When using RS485 technology it is possible that electrical disturbances, such as voltage spikes or stray voltage, can damage a circuit board. The MicroGateway includes tranzorbs at the RS485 ports to protect against these spikes. Not all micro panels include tranzorbs. Refer to the chiller documentation for recommendations on installing tranzorb protection.

Cable Specifications

Power Cables

CAUTION: Aluminum wire is absolutely not acceptable.

For an enclosure style MicroGateway the power cable should be at least an 18 AWG copper wire rated for 10 amps per core at 250 volt AC. If the power cable uses three conductors, the ground conductor must be, as a minimum, the same size with the same current carrying capacity as the live and neutral conductors.

Network Cables

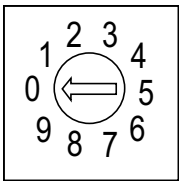
In most cases the network cables are specified and provided by a third-party integrator. For the MicroGateway to chiller interface, a twisted-pair cable, with an overall shield and drain wire, with conductors being at least 24 AWG is the minimum. For the ISN network (between MicroGateways) a 20 AWG twisted-pair cable with overall shield and drain wire is recommended.

Table 3 – Cable Requirements

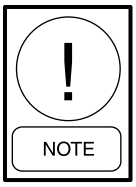
		Network Cable (EIA485)	Analog, Pulse Inputs and Analog Outputs	Digital Input	Digital Outputs	Serial Devices (EIA232)	
Non-Plenum	Part Number	025-40390-012	025-40390-022	025-40602-052	025-40391-032	NA	NA
	Color	Gray/Yellow Stripe	Gray/Green Stripe	Gray/Purple Stripe	Gray/Orange Stripe		
	No. of Pairs	1	1	1	1		
	Shield	Yes	Yes	No	No		
Plenum	Part Number	025-40391-132	025-40390-122	025-40602-152	025-40390-112	025-40390-144	025-40603-146
	Color	Yellow	Green	Gray	Orange	Blue	Tan
	No. of Pairs	1	1	1	1	2	3
	Shield	Yes	Yes	No	No	Yes	Yes

User Selections

Setting the Rotary Switch



Many micro panels use a small rotary switch to set the address of the chiller micro panel on a York Talk network, (York Talk Chiller ID address = Rotary Switch + 1). Since the MicroGateway uses a one to one relationship with the chiller panel, this switch is normally set to 0 (York Talk ID address 1) in all cases but that of a master/slave configuration. In this case the master micro panel rotary switch should be set to 0 (York Talk ID address = 1) and the slave micro panel to 1 (York Talk ID address =2).



NOTE: Only a 2-Port MicroGateway can be programmed to communicate to chillers with different network addresses. Refer to the* Operation Manual *for information regarding chiller ID configuration. A 3-Port MicroGateway requires the use of Quick Starts.

If the chiller micro panel is not equipped with a rotary switch, the York Talk ID address (chiller ID) is embedded in the software. In most cases this is user configurable. Some models of chiller use a fixed chiller panel ID which cannot be changed. Refer to the chiller documentation for information on software configuration of the York Talk ID address or chiller ID.

MicroGateway Jumpers

The MicroGateway is equipped with a jumper (J7) to provide a means of disconnecting the capacitor from the backup circuitry. The jumper should be installed at all times. If removed without power connected, all configurations and setup parameters will be lost.

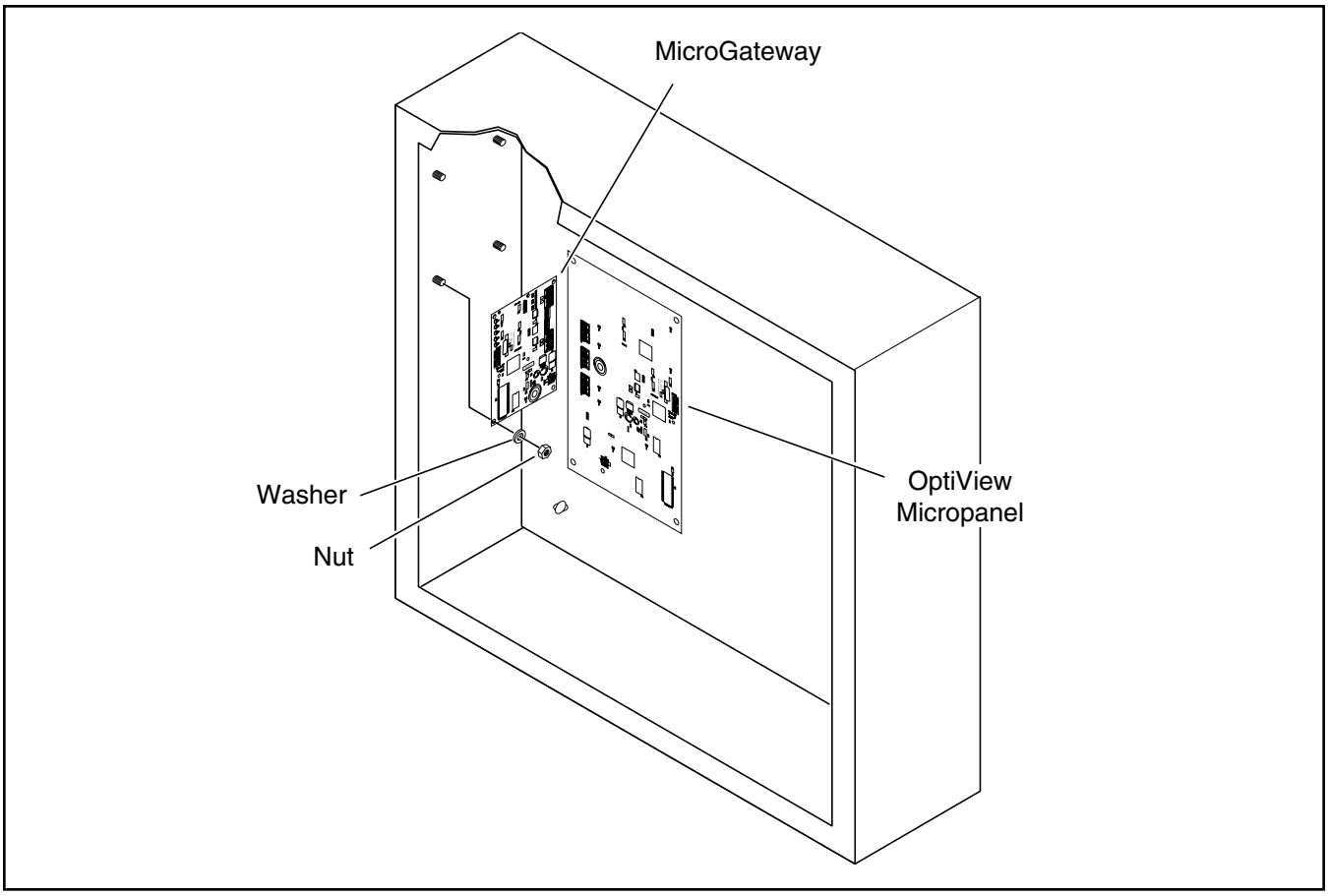


Figure 6. OptiView Mounting

OptiView Installation

CAUTION: Always disconnect power to the chiller panel when working inside. Dropped tools and metal chips from drilling can cause short circuits.

1. Disconnect power to the chiller micro panel and follow standard lock out procedures to prevent electrocution and inadvertent activation.
2. Attach the MicroGateway board to the studs in the upper left corner of the OptiView enclosure using the four screws and washers provided.
3. Connect the communications cable (included with the kit) from TB4 on the MicroGateway to J2 on the OptiView micro panel. Ensure that wires are connected according to Table 4.
4. Connect the LAN wiring to TB1, which is the RS485 connector for Port 1. Refer to Table 4 for port information.

NOTE: The shield should be connected to a ground screw as close to the entrance to the enclosure as possible.

Table 4 – OptiView Wiring Connections

	MicroGateway	Network Device	Wire Color
Rev. 6 or 7 ISN LAN Device	– P2-2	–	White
	+ P3-2	+	Blue
	GND	OPEN	Shield or Drain
OptiView Connection	RX2	GTX	White
	TX2	GRX	Blue
	GND	OPEN	Shield or Drain

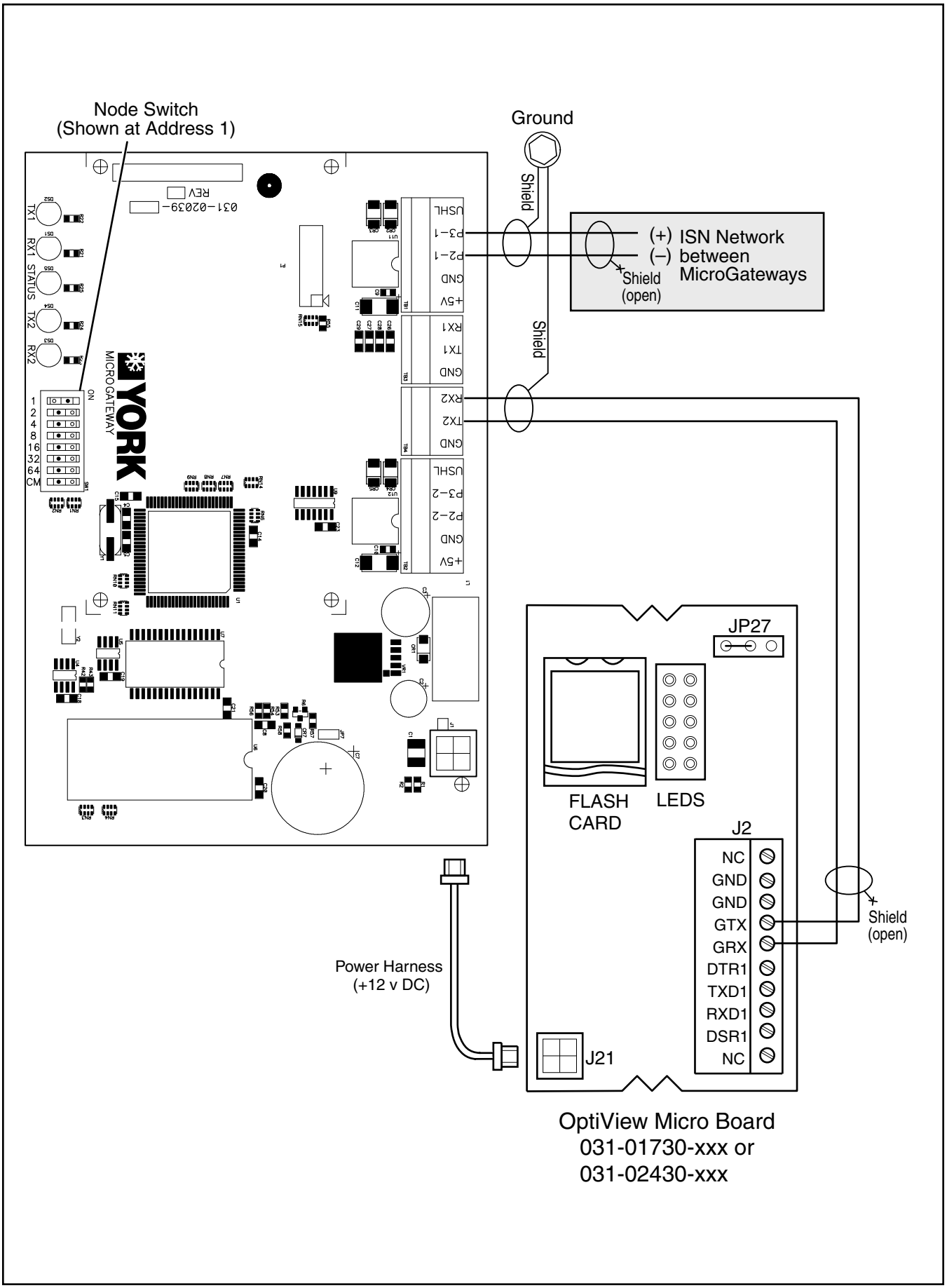


Figure 7. OptiView Connections

5. If applicable, connect the Modbus cable to Port 3 using either TB2 or TB4 on the CLIP. Refer to Figure 11 for wiring details.
6. Check for frayed wire strands which could cause a short circuit. Ensure that all components are secure.
7. Ensure jumper J27 is set for RS232 (refer to Figure 7 – OptiView Connections).
8. Connect the power harness (included with the kit) from J1 on the MicroGateway to J21 on the OptiView micro panel. (Refer to Figure 7 for connection details.)

The MicroGateway board is now connected to an ISN network and ready to be configured using Quick Start. Refer to Section 4 – Commissioning in this manual.

Other Chiller Panels

CAUTION: Never install the MicroGateway outside the confines of a building unless mounted within another enclosure rated at IP 65/ NEMA 4X or higher.

For non-OptiView applications the MicroGateway includes an enclosure. It does not include communication cables due to the variety of types and lengths which may be required.

WARNING: Under no circumstance should the MicroGateway be installed inside a high voltage enclosure (>75 volts). This configuration will result in unreliable operation.

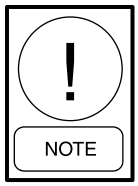
When installing the MicroGateway as a stand-alone enclosure, mount it on either the outside surface of the chiller micro panel (close coupled) or on a smooth surface within close proximity of the chiller panel enclosure.

For mounting on a micro panel, the line voltage power is typically drawn from inside the micro panel.

CAUTION: Always ensure that the cover is securely fastened to the enclosure when operating and the internal ground wire is attached. This helps to prevent RFI from entering the system.

Mounting on a Micro Panel

CAUTION: Always disconnect power to the chiller micro panel when working inside. Dropped tools and metal chips from drilling can cause short circuits.



NOTE: When attaching the MicroGateway to an micro panel, make sure the MicroGateway does not impede access to other components around the micro panel.

1. Disconnect power to the chiller micro panel and follow standard lock out procedures to prevent electrocution and inadvertent activation.
2. Make sure the MicroGateway enclosure will fit properly and that no obstructions, such as internal boards, switches or external conduit, prevent mounting or servicing of the panel.
3. Locate and remove the two plastic caps in the bottom of the MicroGateway enclosure.
4. Mark an appropriate place on the enclosure for a matching set of knock out holes. Mark and drill or punch two holes in the micro panel.

CAUTION: Be careful not to damage the circuit cards in the MicroGateway or micro panel during installation. Protect all circuit boards from metal chips which may cause short circuits if left on the boards at start-up.

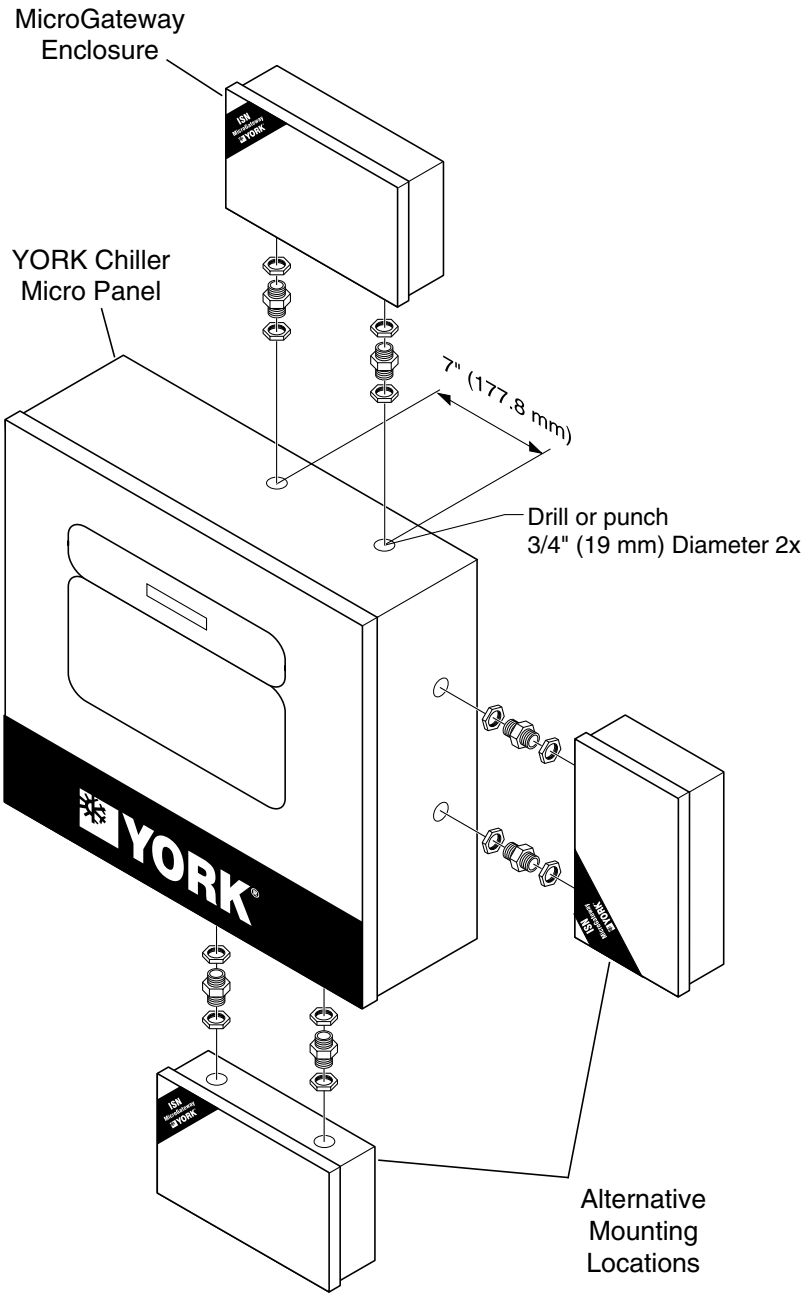


Figure 8. Non-OptiView Enclosure Mounting

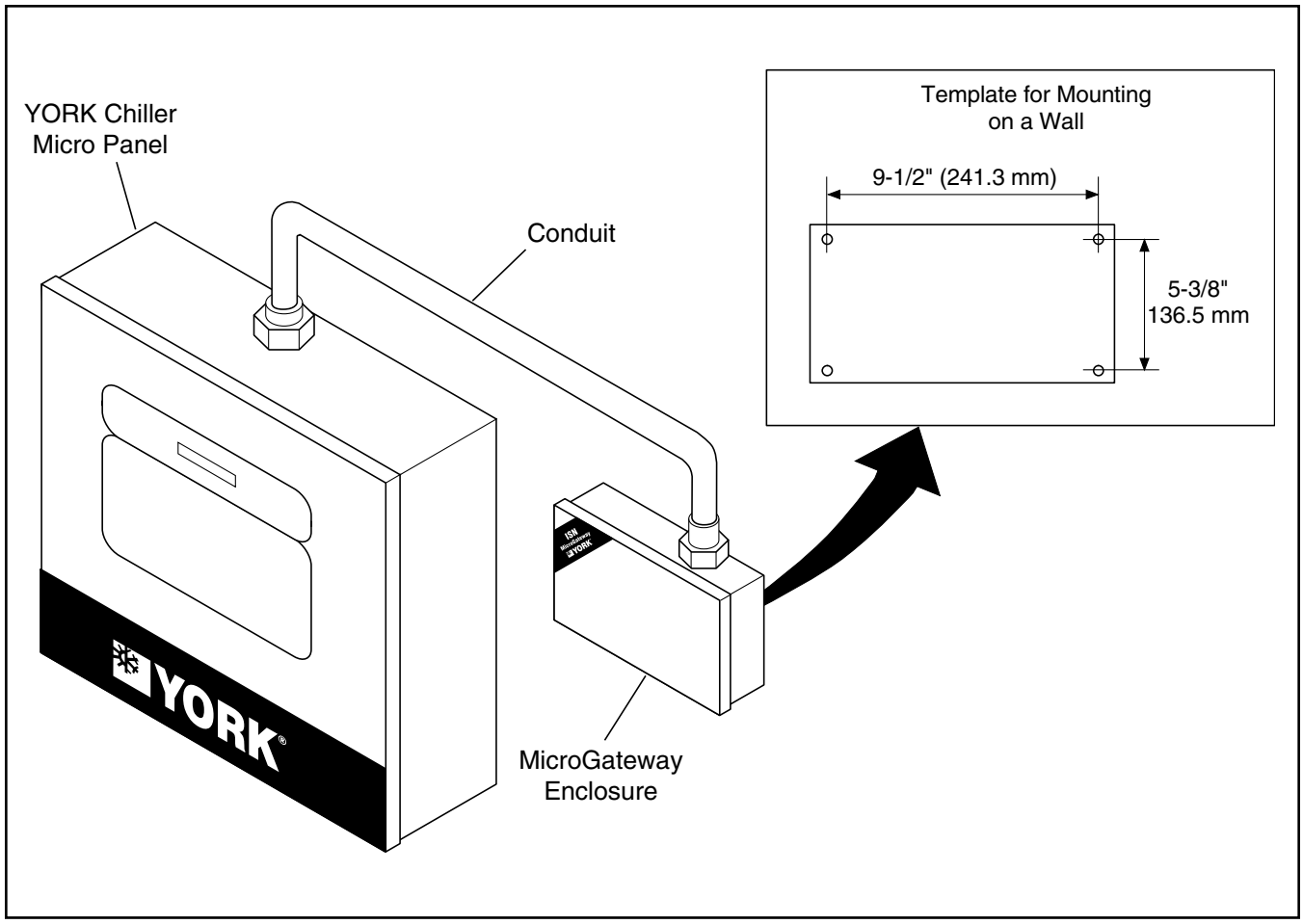


Figure 9. Wall Mounting

5. Using two bulkhead pipe couplers (PN 025-14158 or equivalent), attach the Micro-Gateway enclosure to the micro panel.

NOTE

NOTE: Use of the bulkhead pipe couplers will provide sufficient clearance to allow removal of the MicroGateway cover.

6. Complete the wiring as outlined in "Connecting Power" in this section.

Wall Mounting

NOTE

NOTE: When wall mounting the MicroGateway make sure there is no interference with other components in the near vicinity. Use appropriate conduit to connect the power and communications wiring to the MicroGateway.

1. Check for proper clearances for the necessary electrical and communications cable runs.
2. Power and communications wiring must comply with all local ordinances and customer requirements.
3. Select a suitable location and mark the anchor points. Ensure that the enclosure will be level.
4. Drill the appropriate holes in accordance with the type of wall anchor being used.
5. Install the enclosure on the wall. Be careful not to damage the circuit cards during installation.
6. Check that the mounting is secure and the wiring connections are correct and tight. Check that there are no loose wire strands or other metal objects that could cause a short circuit on the circuit board.
7. Complete the wiring as described in "Connecting Power" in this section.

Connecting Power

When using an enclosure type of MicroGateway, power can be drawn from either a separate power supply or from the main terminal strip in the chiller panel. The MicroGateway should be protected with a suitable fuse or circuit breaker. Ensure the power is from an uninterrupted source, i.e. not controlled by a programmed switch.

If the enclosure is mounted on a wall, the wiring from the power source to the MicroGateway must always be run in a suitable conduit. To obtain the best EMI and EMC performance, care should be taken to ensure that the conduit is bonded to the metal of both enclosures. Scrape the paint around the knockouts, if necessary, to provide a better electrical connection between the joining parts.

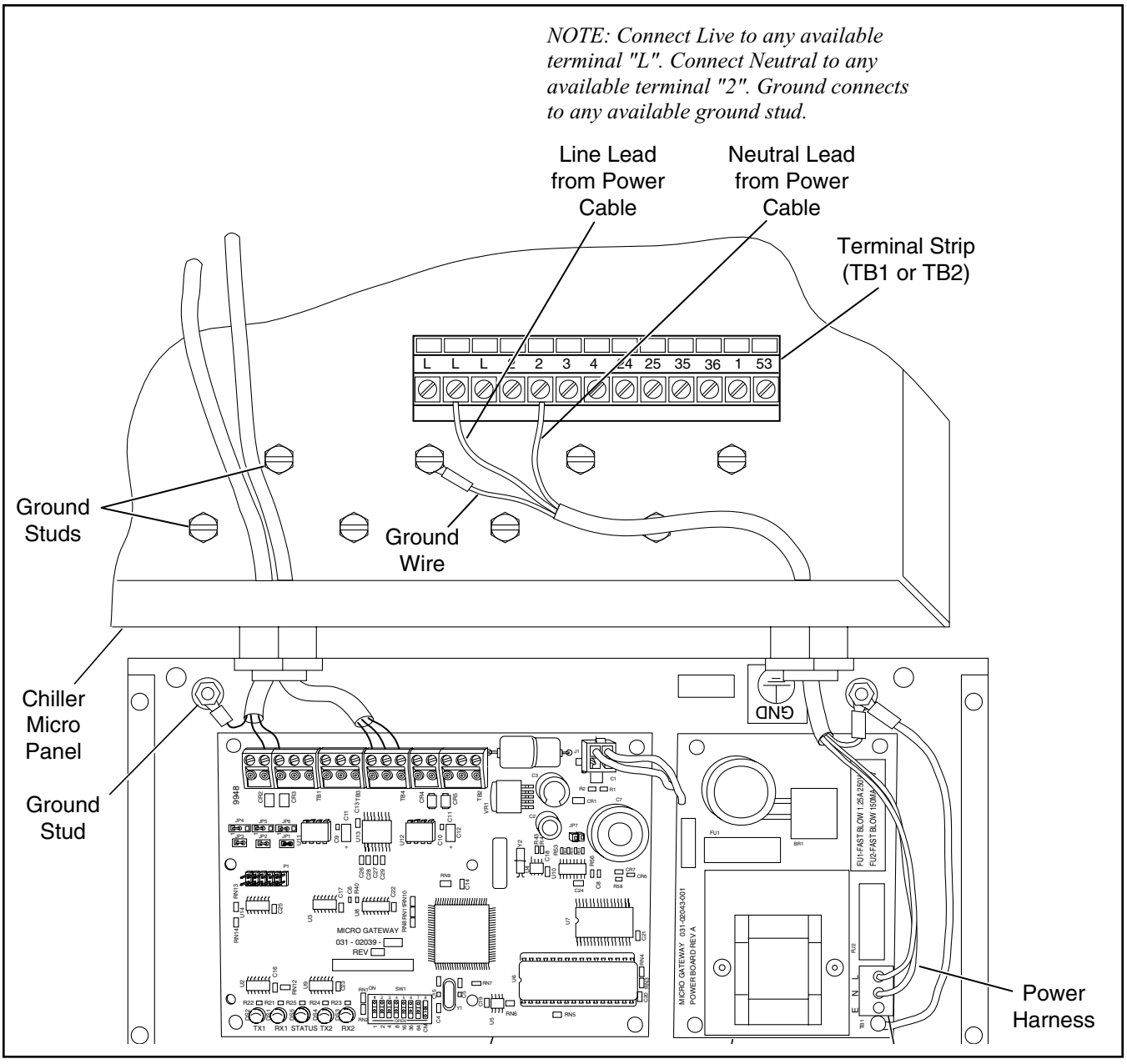
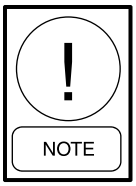


Figure 10. Typical Power Connections for Close-Coupled MicroGateway



NOTE: Whenever possible it is recommended that the power be drawn from the micro panel to ensure a common ground.

CAUTION: Make sure the power source, whether an external power source or from a chiller panel, is rated sufficiently to support the MicroGateway's load.

1. Disconnect power to the chiller micro panel and follow standard lock out procedures to prevent electrocution and inadvertent activation.
2. Connect a 16 - 18 AWG wire from a reliable ground reference to the grounding lug in the MicroGateway's enclosure using a suitable crimp. Do not remove the existing wire that connects the grounding lug to the power board (031-02043-xxx).
3. Remove the input connector at TB1 from the Power Board. Using a screwdriver or a similar tool, depress the small tabs on the side of the connector and insert the proper wires as labelled on the board (N, L).

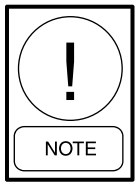
CAUTION: The ground wire must be connected to the ground stud to ensure the enclosure is grounded if the power plug is disconnected.

4. Check for loose wire strands. Reinsert the connector into the power board.

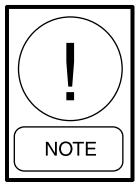
Connecting the Communications Wiring

Port 1 is always connected to the ISN LAN. The chiller micro panel or ASCII device is always connected to Port 2. Each port has two connectors, one for RS232 and one for RS485. The connector used for each port depends upon the physical layer used (RS232 or RS485).

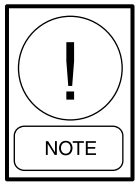
The ISN network connections are daisy-chained between devices using RS485. The polarity of each device must be maintained with P3 of one device connected to P3 of the next device and P2 connected to P2, etc. The drain wire of the communication cable must be connected to the equipment ground at one end only. The other end should be connected to either the unshielded terminal (USHL) or remain unconnected (open).



NOTE: Due to the variety of cables and lengths required, communication cables are not included with enclosure-style MicroGateways. Be sure the cables used meet the standard RS232 or RS485 specifications shown in the table titled "Recommended Cable Specifications."



NOTE: Figures 12 through 23 show the wiring and jumper settings for specific micro panels. Only the applicable details, i.e. jumpers, connectors, rotary switch, are shown for each board. Refer to the chiller documentation for additional switch or software settings.



NOTE: When installing a MicroGateway on an older micro panel, check that the software resident in the micro panel is capable of supporting York Talk communications. Some older units (prior to 1990) were not York Talk-ready and may require updated chiller software.

1. Connect the chiller cable or ASCII device cable to either TB2 or TB4 on the MicroGateway to the appropriate terminals on the chiller micro panel or device.
2. Connect the ISN LAN cable to TB1 on the MicroGateway.

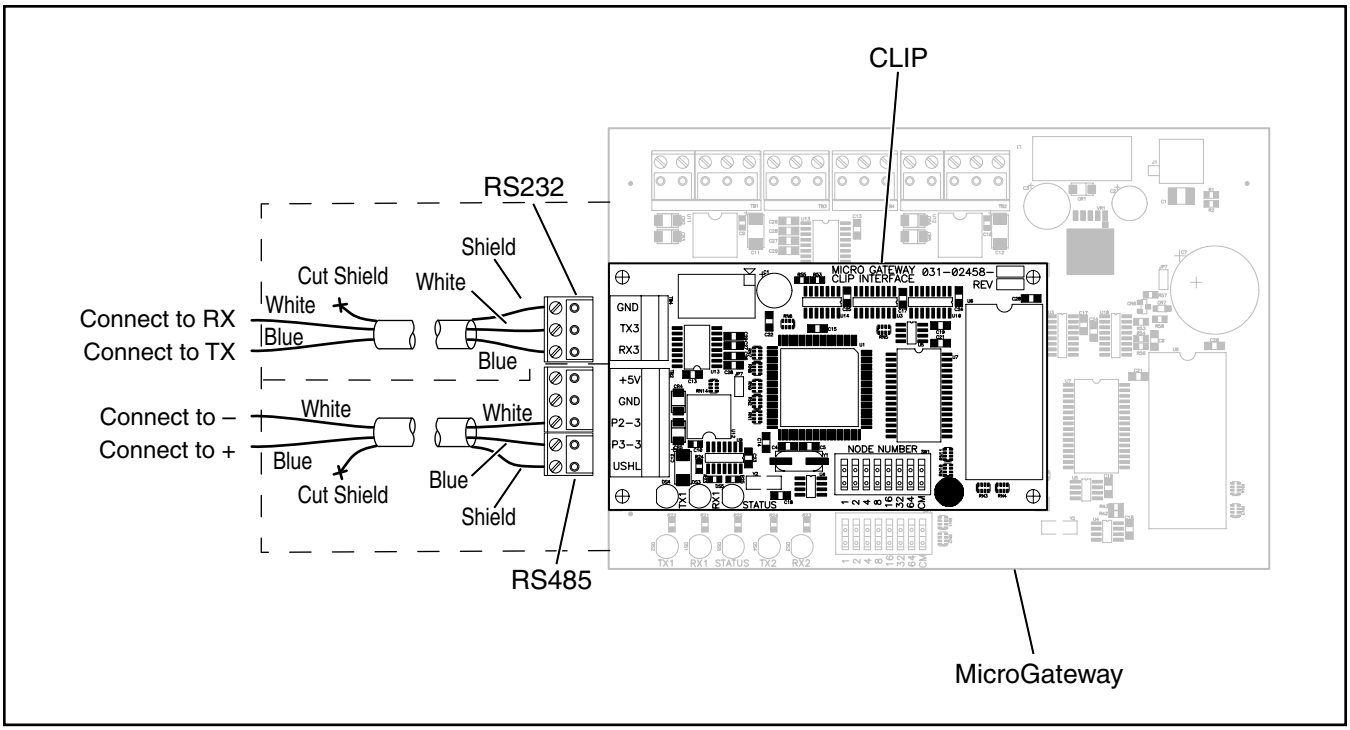


Figure 11. Communication Connection to Port 3

Table 5 – Port Connections

Port 1 RS485 (TB1)	Port 2 RS485 (TB2)	Port 1 RS232 (TB4)
ISN LAN	York Talk 2	
ISN LAN		York Talk 1 or 3
ISN LAN		ASCII or Terminal

3. Check for frayed wire strands which could cause a short circuit. Ensure that all components are secure.
4. Verify that the chiller ID switch (rotary switch) on the micro panel is set to 0 if the chiller is the master or to 1 if the chiller panel is a slave.

NOTE: When the chiller rotary switch is set to 0, the York Talk ID address is 1. When the chiller ID is set to 1, the York Talk ID address is 2.

5. Check the jumpers on the micro panel for proper settings.

Port 3 Communication

The CLIP uses Modbus communications which can operate on an RS232 or RS485 layer via Port 3. Port 3 has connectors labeled TB4 (RS232) and TB2 (RS485) to accommodate either type of signal. Refer to Figure 11 for details on connecting the Modbus RTU monitoring network.

NOTE: The CLIP is not shown on Figures 12 through 23 for clarity.

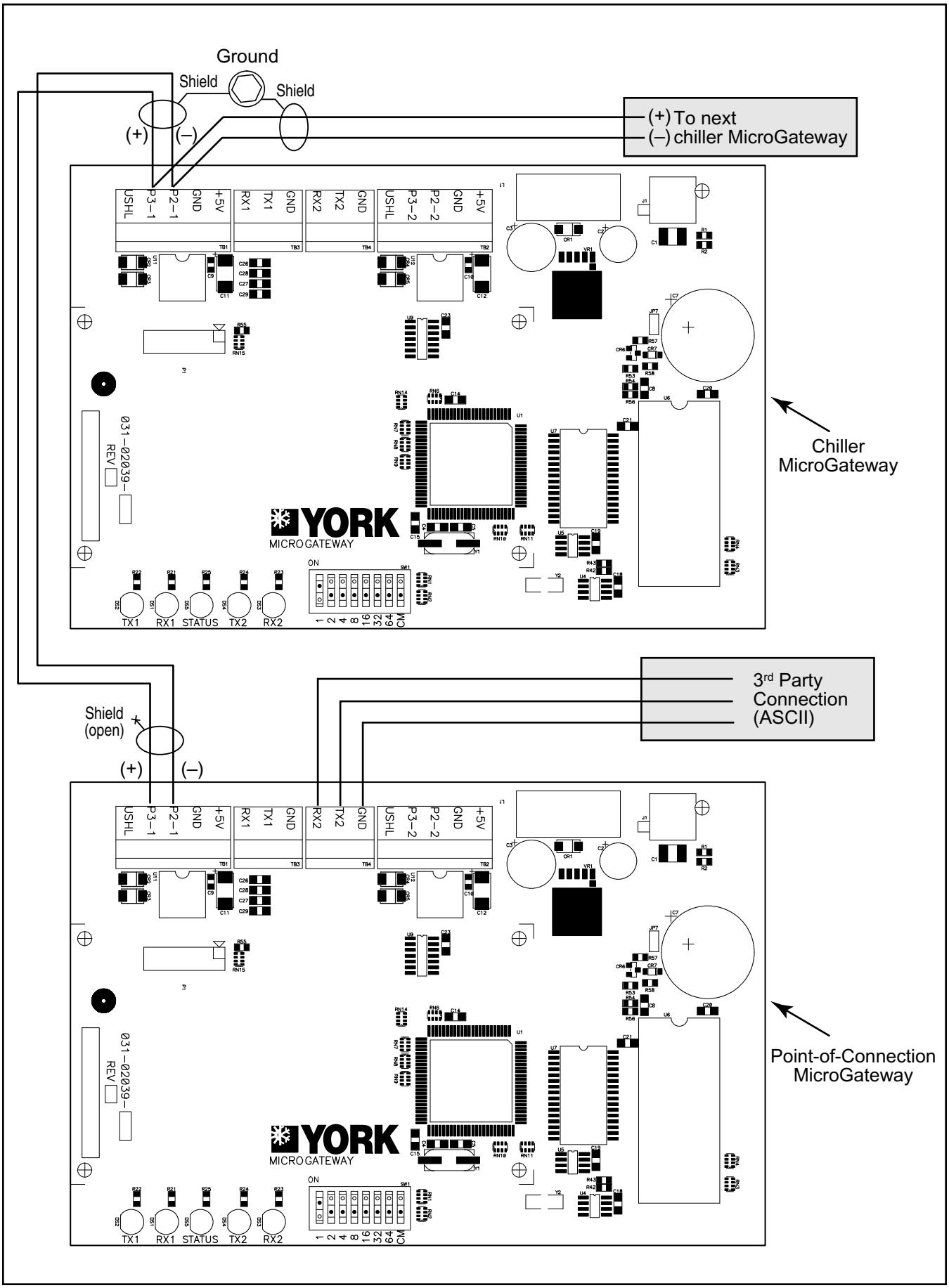


Figure 12. Point-of-Connection for ASCII Interface

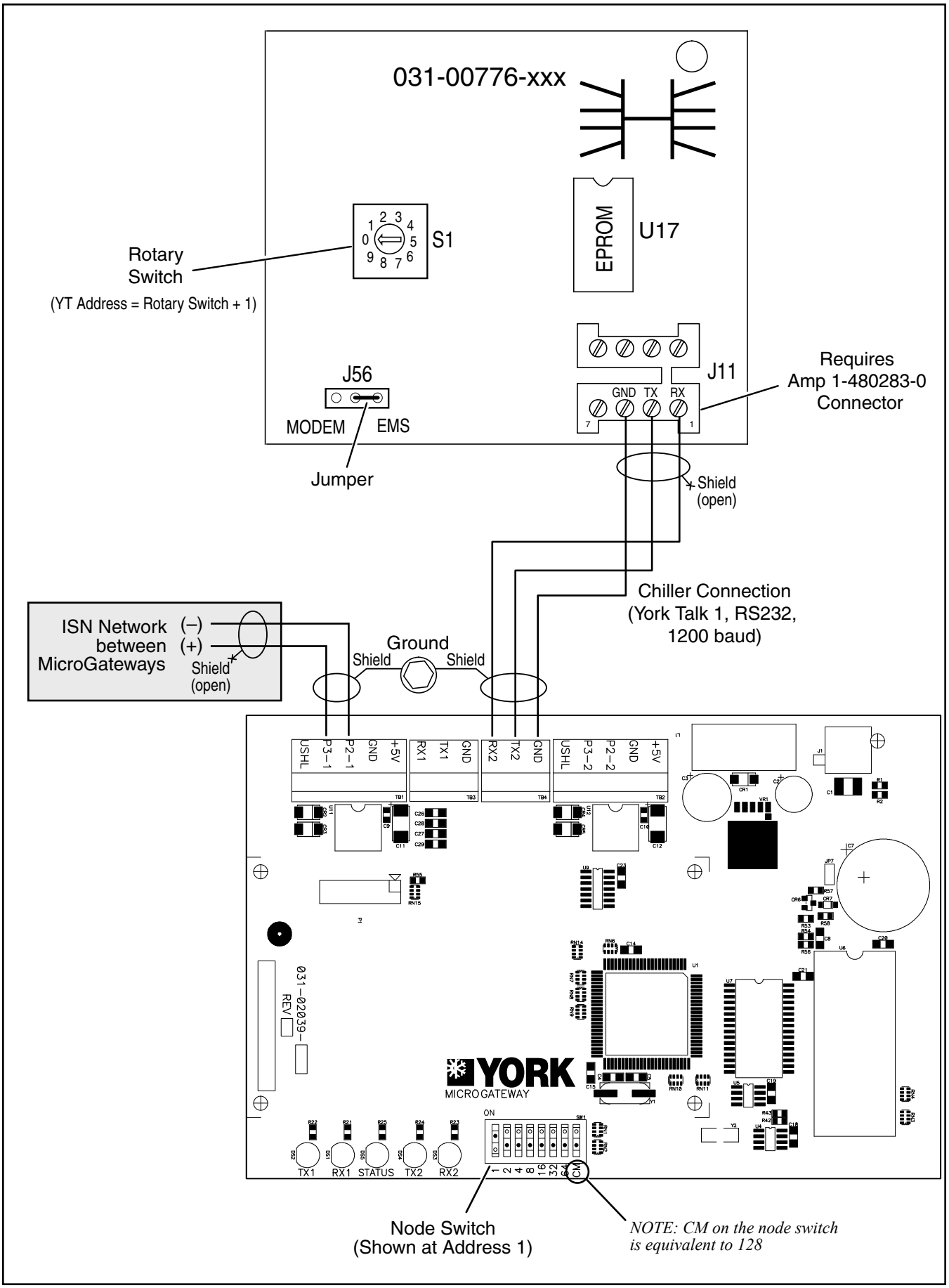


Figure 13. 776 Board Connections

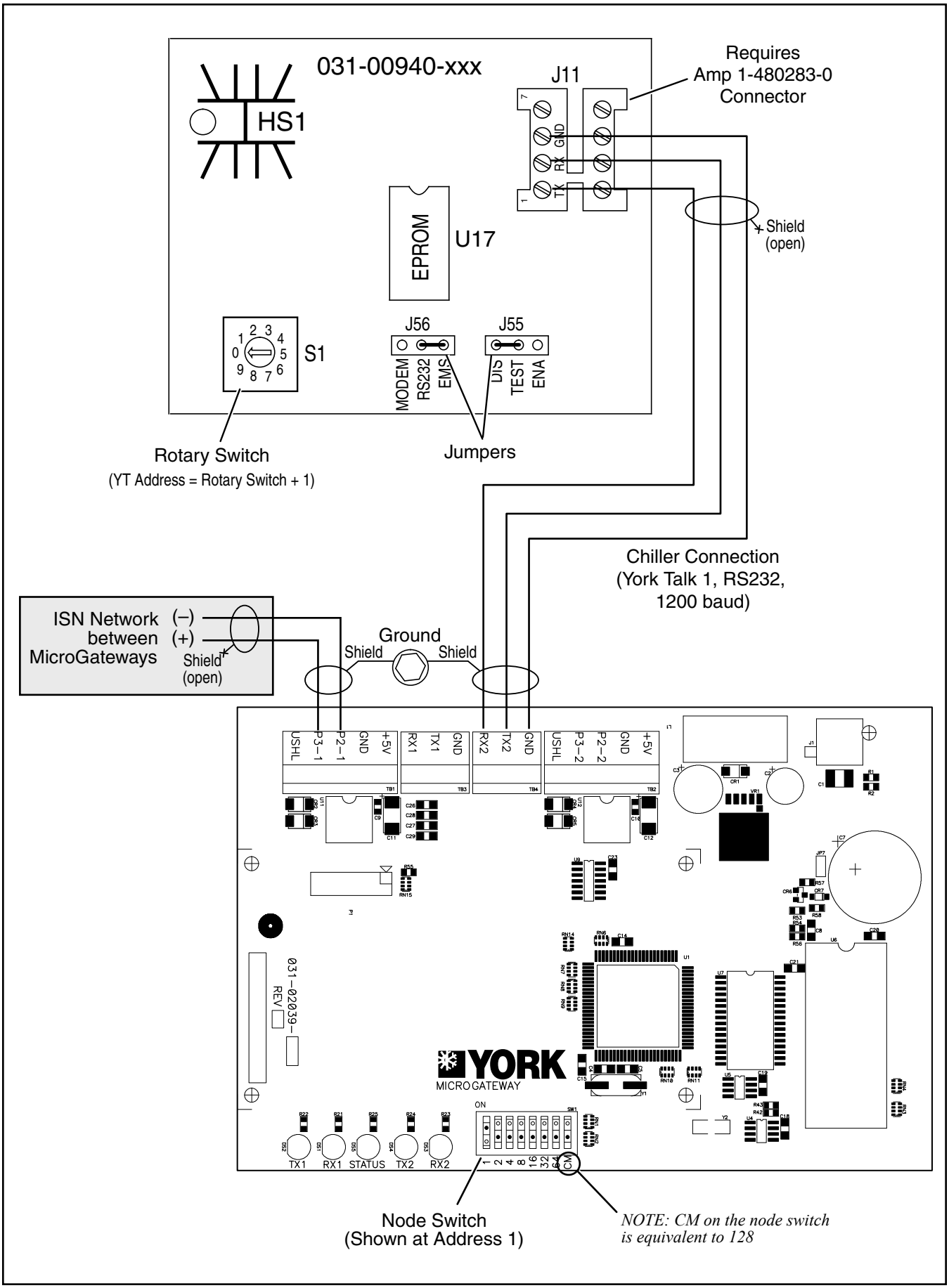


Figure 14. 940 Board Connections

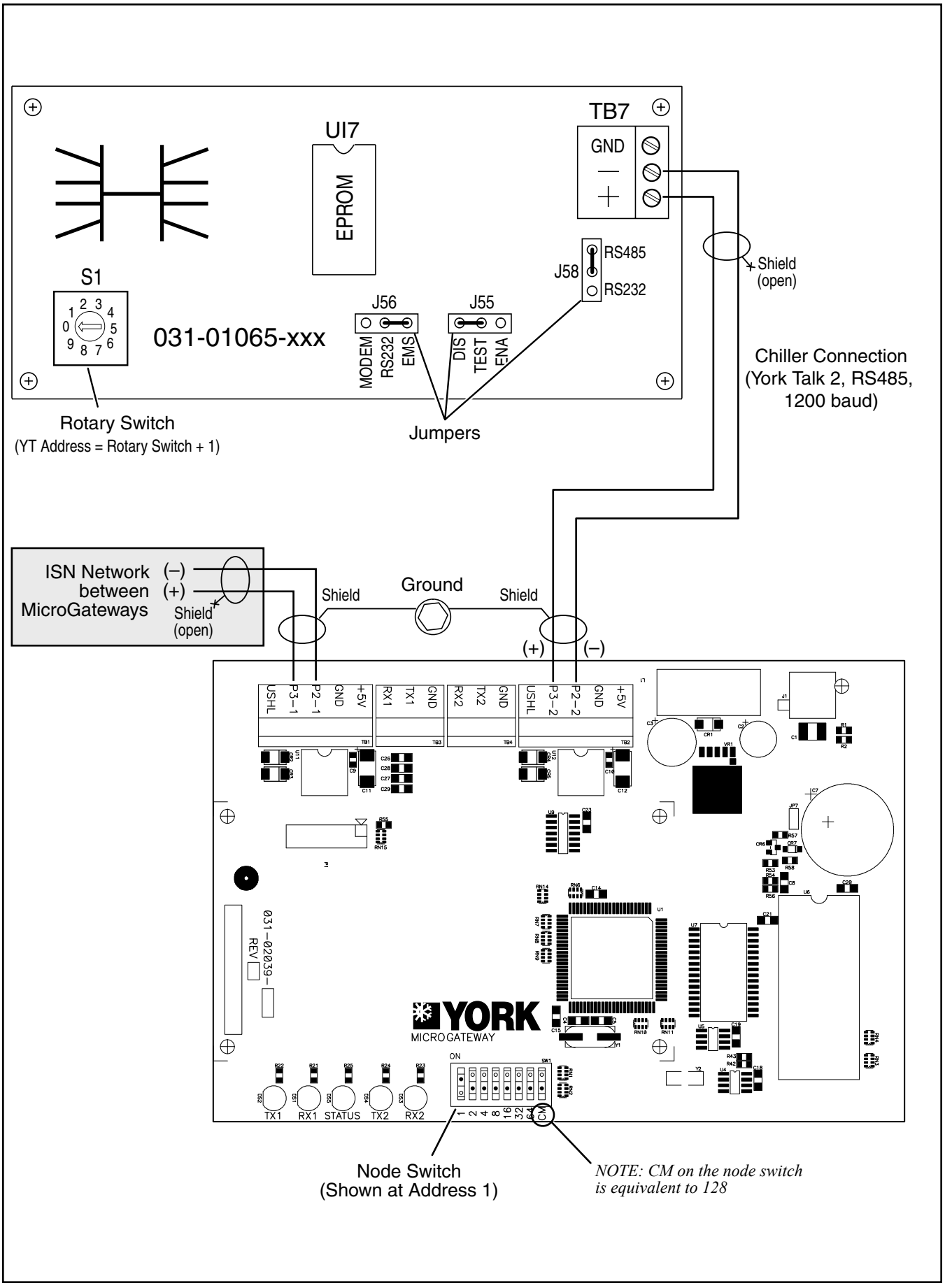


Figure 15. 1065 Board Connections

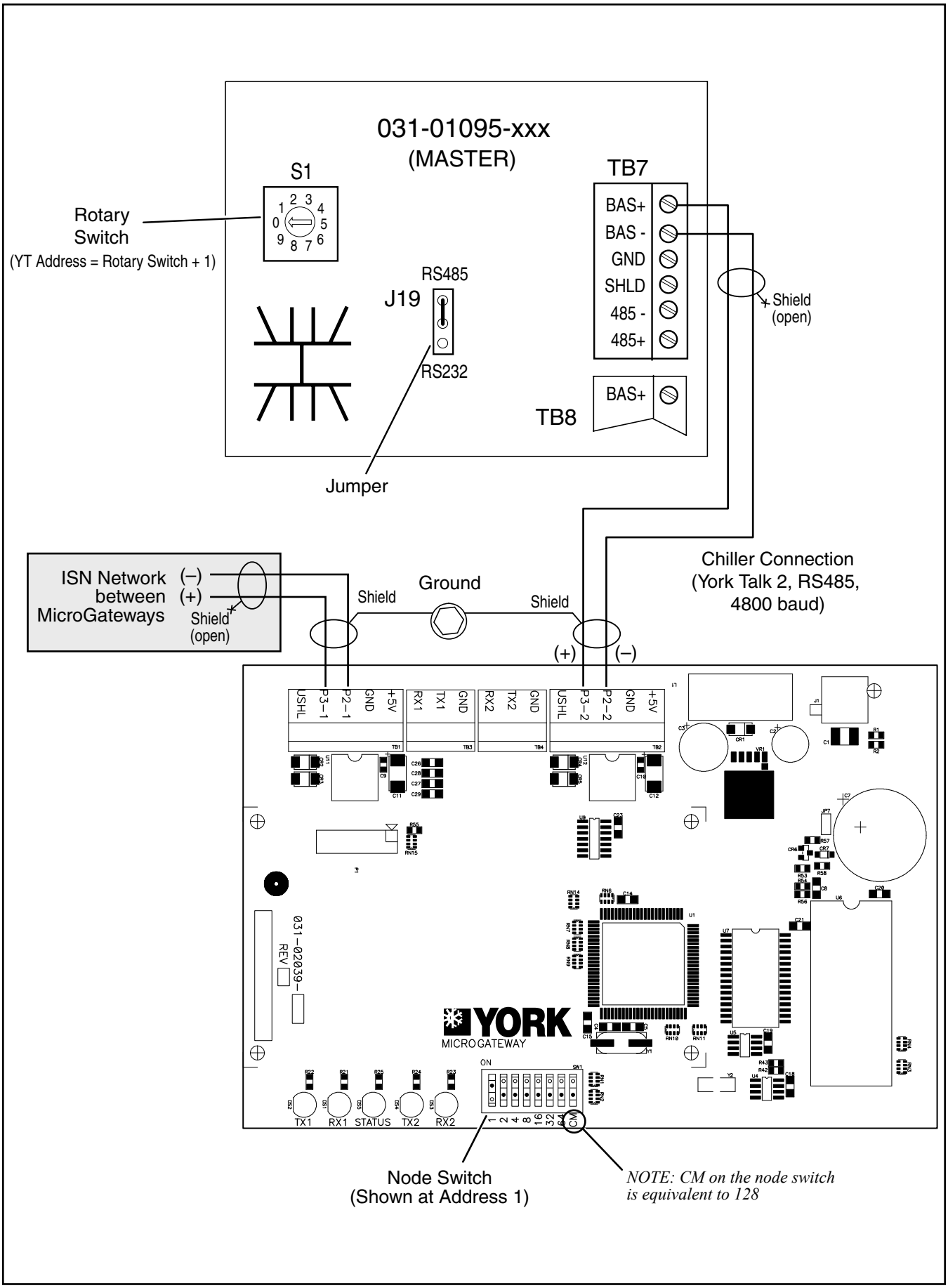


Figure 16. 1095 Master Board Connections

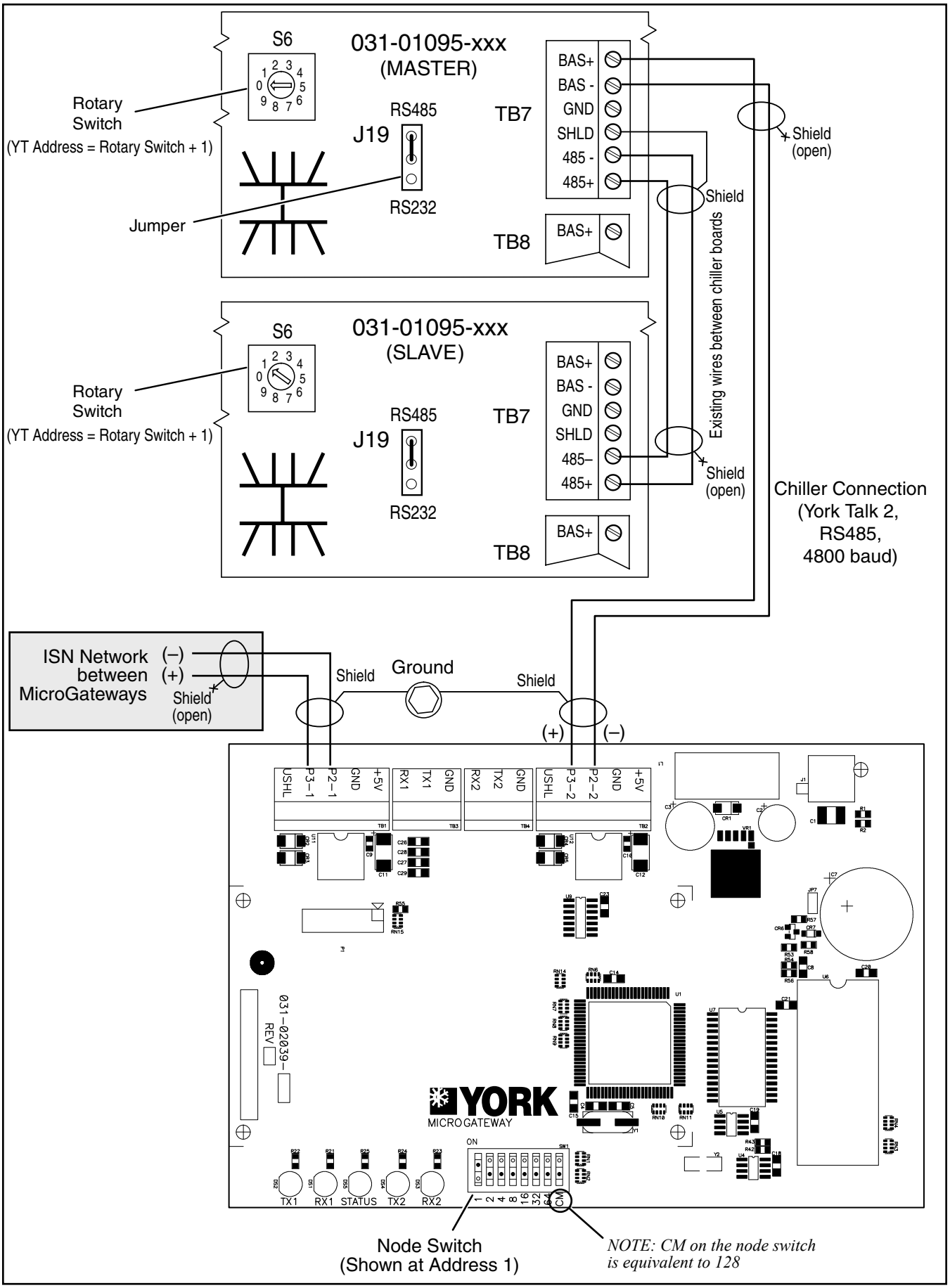


Figure 17. 1095 Master/Slave Board Connections

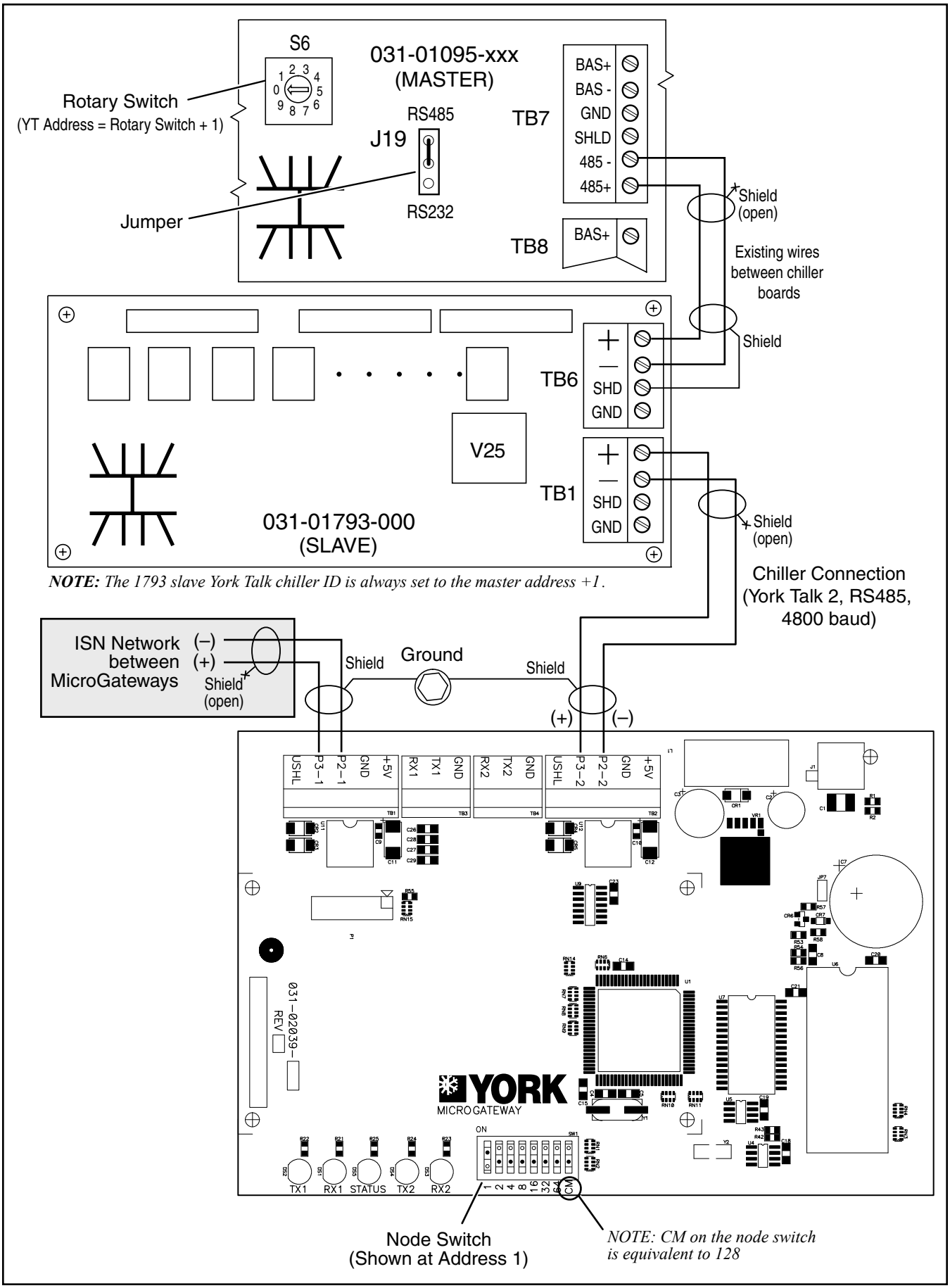
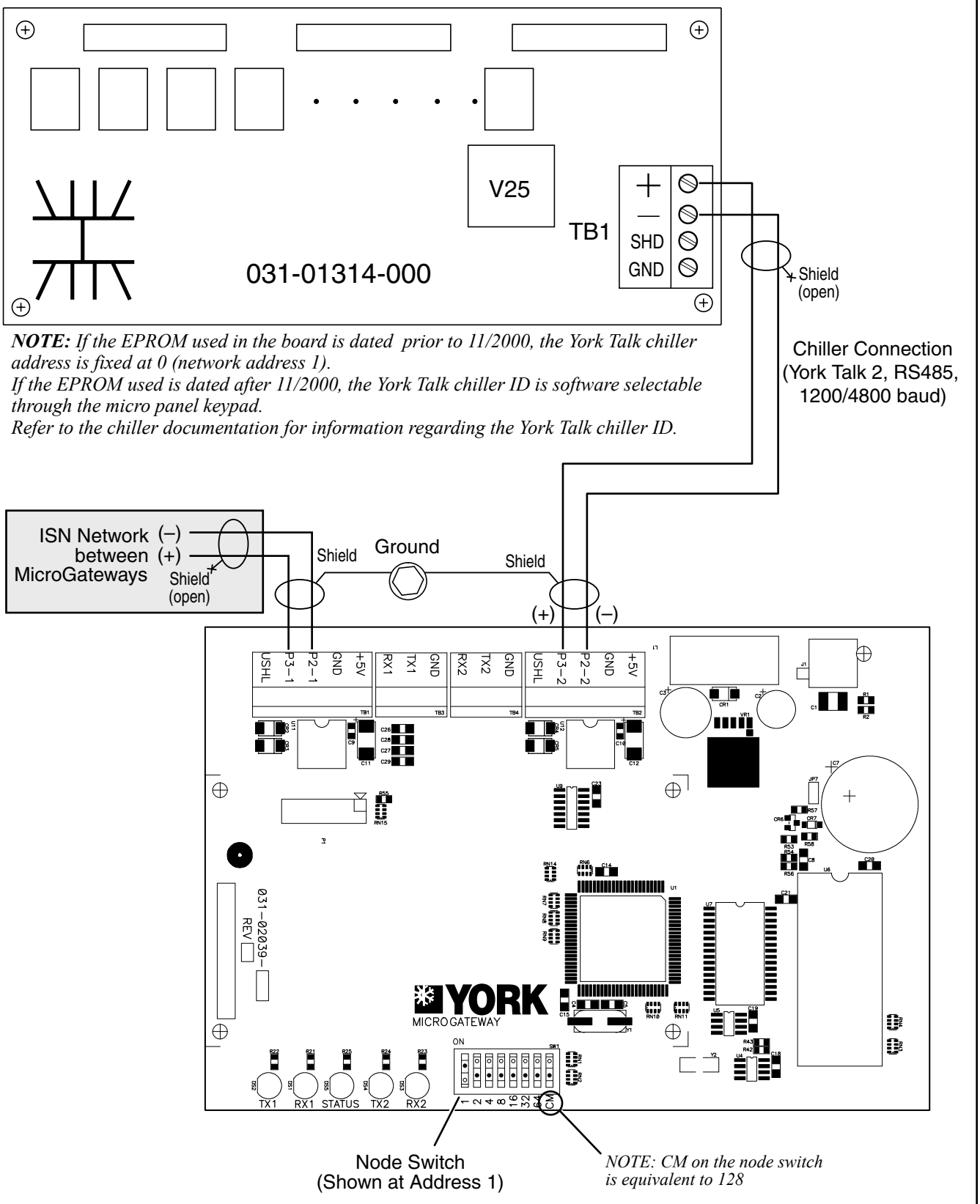
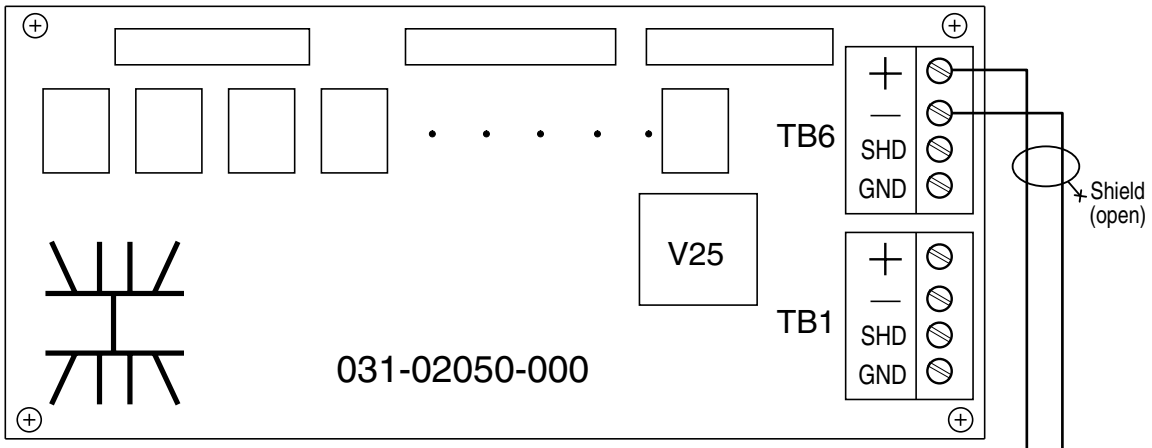


Figure 18. 1095 to 1793 Board Connections



NOTE: *If the EPROM used in the board is dated prior to 11/2000, the York Talk chiller address is fixed at 0 (network address 1).*
If the EPROM used is dated after 11/2000, the York Talk chiller ID is software selectable through the micro panel keypad.
Refer to the chiller documentation for information regarding the York Talk chiller ID.

Figure 19. 1314 Board Connections



NOTE: The York Talk chiller ID is software-selectable through the micro panel keypad. Set the York Talk chiller ID to 0 to make the York Talk address 1.
Refer to the chiller documentation for information regarding the York Talk chiller ID.

Chiller Connection
(York Talk 2, RS485,
4800 baud)

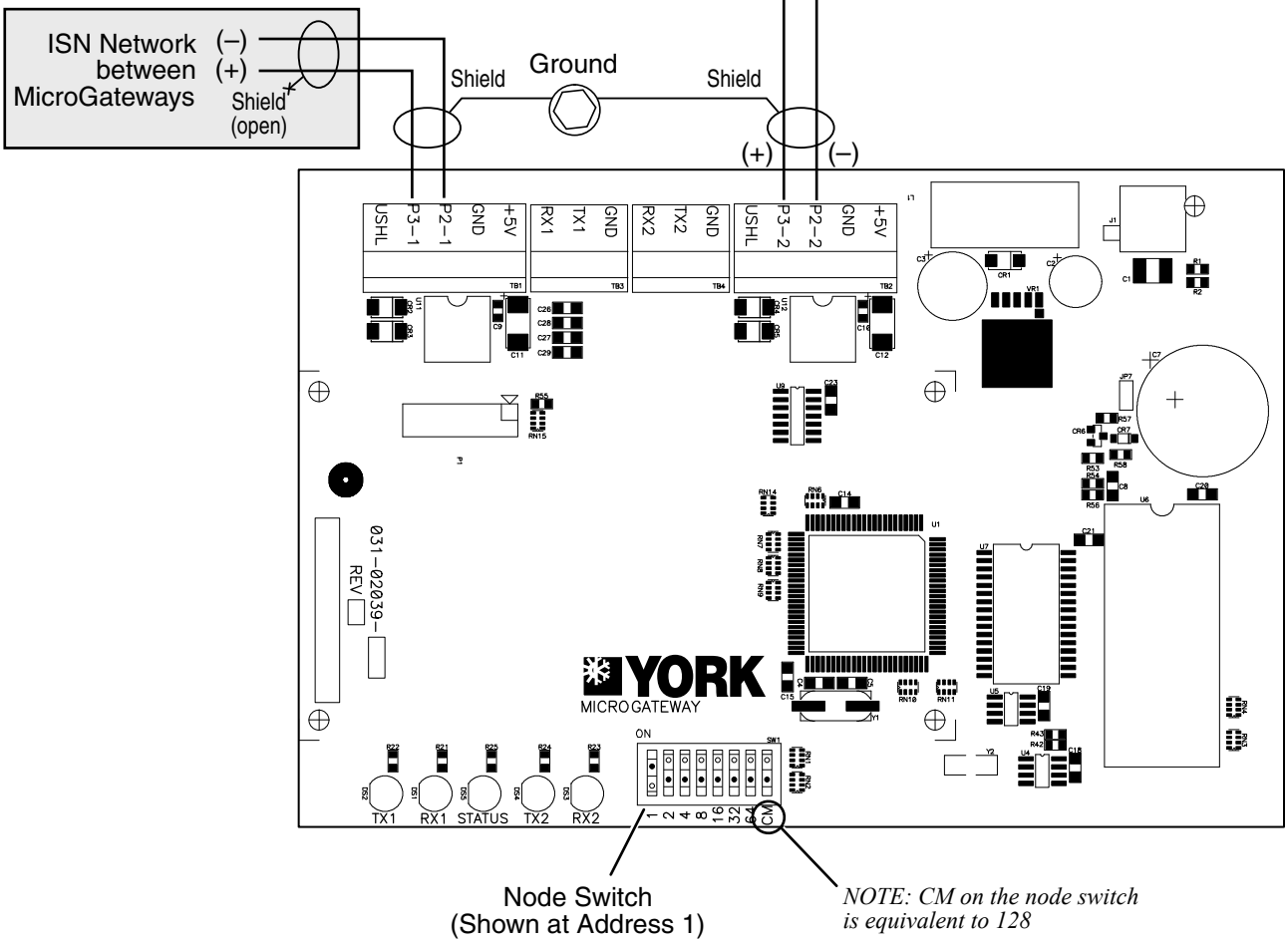


Figure 20. 2050 Board Connections

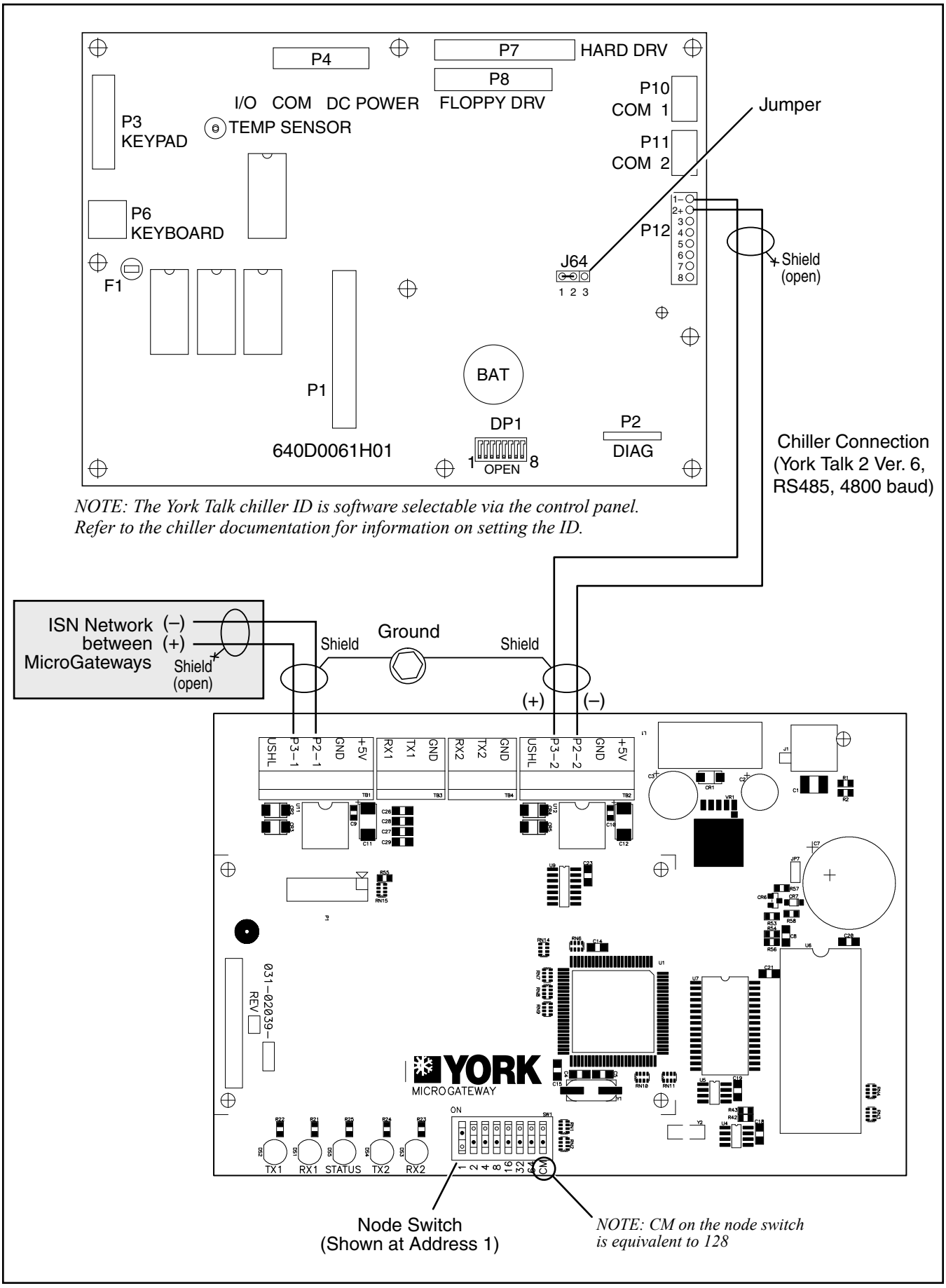
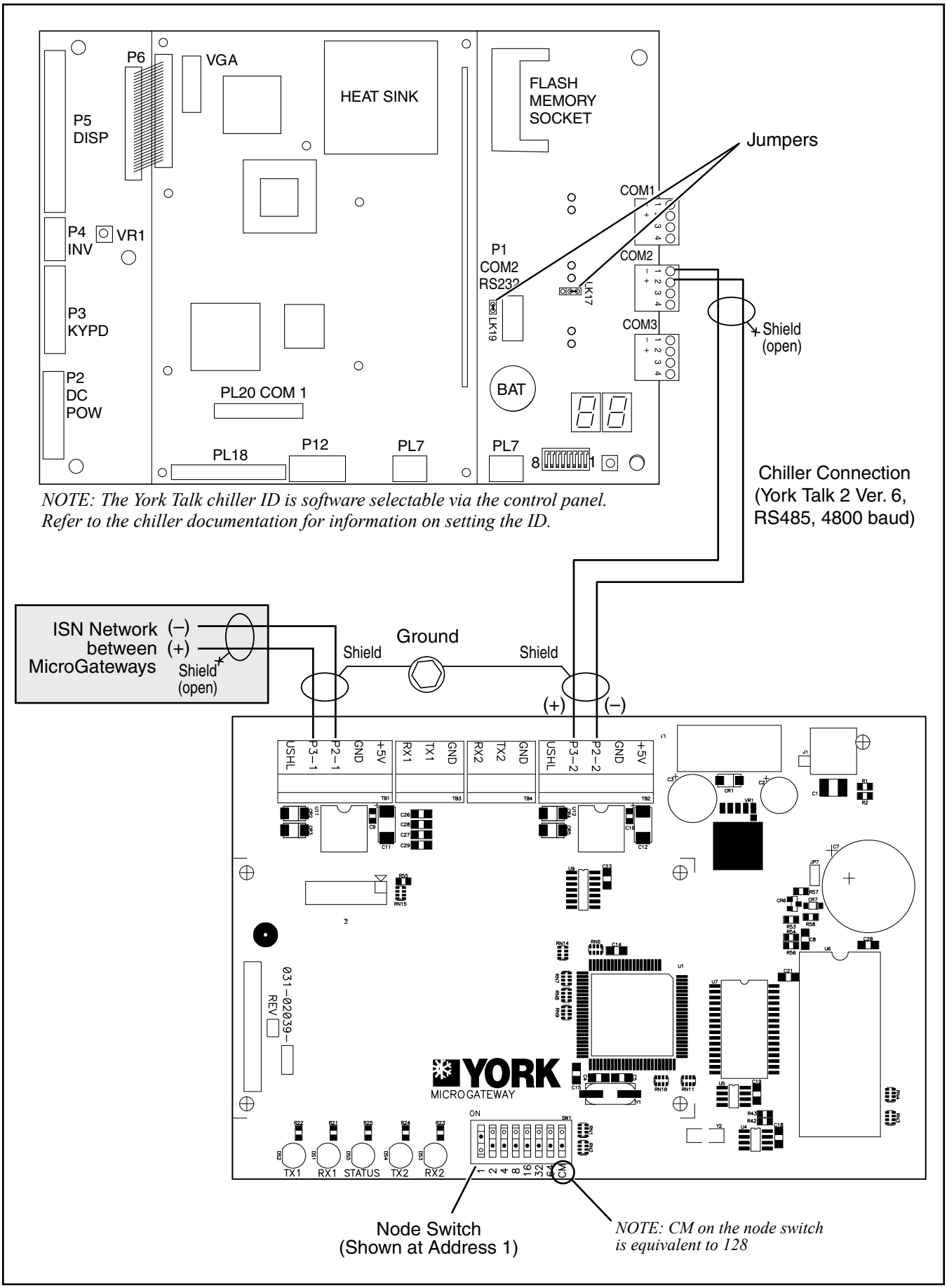


Figure 21. Frick Quantum 1 and 2 Board Connections



NOTE: The York Talk chiller ID is software selectable via the control panel. Refer to the chiller documentation for information on setting the ID.

Figure 22. Frick Quantum 3 Board Connections

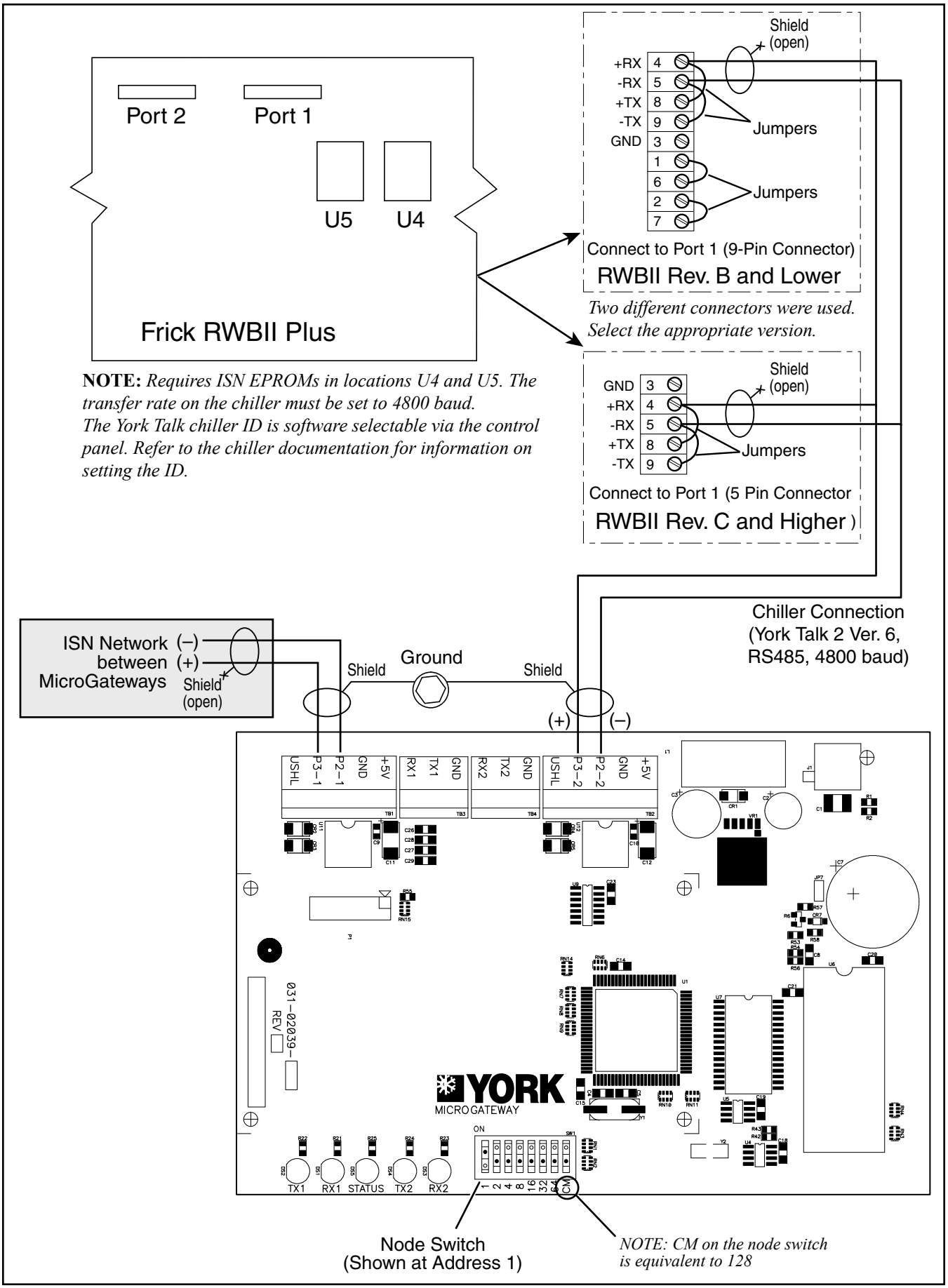


Figure 23. Frick RWB II Board Connections

SECTION 4

COMMISSIONING

Once the hardware is installed and wired the ASCII MicroGateway must be configured for a specific mode of operation. Using the Quick Start feature, all currently offered chillers using the factory-defined points list can be configured for standard communication to an ISN protocol. The 2-Port MicroGateway can also be configured to operate as a point-of-connection to a third-party device using standard ASCII code.

The 2-Port MicroGateway can be customized using a VT100 terminal or computer using terminal emulation software. Refer to the *Operation Manual* for customizing the MicroGateway's operation.

CAUTION

CAUTION: If the MicroGateway is configured in any way other than through the Quick Start, synchronization between the base board and daughter (CLIP) boards cannot be assured.

NOTE

NOTE: Do not apply power to the unit before reading this section.

Default Settings

When shipped from the factory, the MicroGateway is set up as shown in Table 6. For more specific information on the default settings, refer to the *Operation Manual.*

Table 6 – Default Settings

	PROTOCOL	COMMUNICATION
PORT 1	ISN R7	50 kbaud and odd parity
PORT 2	Terminal VT100 Interface	9.6 kbaud and no parity
PORT 3	Modbus RTU	19.2 kbaud, no parity, 2 stop bits

How to Use the Node Switch

NOTE

NOTE: The MicroGateway base board and daughter board each have a node switch. The Quick Start process must be followed specifically to ensure compatibility between the two processors.

The node switch has two purposes. It enables a user to set a unique ISN network address as well as enabling a specific Quick Start option.

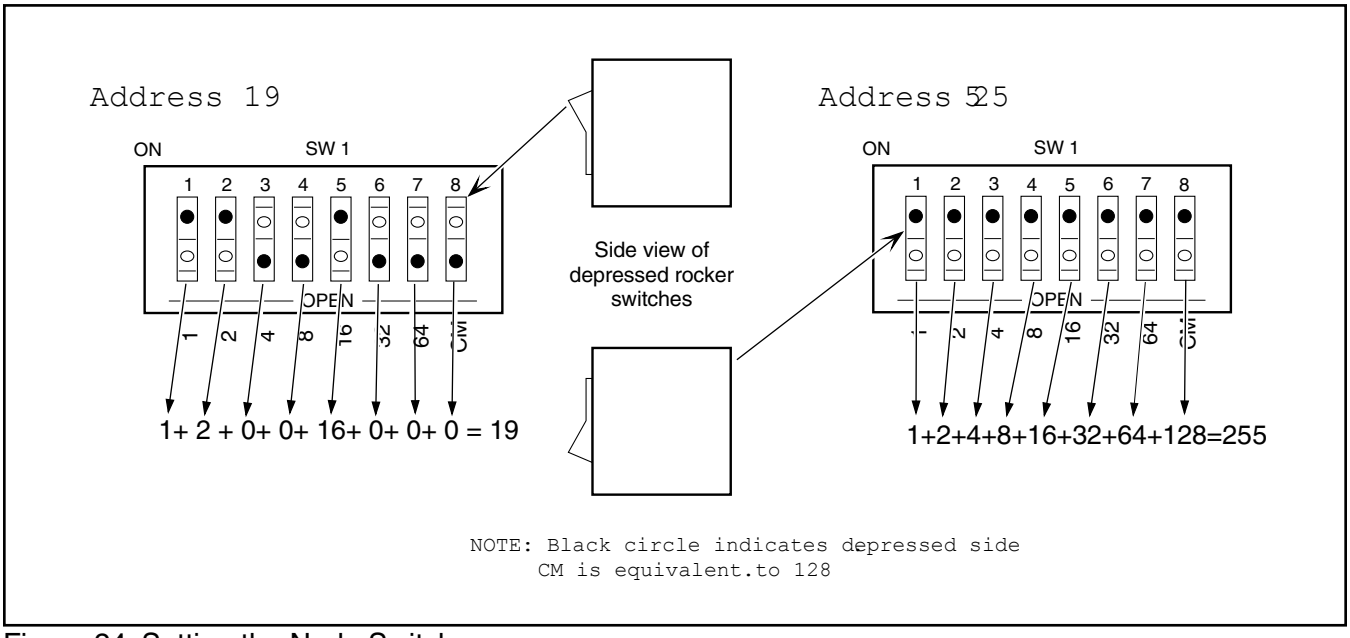
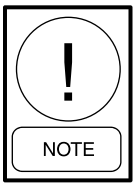


Figure 24. Setting the Node Switch

The node switch consists of eight individual DIP switches that are binary weighted. Summing the value of each of these switches in the ON position forms the decimal value of the node switch. To determine the numeric value assigned to the switch, add the numbers above the corresponding DIP switches which in the ON position. The resulting sum is the number (address) selected, which is either the network address or a Quick Start option.



NOTE: The CM DIP switch is equivalent to binary value 128.

Setting the Network Address

Each device on the ISN network requires a unique node address. This includes units operating as a point-of-connection to a third-party and units connected to a micro panel.

The ISN network is limited to a maximum of 98 nodes per subnetwork. Network addresses above 99 are not recognized by the ISN software and therefore should not be used. Addresses 128 and those between 201 and 239 are reserved for current and future Quick Start features.

The MicroGateway and the CLIP will have different network addresses and reside on different networks.

Quick Start

NOTE: The Quick Start procedures on the daughter board and the base MicroGateway are the same. The same York Talk Points are loaded on both boards but the communication paramters between the two ports differ.

Quick Start allows a user to select a configuration for the most popular chillers, select terminal mode for computer communications, select metric or imperal units and run a basic “loop back” communications test using the node switch. The node switch is used to select the Quick Start features and the STATUS LED flashes to indicate and verify that the proper Quick Start feature is selected.

The Quick Start features are shown in Tables 7 and 8. Table 7 defines the chiller types and communication rates. Table 8 lists auxiliary features.

When a Quick Start selection is made, the STATUS LED flashes a predefined code to allow the user to verify that the required selection has been made. The STATUS LED continues to flash as long as the Quick Start selection is in force.

CAUTION: It is highly recommended that Quick Start 128 be invoked whenever changing chiller profiles using the Quick Start feature. This clears any items not overwritten by a new Quick Start. It is not necessary to use Quick Start 128 when setting auxiliary features.

CAUTION: For 3-Port Micro-Gateways, the DIP switches on the daughter board and the base board must be selected in the exact order specified, i.e., first the base board switch, then the daughter board switch. Otherwise, synchronization between the two boards cannot be assured.

Changing the node switch from one Quick Start address to another will not necessarily remove all Quick Start information from the E^2 memory. Therefore, it is highly recommended that Quick Start 128 be invoked whenever changing chiller profiles. Quick Start 128 clears any items from memory, resetting the unit to the EPROM defaults.

York Talk Points List

Along with the communication parameters, activating a Quick Start feature loads a standard set of points. An up-to-date list of the standard points or micro-objects, referred to as the York Talk Points List, for all YORK chillers is available at

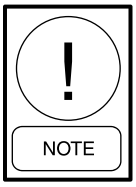
http://intranet.york.com/web0147

This site also cross references the type of York Talk and micro panel board number used for specific chiller models.

CAUTION: If the York Talk Points List is modified in any way, the MicroGateway and CLIP will lose reference to one another and be unable to transfer data.

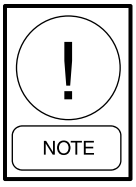
For OptiView micro panels, the points may be modified for non-standard configurations. Refer to the Operations Manual for additional information.

Selecting a Quick Start Address



NOTE: It is recommended that power be removed from the MicroGateway/CLIP any time a node switch address is being modified.

To select a Quick Start feature, follow the procedure shown in the figure titled “Commissioning Sequence.” This guides the user through the process of selecting chiller profiles and auxiliary features.



NOTE: Be sure to read the node switch correctly if it is installed upside down or sideways.

The selected Quick Start feature is loaded into memory when the MicroGateway first has powered applied. The items remain in memory when power is removed unless they are overwritten by a new Quick Start. Hence, the Quick Start information remains when the node switch is eventually set to the network address.

When communications between the MicroGateway and chiller micro panel are operating correctly, the STATUS LED flashes steadily at twice per second. If the communications are not operating properly, the STATUS LED flashes twice and is off for 3.5 seconds.

Once the Port 1 communications are setup, the transmit and receive LEDs (TX1 and RX1) on Port 1 should flash to indicate communication between the chiller micro panel and MicroGateway.

After the Port 2 communications are setup, the Port 2 LEDs (TX2 and RX2) should flash to indicate communication to the ISN network or third-party network.

Sign-Off

A final check-out sheet is provided for use as a summary of the contents of this manual. This, along with other items required by the customer/contractor, should be provided when the job is complete. This ensures that the third-party Controls Contractor has been provided with the information required to communicate with the chiller through the MicroGateway.

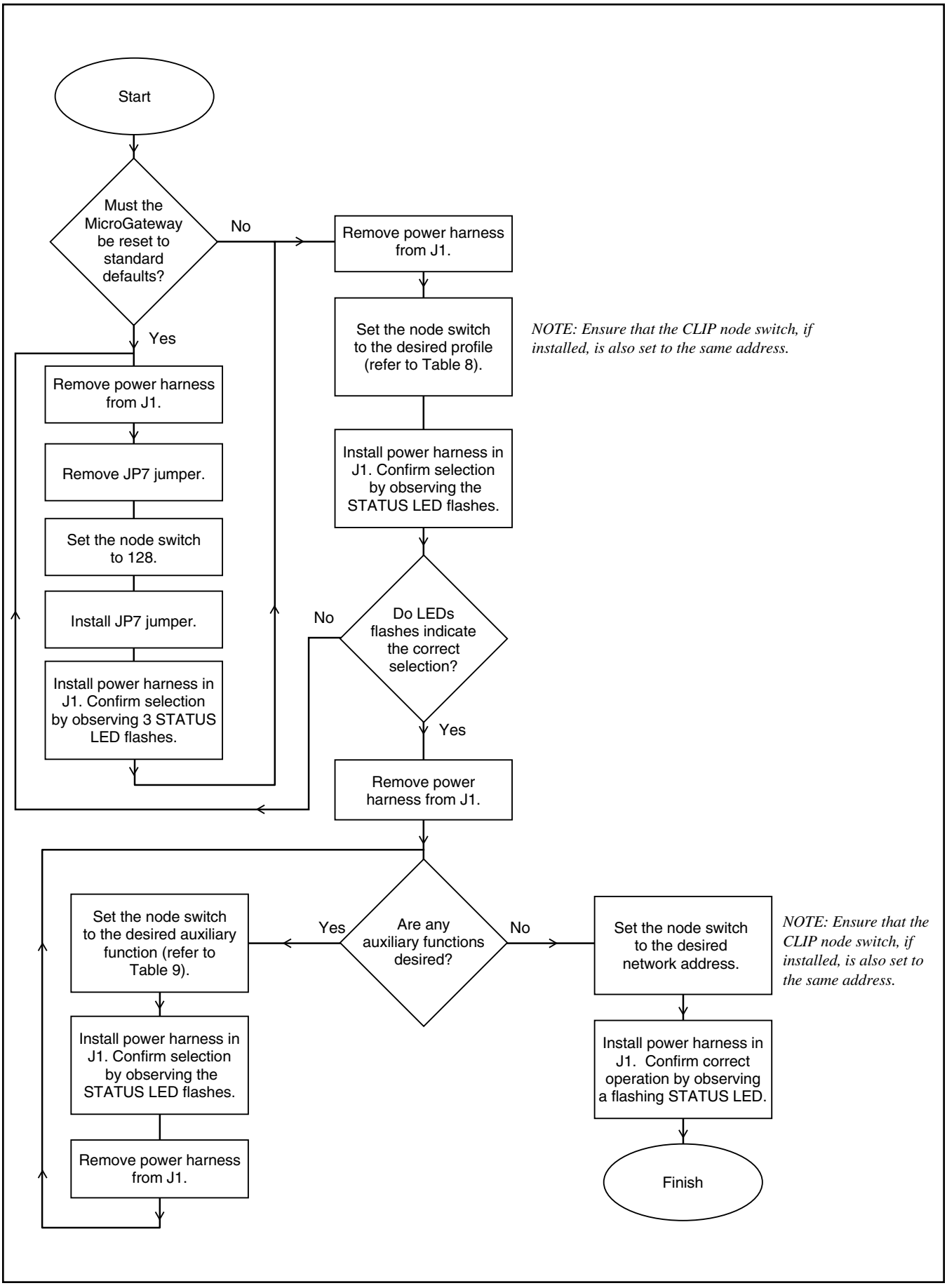
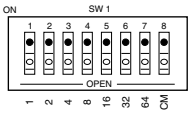
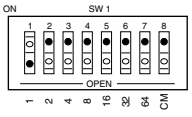
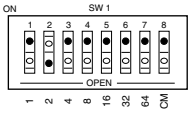
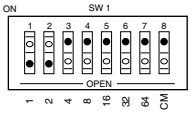
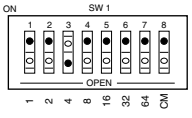
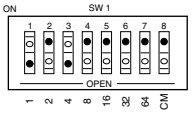
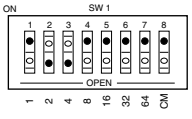
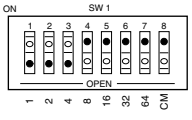
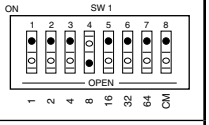
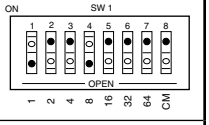
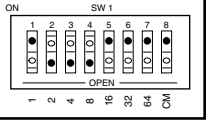


Figure 25. Commissioning Sequence

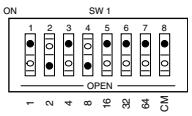
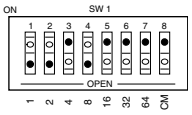
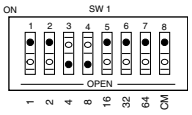
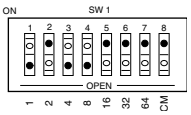
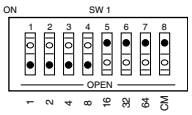
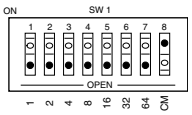
Table 7 – Quick Start Chiller Profiles

Quick Start (NODE Address)	Port 1			Port 2				No. of STATUS LED Flashes	
	Protocol	Transfer Rate	Parity	Protocol	Type	Transfer Rate	Parity		
255	Unchanged	Unchanged	Unchanged	Terminal	None	9600 baud	None	4	
254	ISN Rev. 77	50 kbaud	Odd	York Talk 3	YK SSS	19.2 kbaud	Odd	5	
253	ISN Rev. 77	50 kbaud	Odd	York Talk 3	YK VSD	19.2 kbaud	Odd	6	
252	ISN Rev. 77	50 kbaud	Odd	York Talk 3	YT SSS	19.2 kbaud	Odd	7	
251	ISN Rev. 77	50 kbaud	Odd	York Talk 3	YT VSD	19.2 kbaud	Odd	8	
250	ISN Rev. 77	50 kbaud	Odd	York Talk 3	YS SSS	19.2 kbaud	Odd	9	
249	ISN Rev. 77	50 kbaud	Odd	York Talk 2 Version 6	York Talk 2 with 1 Section	1200 baud	Odd	10	
248	ISN Rev. 77	50 kbaud	Odd	York Talk 1	York Talk 1 with 1 Section	1200 baud	Odd	11	
247	ISN Rev. 77	50 kbaud	Odd	York Talk 2 Version 6	York Talk 2 with 1 Section	4800 baud	Odd	12	
246	ISN Rev. 77	50 kbaud	Odd	York Talk 2 Version 6	York Talk 2 with 2 Sections	4800 baud	Odd	13	
241	ISN Rev. 77	50 kbaud	Odd	Terminal	None	9600 baud	None	18	

NOTE: Each Quick Start loads the equivalent York talk Points on Port 3, if equipped. Port communication parameters are set to 19.2 kbaud, no parity, 8 bits and 2 stop bits.

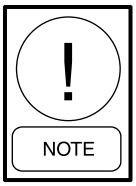
NOTE

Table 8 – Quick Start Auxiliary Functions

Chiller Type	No. of STATUS LED Flashes	Quick Start (NODE Address)	Switch Settings
Select Metric Units in the OptiView micro panel.	14	245	
Select Imperial Units in the OptiView micro panel.	15	244	
Runs a Communications Test on the MicroGateway (Advanced Fault Finding).	1	243	
Sets Port 1 to operate at 19.2 kbaud.	17	242	
Changes the Modbus range field to 50 and scaling of Pages 32 and 33 to a value of 3 (divides the returned value by 10)	19	240‡	
Returns MicroGateway to EPROM defaults. (Requires removal of JP7 and power disconnect.)	3	128	

‡ *Effects Modbus communications from Port 3 only.*

FINAL CHECKOUT LIST	YES	NO (If no, indicate why)
1) Is the unit installed according to the diagrams presented in this manual? (Indicate the chiller board number and Figure No.)		
2) Is the unit wired and grounded according to all local, state and country codes, NEC recommendations and the procedures recommended in this manual?		
3) What is the York Talk Chiller ID address of the chiller board? (This is set using either the rotary switch on the chiller board or via software.)		
4) What is the node address of the MicroGateway? What is the node adderss of the CLIP, if installed?		
5) What was the LED flash rate when the node switch was to the Quick Start address?		
6) Do the RX and TX LEDs to the micro panel flash alternately, indicating York Talk communications?		
7) Is the third-party Controls Contractor connected properly to the correct port?		
8) Is the third-party Controls Contractor able to communicate to the MicroGateway successfully?		
9) What York Talk Points List has been provided to the third-party Controls Contractor? (http://intranet.york.com/web0147/) Include file name, revision level, and Modbus/BACnet map< if applicable.		



NOTE: It is recommended that this page be photocopied before completion and a copy left at the jobsite for reference.

If the answer to any of the above questions is no, indicate why in the space provided.

JOB NAME _____

STARTUP DATE _____

TECHNICIAN _____

NOTES

NOTES

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Form 450.20-N15 (905)
Supersedes 450.20-N15 (1203)

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