

NAC403 Network Area Controller

Installation Instructions

Introduction

This document covers the mounting and installation of the NAC403 and applies to the following products:

- NAC403
- NAC403QS

These models are collectively known as the NAC403.

This document is targeted at service personnel who are involved in control system installation. These are the main topics included in this document:

- [Introduction](#), page 1
- [Safety Precautions](#), page 3
- [Installation](#), page 4
- [Using Status LEDs](#), page 17
- [Maintaining the NAC403](#), page 19
- [Certifications](#), page 23
- [Contacting Technical Support](#), page 24



This document does not cover station configuration. Configuration of IP addresses and other network settings is performed as part of the system start-up, which is done in conjunction with the programming of the control devices that are coordinated by the NAC.

Product Description

The NAC403 (Network Area Controller) is a compact embedded processor platform with flash memory for backup. It provides integrated control, supervision, as well as direct, on-board I/O for monitoring and control. When connected over an Ethernet network, the NAC403 can communicate with power meters, gas meters, water meters, analog sensors, as well as legacy devices and BACnet systems using a variety of optional communications drivers. A complete set of Java-based control, application, logging, and user interface objects are included in a library for the systems integrator to create a robust monitor and control system for any size building. With the Web User Interface option (UI), the NAC403 can directly serve live data and dynamic displays over the Internet to any standard web browser such as Netscape Navigator or Internet Explorer. The total number of connected field devices that the NAC403 can support is 27, including any combination of BACnet, LonWorks, and ModBus devices.

Included in this Package

Included in this package you should find the following items:

- a NAC403.
- These *NAC403 Installation Instructions*, Part Number 10445, Revised: June 9, 2005
- a packing slip, which lists the factory settings for IP address, machine name, and host logon.
- a hardware bag containing the following items:
 - 499 ohm resistors (quantity 6).
 - 6-position I/O screw terminal connector plugs (quantity 4).
 - 3-position RS-485 screw terminal connector plug (quantity 1).
 - wire nuts (quantity 2).
 - 2-position LON screw terminal connector plug.

Notice

This document uses the following warning and caution conventions:

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

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

WARNING

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

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

CAUTION

CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** property damage.



Note Provides additional information to clarify or simplify a procedure.

Safety Precautions



Note Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

The following items are warnings of a general nature relating to the installation and start-up of the NAC403.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- A 120 Vac circuit powers the NAC403 Installation Instructions controller. Disconnect power before installation or servicing to prevent electrical shock or equipment damage.
- Make all connections in accordance with national and local electrical codes. Use copper conductors only.
- To reduce the risk of fire or electrical shock, install in a controlled environment relatively free of contaminants.
- This device is only intended for use as a monitoring and control device. To prevent data loss or equipment damage, do not use it for any other purpose.

Failure to follow these instructions will result in death or serious injury.

Static Discharge Precautions

The following items are cautionary notes for static discharge.

CAUTION

HAZARD OF EQUIPMENT DAMAGE

- Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within a NAC403 are sensitive to static discharge. Follow these precautions when installing, servicing, or operating the system:
- Work in a static-free area.
- Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.
- Do not handle the printed circuit board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs. The wrist strap clamp must be secured to earth ground.

Failure to follow these instructions can result in property damage.

Installation

The two major steps for installing the NAC403 are outlined below:

1. [Unpack the NAC403](#)
2. [Install the NAC403](#)

Please read through the entire document before beginning the installation procedure.

Unpack the NAC403

Unpack the NAC403 and inspect the contents of the package for damaged or missing components. If damaged, notify the appropriate carrier at once and return any damaged components for immediate repair or replacement.

Install the NAC403

Installing the NAC403 controller has two major steps, as outlined below:

1. [Physical Installation](#)
2. [Make Connections](#)

Physical Installation

Tools Required

The following tools and supplies may be required for installation:

- 7 mm (1/4-inch) nut driver: used to remove the transformer shield.
- Small flat-blade screwdriver: used for I/O and RS-485 connectors (all models) and power terminal connections (NAC403I only).
- Phillips screwdriver: used to secure the door.

Mounting

Mount the NAC403 in a location that allows clearance for wiring, servicing, and module removal. For mounting details refer to [Figure 8](#) on page 16.

Pay attention to the following recommendations and precautions when mounting and installing the unit.

- This product is intended for indoor use only. The unit should not be exposed to ambient conditions outside of the range of 0°C (32° F) to 50°C (122° F) and relative humidity outside the range 5% to 95% non-condensing (pollution degree 1).
- If the controller is mounted inside an enclosure, that enclosure should be designed to keep the unit within its required operating range considering a 20-watt dissipation by the controller. This is especially important if the controller is mounted inside an enclosure with other heat producing equipment.
- Minimum clearance from the wall on which the unit is mounted is 0.2-inches (provided by the dimpled mounting feet). Ensure that this space is not compromised and that airflow is not blocked behind the unit.
- Do not mount the unit:

- in an area where excessive moisture, corrosive fumes, or explosive vapors are present.
- where vibration or shock is likely to occur.
- in a location subject to electrical noise. This includes the proximity of large electrical contactors, electrical machinery, welding equipment, and spark igniters.
- The unit is designed to be wall mounted with the battery situated towards the bottom of the unit. For proper airflow at temperature extremes, do not mount the unit oriented in any other way.

Removing and Replacing the Cover

The NAC403 cover is removable, and provides a security screw that secures the cover in place.



Note The security screw that ships with the NAC403 is a standard #10-32 machine screw, pan head, 1/2-inch Phillips. You can replace this screw with a tamper-proof screw to provide a more secure installation. In addition, you can secure the unit with a padlock through the security tab that protrudes through the cover.

Procedure 1 Removing the cover of a NAC403.

- Step 1** Loosen the security screw and open the cover.
 - Step 2** On the inside of the door, loosen and remove the nut and locking washer that secures the green grounding strap to the cover.
 - Step 3** Pull the grounding strap off the screw post.
 - Step 4** Replace the locking washer, then the nut on the screw post and tighten.
 - Step 5** Close the door about half way.
 - Step 6** Slide the cover toward the top of the unit until the tops of the hinge tabs on the cover hit the top of the hinge slots on the left wall of the metal enclosure.
 - Step 7** Slide the hinge tabs out of the slots.
-

Procedure 2 Replacing the cover of a NAC403.

- Step 1** Align the hinge tabs on the cover with the hinge slots on the left wall of the metal casing.
 - Step 2** Slide the hinge tabs into the slots and slide the door toward the bottom of the unit, until the bottom of the hinge tabs hit the bottom of the slots.
 - Step 3** Loosen and remove the nut and locking washer on the grounding strap post on the door.
 - Step 4** Slide the ground strap onto the screw post and replace the locking washer, then the nut and tighten.
 - Step 5** Close the door and tighten the security screw.
-

Make Connections

Make connections to the NAC403 in the following order. For specific details on each step, refer to the “[Wiring Details](#)” section on page 7.

1. Unplug the 6-position power connector from the circuit board.
2. Connect external power wiring to the transformer. Replace barrier.
3. Connect the Ethernet cable.
4. Connect any other communication cables.
5. Connect any I/O wiring.

See [Figure 7](#) on page 15 to locate connectors and other components on the NAC403.

Power Up and Initial Checkout

Ensure power wiring to the transformer has been completed before proceeding (see the “[Power Wiring](#)” section on page 7). To apply power, insert the 6-position power connector to the board.

Refer to [Figure 7](#) on page 15 for the locations of status LEDs on the NAC403.

Checking the Heartbeat LED

When power is first supplied to the controller, the red heartbeat LED will come on solid for approximately 10 seconds, then begin to blink. The blink pattern of the heartbeat LED under normal operation will differ for each installation (depending on station activity). But, in general, the LED should blink about once per second. The rate will be slower when the control engine is executing the station database and as more objects are added. See also the “[Heartbeat](#)” section on page 17.

About the Battery

The NAC403 is provided with a sealed lead acid battery, which is nearly fully charged. Therefore, the NAC403 has battery back up protection immediately upon installation. If battery trouble messages are generated upon power up, contact Tech Support for assistance.

CAUTION

HAZARD OF EQUIPMENT DAMAGE

In the event of battery trouble messages, ensure the station database is backed up to removable storage such that it can be restored in the event of a power outage and loss of data.

Failure to follow these instructions can result in property damage or data loss.

For more information on the use and replacement of the battery, refer to the “[Required Battery Maintenance](#)” section on page 19.

Wiring Details

The following sections provides details on:

- [Power Wiring](#)
- [Communications Wiring](#) including:
 - Ethernet
 - Serial
 - LonWorks (LON)
 - Modem (Optional)
- [I/O Wiring](#)

Power Wiring

Building power is wired directly to the transformer supplied with the NAC403. There is no disconnect switch in the unit, therefore you should wire the controller to an external switch or circuit breaker. Refer to your local code for location and rating requirements of the disconnect device. Note you must unplug the 6-position power connector to fully disconnect power from the controller. This connector supplies power from both the transformer and the battery. The battery will continue to power the controller when the external disconnect is opened.

About the Transformer

The NAC403 ships with a 120 Vac, 35 W, 50/60 Hz transformer and 12 V battery. The transformer provides power to the controller in a 28 Vac center tapped configuration. The power connector has been disconnected for shipping.

The following safety precautions should be noted about the NAC403 transformer:

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Wiring is to be made to the supplied transformer. All connections should be made in accordance with national and local electrical codes. Use copper conductors only.
- Do not power other devices from the transformer of the NAC403. The transformer should be dedicated to running the NAC403.
- Do not attempt to use any other power source or otherwise defeat the isolation provided by the integral transformer. A two-wire power source, including a 24V transformer, can cause permanent damage or greatly shorten the life of the unit.
- Verify that neither side of the transformer's secondary winding is connected to earth ground or building neutral.

Failure to follow these instructions will result in death or serious injury.

Making the Power Connection to the Transformer

With the 6-position power connector disconnected from the PCB, unscrew the nut and locking washer and remove the metal enclosure of the transformer.



Note As typically required by code, “Class 1” wiring must be confined behind the transformer’s enclosure divider. Be sure to replace this barrier after completing the wiring. Do not pinch wires underneath the barrier when re-installing the barrier.

For NAC403—Using the provided wire nuts, connect 120Vac 60 Hz power to the transformer and power connector using the information in [Table 1](#).

Table 1 US models—building power termination.

Building Power Source		Termination point
Type of Wire	Typical Color of Wire	
Ungrounded—Hot	Black	Transformer primary wire, black*
Grounded—Neutral	White	Transformer primary wire, black*
Grounding—Ground	Green or bare copper	Grounding stud inside transformer enclosure.

* Do not connect Hot and Neutral to the same primary wire.

Communications Wiring

All communications wiring is made through knockouts adjacent to the communication ports. Prior to connecting cables, ensure that the grommet bushing has been installed for each knockout. Employ strain relief on the communication wiring to prevent damage to the controller.

Ethernet

A single, female 10/100-Mbit Ethernet connection is provided on the controller. This connection is capable of running at either 10 Mbps or 100 Mbps—it automatically adjusts to either speed. This means the NAC403 can exist on the same network with a mixture of 10BaseT and 100BaseTX hardware connected to a smart 10/100 hub capable of adjusting to the devices it supports.

Connection is made via a standard male RJ-45 (8-wire) connector. Using a Category 5 unshielded twisted pair (UTP) cable, connect one end of the cable through the knockout adjacent to the RJ-45 connector on the NAC403, and the other end to a hub on the Ethernet LAN.

The maximum end-to-end distance from the controller to the hub is 328 feet (100m).

Serial

There are two serial ports on the NAC403. From the top of the board (see [Figure 7](#)), the top serial port is an [RS-232](#) port using an RJ-45 connector. Below this is a two-wire with shield, non-isolated [RS-485](#) port.

RS-485

RS-485 multi-point connections are made to the 3-position, screw terminal connector on the board. Wire to this connector with shielded 18-22AWG wiring (refer to the TIA/EIA-485 standard). The screw terminals (from top to bottom) are shield, plus (+), and minus (–).

RS-232

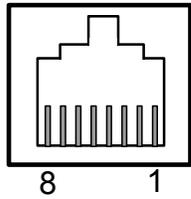
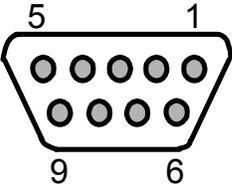
An RS-232 serial port connection can be made to the female (socket) RJ-45 connector using an 8-conductor flat silver satin stranded cable with standard male (plug) RJ-45 connectors. Connect the flat satin cable (maximum distance 50 feet) through the enclosure knockout nearest the port. This “straight-through” cable is then connected to a socket-to-socket type RJ-45-to-DB-9 adapter.

The NAC403 is a serial DTE device, such another DTE device (PC, for example) requires a “null modem” adapter. If connecting the NAC403 to a DCE device (modem, for example), a straight-through adapter is used. [Table 2](#) provides pinouts for both types of RJ-45 to DB-9 adapters.



- Notes**
- Silver satin cable is not standard Ethernet UTP cable, in which the pairs are twisted around each other. The twisting of the pairs may cause undesirable effects on the serial communication, therefore we recommend the use of flat silver satin cable instead.
 - Flat silver satin cable is unshielded. If installing this cable in a noisy electrical environment, run the cable through conduit.

Table 2 RJ-45 to DB-9 adapter pinouts.

RJ-45 and DB-9 Pinout References	Type of Adapter	RJ-45 Socket Pin	Signal		DB-9 Socket Pin
RJ-45 Socket (female) 	Null Modem (for connecting to another DTE device) Part number 10148	5	DCD	Data carrier detect	1
		3	TXD	Transmit data	2
		6	RXD	Receive data	3
		8	DSR	Data set ready	4
		4	GND	Ground	5
		1	DTR	Data terminal ready	6
		7	CTS	Clear to send	7
		2	RTS	Request to send	8
		—	not used on the NAC-4		9
DB-9 Socket (female) 	Straight-through (for connecting to a DCE device)	5	DCD	Data carrier detect	1
		6	RXD	Receive data	2
		3	TXD	Transmit data	3
		1	DTR	Data terminal ready	4
		4	GND	Ground	5
		8	DSR	Data set ready	6
		2	RTS	Request to send	7
		7	CTS	Clear to send	8
		—	not used on the NAC-4		9

LonWorks (LON)

A single, two-pin, male LonWorks FTT-10A Weidmuller connection is provided on the controller. This connection supports twisted pair, unshielded, polarity-insensitive, peer-to-peer communications at 78 Kbps.

Refer to the *LonWorks FTT-10A Free Topology Transceiver User's Guide* (078-0156-01F) for technical guidelines associated with free topology restrictions and the *Junction Box and Wiring Guidelines for Twisted Pair LonWorks Networks* (005-0023-01) for more detailed information on wiring specifications. These documents are available on Echelon's web site (www.echelon.com).

Modem (Optional)

The female RJ-11 connection for the modem is located below the RS-485 port. Connect one end of a standard flat satin telephone cable (4-conductor) through the adjacent knockout to the modem's RJ-11 connector and the other end to an analog telephone port.

This modem is approved for US use only, and must be tested for use in other countries.

I/O Wiring

The NAC403 provides six (6) universal **inputs** supporting analog inputs (temperature, resistance, voltage, and current) and digital inputs (contact closure, pulse count), as well as four (4) form-C (SPDT) relay **outputs**.

Inputs

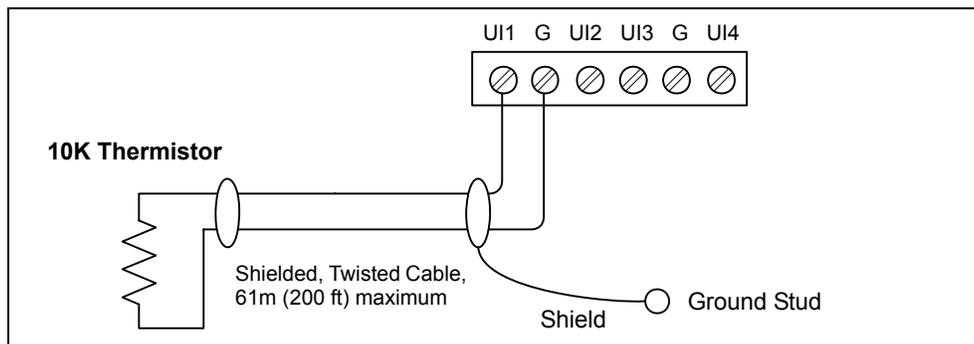
Each of the 6 universal inputs can support any one of the following:

- Type 3 (10K) **Thermistor**
- **Resistive**
- **0–10 Vdc**
- **4–20 mA**
- **Binary Input**

Thermistor

The inputs support Type 3 10K Thermistor temperature sensors with a sensor range of -10° to 135°F (23.3° to 57.2°C). Input accuracy is in the range of $\pm 1\%$ of span. [Figure 1](#) shows the wiring diagram.

Figure 1 Thermistor wiring.



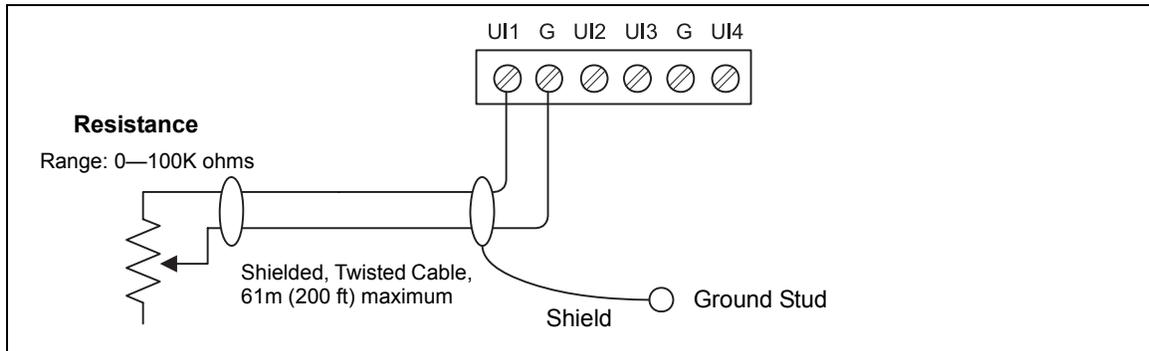
Note

Note that UI inputs are optimized to provide the best resolution around the 10K ohm range. For a sensor with a range far from 10K ohms (such as a 100-ohm or 1000-ohm type), resolution will be poor. To use such a sensor, it is recommended you install a transmitter that produces a Vdc or mA signal, and then wire the transmitter to the UI according to the [Resistive](#) or [4–20 mA](#) instructions.

Resistive

The inputs support resistance inputs with a range of 0–100K ohms. Input accuracy is in the range of $\pm 1\%$ of span.

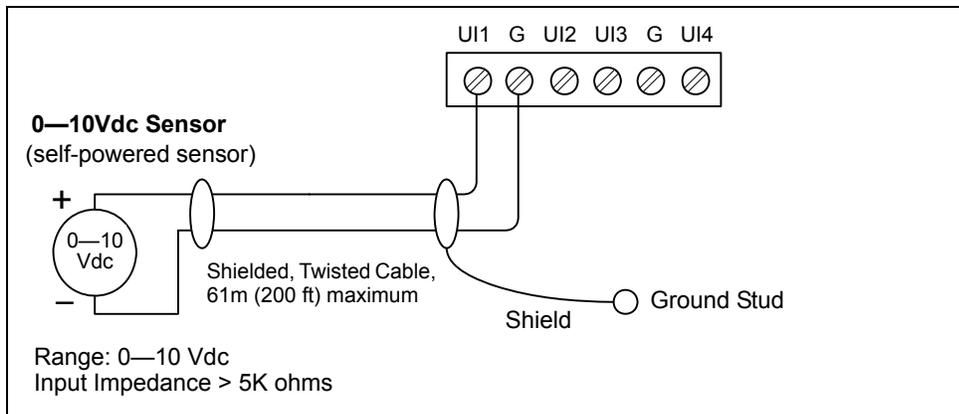
Figure 2 Resistive wiring.



0–10 Vdc

The inputs support self-powered 0–10 Vdc sensors. Input impedance must be greater than 5K ohms. 0–10 volt accuracy is $\pm 2\%$ of span, without user calibration. [Figure 3](#) shows the wiring diagram.

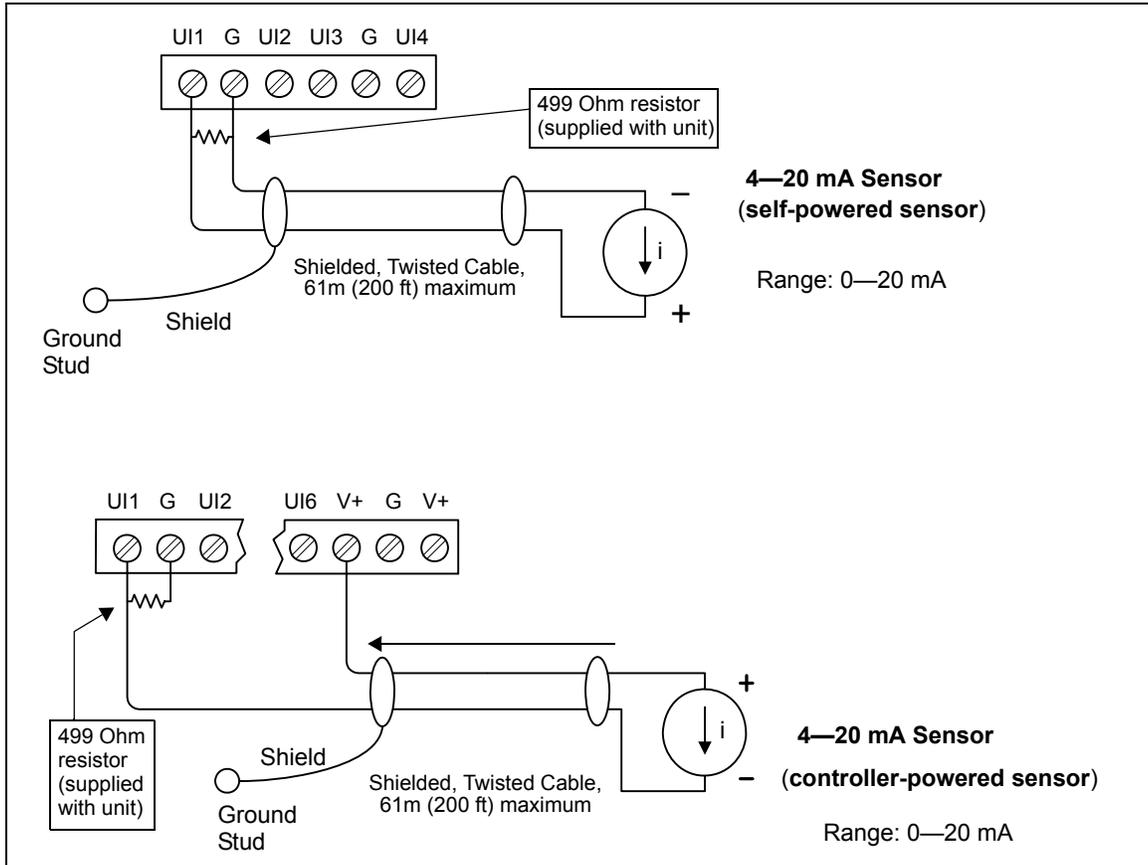
Figure 3 0–10 Vdc wiring.



4–20 mA

The inputs support self-powered or controller-powered 4–20 mA sensors. For controller-powered sensors, the controller's two V+ terminals supply 20 Vdc, at up to 80 mA combined. Input accuracy is $\pm 2\%$ of span, without user calibration. The input requires an external 499-ohm resistor for current input (six are supplied with the unit). [Figure 4](#) shows wiring used for a self-powered sensor (top) and a 2-wire controller-powered sensor (bottom).

Figure 4 4 to 20 mA wiring.



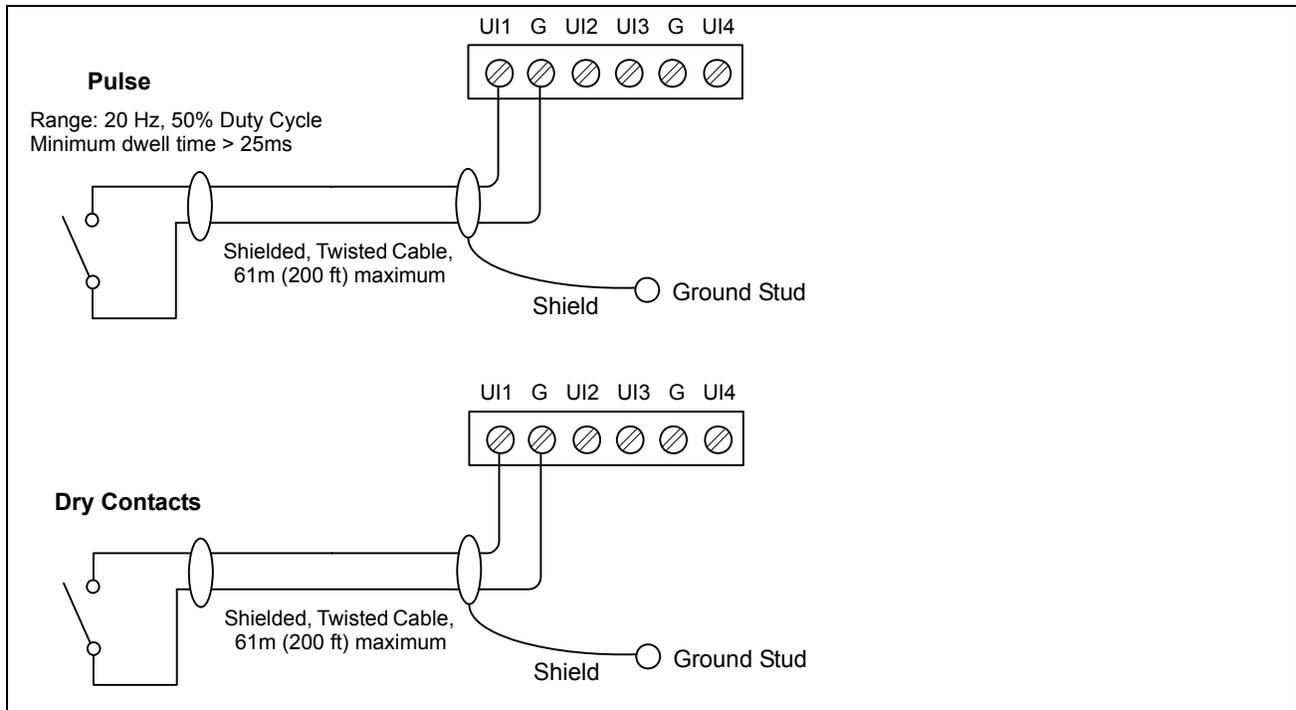
Binary Input

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

- Pulse contacts may have a change-of-state (COS) frequency of up to 20 Hz with a 50% duty cycle.
Note: Minimum dwell time must be > 25ms.
- Standard dry contacts must have a 1 Hz. (or less) COS frequency, with minimum dwell time > 500ms.

Both types of dry contacts support 3.3 Vdc open circuits or 330 μ A short-circuit current. [Figure 5](#) shows the wiring diagram.

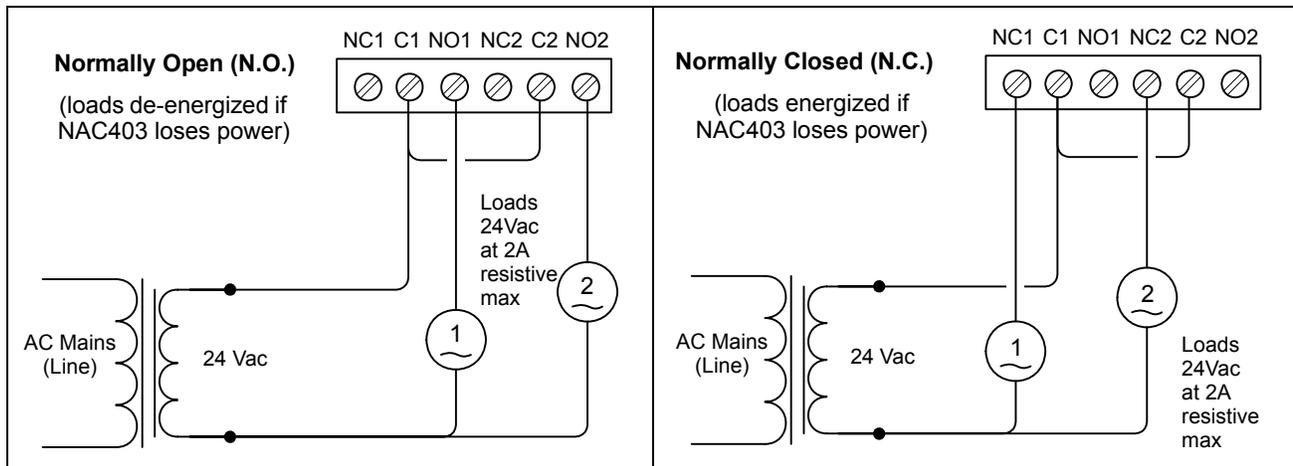
Figure 5 Binary input wiring.



Outputs

Four (4) form-C relay outputs provide isolated dry-contact control of 24 VAC/DC loads at up to 2A resistive. An LED indicator for each relay is located between the relay and the wiring connection point (see the “[Relay Output Status](#)” section on page 18). [Figure 6](#) shows example wiring diagrams.

Figure 6 Example DO (relay) output wiring.

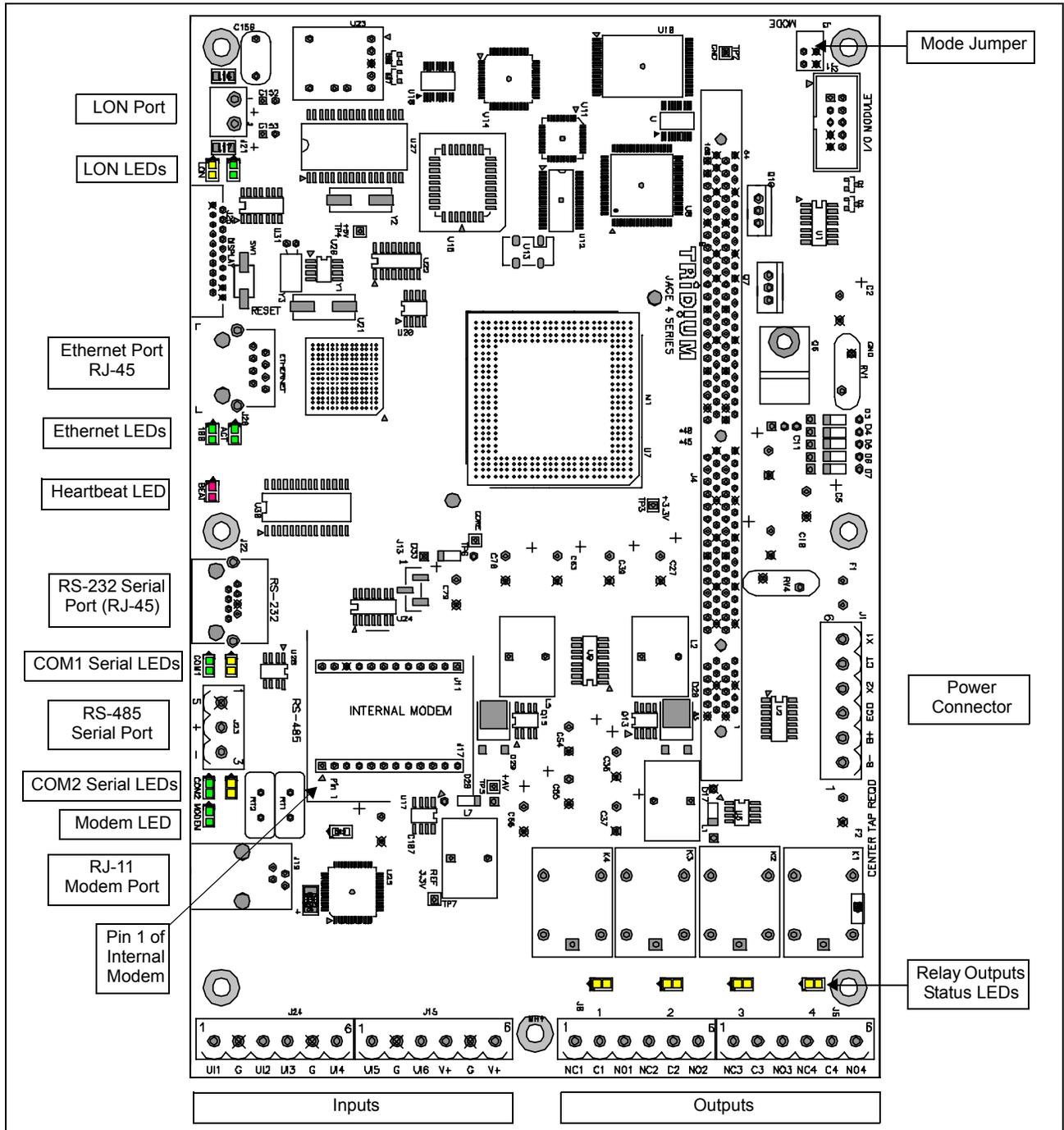


Figures

The following figures provide a [board layout](#) and [mounting details](#).

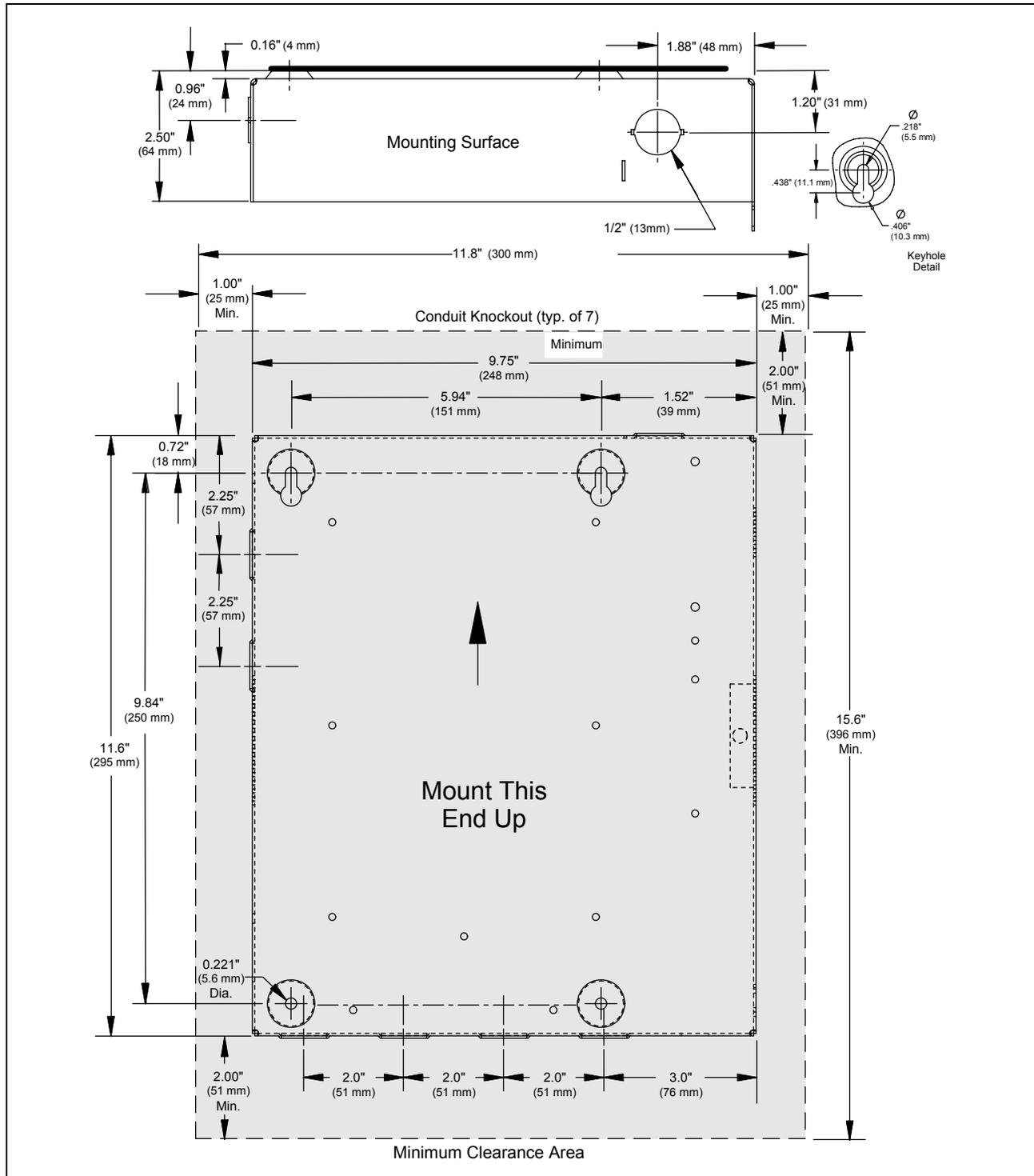
Board Layout

Figure 7 NAC403 board layout details.



Mounting Details

Figure 8 Mounting details.



Using Status LEDs

The NAC403 controller includes a series of LEDs that can be used to determine the status of a variety of normal operating parameters for the unit. They are located on the circuit board. From the top of the board to the bottom, these include the following:

- [LON \(LonWorks\) Port](#)
- [Ethernet Port](#)
- [Heartbeat](#)
- [Serial Ports](#)
- [Modem](#)
- [Relay Output Status](#)

Refer to [Figure 7](#) on page 15 for the exact locations of status LEDs on the NAC403 controller.

LON (LonWorks) Port

Two LEDs are located below the LON port and show transmit and receive activity.

- The **yellow** transmit LED (TxD) indicates that the NAC403 is *transmitting* a message on the LON trunk.
- The **green** receive LED (RxD) indicates that *another* LonWorks device is transmitting a message.

Ethernet Port

The Ethernet port has two green LEDs, located below the Ethernet connector.

- The LED marked “100” indicates whether the NAC403 is operating at 10 Mbps (Ethernet) or 100 Mbps (Fast Ethernet). If the 100 LED is on, the network connection is operating at 100 Mbps. Otherwise, the port is communicating at 10 Mbps.
- The “ACT” LED indicates activity on the port as follows:
 - **Off**—No Ethernet link is made
 - **On**—Ethernet link is present, but no activity on the LAN
 - **Blinking**—Ethernet link is present with data activity on the LAN.

Heartbeat

The “BEAT” LED is located below the Ethernet status LEDs, and is red. Under normal operation, this LED should blink about once per second. The blink pattern will differ as station activity increases, but any pulse rate from once per second to 10 blinks per minute usually indicates normal control engine activity. If the heartbeat LED stays on constantly or does not light, contact Technical Support.

Serial Ports

The status LEDs for the serial ports are located below the respective RS-232 and RS-485 ports. They are marked COM1 and COM2 and correspond to the software configuration of the COM ports. They show the transmit and receive information for the serial ports and optional modem.

- The **yellow** transmit LED indicates that the NAC403 is *sending* data out the serial port over a communications line to a connected device.
- The **green** receive LED indicates that the NAC403 is *receiving* data from a connected device.

These LEDs are driven by pulse detectors that provide a fixed on-time when data is detected on the port. If these LEDs are on constantly, this indicates a problem with the communications channel, such as a shorted wire or reversed wiring.

Modem

The modem LED is located directly above the RJ-11 connector for the modem, and is green. When lit, it indicates that the modem is connected to another modem (a carrier is detected). In this case, the serial port LEDs for COM2 should indicate transmit and receive activity—see “[Serial Ports](#)” above.

Relay Output Status

There are four (4) relay output status LEDs. These are yellow LEDs, with each one located below the associated form-C relay (just above the screw terminals for each output’s wiring).

Under normal operation, a relay status LED indicates activity as follows:

- **Off**—Relay coil is not energized
- **On**—Relay coil is energized

Therefore, for a circuit with a normally open contact, an On status indicates that the contact is closed. For a circuit with a normally closed contact, an On status indicates that the contact is open.

Maintaining the NAC403

This section provides information on the following topics:

- [Cleaning](#)
- [Required Battery Maintenance](#)
- [Replacement Parts](#)

Cleaning

If dust or metal filings are present inside the unit, clean with vacuum or compressed air. Otherwise, no cleaning inside the unit is required. Optionally, if the outside of the metal enclosure becomes dirty, you can wipe it with a damp cloth and mild detergent.

Required Battery Maintenance

Battery life expectancy is a function of its discharge cycles (the number of discharges and their depth) and the ambient temperature of the battery during normal operation. In most applications, the battery should see relatively few discharges. Therefore, ambient temperature has more to do with determining the life expectancy of the battery than does any other factor. If the NAC403 is installed in a conditioned space, the battery should provide dependable service for approximately three years (average). In an environment where the operating temperature is higher (that is, 50°C or 122°F), you should only expect the battery to last approximately one year.

The sealed lead acid battery in the NAC403 is nearly fully charged before shipping. The battery is automatically float-charged during normal operation (while power is applied to the unit). The NAC403 monitors the battery and periodically loads the battery to test its ability to maintain battery-backed functions. You should investigate any battery trouble message. Check the voltage level and its connections to the unit. Replace the battery as required.

To order a new battery, see the “[Standard Replacement Parts](#)” section on page 21.

Replacing the Battery

CAUTION

HAZARD OF EQUIPMENT DAMAGE

When replacing the battery or harness, maintain property polarity as marked on the label inside the unit. Although the NAC403 is fully protected against shorted battery terminals, the battery itself is not internally protected. Use extreme care not to short circuit the battery. A shorted battery may overheat rapidly and damage the power wiring harness or cause other physical harm to the hardware.

Failure to follow these instructions can result in equipment damage.

Replacement Parts

To replace the battery, proceed as follows:

Procedure 3 Replacing a NAC403 battery.

- Step 1** Using the local disconnect, remove power to the transformer.
- Step 2** Unplug the 6-position power connector. Do not remove the male connector from the wiring harness.
- Step 3** Using a 7 mm (1/4-inch) nut driver, unscrew the lock nut from the bracket that is holding the battery.
- Step 4** Hold the battery in place while you remove the bracket that secures it to the bottom of the unit.
- Step 5** Disconnect the two quick connect terminals on the battery.



Note The NAC403 will lose its time and date settings if it is disconnected from both battery and AC power for more than one hour.

- Step 6** Remove the old battery and recycle as defined by your regional codes. For recycling within the US, see the labelling on the battery.
- Step 7** Connect the quick connect terminals to the new battery. Make sure the RED (+) wire is connected to the positive terminal of the battery and the BLACK (-) wire is connected to the negative terminal.
- Step 8** Secure the new battery to the bottom of the unit with the bracket and tighten the lock nut.
- Step 9** Plug the power connector in, restore transformer power, and verify normal operation.
-

Replacement Parts

Servicing the NAC403 may call for replacement parts. There are two categories of parts:

- [Non-replaceable Parts](#)
- [Standard Replacement Parts](#)

Non-replaceable Parts

Other than the parts listed in the replacement parts sections, there are no serviceable components on the base assembly.

Memory

Any addition, modification, or replacement of memory components requires software configuration and is not a field upgrade.

Fuses

The NAC403 has two 250V, 2.5A delay (series 372) fuses on the printed circuit board. These fuses are Wickman F015-2.5A250V fuses. However, on-board power circuit protection is not user-serviceable. If this circuitry is suspect, contact Technical Support.

Standard Replacement Parts

Standard replacement parts are listed in [Table 3](#) and can be ordered from stock without restriction. Standard replacement parts cannot be returned for credit and should be disposed of in an appropriate manner.

Table 3 Standard replacement parts.

Part Number	Description
10023	Battery, 12 Vdc, 1.2 AH (see “Replacing the Battery,” page 19.)

Replacing the (optional) Modem

CAUTION

HAZARD OF EQUIPMENT DAMAGE

Before handling board components, discharge any static electricity that you may have accumulated by touching the metal surface of the NAC403. For more information, see the [“Static Discharge Precautions”](#) section on page 3.

Failure to follow these instructions can result in equipment damage or data loss.

To replace the modem, proceed as follows:

Procedure 4 Replacing the on-board modem.

- Step 1** Using the local disconnect, remove power to the transformer.
- Step 2** Open the cover of the unit.
- Step 3** Unplug the 6-position power connector. Do not remove the male connector from the wiring harness.
- Step 4** Unplug the RJ-11 telephone wire from the modem’s RJ-11 connector.
- Step 5** Remove the old modem as follows:
 - a. Locate the on-board modem (see [Figure 7](#) on page 15) and note the following:
 - Orientation of the sockets for the pins on the modem. The sockets are two parallel lines. The socket for pin 1 (noted on [Figure 7](#)) is the left-most pin on the bottom line.
 - Orientation of the writing on the modem. Writing on the replacement modem will be the same.
 - b. Place the blade of a flat-blade screwdriver under the left end of the modem between the pin sockets.
 - c. Gently pry the modem up about 3 mm (1/8th inch).

CAUTION

HAZARD OF EQUIPMENT DAMAGE

Do not try to completely remove the modem with this step. Doing so may damage the pins.

Failure to follow these instructions can result in equipment damage.

- d. Place the blade of the screwdriver under the right end of the modem and gently pry the modem up about 3 mm (1/8th inch).
- e. Repeat steps b–d until the modem is out of its socket.
- Step 6** Insert a new modem as follows:
 - a. Locate pin 1 on the modem. If you are reading the writing on the modem, pin 1 is the first pin in the lower left corner. It is marked with a small black dot on the top of the modem.

Replacement Parts

- b. Locate the socket for pin 1 on the board (see [Figure 7](#)).
- c. Orient the modem so that pin 1 of the modem is over the socket for pin 1.



Tip Use the white trace lines on the board to help you align the modem. When the modem is correctly aligned, the trace lines will outline the modem completely.

- d. Push the modem into the sockets using your thumbs. All pins should be properly inserted.

Step 7 Plug the RJ-11 telephone wire into the modem's RJ-11 connector.

Step 8 Plug the power connector in, restore transformer power, and verify normal operation.

Certifications

Federal Communications Commission (FCC)

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference with radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case, users at their own expense will be required to take whatever measures may be required to correct the interference. Any unauthorized modification of this equipment may result in the revocation of the owner's authority to continue its operation.

Canadian Department of Communications (DOC)

**Note**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

**Note**

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Contacting Technical Support

Our technical support specialists provide prompt, on-line assistance for your product via phone, fax, or e-mail.

Contact POWERLINK[®] Technical Support at:

Phone: (615) 287-3400

Fax: (615) 287-3404

Email: powerlink.support@us.schneider-electric.com

Address: 295 Techpark Drive, Suite 100, LaVergne, TN 37086

Support is available in English. Fax is available 7-days a week, 24-hours a day; however, you'll receive a response to your fax on the next business day. Be sure to include your name and company, address, phone number, product name, and a detailed description of the problem or question.