

JACE-545

MOUNTING AND WIRING INSTRUCTIONS

This document covers the mounting and wiring of the Wykon® JACE-545 series controller, and applies to the following product models:

US Models

J-545-AX, J-545-EM-AX

International models

J-545I-AX, J545I-EM-AX, J-545J-AX

This document assumes that you are an engineer, technician, or service person who is performing control system installation of the Niagara Framework®. Please read through this entire document before beginning the installation procedures.



Note Not covered in this document is the Niagara software installation and configuration required for a fully functioning unit. This includes host IP address and password, serial port configuration, and other parameters. Please refer to the *JACE NiagaraAX Install & Startup Guide* for this information.

These are the main topics included in this document:

- [Preparation](#), page 1
- [Precautions](#), page 2
- [Mounting](#), page 3
- [Board Layout](#), page 6
- [Wiring Details](#), page 7
- [Power Up and Initial Checkout](#), page 10

Also included in this document are several appendixes, as follows:

- [Using Status LEDs](#), page 11
- [Maintaining the JACE-545](#), page 12
- [Replacement Parts](#), page 13
- [Certifications](#), page 18
- [Declaration of Conformity](#), page 19



Preparation

Unpack the JACE-545 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. See [“Returning a Defective Module”](#) on page 17.

- [Included in this Package](#)
- [Tools Required](#)

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Included in this Package

Included in this package you should find the following items:

- a JACE-545.
- These *JACE-545 Mounting and Wiring Instructions*, Part Number 10582, Rev. 1.1.
- A packing slip, which lists the factory settings for IP address, machine name, and host login.
- A hardware bag containing the following items:
 - Four 3-position RS-485 screw terminal connector plugs.
 - Two wire nuts (US models only).
 - One 2-position LON connector plug
- Optional items (if ordered):
 - Factory-installed modem.
 - RJ-45 to DB-9 adapter (for the RS-232 port).
 - Silver satin patch cable (used between the adapter and serial port).

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 LON and RS-485 connectors (all models) and power terminal connections (J-545J-AX and J-545I-AX models only).

**Note**

If removing or installing the circuit board from the enclosure, a 1/4-inch thin-walled *socket* is required (*do not use a nut driver*). See [“Replacing the JACE-545 circuit board,”](#) page 16.

Precautions

This document uses the following warning and caution conventions:

**Caution**

Cautions remind the reader to be careful. They alert readers to situations where there is a chance that the reader might perform an action that cannot be undone, might receive unexpected results, or might lose data. Cautions contain an explanation of why the action is potentially problematic.

**Warning**

Warnings alert the reader to proceed with extreme care. They alert readers to situations where there is a chance that the reader might do something that can result in personal injury or equipment damage. Warnings contain an explanation of why the action is potentially dangerous.

Safety Precautions

The following items are warnings of a general nature relating to the installation and start-up of the JACE-545 controller. Be sure to heed these warnings to prevent personal injury or equipment damage.

**Warning**

- **A 120Vac (US models), 240Vac (International model), or 100Vac (Japan model) circuit powers the JACE-545 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.**

Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within a JACE-545 controller are sensitive to static discharge. Follow these precautions when installing, servicing, or operating the system:

**Caution**

- **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.**

Mounting

Mount the JACE-545 controller in a location that allows clearance for wiring, servicing, and module removal. For mounting details refer to [Figure 1](#) on page 4 (a drill template is provided on the [last page](#) of this document).

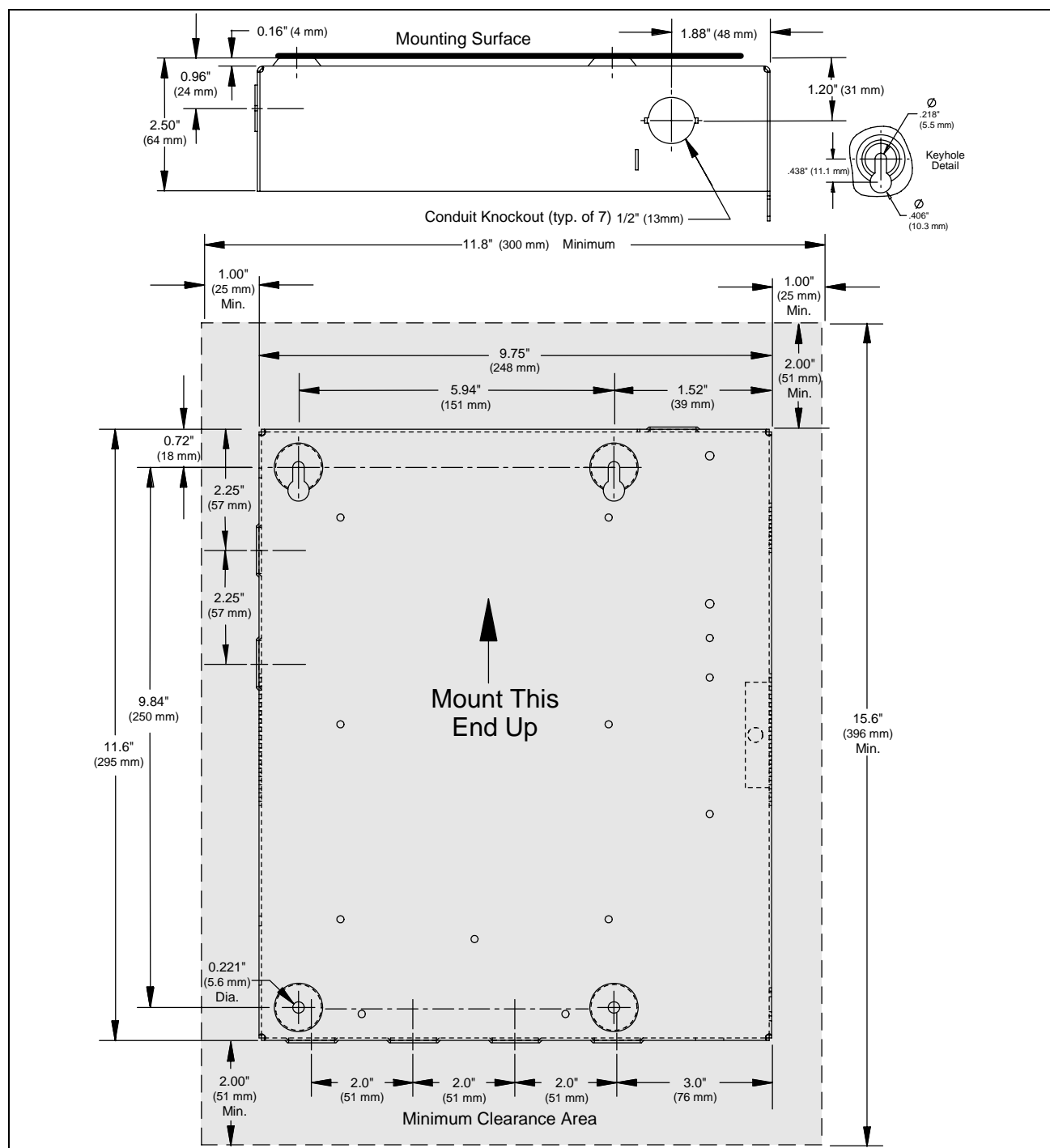
Pay attention to the following recommendations and precautions when mounting and installing the unit.

- 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 contractors, electrical machinery, welding equipment, and spark igniters.

Removing and Replacing the Cover

- 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.

Figure 1 Mounting details.



Removing and Replacing the Cover

The JACE-545 cover is removable. The cover is secured in place with a knurled-edge, *slotted-head* screw.



Note If you need a more secure installation for the cover, you can use a padlock through the security tab that protrudes through the cover.

Procedure 1 Removing the cover of a JACE-545.

- Step 1** Loosen the cover screw and open the cover.
(You may need a slotted-head screwdriver to loosen the cover screw, if previously tightened this way.)
 - 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.
-

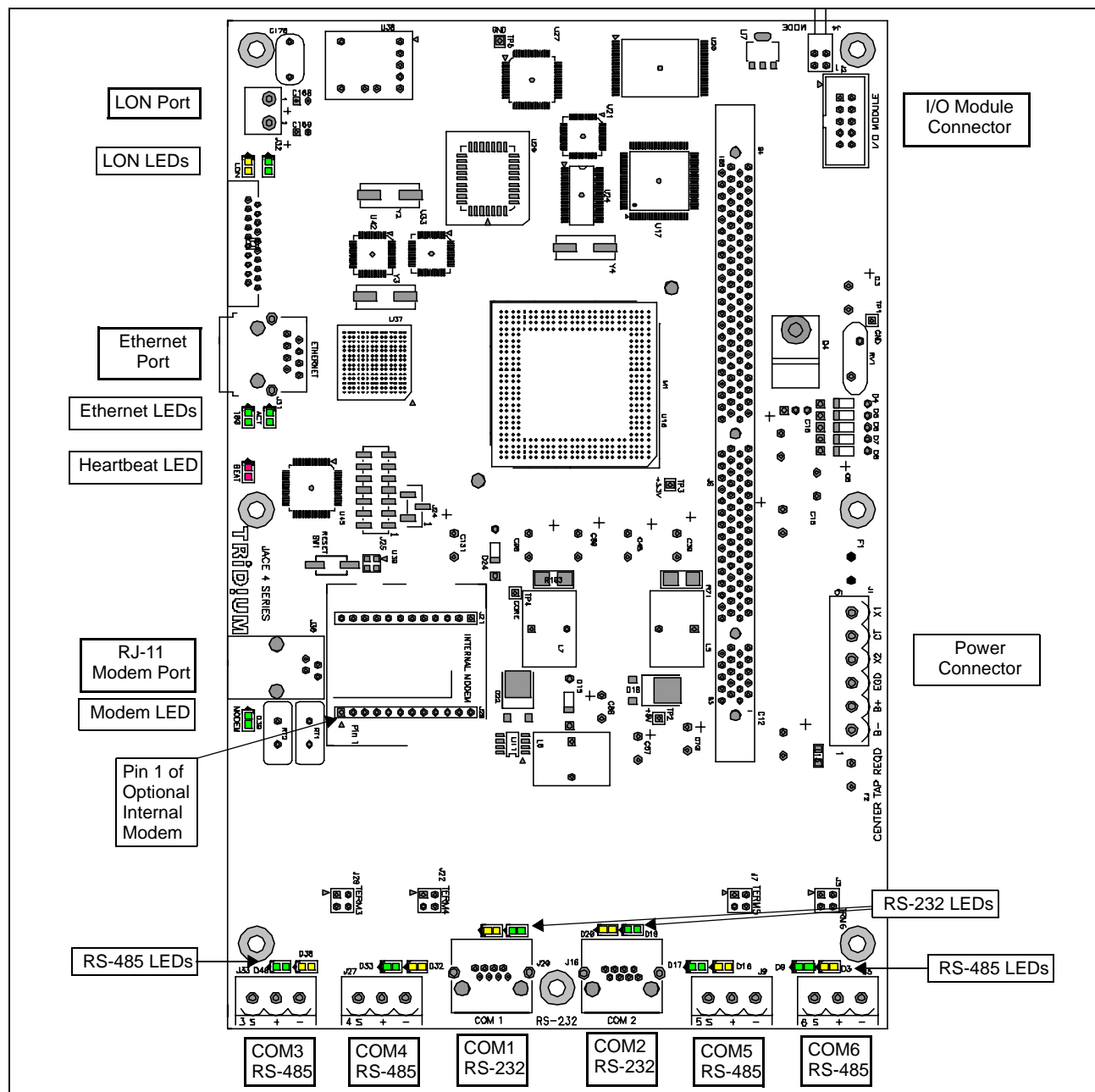
Procedure 2 Replacing the cover of a JACE-545.

- 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.
-

Board Layout

Refer to [Figure 2](#) for location of communications ports, LEDs, and other features of the JACE-545.

Figure 2 JACE-545 board layout details.



Wiring Details

See [Figure 2](#) on page 6 to locate connectors and other components on the JACE-545 controller. Make connections to the JACE in the following order:

1. With the 6-position power connector disconnected from the board, wire the power to the transformer (US models) or the power terminal block (International models). See [“Power Wiring,”](#) page 7.
2. Connect communications cables. See [“Communications Wiring,”](#) page 8.
3. Apply power to the unit. See [“Power Up and Initial Checkout,”](#) page 10.

Power Wiring

Building power is wired directly to the transformer supplied with the JACE-545. There is no disconnect switch in the unit, therefore you should wire the JACE to an external switch or breaker. Some local codes require the switch to be in sight of the unit. The switch must be capable of 120Vac (or if JACE-545I: 240Vac, or if JACE-545J: 100Vac), plus sufficient capacity for test equipment.

- [About the Transformer](#)
- [Making the Power Connection to the Transformer](#)

About the Transformer

The J-545-AX and J-545-EM-AX models ship with a 120Vac, 50/60 Hz transformer. The J-545I-AX model ships with a 240Vac, 50/60 Hz transformer. The J-545J-AX model ships with a 100Vac 50/560 Hz transformer. All models ship with a 12V battery.

The transformer provides power to the controller in a 14-CT-14 configuration (28Vac center tapped). The power connector has been disconnected for shipping.

Note the following about the JACE-545 transformer:



Warning

- **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 JACE. The transformer should be dedicated to running the JACE.**
- **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.**

Making the Power Connection to the Transformer

With the 6-position power connector disconnected from the PCB, unscrew the nut and lock washer and remove the metal enclosure of the transformer. Input voltage differs between a [J-545-AX](#) or [J-545-EM-AX](#), [J-545I-AX](#), and [J-545J-AX](#).



Note As typically required by code, high voltage “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.

J-545-AX or J-545-EM-AX—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 (U.S.)		Termination point
Type of Wire	Typical Color of Wire	
Ungrounded—Hot	Black	Either wire of the 120V transformer
Grounded—Neutral	White	Other wire of the 120V transformer
Grounding—Ground (Earth)	Green or bare copper	Grounding stud

J-545I-AX—Connect **240Vac 50-60 Hz** power to the power terminal block using information in [Table 2](#).

Table 2 International or Japan models—building power termination.

Building Power Source (International or Japan)		Termination point
Type of Wire	Typical Color of Wire	
Ungrounded—Hot	Brown	Either empty terminus of the terminal block
Grounded—Neutral	Blue	Other empty terminus of the terminal block
Grounding—Protective Earth (Ground)	Green/yellow or bare copper	Grounding stud

J-545J-AX—Connect **100Vac 50-60 Hz** power to the power terminal block using information in [Table 2](#).

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 JACE-545 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 JACE, 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 six serial ports on the JACE-545, located at the bottom of the board (see [Figure 2](#) on page 6). From left-to-right, ports are two [RS-485](#) (COM3 and COM4), two [RS-232](#) (COM1 and COM2), and two more [RS-485](#) (COM5 and COM6). All RS-485 ports are optically-isolated; the RS-232 ports are not isolated.

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

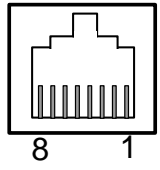
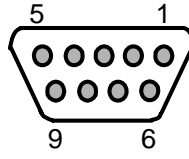
RS-232—RS-232 serial port connections can be made to the female (socket) RJ-45 connectors using an 8-conductor flat silver satin stranded cable with standard male (plug) RJ-45 connectors. Connect the flat satin cable (maximum distance 50 feet) through the enclosure knockout nearest the port. This “straight-through”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

The JACE-545 is a serial DTE device, such another DTE device (PC, for example) requires a “null modem” adapter (part number 10148, optional item). If connecting the JACE-545 to a DCE device (modem, for example), a straight-through adapter is used. Table 3 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 3 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)  DB-9 Socket 	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 JACE-545		9
	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 JACE-545		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.

Modem (Optional)

The female RJ-11 connection for the modem is located near the internal modem. Connect one end of a standard flat satin telephone cable (4-connector) 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.

Power Up and Initial Checkout

Ensure power wiring to the transformer has been completed before proceeding (see the [“Power Wiring”](#) section on page 7). The JACE-545 controller does not include an on/off switch. To apply power, insert the 6-position power connector to the board.

See [Figure 2](#) on page 6 for the locations of the power connector and status LEDs on the controller.

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.

After applying power to the controller, if the heartbeat LED comes on (steady) and stays lit longer than two minutes, contact Systems Engineering for technical assistance. See also the [“Using Status LEDs”](#) section on page 11.

About the Battery

The JACE-545 is provided with a sealed lead acid battery, which is nearly fully charged. Therefore, the JACE-545 has battery back up protection immediately upon installation. If battery trouble messages are generated upon power up, contact Systems Engineering for technical support.

For more information on the use and replacement of the battery, refer to the [“Required Battery Maintenance”](#) section on page 12.

Related Documentation

For more information on configuring and using the JACE-545 controller, consult the following documents:

JACE-545 with Niagara^{AX}

- *JACE NiagaraAX Install and Startup Guide*
- *NiagaraAX Platform Guide*
- *NiagaraAX User Guide*

Using Status LEDs

The JACE-545 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](#)
- [Serial Ports](#)

Refer to [Figure 2](#) on page 6 for the exact locations of status LEDs on the JACE-545 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 JACE 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 JACE-545 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 Systems Engineering for technical support.



Caution

During boot-up, the heartbeat LED blinks in a 90% on — 10% off pattern. Do not remove power during this time, or data loss may result (I/O module's firmware upgrade may be in progress).

Serial Ports

Status LEDs for the serial ports are located directly above each respective RS-485 and RS-232 port. They show transmit and receive activity for the serial ports and optional modem.

- The **yellow** transmit LED indicates that the JACE-545 is *sending* data out the serial port over a communications line to a connected device.
- The **green** receive LED indicates that the JACE-545 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 the receive LED is on constantly, this indicates a problem with the communications channel, such as a shorted wire or reversed wiring.

Modem

The modem LED is located below the RJ-11 connector for the optional internal modem. When the modem LED is 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.

Maintaining the JACE-545

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 JACE-545 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 (i.e., 50°C or 122°F), you should only expect the battery to last approximately one year.

The sealed lead acid battery in the JACE-545 controller is nearly fully charged before shipping. The battery is automatically float-charged during normal operation (while power is applied to the unit). The JACE-545 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 14.

Replacing the Battery



Warning

When replacing the battery or harness, maintain proper polarity as marked on the label inside the unit. Although the JACE-545 is fully protected against shorted battery terminals, the battery itself is not internally protected. Use extreme care to not short circuit the battery. A shorted battery may overheat rapidly and damage the power wiring harness or cause other hardware damage.

To replace the battery, proceed as follows:

Procedure 3 Replacing a JACE-545 battery.

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



Note The JACE-545 will lose its time and date settings if it is disconnected from both battery and AC power for more than one hour.

- Step 5** Remove the old battery and recycle as defined by your regional codes. For recycling within the US, see the labelling on the battery.
- Step 6** 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 7** Secure the new battery to the bottom of the unit with the bracket and tighten the lock nut.
- Step 8** Plug the power connector in and verify normal operation.
-

Replacement Parts

Servicing the JACE-545 may call for replacement parts. There are three categories of parts:

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

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. For additional information on modifying the memory capacity of the JACE-545, consult your regional Tridium office.

Fuses

The JACE 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 your regional Tridium office for technical support. See the [“Returning a Defective Module”](#) section on page 17.

Standard Replacement Parts

Standard replacement parts are listed in [Table 4](#) 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 4 Standard replacement parts.

Part Number	Description
10023	Battery, 12 Vdc, 1.2 AH (see “Replacing the Battery,” page 12.)
10026	LON Plug, 2-position
10027	RS-485 connector plug, 3-position
10138	Battery/ground harness (also includes 6-position power connector)
10148	Adapter, RJ-45 to DB-9 null modem, for serial port to connect to DTE device
10180	Silver satin patch cable, 4 feet (used between adapter and serial port)
10181	Silver satin patch cable, 10 feet (used between adapter and serial port)
10182	Silver satin patch cable, 25 feet (used between adapter and serial port)
MDM-401	On-board auto dial/auto answer 56k modem (see “Replacing the Modem,” below)

Replacing the Modem



Caution

Be sure to discharge any accumulated static by touching the metal surface of the JACE before handling board components. For more information, see the [“Static Discharge Precautions”](#) section on page 3.

To replace the modem, proceed as follows:

Procedure 4 Replacing the on-board modem.

- Step 1** Open the cover of the unit.
- Step 2** Unplug the 6-position power connector. Do not remove the male connector from the wiring harness.
- Step 3** Unplug the RJ-11 telephone wire from the modem's RJ-11 connector.
- Step 4** Remove the old modem as follows:
 - a. Locate the on-board modem (see [Figure 2](#) on page 6) 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 2](#)) 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

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

- 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 5 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.
- b. Locate the socket for pin 1 on the board (see [Figure 2](#)).
- 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 6 Plug the RJ-11 telephone wire into the modem's RJ-11 connector.

Step 7 Plug the power connector in and verify normal operation.

Field Replacement Units

To replace a faulty unit, order from the field replacement units (FRUs) listed in [Table 5](#). An FRU consists of only the JACE-545 circuit board, without connector plugs.



Notes

- When ordering, you must specify whether the JACE-545 is running Niagara^{AX} or Niagara r2.3.x.
- To replace a faulty modem, order it using the part number listed in [Table 4](#), and see the “[Replacing the Modem](#)” section on page 14.

FRU parts can be ordered from stock, but the replaced circuit board (removed from the JACE-545) must be returned to your regional Tridium office for credit.



Notes

- Before ordering an FRU, it is strongly recommended that you contact your normal technical support resource to eliminate the possibility of a software issue or misconfiguration problem.
- Be sure to contact Tridium for a return authorization (RA) number (see “[Returning a Defective Module](#),” page 17) before shipping an item for return credit or repair. To allow proper licensing of the replacement unit, please have information ready about the existing unit, including its serial number, model number, and project licensed to, when placing the order.

Table 5 Field replacement units for JACE-545.

Part Number	Description
R-JACE-545-AX	Circuit board, models J-545-AX, J-545-EM-AX, J-545I-AX, or J-545J-AX, (any NiagaraAX)
R-JACE-545-R2	Circuit board, models JACE-545, JACE-545I, JACE-545J (any Niagara r2.3.x)

Replacing the JACE-545 circuit board




Caution

- Be aware of small surface-mounted components on the circuit board near each mounting point! Use a 1/4" (7mm) thin-walled socket, **not a nut driver**, to carefully loosen or tighten the nuts that secure the JACE-545 circuit board to the 7 mounting studs. A **nut driver** invariably **causes board damage** to adjacent components, while a socket (if used carefully) typically does not.
- Retain and reuse metal spacers on all mounting studs (between the board's back and enclosure).
- Before handling circuit boards, discharge any accumulated static by touching the metal surface of the JACE-545. For details, see the "[Static Discharge Precautions](#)" section on page 3.

To replace the JACE-545 circuit board with an FRU circuit board in the field, proceed as follows:

Procedure 5 Replacing an FRU.

-
- Step 1** Using the appropriate Niagara software tool, back up the station database to your PC.
- Step 2** Open the cover of the unit.
- Step 3** Turn off building power to the unit. The unit should power down automatically.
- Step 4** Unplug the 6-position power connector from the board.
- Step 5** Note positions of all communications connectors going to the circuit board.
If necessary, label connectors to avoid mis-connection later (after circuit board is replaced).
-
-  **Note** The software that runs on the unit expects the terminal positions to be the same to collect data from or to control the attached devices.
-
- Step 6** Unplug all Ethernet, serial, LON, and modem connectors from the circuit board.
- Step 7** Using a 1/4" socket (see previous [Caution](#) •), carefully remove and retain the seven 1/4" nuts securing the circuit board. Be mindful of small surface-mount components located near board mounting points.
- Step 8** Remove the circuit board.
Make sure that metal spacers (behind the board) remain on the seven mounting studs.
- Step 9** Replace the FRU circuit board on the mounting studs and spacers, carefully securing with the seven 1/4" nuts. Again, be mindful of small surface-mount components located near board mounting points.
- Step 10** Turn on building power to the unit.
- Step 11** Plug the 6-position power connector in and verify normal operation.
- Step 12** Reconnect any Ethernet, serial, LON, and modem connectors.
- Step 13** Using the appropriate Niagara software tool, re-commission the JACE-545, including the following:
- a. Install the correct Niagara release and set the date and time.
 - b. Install the new license file.
 - c. Restore the station database and start the station.
-

Returning a Defective Module

For proper credit on the returned unit, ship the defective module to Tridium within 30 days.

Prior to returning the unit, contact one of the following Tridium offices to obtain a return authorization (RA) number and other instructions. Please provide:

- Product model • Serial number • Project currently licensed to • Nature of the defect
- Whether running Niagara^{AX} or Niagara r2.3.x

United States

Phone: 804-254-7086, ext. 11

Return to:

Tridium, Inc.
2256 Dabney Road, Suite C
Richmond, VA 23230
Attn: Return Department RA# _____

Europe

Phone: +44 (0) 1403 740290

Fax: +44 (0) 1403 741804

Return to:

Tridium Europe Ltd
1, The Grainstore
Brooks Green Road
Coolham
West Sussex
RH13 8GR
United Kingdom
Attn: Return Department RA# _____

Email for technical support:

supportuk@tridium.com

Email for product orders:

ordersuk@tridium.com

Asia/Pacific

Phone: +65 6887 5154

Fax: +65 6887 5342

Mobile: +65 9665 6024

Address:

Tridium Asia Pacific Pte Ltd
101 Cecil Street,
#10-11, Tong Eng Building,
Singapore 069533
Attn: Mr Lim Hoon Chiat, Engineering Manager RA# _____

Email for technical support:

hclim@tridium.com

Sales: (Australia): **Phone:** +61 7 5539 1211

Fax: +61 7 5597 2334

(Japan): **Phone:** +81 044 829 1750

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.

UL Test Parameters

The JACE-545 was tested by Underwriters Laboratories Inc. using the following test parameters.

Environmental conditions	Standard
Operating conditions	Continuous
Connection to supply mains	Permanent
Degree of mobility	Permanently connected
Overall size of equipment: width, depth, height	9.75", 2.5", 11.6"
Mass of the equipment	Net: 4lbs., Gross: 5 lbs.
Special protection to IEC 529	Yes: IP-20
Accessories and detachable parts included in the evaluation	None
Options included	None

Declaration of Conformity

JACE-545 (J-545-AX, J-545-EM-AX, J-545I-AX, J-545J-AX)

Application of Council Directive: 89/336/EEC, 93/68/EEC, 73/23/EEC, 92/31/EEC

Manufacturer's Name: Tridium, Inc.

Manufacturer's Address: 3951 Westerre Parkway
Suite 350, Richmond,
Virginia 23233, USA

Manufacturer's Representative: Terry Casey, President
Tridium Europe Ltd.
1, The Grainstore
Brooks Green Road
Coolham, West Sussex, RH13 8GR
United Kingdom

Product Model Number: J-545-AX, J-545-EM-AX, J-545I-AX, J-545J-AX

Type of Equipment: Information Technology Equipment

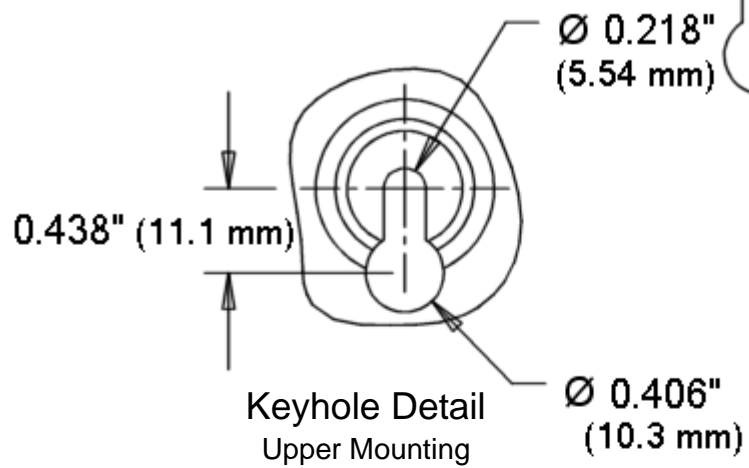
	Standard	Description	Criteria Met
EMS Standards Applied:	EN 61000-6-4	Electro-Magnetic Compatibility Generic Emissions	Fully Complies
	EN 61000-6-1	Electro-Magnetic Compatibility	Complies as stated below.
	EN 61000-6-2	Immunity	
	CISPR 11	Power Line Conducted Emissions	PASS
	CISPR 11	Power Line Radiated Emissions	PASS
	IEC 61000-4-2	E.S.D.	PASS Criteria A, B
	IEC 61000-4-3	Radiated Field Immunity	PASS Criteria A
	IEC 61000-4-4	Electrical Fast Transient Immunity (Signal Ports)	PASS Criteria B
		Electrical Fast Transient Immunity (AC Power)	PASS Criteria B
	IEC 61000-4-5	Surge Immunity	PASS Criteria A
	IEC 61000-4-6	Conducted Immunity	PASS Criteria A
	EN 61000-3-2	Harmonic Current	PASS
	EN 61000-3-3	Quasi-Stationary Harmonics Test,	PASS
		Voltage Fluctuation and Flicker	
	EN 61000-4-11	Voltage Dips	PASS Criteria A, B
	EN 61000-4-11	Voltage Interrupts	PASS Criteria B
	IEC 61010-10-1:90 + A1:92 + A2:95	Safety requirement for electrical equipment for measurement, control & laboratory use	PASS

I, **Terry Casey**, hereby declare that the equipment specified above conforms to the above Directives and Standards.

Place: Coolham, West Sussex, United Kingdom

September, 2003

Position: President, Tridium Europe Ltd.



JACE-545 Mounting Guide

9.84" or $9\frac{27}{32}$ "
(250 mm)



Mount with this end up.

Note: Electronic and printed versions of this guide may not show the mounting guide to scale. Verify all measurements before drilling.

Lower mounting holes are 0.221" (5.61 mm) dia.

5.94" or $5\frac{15}{16}$ "
(151 mm)