



LX

Technologies, Inc.

Enterprise Security & Access Control

"Where Data Encryption meets Security and Access Control"



Installation Guide for IAD-4514



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IAD-4514 Overview

The IAD-4514 Intelligence Access Device provides real time control and processing for access control, alarm reporting and remote control operation in the security environment. The IAD -4514 has three high-speed communication ports, 14 inputs, user defined, supervised or non-supervised, 2 inputs non-supervised and 5 Form C heavy duty commercial contact relays. The IAD 4514 with three communication ports, the first port is used to communicate to upper host, the second port can be used for remote connect to a central alarm station or can be used for lower panels ICD-810. The third port can be used for Rs485 readers or can be used for access keypad (IAD-KPAC-2). Furthermore the IAD-4514 also has various memory storage options (See your dealer for more information). Standard memory is 4 Meg of static ram and expandable to 16 Meg of static ram.

SAFETY

LX products operate from various power sources and communicate via a variety of I/O interfaces. Understanding the power requirements and interface signals, their characteristics, merits and limitations, will ensure successful installation and system reliability.

RS-485 Cable

The LX systems are typically 2-wire communication but have the ability for RS232, modem (FSK), fiber optics, and Internet communication between devices. If using RS485 devices, the cable runs must be shielded, low capacitance single twisted pair with 120-ohm for 2-wire (C4841A General Cable, or equivalent) and two twisted pairs, with 120-ohm characteristics impedance for 4-wire (C4842A General Cable, or equivalent). Wire size is 24 AWG minimum. Total length of the communication cable must not exceed 4000 ft. (1219 m) for 24 AWG wire size.

RS-232 Cable

The RS-232C interface is used for short distance, point to point communication. This interface is intended for short distance communication because its high impedance is more susceptible to noise. Cable length is generally limited to 50 feet (15m). If required, this distance may be extended to a few hundred feet by using low capacitance shielded cables.

RS-232C connection is straight forward. Observe the distance limitation or use suitable cable if the distance is greater than 50 feet. Remember to strap control lines (RTS, CTS, etc.) if the device you are connecting to LX equipment requires it.

NECC-1 CONNECTION

The NECC-1 Network Encryption Communications Card (Single Port) modules are used for communication between the IAD-4514 and the host computer as well as the IAD-4514 and/or LX field devices over an Ethernet network. It is designed to make full use of SafeCryptNet technology to encrypt all communications sent along the network.

The NECC-1 is a daughter board that connects into the communications slot of most LX hardware panels. It comes in two models, one for normal installations and one for extreme environments (includes high temp parts and heat sink).

Use of Signal Ground

The Signal Ground (SG) provides a common mode signal reference for the communicating devices. Each device must connect its SG to the cable shield drain wire. Failure to use the SG connection may cause communication error. If the environment is known to be noisy, additional wire may be used for the signal ground. The shield can then be grounded as a noise shield.

Device to Device Connection

Communication cable for RS-485 should be laid out in a daisy chain configuration. Long "T" stub connections greater than 10 ft. (3m) should be avoided because they create discontinuities and degrade signals. **DO NOT** connect devices in STAR configuration. STAR connection creates long stubs and causes difficulty in proper cable termination.

MINIMUM POWER REQUIREMENTS

AC input:	16 VAC, 1.75 A
DC input:	13 VDC, 1.25 A

BOARD DIMENSIONS

9.5 in (L)	7.5 in (W)	2.5 in (H)
(241.3 mm)	(190.5 mm)	(63.5 mm)

AC POWER SAFETY

The AC power wiring to power supplies consists of the AC LINE (L), AC NEUTRAL (N), and SAFETY GROUND (G). These lines from the AC source (outlet) to the power supply input terminals must be retained without accidental interchange. Interchange of the AC LINE and AC NEUTRAL expose components within the power supply to the hot side of the input power even if the AC line switch is turned off. This presents a safety hazard. Interchange of the AC LINE and SAFETY GROUND places the supply chassis to an AC potential equal to the input voltage. This could result in a potentially lethal shock hazard or equipment damage.

The interchange of the AC NEUTRAL and SAFETY GROUND may result in ground current flowing through the power supply chassis and other ground paths. This will cause unreliable/improper system operation. The AC LINE input to LX power supplies must be appropriately fused and switched. Local safety regulations may require an additional switch and fuse to be installed in the NEUTRAL input. The IAD-4514 and ICD-810 have the ability to accept AC input with a nominal voltage of 16 VAC RMS. Reference applicable section of this manual for input requirements.

DC POWER SAFETY

Most LX devices can be operated from DC power either as a main power source or as backup. The recommended use being for backup power.

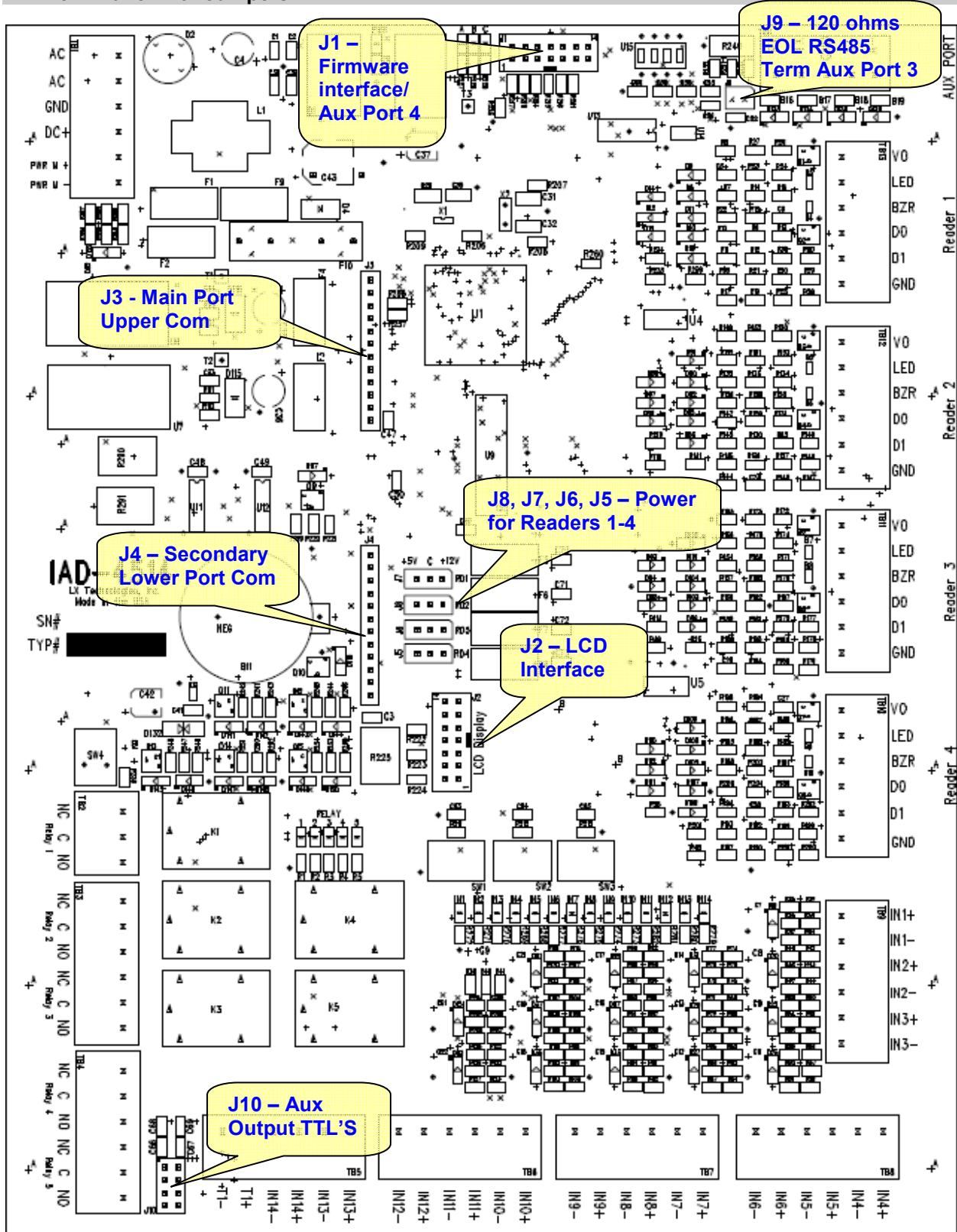
RS-485 Communication Wiring SAFETY

RS-485 communication lines connect devices over a long distance. This group of wires is most likely to cause problems in bringing up a system. The RS-485 communication wiring must be planned out with the following guidelines:

Use only low capacitance, shielded cable with 2-24 AWG twisted pairs, characteristic impedance 120 ohms (Belden 9842, or equivalent) or 1-24 AWG twisted pair, characteristic impedance 120 ohms (Belden 9841, or equivalent) for the main RS-485 run.

- Keep maximum end to end distance below 4000 feet.
- The connection from device to device must be in a daisy chain configuration (Communication will NOT be reliable with star type connections).
- Keep stub-down leads under 10 ft. (3m) and use the same type of cable as the main RS-485 run.
- Terminate cables at both ends by installing the appropriate jumper at the last device.
- Always use the signal ground (SG) connection. Carefully insulate the shield drain wire (SG) for a reliable installation.

IAD-4514 Panel with Jumpers











IAD-4514 Jumper Settings

To set back to factory setting, follow the * setting next to the options.

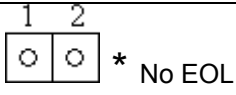
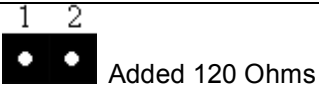
	Function	Option
J1	Firmware Port	Used at the factory

	Function	Option
J2	LCD Module	Option / required for setup

	Function	Option
J3	Primary Port – Upper Communications	Supports, NECC-1, CC-232 Card, CC-485 Card, Firber Card, Modem Card
J4	Secondary Port – Lower Communications	Supports, NECC-1, CC-232 Card, CC-485 Card, Firber Card, Modem Card

	Reader Power 5V	Reader Power 12V
J5	1 2 3  Reader 1	1 2 3  * Reader 1
J6	1 2 3  Reader 2	1 2 3  * Reader 2
J7	1 2 3  Reader 3	1 2 3  * Reader 3
J8	1 2 3  Reader 4	1 2 3  * Reader 4

* = factory settings

	Aux Port EOL 120 Ohms Terminal	
J9		

* = factory settings

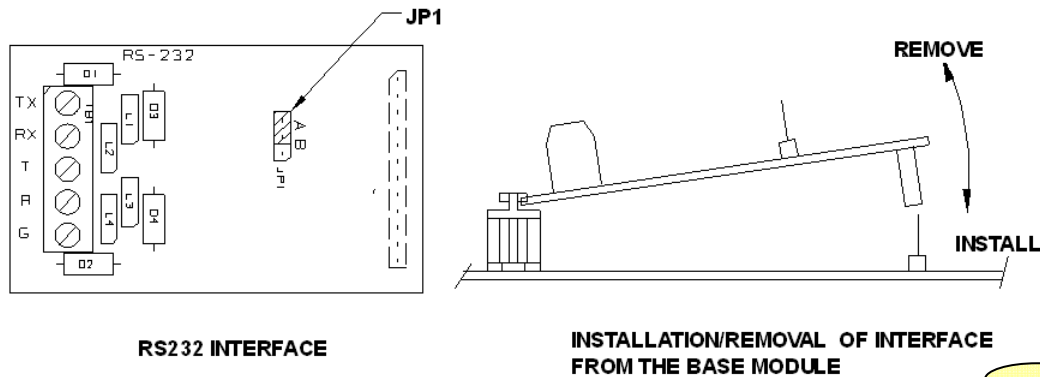
	Function	Option
J10	Aux Outputs TTL's (slink to ground 50ma)	ERO-4 Board - 4 Form C heavy duty commercial contact relays

Fuses

- All fuses are auto-resetting except F10
- F10 is a 3A 125 Volts Slow-Blow Fuse

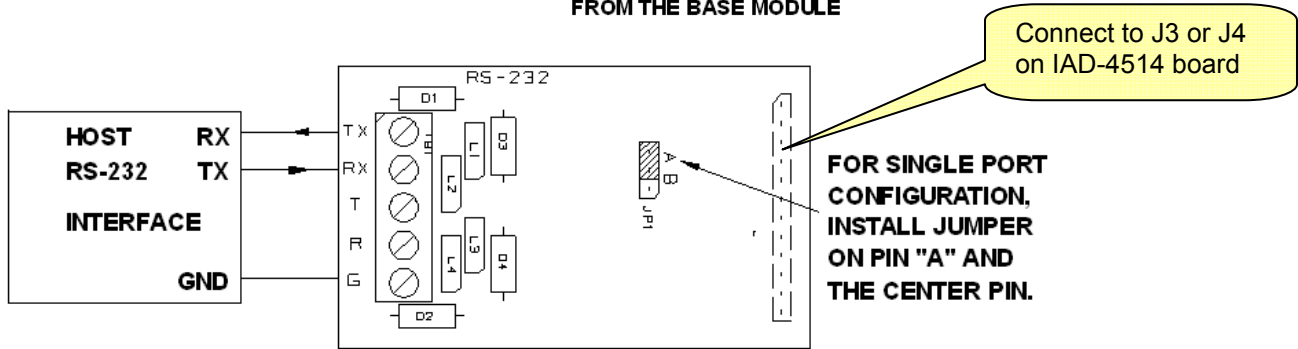
Fuses (F1, F9, and F2) are in line with the power input and will open if the input voltage exceeds 35V or the maximum current is exceeded.

CC-232 - RS-232 Communications Interface



RS232 INTERFACE

INSTALLATION/REMOVAL OF INTERFACE FROM THE BASE MODULE



NOTE: In serial communications, TX must connect to RX on the opposite end.

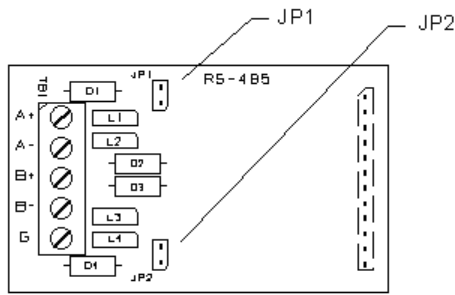
Both the RS-232 and the RS-485 are designed to be easily interchangeable to meet communication protocols. The module has the capability of operating as a single communications channel (four-wire) or as a dual communications channel (two-wire) allowing for redundancy. To implement single channel operation place the jumper on J1 across the "A" terminal and the center terminal.

Note: IAD-4514 only support 2 wire RS485 and 3 wire RS232-C

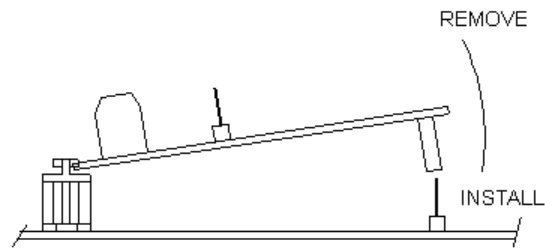
Cable Requirements:

24AWG twisted 2 pair cable; with a shunt capacitance of 16 pF per foot and 100 ohm characteristic impedance, maximum 50 ft. (240m) maximum

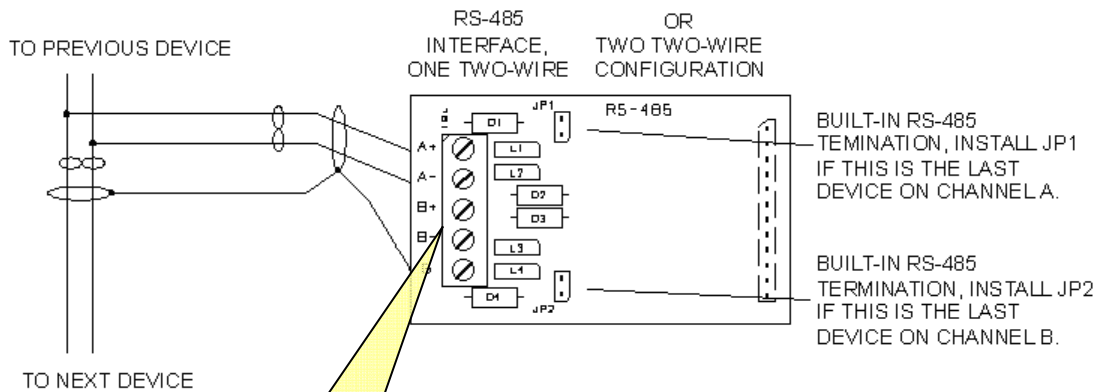
CC485 - RS-485 Communication Interface



RS-485 INTERFACE



INSTALLATION/REMOVAL OF INTERFACE FROM THE BASE MODULE



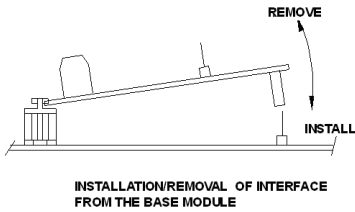
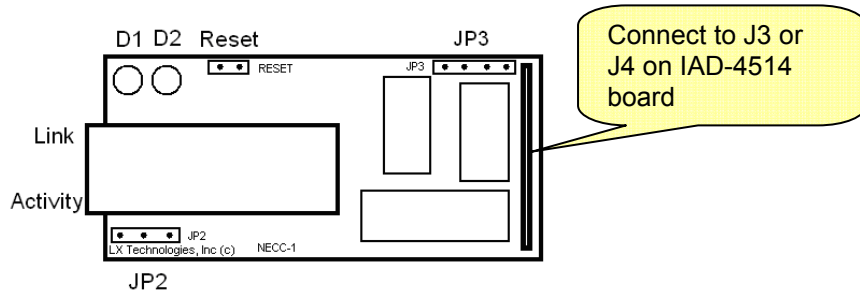
4 wire RS485 not supported on IAD-4514
 IAD-4514 supports only 2 wires RS485

Cable Requirements:

RS485: 24 AWG, 120-ohm impedance, twisted pair with shield 400 feet (1,200m) maximum

NECC-1 Connection

The NECC-1 is a communications daughter board to the LX hardware panels. As such, power and data are provided by a common connection to the motherboard.



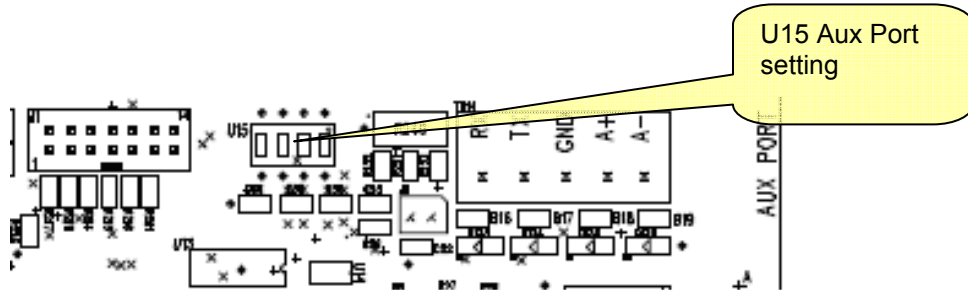
Jumper Settings Necc-1 for JP2	
Not Used	1 2 3 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Default Setting
Enabled	1 2 3 <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Disabled	1 2 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>

* For more information on connecting and configuring NECC-1, see NECC-1 Installation Guide

Cable Requirements:

Cat5e or Cat6 Network Ethernet Cable 295 ft (89 m) maximum

DIP Switch Settings



AUX PORT	RS232	RS485
SW1	ON	*OFF
SW2	OFF	*ON
SW3	ON	*OFF
SW4	OFF	*ON

Baud rate is set thru the commands on the IAD--4514 board see command setting.

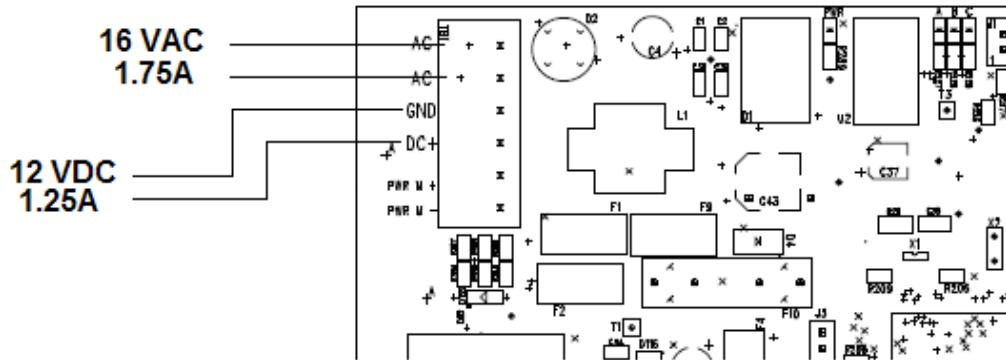
*= Factory set defaults

NOTE: Any changes to switches does not require to re-powering the panel for new settings to take affect.

IAD-4514 Power Wiring

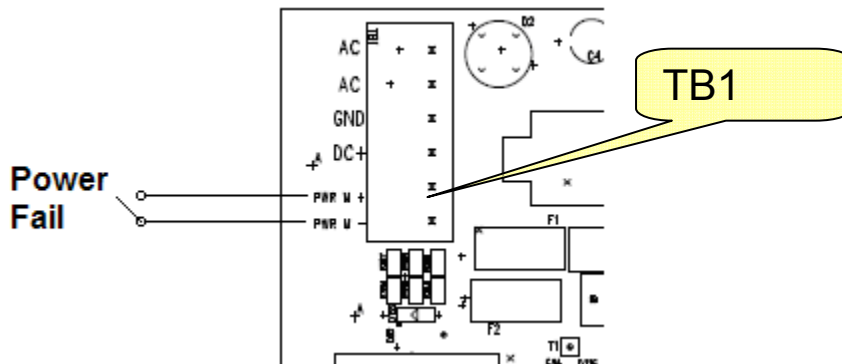
When connecting a 16 Vac RMS source or 12 to 24 Vdc source to the power terminals (TB-1) on the IAD-4514; use 18 AWG wires to avoid voltage loss. For other powering requirements see the full Installation Manual.

Note: Max 24 AC or DC Volts input on both power terminals for proper operation



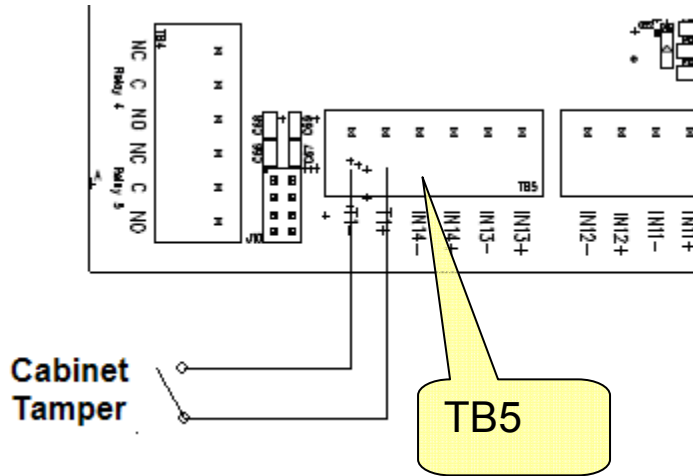
Power Fault and Cabinet Tamper Wiring

The IAD-4514 provides an input monitor point to monitor the input power in case of failure. If the cabinet/enclosure has a tamper switch installed, you can also have an input monitor point for that. Insure wires are connected as shown below.



Cable Requirements:

Power: 18 AWG, one twisted pair



Both Power fail and cabinet tamper inputs are non-supervised and normal closed.

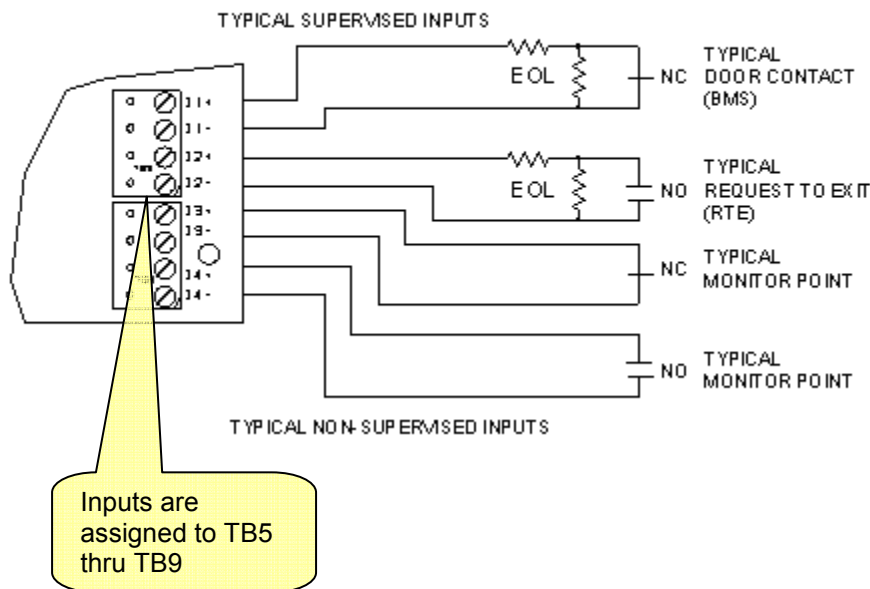
Cable Requirements:

Input: 24 AWG, one twisted pair

Input Termination

The IAD-4514 has the ability to monitor simple contact inputs or provide the security of full line supervision. These processes are made possible by the utilizing End-Of-Line (EOL) Terminating resistors. Note that values for the EOL terminating resistors are not given for the supervised inputs. The EOL resistance parameters can be configured for each input. This allows for easy integration into existing sensor wiring.

Standard EOL (End of Line) Termination is 1K, 1K ohm resistance but custom tables are available, see you dealer for more information.



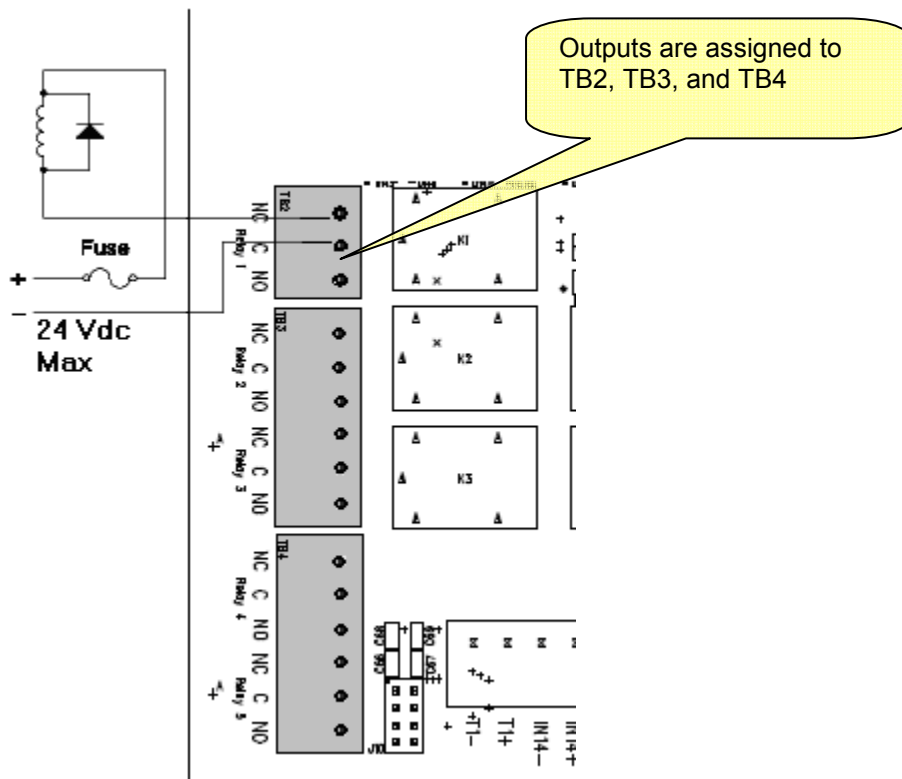
The IAD-4514 provides up to 14 inputs on board and additionally supports 3 ICD-810 with ECD-43 with 16 inputs for the total of 62 inputs. Each input has the ability to monitor simple contact inputs or provide the security of full line supervision.

Cable Requirements:

Alarm inputs: One twisted pair per input, 30 ohms maximum

Relay Termination

The IAD-4514 provides up to 5 relays on board and addition 4 relays from the ERO-4 board; the IAD-4514 also supports 3 ICD-810, each has total 16 using the ECD-43 board for the total of 57 relays. Each Relay can handle up to 5A 24VDC or 2A 125VAC Form C contacts.



Relays can be redirected by software for any purposes, see Reference Manual for more information.

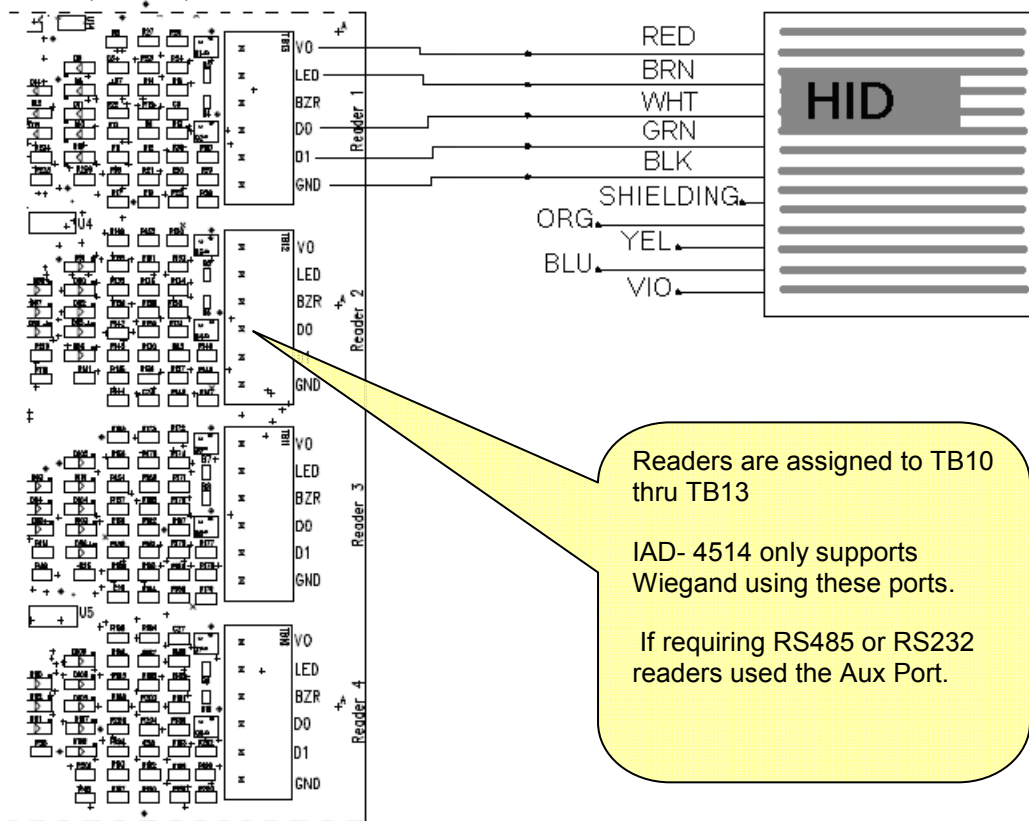
For additional output locations see each of the daughter boards (ERO-4) or ICD-810 installation guide.

Cable Requirements:

Outputs: as required for load

Reader Termination

The IAD-4514 provides up to 4 reader inputs. The IAD-4514 can support multiple reader technologies. The wiring to a typical HID Prox reader is shown below. If the buzzer is connected to the LED output, it will sound on an LED pulse giving an audible indication of the access request.



This diagram is only a typical Wiegand interface using HID Prox reader. See reader manufacturer on any other type of reader interface.

Note: reader data interface are open collector, single ended. This interface is commonly used to send DATA 1 / DATA 0 (WD 1 / WD 0) data from a reader to a control panel. Because it is single ended, it is susceptible to noise and its wiring distance should be limited to 500 feet. A single twisted pair; shielded cable should be used for the reader data in a noisy environment.

Cable Requirements:

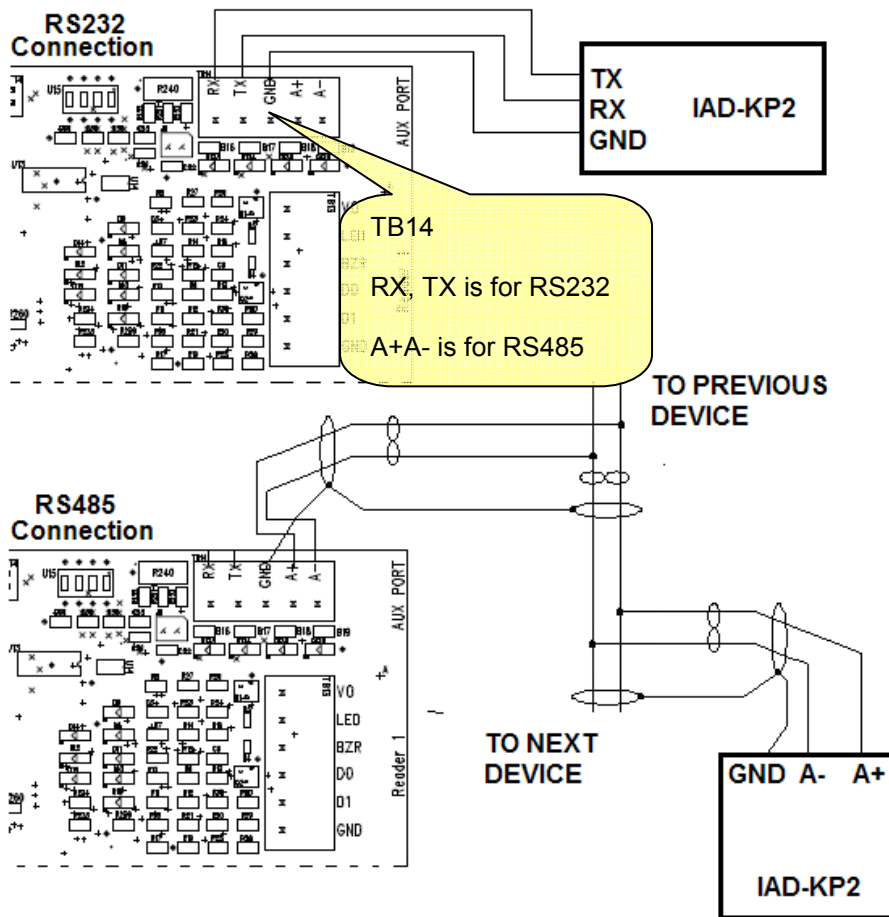
Reader data: six conductors, 18AWG, 500 feet (150m) maximum

Aux Port Termination

The Aux supports either RS232-C or RS485; two wire communication. The type of hardware that can be connected to the Aux Port is based on the firmware loaded from the factory. Standard protocol supports IAD-KP2 access/secure keypad.

If using RS485 connection the aux port supports two IAD-KP2, access/secure keypads. Other configurations are also available, see you dealer for more information.

If using Aux port for Readers the IAD-4514 supports up to four RS485 readers, see dealer for more information. (Not supported with standard firmware).



Cable Requirements:

RS485: 24 AWG, 120-ohm impedance, twisted pair with shield 400 feet (1,200m) maximum

RS232: 24AWG twisted 2 pair cable; with a shunt capacitance of 16 pF per foot and 100 ohm characteristic impedance, maximum 50 ft. (240m) maximum

Installation Verification

After the power is applied, verify that the board is installed correctly by observing the LED's. The LED's sequence quickly through initialization, then show "heartbeat" on A and communication activity is on B and C. The IAD-4514 also has LED's for all input and output points.

POWER UP			
A	B	C	RESULTS
ON	ON	ON	RESET/ .5 sec
ON	OFF	OFF	Init start/ 1 sec
OFF	ON	OFF	ROM Test
OFF	ON	ON	RAM Test
ON	ON	ON	Complete Test -1 sec
OFF	OFF	OFF	For 1 sec
OPERATIONAL STATUS			
Heart Beat	Blink once per second		
	T X Upper communication	Flicker	
		RX Upper communication	Flicker

Note: **Output Led's:** ON = Active, OFF= Inactive

Input Led's: ON=Alarm, Blink = Trouble, OFF=Secured

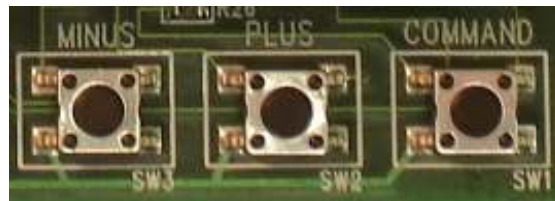
Command Setup

The IAD-4514 needs to be configured through use of the LCD (Liquid Crystal Display) along with the COMMAND, PLUS, and MINUS buttons (See location of configuration buttons and LCD).



Configuration of the IAD4514 is done by going through a cycle of prompts and responses following the information shown on the LCD. Choices are made by pressing the PLUS or MINUS buttons. The COMMAND button accepts the change and cycles to the next prompt.

Press the "**COMMAND**" button to start the configuration cycle.



After setting the setting you need to write the configuration to static ram on the microcontroller using the WRI RAM command.

Note: There are 2 commands that need configuration before the IAD-4514 will commutate to the upper host. The first one is the address and the second one is the baud rate. Defaults setting are set to address 0 and baud rate is 19200.

The following are the commands available on the IAD-4514 LCD menu;

"Pri Baud" This set the primary port baud rate. (The NECC-1 needs to match)

"Sec Baud" This set the secondary port baud rate to lower panels

"Pri Pads" This is the leading pads for the communication (normally set to 2)

"Sec Pads" This is the leading pads for the communication for the secondary port (normally set to 2)

"PanelAdd" This is the panel address (default set to 0)

"Aux Baud" This is for adding Keypads / Readers setting baud rate.

"Aux Pads" This is the leading pads for the communication (normally set to 2)

"TST-inpt" This is for testing inputs, (option)

"SET-STAT" This is to send input status if com restored.

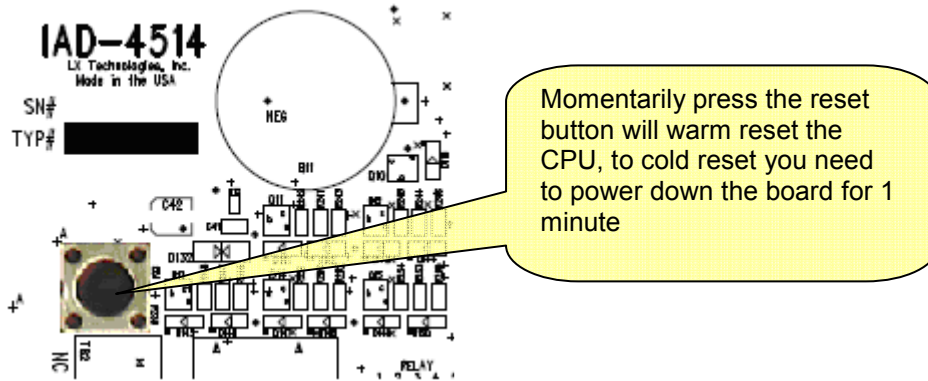
"SET-OUTS" This is turn on/off reporting output status to upper computer.

"SET-DELY" This is to set the delay for secondary port (normally set to 0)

"WRI-RAM " After setting the setting you need to write the configuration to static ram on the microcontroller using the WRI RAM command.

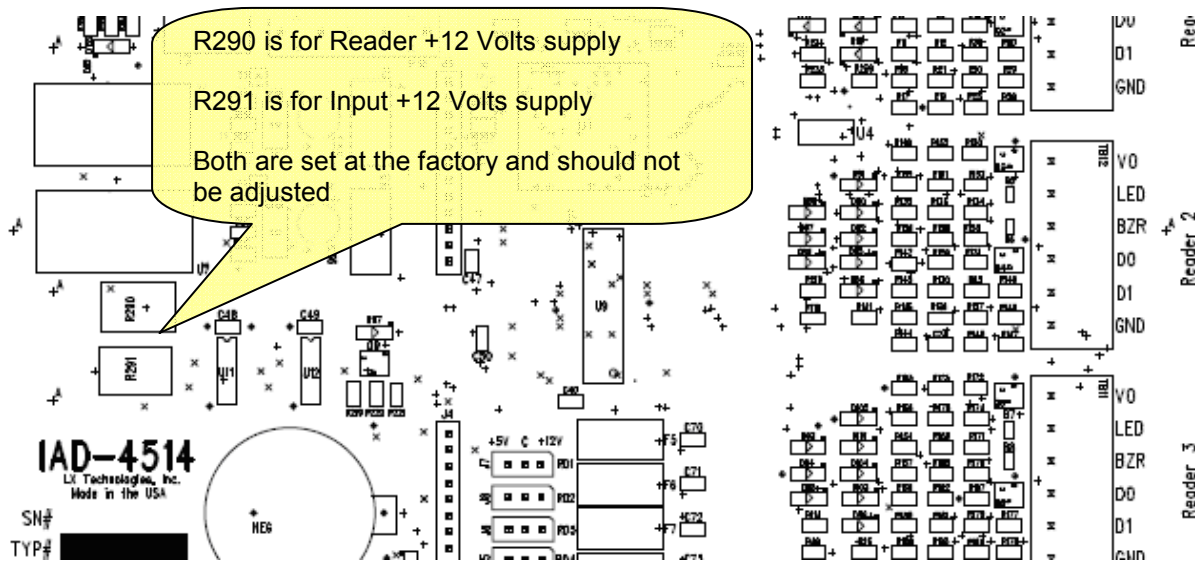
Resetting the IAD-4514

On the IAD-4514 board, there is a “RESET” button. To reset the board momentarily press the “RESET” button and release it.



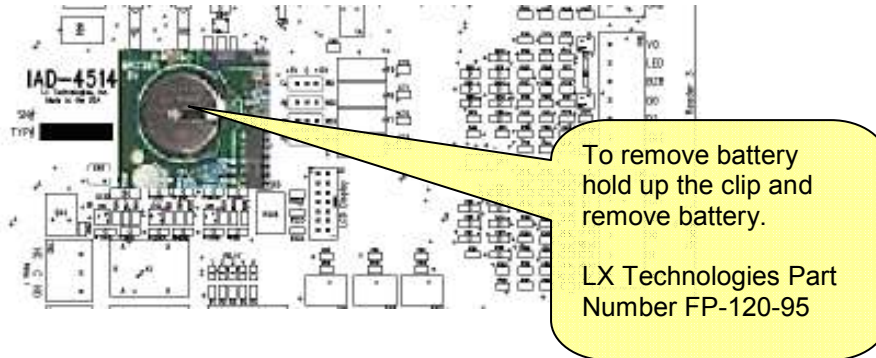
+12 Volts Adjustment for Readers and Inputs

Factory default set at 12 VDC and should not be adjusted



Static RAM Battery

IAD-4514 has a CR Lithium Coin Cell Batteries 3V 23 X 3.0 MM 265mA for memory backup, this battery will hold the memory for up to six months if loss of input power.

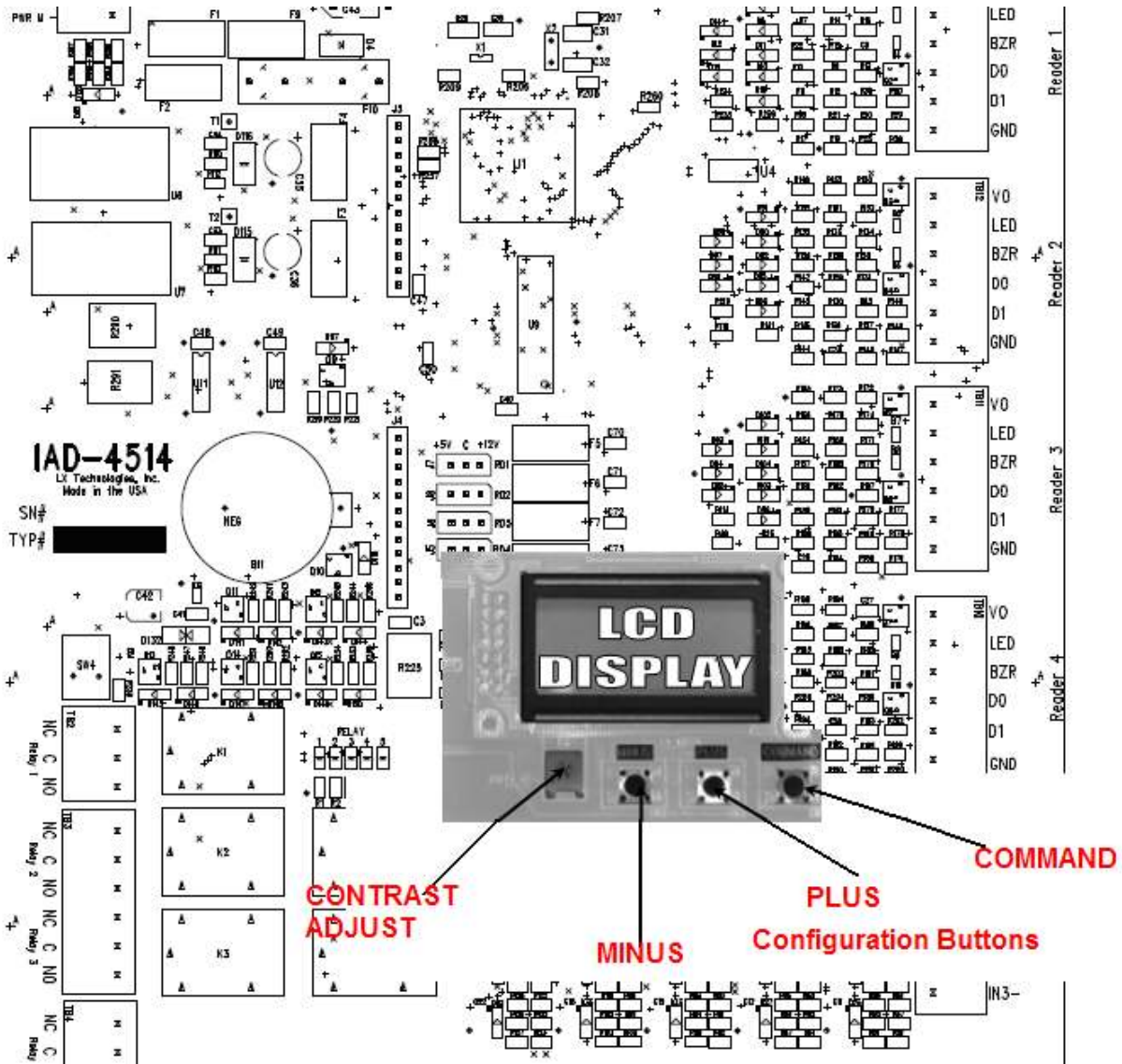


WARNING: CHANGE THE BATTERY ONLY WITH POWER APPLIED OR THE CONTENTS OF THE IAD-4514 WILL BE LOST!

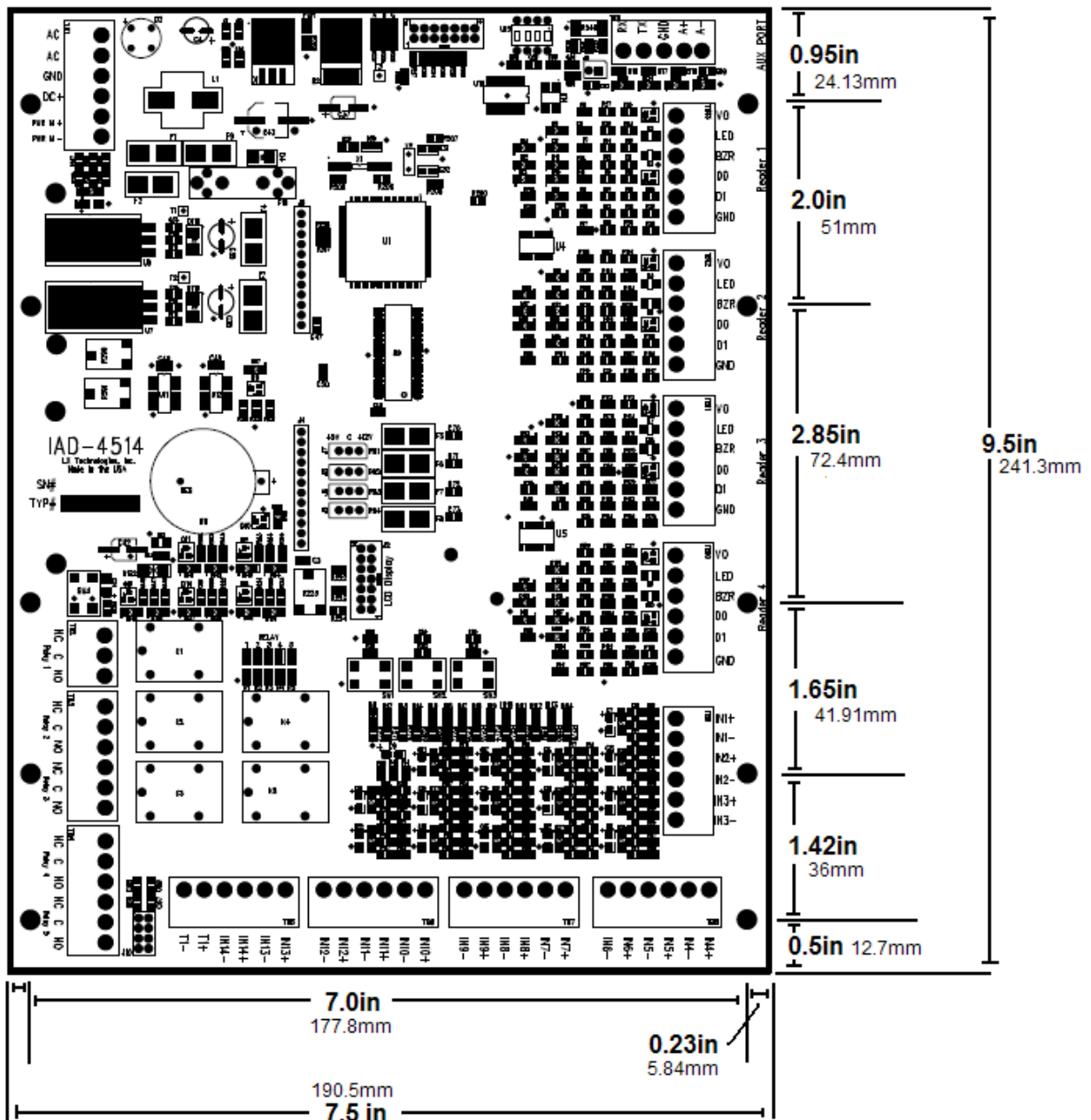
You should change this battery every six months. LX Technologies Part Number FP-120-95.

LCD Contrast Adjustment

The Contrast Adjustment control allows for fine tuning the appearance on the LCD display.



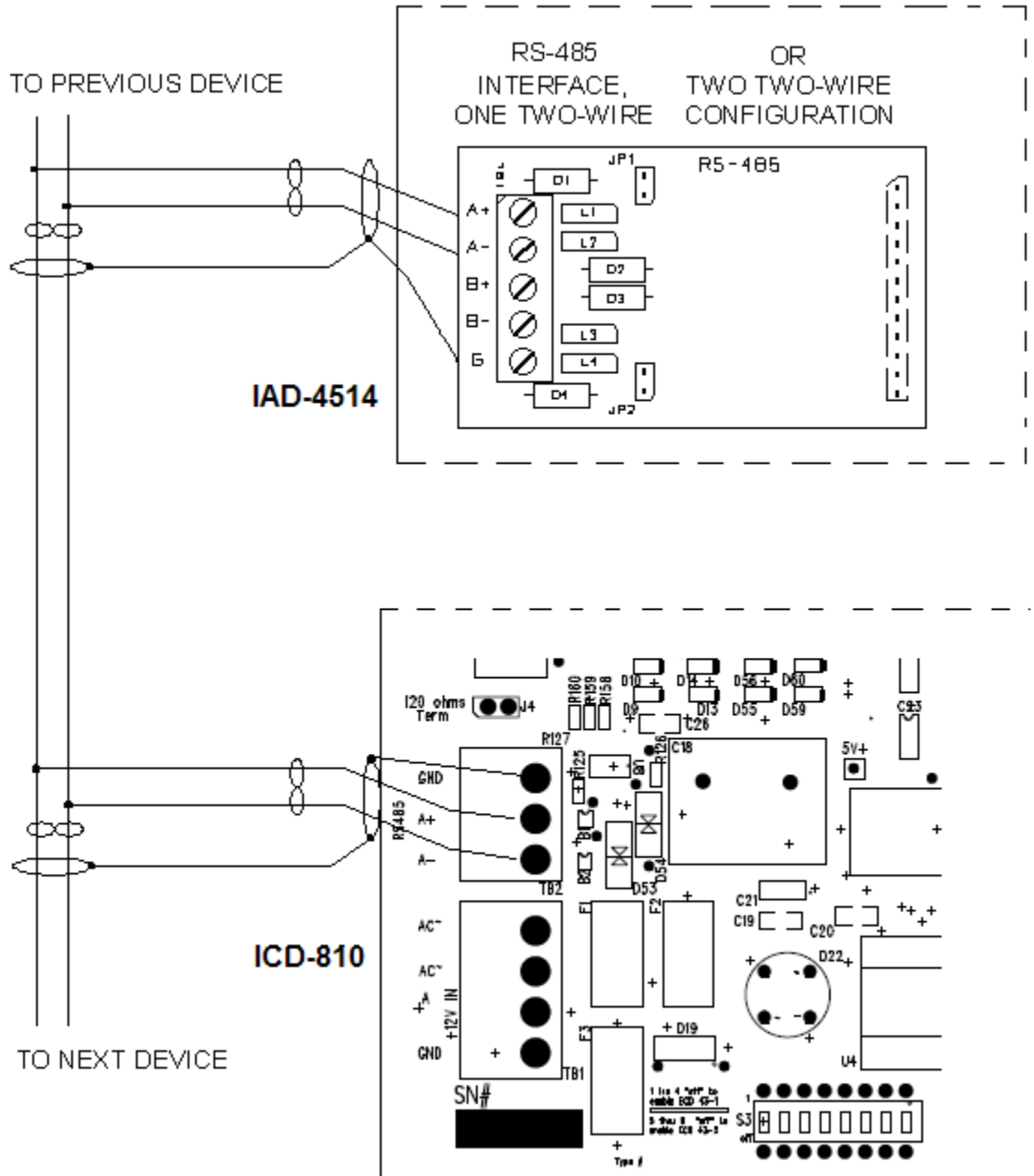
IAD-4514 Mounting Holes



Connecting ICD-810

The IAD-4514 has the available to connect up to 3 ICD-810's to expand the inputs and output to the IAD-4514. The total inputs are 62 and the outputs are 57. The numbers of IAD-4514 are based on the host software.

Input and output configuration, sees the ICD-810 installation guide.



THREE YEAR WARRANTY INFORMATION

Unless otherwise specified, hardware products developed by LX Technologies, Inc. are warranted against defects in materials and workmanship for a period of (3) three years from the date of shipment, as evidenced by receipts or other documentation.

Products suspected to be deficient may be delivered to LX Technologies, Inc. which will, at its sole obligation hereunder and at its option, replace or repair any product that we find to be deficient. All warranties are immediately voided if modifications/repairs are performed by anyone except LX Technologies Inc. When returning products, we ask that you follow the steps outlined in this document.

The warranty provided herein does not cover damages, defects, malfunctions, or service failures caused by owner's failure to follow the LX Technologies, Inc. installation, operation, or maintenance instructions; owner's modification of the product; owner's abuse, misuse, or negligent acts; and power failure or surges, fire, flood, accident, actions of third parties, or other events outside reasonable control.

LX TECHNOLOGIES, INC. DOES NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES (EXCEPT AS STATED ABOVE) INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF DESIGN, MERCHANTABILITY, NONINFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICE.

Limitation of Liability

IN NO EVENT WILL LX TECHNOLOGIES, INC. BE LIABLE FOR ANY LOST REVENUES OR PROFITS, OR OTHER SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, EVEN IF LX TECHNOLOGIES, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

NOT WITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, LX TECHNOLOGIES, INC.'S MAXIMUM LIABILITY FOR DAMAGES SHALL BE LIMITED TO THE PAYMENTS MADE BY CUSTOMER UNDER THIS AGREEMENT FOR THE SPECIFIC PRODUCT THAT CAUSED THE ALLEGED DAMAGES.

This limitation of the liability of LX Technologies, Inc. will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against LX Technologies, Inc. must be brought within one year after the cause of action accrues. LX Technologies, Inc. shall not be liable for any delay in performance due to causes beyond its reasonable control.

Standard Return Policy

All returns require a Return Material Authorization (RMA) number. A Customer Service Representative with LX Technologies, Inc. can issue RMA numbers following a review of each RMA request as they are submitted. Each request will be approved or denied on the basis of the following guidelines.

Permissible Timeframe for Return

LX Technologies, Inc provides a thirty (30) day return policy. All RMA requests for non-defective returns must be made within thirty (30) days from the invoice date. RMA numbers issued by LX Technologies, Inc. are only valid for fifteen (15) days and the product must be returned within this timeframe. RMA numbers will not be extended or reissued.

Defective or DOA Product

Product that is defective or Dead On Arrival (DOA) will be repaired, replaced, or credited according to the manufacturer's warranty at LX Technologies Inc, discretion.

Restrictions on Returns

Non-defective returns are accepted for credit or exchange at LX Technologies, Inc.'s discretion. All non-defective returns are subject to a fifteen percent (15%) restock fee including returns due to the customer's refusal to pay duties or taxes resulting from the shipment. With defective product(s), LX Technologies, Inc. reserves the right to refuse shipment and/or charge a restocking fee. With some software product(s), open source codes may void our return policy.

RMA Procedure

Most product issues (hardware and software) can be resolved with an email to the tech support department. Tech support department contact information is as follows:

support@lxtechnologies.com

If tech support does not resolve the problem, a product exchange may be the solution. In which case, you will need to obtain a valid Return Merchandise Authorization (RMA) number. To obtain a valid RMA number you will need to contact an LX Technologies Customer Service Representative at 602-870-4LXT (4598). To hasten the process please have the following information available before placing your call:

Name, and phone number of person calling (customer number if you have one)

Name of product (serial number)

Name of system (version number)

Tell us why you are returning the product. We may be able to suggest a different product that will better suit your needs.

Shipping

In the case of shipments related to warranty actions, the customer will bear shipping costs for shipments to LX Technologies and will bear all risk, and LX Technologies will bear shipping costs for shipments to the customer. For products that do not fall under warranty conditions the customer will be responsible for all repair and/or shipping costs.

No Returns will be accepted without a valid RMA number!

Non-defective products MUST be returned in resalable condition!

Your returned package MUST contain ALL original material. This includes boxes, disks, manuals, registration forms and advertising inserts.

Please do not write on the original manufacturers label or packaging.

Include a copy of your invoice and RMA number with the returned package.

Returns may be rejected if the product has been damaged during shipment.

To prevent shipping damage, pack products securely in an EXTERNAL carton.

We recommend using a carrier that has a reliable tracking system (e.g. Federal Express, DHL, UPS).

SERVICE INFORMATION

There are no user serviceable parts inside the unit.

In the event that service is required to this unit, please direct all inquires to:

LX Technologies

Phone: (602) 870-4LXT (4598)

11001 N. 24th Ave. # 612

Phoenix, AZ 85029

FAX (602) 870-3702

E-mail: support@lxtechnologies.com

Note: Email will automatically create a trouble ticket, please be sure to include a valid return telephone number.

<http://support.lxtechnologies.com>

<http://www.lxtechnologies.com>

LX Technologies
11001 N. 24th Ave. # 612
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techinfo@lxtechnologies.com

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