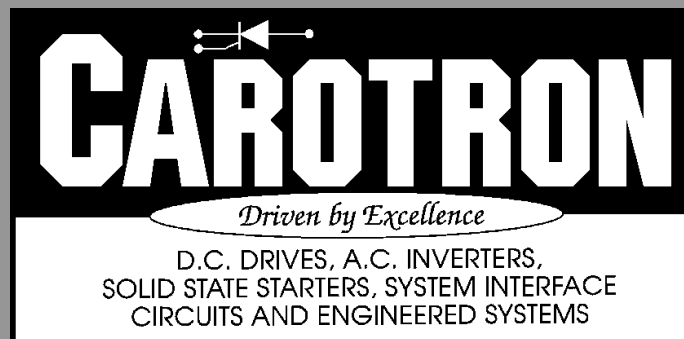


Elite® Pro V3 Modbus® TCP Ethernet Option Card

**Instruction Manual
C14521-000**



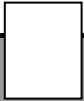


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General Description

Model C14521-000 provides the Elite Pro V3 series of drives with an Ethernet Interface using the Modbus® TCP/IP protocol. The card uses a Lantronix XPort gateway module to translate Ethernet TCP to Modbus® RTU.

When installed, the card overrides the Elite Pro V3's RS422/485 communication channel.

Features

- 10/100M Ethernet
- DHCP, BOOTP, AutoIP or Static IP Address
- Web Page Configuration
- Status LEDs

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Specifications

2.1 Electrical

Power Input

- Powered internally from Elite Pro V3 drive

Network Interface

- RJ45
- 10/100M Ethernet

Temperature Range

- 0-55° C

2.2 Physical

(All dimensions are in inches)

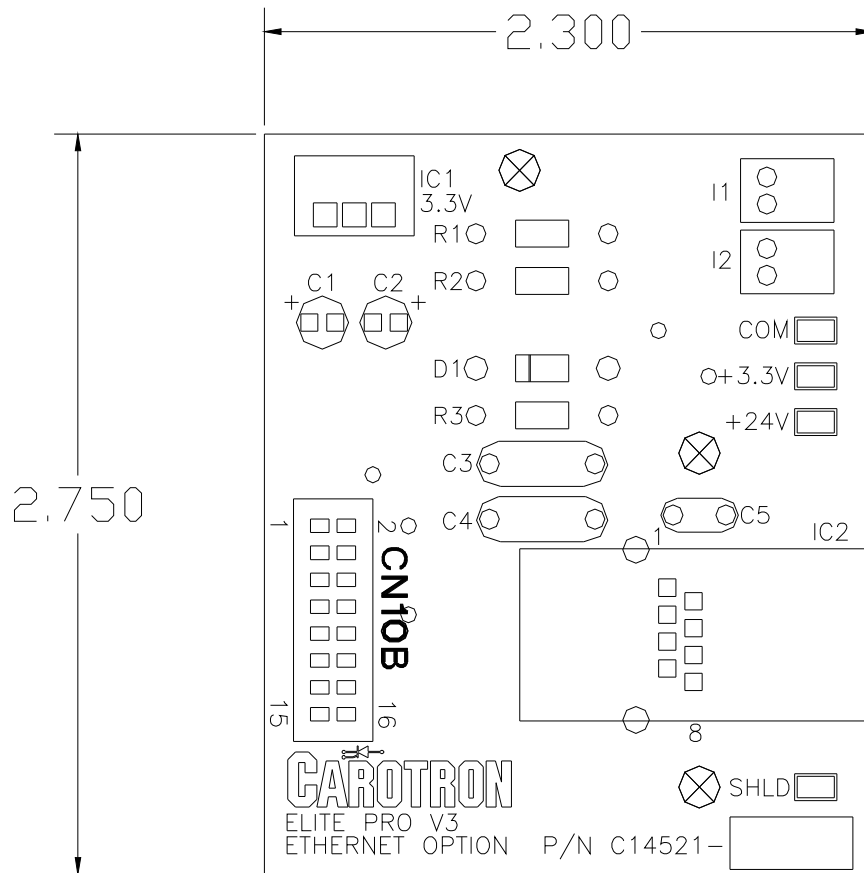


Figure 1: Dimensions

3.1 Physical Installation

The C14521-000 option card installs onto the control board of the Elite Pro V3 drive.

1. Remove all power from the Elite Pro V3 drive. This includes main and control power.
2. Align the option card connector CN10B with the control board connector CN10. Ensure the 3 support standoffs are aligned with the holes on the control board.
3. Press down on the option card ensuring all 3 standoffs are seated fully.
4. Connect your Ethernet cable to the option card.

3.2 Wiring Guidelines

To prevent electrical interference and to minimize start-up problems, adhere to the following guidelines:

Use fully insulated and shielded cable for all signal wiring. The shield should be connected to circuit common at one end only. The other end of the shield should be clipped and insulated to prevent the possibility of accidental grounding.

Signal level wiring such as listed above should be routed separately from high level power wiring (such as the A.C. line, motor, operator control, and relay control wiring). When these two types of wire must cross, they should cross at right angles to each other.

Any relay, contactor, starter, solenoid or other electro-mechanical device located in close proximity to the C14521-000 should have a transient suppression device such as an MOV or R-C snubber connected in parallel with its coil. The suppressor should have short leads and be connected as close to the coil as possible.

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LED Descriptions

Module LEDs

| <i>Right LED</i> | <i>State</i> |
|------------------|---------------|
| Solid Amber | 10BASE-T |
| Solid Green | 100BASE-T |
| Off | No Connection |

Table 1: Connection LED

| <i>Left LED</i> | <i>State</i> |
|-----------------|----------------------|
| Blinking Amber | Half Duplex Activity |
| Blinking Green | Full Duplex Activity |

Table 2: Activity LED

Option Card LEDs

| <i>LED I1</i> | <i>State</i> |
|---------------|-------------------|
| On | Device configured |
| Off | Unconfigured |

Table 3: Connection LED

| <i>LED I2</i> | <i>State</i> |
|---------------|-------------------|
| On | Comms Activity |
| Off | No Comms Activity |

Table 4: Activity LED

Step 1: Drive Configuration

1. Apply power to the Elite Pro drive. Set the following parameters:
 - 1.1. R3.02=38400
 - 1.2. R3.04=2 STOP BITS
 - 1.3. R3.05=ON (Note! Value will automatically return to OFF)
2. Verify option card is installed properly and recognized by the drive by examining parameter T1.17. It should list the model number of the installed card: C14521-000.

Step 2: IP Address

1. When the option card is initially used, an IP address will be automatically assigned if a DHCP server exists on the network. If this IP address is unknown or no DHCP server exists, the Lantronix DeviceInstaller utility must be used to 'find' and configure the unit's network settings. Download and install the DeviceInstaller utility from

<http://www.carotron.com/instsoftwlist/DevInstallSetup4.4.0.4.exe>
2. When the DeviceInstaller utility initially runs, it searches the network for devices and displays the IP address when found. If you wish to change the IP address, select the device in the right hand pane. Click on the Assign IP button in the toolbar. Follow the prompts to change the network settings.
3. When complete, close the DeviceInstaller utility. The IP address of the card is now set. Refer to the drive's manual for the parameter's Modbus addresses.

Step 3: Web Configuration

Under most circumstances, the web configuration is only needed for advanced configurations. When changes are made on a page, click the OK button. After all pages have the desired settings, click the Apply Settings on the left.

1. Open a web browser (Chrome or Safari recommended) and enter the IP address of the card from the previous section. Leave the username and password fields blank when prompted.
2. The module's web page configuration utility should be displayed. Below are the standard settings that should be used with an Elite Pro V3 drive.

- Network
- Server
- Modbus Bridge
- Serial Settings
- Modbus/TCP
- Configurable Pins
- Apply Settings
- Apply Defaults

Server Settings

Server Configuration

Enhanced Password: Enable Disable

Telnet/Web Manager Password:

Retype Password:

Advanced

ARP Cache Timeout (secs):

TCP Keepalive (secs):

Monitor Mode @ Bootup: Enable Disable

CPU Performance Mode: Low Regular High

HTTP Server Port:

MTU Size:

TCP Re-transmission timeout (ms):

Figure 2: Server Settings

- Network
- Server
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- Apply Settings
- Apply Defaults

Serial Settings

Port Settings

Channel: Interface:

Baud Rate: Data Bits: Parity: Stop Bits:

Flow Control Out: Delay before Transmit (1): ms

Hold after Transmit(4): ms

Flow Control In: Wait til Active (2): Delay after Active (3): ms

Modem Control Out:

Modbus

Protocol: RTU ASCII Character Timeout: ms (0=auto)

Tx Delay after Rx: ms Message Timeout: ms

Figure 3: Serial Settings

- Network
- Server
- Modbus Bridge
- Serial Settings
- Modbus/TCP
- Configurable Pins
- Apply Settings
- Apply Defaults

Connection Settings

Connect Protocol

Protocol: Modbus/TCP Server attached to slave(s) ▼

Advanced Server Settings

Modbus/TCP Port: 502 Queue Multiple Modbus/TCP Requests: Yes No

Fixed Slave Address: 0 (0=MB/TCP header) Allow Modbus Broadcast: Yes No

Use Bridge Error Codes (0AH/0BH): Yes No

Swap 4x/0x access to get 3x/1x: Yes No

Swap Holding Reg (4x) access to Input Reg (3x) after offset: 0 (0 to disable)

Swap Coil Status (0x) access to Input Status (1x) after offset: 0 (0 to disable)

(Example: read of 401023 maps to 300023 if you enter 1000)

Preset Automated Scan Table (optional)

| No. | Unit Id (1-255) | Register Type | Offset | Count (1-124) | Frequency (ms) | |
|-----|----------------------|--|----------------------|----------------------|----------------------|---------------------------------------|
| 0 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 1 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 2 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 3 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 4 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 5 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 6 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 7 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 8 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |
| 9 | <input type="text"/> | <input style="width: 100px;" type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="button" value="Remove"/> |

Figure 4: Modbus TCP Settings

- Network
- Server
- Modbus Bridge
- Serial Settings
- Modbus/TCP
- Configurable Pins
- Apply Settings
- Apply Defaults

Configurable Pin Settings

| CP | Function | Direction | Active Level |
|----|--|---|---|
| 1 | Status LED 1 ▼ | <input checked="" type="radio"/> Input <input type="radio"/> Output | <input type="radio"/> Low <input checked="" type="radio"/> High |
| 2 | General Purpose I/O ▼ | <input type="radio"/> Input <input checked="" type="radio"/> Output | <input type="radio"/> Low <input checked="" type="radio"/> High |
| 3 | Status LED 3 ▼ | <input checked="" type="radio"/> Input <input type="radio"/> Output | <input type="radio"/> Low <input checked="" type="radio"/> High |

Figure 5: Configurable Pin Settings

Note: The Direction selection is irrelevant when the function is set for Status LEDs.

Standard Terms & Conditions of Sale

1. General

The Standard Terms and Conditions of Sale of Carotron, Inc. (hereinafter called "Company") are set forth as follows in order to give the Company and the Purchaser a clear understanding thereof. No additional or different terms and conditions of sale by the Company shall be binding upon the Company unless they are expressly consented to by the Company in writing. The acceptance by the Company of any order of the Purchaser is expressly conditioned upon the Purchaser's agreement to said Standard Terms and Conditions. The acceptance or acknowledgement, written, oral, by conduct or otherwise, by the Company of the Purchaser's order shall not constitute written consent by the Company to addition to or change in said Standard Terms and Conditions.

2. Prices

Prices, discounts, allowances, services and commissions are subject to change without notice. Prices shown on any Company published price list and other published literature issued by the Company are not offers to sell and are subject to express confirmation by written quotation and acknowledgement. All orders of the Purchaser are subject to acceptance, which shall not be effective unless made in writing by an authorized Company representative at its office in Heath Springs, S.C. The Company may refuse to accept any order for any reason whatsoever without incurring any liability to the Purchaser. The Company reserves the right to correct clerical and stenographic errors at any time.

3. Shipping dates

Quotation of a shipping date by the Company is based on conditions at the date upon which the quotation is made. Any such shipping date is subject to change occasioned by agreements entered into previous to the Company's acceptance of the Purchaser's order, governmental priorities, strikes, riots, fires, the elements, explosion, war, embargoes, epidemics, quarantines, acts of God, labor troubles, delays of vendors or of transportation, inability to obtain raw materials, containers or transportation or manufacturing facilities or any other cause beyond the reasonable control of the Company. In no event shall the Company be liable for consequential damages for failure to meet any shipping date resulting from any of the above causes or any other cause.

In the event of any delay in the Purchaser's accepting shipment of products or parts in accordance with scheduled shipping dates, which delay has been requested by the Purchaser, or any such delay which has been caused by lack of shipping instructions, the Company shall store all products and parts involved at the Purchaser's risk and expense and shall invoice the Purchaser for the full contract price of such products and parts on the date scheduled for shipment or on the date on which the same is ready for delivery, whichever occurs later.

4. Warranty

The Company warrants to the Purchaser that products manufactured or parts repaired by the Company, will be free, under normal use and maintenance, from defects in material and workmanship for a period of one (1) year after the shipment date from the Company's factory to the Purchaser. The Company makes no warranty concerning products manufactured by other parties.

As the Purchaser's sole and exclusive remedy under said warranty in regard to such products and parts, including but not limited to remedy for consequential damages, the Company will at its option, repair or replace without charge any product manufactured or part repaired by it, which is found to the Company's satisfaction to be so defective; provided, however, that (a) the product or part involved is returned to the Company at the location designated by the Company, transportation charges prepaid by the Purchaser; or (b) at the Company's option the product or part will be repaired or replaced in the Purchaser's plant; and also provided that (c) the Company is notified of the defect within one (1) year after the shipment date from the Company's factory of the product or part so involved.

The Company warrants to the Purchaser that any system engineered by it and started up under the supervision of an authorized Company representative will, if properly installed, operated and maintained, perform in compliance with such system's written specifications for a period of one (1) year from the date of shipment of such system.

As the Purchaser's sole and exclusive remedy under said warrant in regard to such systems, including but not limited to remedy for consequential damages, the Company will, at its option, cause, without

charges any such system to so perform, which system is found to the Company's satisfaction to have failed to so perform, or refund to the Purchaser the purchase price paid by the Purchaser to the Company in regard thereto; provided, however, that (a) Company and its representatives are permitted to inspect and work upon the system involved during reasonable hours, and (b) the Company is notified of the failure within one (1) year after date of shipment of the system so involved.

The warranties hereunder of the Company specifically exclude and do not apply to the following:

- a. Products and parts damaged or abused in shipment without fault of the Company.
- b. Defects and failures due to operation, either intentional or otherwise, (1) above or beyond rated capacities, (2) in connection with equipment not recommended by the Company, or (3) in an otherwise improper manner.
- c. Defects and failures due to misapplication, abuse, improper installation or abnormal conditions of temperature, humidity, abrasives, dirt or corrosive matter.
- d. Products, parts and systems which have been in any way tampered with or altered by any party other than an authorized Company representative.
- e. Products, parts and systems designed by the Purchaser.
- f. Any party other than the Purchaser.

The Company makes no other warranties or representation, expressed or implied, of merchantability and of fitness for a particular purpose, in regard to products manufactured, parts repaired and systems engineered by it.

5. Terms of payment

Standard terms of payment are net thirty (30) days from date of the Company invoice. For invoice purposed, delivery shall be deemed to be complete at the time the products, parts and systems are shipped from the Company and shall not be conditioned upon the start up thereof. Amounts past due are subject to a service charge of 1.5% per month or fraction thereof.

6. Order cancellation

Any cancellation by the Purchaser of any order or contract between the Company and the Purchaser must be made in writing and receive written approval of an authorized Company representative at its office in Heath Springs, S.C. In the event of any cancellation of an order by either party, the Purchaser shall pay to the Company the reasonable costs, expenses, damages and loss of profit of the Company incurred there by, including but not limited to engineering expenses and expenses caused by commitments to the suppliers of the Company's subcontractors, as determined by the Company.

7. Changes

The Purchaser may, from time to time, but only with the written consent of an authorized Company representative, make a change in specifications to products, parts or systems covered by a purchase order accepted by the company. In the event of any such changes, the Company shall be entitled to revise its price and delivery schedule under such order.

8. Returned material

If the Purchaser desires to return any product or part, written authorization thereof must first be obtained from the Company which will advise the Purchaser of the credit to be allowed and restocking charges to be paid in regard to such return. No product or part shall be returned to the Company without a "RETURN TAG" attached thereon which has been issued by the Company.

9. Packing

Published prices and quotations include the Company's standard packing for domestic shipment. Additional expenses for special packing or overseas shipments shall be paid by the Purchaser. If the Purchaser does not specify packing or accepts parts unpacked, no allowance will be made to the Purchaser in lieu of packing.

10. Standard transportation policy

Unless expressly provided in writing to the contrary, products, parts and systems are sold f.o.b. first point of shipment. Partial shipments shall be permitted, and the Company may invoice each shipment separately. Claims for non-delivery of products, parts and systems, and for damages thereto must be filed with the carrier by the Purchaser. The Company's responsibility therefor shall cease when the carrier signs for and accepts the shipment.



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