LONWORKSTM MODULE
16-CHANNEL ISOLATED DIGITAL INPUT

This Instruction contains installation and servicing procedures for the LonWorks module(s) listed in the table below. Acromag, Inc. manufactures the module(s). The table provides the module description, the Moore part number, and the equivalent Acromag model number.

<table>
<thead>
<tr>
<th>MODULE DESCRIPTION</th>
<th>MOORE P/N</th>
<th>ACROMAG MODEL NUMBER</th>
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<tbody>
<tr>
<td>16-Channel Isolated Digital Input Module</td>
<td>16802-3</td>
<td>4925A</td>
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</table>

Two major sections are found in this Instruction. General information on a LonWorks module ordered from Moore is located in this section. The Acromag User’s Manual for the module is the second section.

Go to the Acromag section of this Instruction to install or calibrate a module. For product support or repair, read the following paragraphs. These statements supersede or amend similar information in the Acromag section.

PRODUCT SUPPORT

Product support can be obtained from a Technical Information Center (TIC). Each regional TIC is a customer service center that provides direct telephone support on technical issues related to the functionality, application, and integration of all products supplied by Moore. Regional TIC contact information is provided in the following table. Your regional TIC is the first place you should call when seeking product support information. When calling, it is helpful to have the following information ready:

- Caller ID number or name and company name - When you call for support for the first time, a personal caller number is assigned. Having the number available when calling for support will allow the TIC representative taking the call to use the central customer database to quickly identify the caller’s location and past support needs.

- Product part number or model number and version

- If there is a problem with product operation:
  - Whether or not the problem is intermittent
  - The steps performed before the problem occurred
  - Any error messages or LED indications displayed
  - Installation environment

Customers that have a service agreement (ServiceSuite or Field Service Agreement) are granted access to the secure area of our Web site (www.mooreproducts.com/techservices). This area contains product support information. To log on, you will be prompted to enter your username and password.
TIC North America also offers a free faxback service called FaxRequest. You can dial-in to this service to access documents such as press releases, product information sheets, and training schedules. The service is completely automated and available 24 hours a day. To access this service, call the FaxRequest number listed in the tables below. The first document you should request is the directory (document number 9999). This document is updated as new documents are added. Each document has a number code assigned to it that you enter along with your fax number (area code entry is always required). Upon completing your entry, the FaxRequest computer automatically calls your fax machine and sends the requested documents.

<table>
<thead>
<tr>
<th>TIC NORTH AMERICA</th>
<th>Tel: +1 215 646 7400, extension 4842, option 1</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Fax: +1 215 283 6343</td>
</tr>
<tr>
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<td>E-mail: <a href="mailto:ticgroup@mpco.com">ticgroup@mpco.com</a></td>
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<td>FaxRequest: +1 215 646 7400, extension 4842, option 2</td>
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<td>Hours of Operation: 8 a.m. to 6 p.m. eastern time</td>
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<td>E-mail: <a href="mailto:lohho@mpco.com">lohho@mpco.com</a></td>
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<td>E-mail: <a href="mailto:uktic@mpco.com">uktic@mpco.com</a></td>
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<tr>
<td></td>
<td>Hours of Operation: 8:30 a.m. to 5:15 p.m. GMT/BST</td>
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<td></td>
<td>Secure Web Site: <a href="http://www.mooreproducts.com/techservices">www.mooreproducts.com/techservices</a></td>
</tr>
</tbody>
</table>
RETURN FOR REPAIR
This section modifies the General Maintenance section in the Acromag User’s Manual.

During the warranty period, remove a failed instrument from service and proceed as follows to return it to Moore for repair. For out of warranty repair, return the module to either Moore or Acromag.

TO RETURN EQUIPMENT

- Call Moore Products Co. at (215) 646-7400, ext. 4RMA (4762) weekdays between 8:00 a.m. and 4:45 p.m. Eastern Time. If outside of North America go, to www.mooreproducts.com for the address and telephone and FAX numbers of your nearest Moore Products Co. subsidiary. Ask for an RMA (Return Material Authorization) number and be sure to mark the RMA number prominently on the outside of the shipment.

  When calling for an RMA number, provide the reason for the return. If returning equipment for repair, failure information (e.g., error code, failure symptom, installation environment) will be requested. A purchase order number will also be needed.

MATERIAL SAFETY DATA SHEET

- A Material Safety Data Sheet (MSDS) must be included with each item being returned that was stored or used anywhere hazardous materials were present.

PACKAGING

- Package assembly in original shipping materials. Otherwise, package it for safe shipment or contact the factory for shipping recommendations.

  An electronic module must be placed inside a static shielding bag to protect it from electrostatic discharge.

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Procedures in this document have been reviewed for compliance with applicable approval agency requirements and are considered sound practice. Neither Moore Products Co. nor these agencies are responsible for repairs made by the user.
SmartPack LONWORKS® Module
Model 4925A
16 Isolated Digital Inputs, DC-Powered

USER'S MANUAL

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1.0 INTRODUCTION

These instructions cover Model 4925A input modules. The 4925A is another member of the SmartPack family of Neuron® Chip based, LonWORKS network control modules. This model converts sixteen 0-42V DC digital inputs, into a corresponding network variable. The sixteen inputs share a common connection and are isolated as a group from power and the communication network. Also associated with each input channel are configuration network variables for configuring debounce. The 16 inputs share a common update interval configuration.

SmartPack models include an isolated, free-topology, network communication transceiver (FTT-10A). This module supports free-topology, polarity insensitive, network installations (bus, star, and/or loop formats). Up to 64 modules can be connected on a single network segment. An unpowered module appears as a high-impedance to the network and does not interfere with network communications. Multiple network segments may be connected using repeaters to increase the number of modules and distances. SmartPacks are interoperable with LonWorks® products from other manufacturers that use standard network variable types (SNVT’s). Module configuration and network management are performed using a Windows® based configuration program running on a PC.

All SmartPack modules are designed to withstand harsh industrial environments. They feature RFI, EMI, ESD, EFT, and surge protection, plus low radiated emissions per European Community requirements, wide ambient temperature operation, and isolation from inputs, to power and the network. As a wide-range DC-powered device, the unit may be powered from DC power networks incorporating battery backup. Additionally, the input power terminal is diode-coupled, providing reverse polarity protection. This allows the unit to be connected to redundant power supplies, or several units to safely share a single DC supply.

Units are DIN-rail mounted and removable terminal blocks facilitate ease of installation or replacement, without having to remove wiring. Connectors are industry standard screw clamp type and accept a wide range of wire sizes.

Key SmartPack 4925A Features

- Convenient Windows® Configuration - Fully configurable via our user friendly Windows® Configuration Program.
- Free Topology Communication Network - Communicates via the popular LonTalk® protocol at 76K bps. Free-topology transceiver supports star, bus, and/or loop network wiring configurations, with up to 64 nodes per segment and 500 meter wire lengths.
- Standard Network Variables - Uses only standard network variable types (SNVTS) to provide interoperability with other LonWorks® products. Inputs are read as a single word (SNVT_state).
- Nonvolatile Reprogrammable Memory - This module contains an advanced technology Neuron® microcontroller and programmable, nonvolatile EEPROM, for configuration parameter and program storage.

LON, Neuron, and LonTalk are U.S. registered trademarks of Echelon Corporation. LonWORKS is a trademark of Echelon Corporation. Windows is a trademark of Microsoft Corporation.
Key SmartPack 4925A Features...continued

- **Input Debounce Parameters & Update Interval** - Each input includes configuration network variables for configuring debounce. An update interval parameter can be adjusted for all inputs.
- **Fully Isolated** - The inputs, power, and network circuits are isolated from each other. The sixteen inputs of this model share a common and do not provide input-to-input isolation.
- **Input Excitation Supply** - A current-limited excitation supply is provided for input load pullup operation.
- **Reset & Service Push-buttons** - Push-button Reset will reset the module to power-up (default) conditions. A Service Push-button will cause the node to transmit its unique node identification strings over the communication network.
- **High Voltage/High Impedance Inputs** - High impedance and high voltage inputs sense up to 42VDC. Each input includes a transient suppression and voltage clamping device for added protection.
- **LED Status Indicators** - A green Power LED indicates power is applied to the unit. A red Service LED provides configuration and operating function information. A yellow Status LED indicates whether the node is "off line."
- **Wide-Range DC-Powered** - This device receives power over a wide DC supply range and the power terminal is diode-coupled. This makes this device useful for systems with redundant supplies, and/or battery backup power.
- **Wide Ambient Operation** - The unit is designed for operation over wide ambient temperatures.
- **Hardened For Harsh Environments** - The unit will operate reliably in harsh industrial environments and includes protection from RFI, EMI, ESD, EFT, and surges, plus low radiated emission levels per CE requirements.
- **Convenient Mounting, Removal, & Replacement** - DIN-rail mounting and plug-in type terminal blocks for input, power, and network communication wiring make replacement and removal easy.

2.0 PREPARATION FOR USE

**UNPACKING AND INSPECTION**

Upon receipt of this product, inspect the shipping carton for evidence of mishandling during transit. If the shipping carton is badly damaged or water stained, request that the carrier's agent be present when the carton is opened. If the carrier's agent is absent when the carton is opened and the contents of the carton are damaged, keep the carton and packing material for the agent's inspection.

For repairs to a product damaged in shipment, refer to the Acromag Service Policy to obtain return instructions. It is suggested that salvageable shipping cartons and packing material be saved for future use in the event the product must be shipped.

This module is physically protected with packing material and electrically protected with an anti-static bag during shipment. However, it is recommended that the module be visually inspected for evidence of mishandling prior to applying power.

This circuit utilizes static sensitive components and should only be handled at a static-safe workstation.

**INSTALLATION**

The module is packaged in a general purpose type of enclosure. Use an auxiliary enclosure to protect the unit in unfavorable environments or vulnerable locations. Stay within the recommended operating temperature range of -15°F to 185°F (-25°C to +85ºC) for best performance. Connect the unit as shown in Electrical Connections Drawing 4501-666.

Model 4925A Input Modules have no internal hardware jumpers or switches to configure. All configuration is done through software command.

**Mounting**

Refer to the Enclosure Dimensions Drawing 4501-661 for mounting and clearance dimensions.

**DIN Rail Mounting:** Use suitable fastening hardware to secure the DIN rail to the designated mounting surface. This module can be mounted on "T" type DIN rails. Units may be mounted side-by-side on approximately 1-inch centers for limited space applications.

"T" Rail (35mm), Type ENS50022: To attach a module to this style of DIN rail, angle the top of the unit towards the rail and locate the top groove of the adapter over the upper lip of the rail. Firmly push the unit towards the rail until it snaps solidly into place. To remove a module, first separate the terminal block(s) from the bottom side of the module to create a clearance to the DIN mounting area. Next, insert a screwdriver into the lower arm of the DIN rail connector and use it as a lever to force the connector downward until the unit disengages from the DIN rail.

**Electrical Connections**

The wire size used to connect the unit to the control system is not critical. All terminal strips can accommodate wire from 14-26 AWG. Strip back wire insulation 1/4-inch on each lead before installing into the terminal block. Input wiring may be shielded or unshielded, while network wires should be twisted pair. Since common mode voltages can exist on signal wiring, adequate wire insulation should be used and proper wiring practices followed. It is recommended that network and power wiring be separated from the signal wiring for safety, as well as for low noise pickup. Note that input, power, and network terminal blocks are plug-in type and can be easily removed to facilitate module removal or replacement without disconnecting individual wires. Refer to Electrical Connections Drawing 4501-666.
1. **Power**: Refer to Electrical Connections Drawing 4501-666. Variations in power supply voltage within rated limits have negligible effect on module accuracy. The power terminal is diode-coupled for reverse polarity protection. Refer to the SPECIFICATIONS section for current requirements.

2. **Network**: See the SPECIFICATIONS section for detailed information about wiring, distance, and the maximum number of nodes per network segment. Note that the network circuit is electrically isolated from the input and power circuits. An optional earth ground network connection is available and its use is required for rated transient protection.

3. **Input**: All inputs share a signal common and include transient suppression devices. Refer to SPECIFICATIONS for input requirements and see the module's side label for terminal designations. Observe proper signal polarity when making connections. The input circuit as a group is electrically isolated from the network and power circuits.

4. **Shielding & Grounding**: The module housing is plastic and does not require an earth ground connection. However, there are mounting positions at each side of the input module to connect an input cable shield, plus earth ground. These connections are isolated from the internal circuit and are recommended to minimize noise and provide additional protection from input transients. Additionally, the network terminals include an earth ground connection for noise suppression and transient protection. For rated protection, you must make use of these connections as outlined in Electrical Connections Drawing 4501-666.

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**3.0 MODULE CONFIGURATION**

The SmartPack module must be configured for your application. This is typically accomplished using a Windows® based configuration and network management program running on a personal computer. Use of this software is not covered here. A description of applicable network variables follows.

**NETWORK VARIABLES**

To provide interoperability, standard network variable types are used for all external interface and configuration variables. Figure 1 illustrates the network variable types available in this module.

- **nvo_outstatwrd**: State Word Output Variable
  - **Declaration**: network output SNVT_state nvo_outstatwrd;
  - **Description**: This output network variable contains the latest value of all digital input channels in units defined by SNVT_state. Bit 0 corresponds to input 1 and bit 15 corresponds to input 16. A bit value of “1” equates to an “ON” input for the corresponding channel, while a bit value of “0” indicates that the input is “OFF”. The update rate for this variable is controlled by nci_pvtim and/or nci_debounce[ x ].
  - **Power-up/Reset Value**: Per input.

- **nci_debounce[ x ]**: Input Debounce Configuration Variable
  - **Declaration**: EEPROM network input SNVT_elapsed_tm nci_debounce[ x ];
  - **Description**: This configuration input network variable specifies the amount of delay between updates (0 to 50 milliseconds) before the input ON or OFF state will be accepted as a correct input. This is used to eliminate false state transfers due to input spikes or glitches. Glitches are frequently caused by contact bounce in mechanical relays and switches. Only the millisecond (LL) member of this network variable structure determines the debounce time (0 to 50ms). Anything greater will be clipped to 50 milliseconds.

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**Figure 1: Series 4925A SNVT Diagram**

![SNVT Diagram](image-url)

Input 1 .................................. Input 16

nvo_outstatwrd: State Word Output Variable
nci_pvtim
nci_debounce[ x ]
SNVT_elapsed_tm

External Interface Section

Configuration Section
The day, hour, minute, and second members are ignored and should be set to 0. To disable the debounce delay function, set the millisecond member to 0. This variable is maintained in EEPROM and does not take effect until the module is reset.

**Initial Factory Value**
DD=0, HH=0, MM=0, SS=0, LL=0: Debounce delay disabled.

**nci_pvttime**: Output Word Update Time Configuration Variable Declaration
EEPROM network input SNVT_elapsed_tm nci_pvttime;

**Description**
This configuration input network variable specifies the maximum period of time between updates of nvo_outstate,word if no change occurs at the inputs. Internal resolution is 0.1 seconds. The maximum allowable time expressed in DD:HH:MM:SS:LL format is 00:01:49:13:500 (6553.5 s). Anything greater will be clipped at 01:49:13:500. To disable periodic updates, set all members to 0. This variable is maintained in EEPROM and does not take effect until the module is reset.

**Initial Factory Value**
DD=0, HH=0, MM=0, SS=0, LL=0: Periodic updates disabled.

### 4.0 THEORY OF OPERATION

Refer to the Block Diagram of Drawing 4501-667 to gain a better understanding of the circuit. This input module uses 10 I/O lines of the LonWorks neuron chip to alternately read eight channels of input from separate octal buffers that are driven by individual comparators that sense the input levels. The comparators are wired to provide input hysteresis. Inputs share a common connection and include transient suppression devices. The neuron chip provides all the key functions necessary to process inputs from sensors and control devices intelligently, and transmit control information across the network. An Echelon FTT-10A free-topology transceiver provides the isolated network interface. A wide input switching regulator (isolated flyback mode) provides isolated +5V power to the circuit.

### 5.0 SERVICE AND REPAIR

#### SERVICE AND REPAIR ASSISTANCE

This module contains solid-state components and requires no maintenance, except for periodic cleaning and configuration parameter verification. It is highly recommended that a non-functioning module be returned to Acromag for repair, since Surface Mounted Technology (SMT) boards are generally difficult to repair. The board can be easily damaged unless special SMT repair and service tools are used. Acromag has automated test equipment that thoroughly checks and calibrates the performance of each module. Please refer to Acromag’s Service Policy Bulletin or contact Acromag for complete details on how to obtain parts and repair.

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**PRELIMINARY SERVICE PROCEDURE**

Before beginning repair, be sure that all installation and configuration procedures have been followed. The unit has three LED's which can be used to aide fault diagnosis. The green "Power" LED provides a visual indication that power is applied to the unit. The red "Service" LED flashes at a ½ Hz. rate for an unconfigured node. It is OFF for a properly functioning node, and it is ON for a failed node. There is also a yellow "Status" LED which remains ON indefinitely upon receiving an "offline" network management command. It remains OFF upon receiving an "online" network management command (normal operation). This LED will also flash at a 2.5Hz rate for 10 seconds upon receiving a "wink" network command. This can be used to identify and verify communication with the unit of interest within a group of SmartPacks.

If the LED's indicate a failure, or if other evidence points to a problem with the unit, an effective and convenient fault diagnosis method is to exchange the questionable module with a known good unit.

Acromag's Application Engineers can provide further technical assistance if required. Note that this unit may be customized for other input sense thresholds and hysteresis levels (consult the factory). If required, complete repair services are available from Acromag.
6.0 SPECIFICATIONS:

Final product specifications are contingent upon CSA & FM Hazardous Location approvals.

Model: 4925A, 16 Isolated, 0-42VDC Digital Inputs

Series 4925A input modules are color coded with a white label and DIN-rail mounted. These DC-powered, SmartPack, LonWorks® modules accept 16 DC input voltage signals which share a common return, and convert the ON/OFF state of these signals to network variables using standard network variable types (SNVT’s). Input are compatible with TTL outputs. Each input includes configuration network variables for debounce. The update time for all inputs may also be configured. Three-way isolation is provided between the inputs, communication network, and power circuit.

NETWORK SPECIFICATIONS:

Speed: 75K bits per second.
Media: See Cable Type in Table 2 below.
Distance: See Table 2 below.
Nodes per Network Segment: 64 maximum. A LonWorks® router configured as a repeater is required for more than 64 nodes.
Network Response Time: A transition at one input will generate a network variable message within 15ms (debounce time 0ms). A transition on up to 16 channels will generate a network variable message within 20ms. These times will increase by the debounce time, plus the debounce jitter.

Table 2A: Free Topology Specifications*

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Max Module-to-Module Distance</th>
<th>SmartPack Max Total Wire Length</th>
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<tr>
<td>Belden 85102</td>
<td>1640 ft (500 m)</td>
<td>1840 ft (500 m)</td>
</tr>
<tr>
<td>Belden 8471</td>
<td>1312 ft (400 m)</td>
<td>1540 ft (500 m)</td>
</tr>
<tr>
<td>Level IV, 22 AWG</td>
<td>1312 ft (400 m)</td>
<td>1540 ft (500 m)</td>
</tr>
<tr>
<td>JY (ST) Y 2x2x0.8</td>
<td>1050 ft (320 m)</td>
<td>1840 ft (500 m)</td>
</tr>
<tr>
<td>TIA Category 5</td>
<td>820 ft (250 m)</td>
<td>1475 ft (500m)</td>
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Table 2B: Doubly Terminated Bus Topology*

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Max Bus Length w/Free-Topology Transceivers (FTT-10, FTT-0A)</th>
<th>Max Bus Length w/Free-Topology &amp; Link-Power Transceivers (FTT-10, FTT-10A, LPT-10)</th>
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<tbody>
<tr>
<td>Belden 85102</td>
<td>8955 ft (2700 m)</td>
<td>7218 ft (2200 m)</td>
</tr>
<tr>
<td>Belden 8471</td>
<td>8955 ft (2700 m)</td>
<td>7218 ft (2200 m)</td>
</tr>
<tr>
<td>Level IV, 22 AWG</td>
<td>4935 ft (1400 m)</td>
<td>3773 ft (1150 m)</td>
</tr>
<tr>
<td>JY (ST) Y 2x2x0.8</td>
<td>2953 ft (900 m)</td>
<td>2481 ft (750 m)</td>
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<tr>
<td>TIA Category 5</td>
<td>2953 ft (900 m)</td>
<td>2481 ft (750 m)</td>
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INPUT SPECIFICATIONS:

This module has sixteen wide-range DC voltage inputs compatible with TTL voltage thresholds. All inputs share a common and are not isolated from each other.

Voltage Range: 0 to 42V DC.
Voltage Threshold (L to H): TTL, 2.2V DC nominal.
Voltage Threshold (H to L): TTL, 1.0V DC nominal.
Hysteresis: 1.2V DC, typical.
Input Resistance: 47K ohms, typical.
Input Current: 140uA maximum at 42V DC.
Debounce Time: 0 to 50ms configurable in 1ms increments, plus up to 6ms of jitter.
Response Time: See Network Response Time.
Input Excitation Supply: 4VDC, Nominal, 48mA Maximum
Sources current to excite switch contacts for input voltage level sensing. This source is limited to 48mA total (i.e. the sum of all input loads must be less than this). Use one externally mounted resistor per input (user supplied) to limit the current through switch contacts.
Minimum recommended pull-up resistor is 10K ohms.

AGENCY APPROvals:

All units are designed to comply with European Community “CE” requirements, plus CSA & FM Class 1, Division 2, Groups A, B, C, and D. Approvals are pending.

ENCLOSURE PHYSICAL SPECIFICATIONS:

See Enclosure Dimensions Drawing 4501-661. Units are packaged in a general purpose plastic enclosure that is DIN rail mountable for flexible, high density (approximately 1” wide per unit) mounting.

Dimensions: Width = 1.0 inch, Height = 4.6 inches, Depth = 4.40 inches.
DIN Rail Mounting: DIN rail mount, Type EN50022, ‘T’ rail (35mm).
Connectors: Removable plug-in type terminal blocks, color is black (TB1, TB2, TB4) and safety orange (TB3); Current/Voltage Ratings: 10A/300V;
Wire Range: AWG #14-22.
Case Material: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2, color beige; general purpose NEMA Type 1 enclosure.
Printed Circuit Boards: Military grade FR-4 epoxy glass circuit board.
Shipping Weight: 1 pound (0.45 Kg) packed.
Power Requirements: +110V Minimum to +36V DC
Maximum (-25°C to +70°C). Above 70°C, the supply voltage is derated 0.8%/°C, to 24VDC maximum at 85°C. Current draw is a function of the supply voltage (see Table 3). Currents specified are maximum values with all digital inputs at 42V and the module transmitting on the network. An internal diode provides reverse polarity protection.

CAUTION: Do not exceed 36VDC peak supply input, to avoid damage to the module.
Table 3: Power Supply Current

<table>
<thead>
<tr>
<th>Supply Voltage (V DC)</th>
<th>Maximum Current Draw No Excitation</th>
<th>Maximum Current Draw w/ Excitation</th>
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</thead>
<tbody>
<tr>
<td>10V</td>
<td>50mA</td>
<td>100mA</td>
</tr>
<tr>
<td>12V</td>
<td>42mA</td>
<td>80mA</td>
</tr>
<tr>
<td>15V</td>
<td>36mA</td>
<td>70mA</td>
</tr>
<tr>
<td>24V</td>
<td>26mA</td>
<td>50mA</td>
</tr>
<tr>
<td>36V</td>
<td>22mA</td>
<td>40mA</td>
</tr>
</tbody>
</table>

Power Supply Effect: None.

ENVIRONMENTAL SPECIFICATIONS:

Reference Test Conditions: Digital inputs: 0-42VDC; Network (78Kbps), Temperature: 25°C; +24V DC supply.
Operating Temperature Range: -25°C to +85°C.
Storage Temperature Range: -40°C to +85°C.
Relative Humidity: 20 to 90% (transceiver limitation).
Ambient Temperature Effect: None.

Shielding & Grounding: The module housing is plastic and does not require an earth ground connection. However, there are mounting positions at each side of the input module to connect an input cable shield, plus earth ground. These connections are isolated from the circuit and are recommended to minimize noise and help protect the unit from input transients. Additionally, the network terminals also include an earth ground connection for noise suppression and transient protection. For rated protection, you must make use of these connections as outlined in Electrical Connections Drawing 4501-660.

Isolation: Three-way galvanic isolation is provided between the digital inputs, DC power, and the communication network as follows:

Inputs-to-Power and Network-to-Power: The digital inputs as a group can operate at up to 250V AC, or 354V DC off ground, on a continuous basis (will withstand 1500V AC dielectric strength test for one minute without breakdown). This complies with test requirements outlined in ANSI/ISA-S82.01-1988 for the voltage rating specified.

Network-to-Input: The network can operate at up to 277V AC off DC power ground, on a continuous basis (will withstand 1000V AC dielectric strength test for one minute without breakdown).

Input-to-Input Isolation: None - all digital inputs share a circuit common and are not isolated from each other.

Installation Category: Designed to operate in an Installation Category (Overvoltage Category) II environment per IEC 1010-1 (1990).

Radiated Field Immunity (RFI): Complies with IEC1000-4-3 Level 3 (10V/m, 27 to 500MHz) and European Norm EN50082-1.

Electromagnetic Interference Immunity (EMI): Unit operates without digital upset under the influence of EMI from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient Immunity (EFT): Complies with IEC1000-4-4 Level 2 (1KV power, 0.5KV signal lines) and European Norm EN50082-1.

Surge Immunity: Complies with IEC1000-4-5 Level 2 (10KV) and European Norm EN50082-1.

Electrostatic Discharge (ESD) Immunity: Complies with IEC1000-4-2 Level 3 (8KV air discharge) and European Norm EN50082-1.

Radiated Emissions: Meets or exceeds European Norm EN50081-1 for Class A equipment.

Warning: This is a Class A rated product. In a domestic environment, this product may cause radio interference in which the user may be required to take adequate measures.

Conducted Emissions: Not applicable; these units are not AC powered.

MISCELLANEOUS:

Interoperability: Smart Packs are interoperable with LonWORKS® products from other manufacturers that use Standard Network Variable Types (SNVTs).

Module Configuration and Network Management: Performed using a Windows® configuration program running on a PC.

Nonvolatile Reprogrammable Memory: The Neuron® microcontroller has integrated, programmable, nonvolatile EEPROM (10K programming cycles) for configuration parameter storage.

Reset/Service Pushbuttons (See Dwg 4501-666 for Location):

Reset Button: Allows the module to be reset to power-up conditions.

Service Button: Causes the Neuron® chip inside the node to transmit its unique 48-bit ID and 8-byte program ID strings.

LED Indicators:

(See Drawing 4501-666 for Location)

Power LED (Green): Indicates power is applied to the unit.

Service LED (Red): LED is OFF for a properly functioning node and ON for a failed node. LED flashes at a ½ Hz rate for an unconfigured node.

Status LED (Yellow): (See Figure 2) LED remains ON indefinitely upon receiving an "offline" network management command. LED remains OFF upon receiving an "online" network management command (normal operation). The LED will also flash at a 2.5Hz rate for 10 seconds upon receiving a "wink" network command.

Figure 2: Status LED Behavior

1. Offline/Online Commands:

   ON
   OFF

   Offline Command
   Online Command

2. Wink Command:

   ON
   OFF 200 ms
   200 ms

   10 Seconds

- 7 -
MODEL 4925A SIMPLIFIED SCHEMATIC

4501-667
INPUT CONNECTIONS
(POSSIBLE VARIATIONS)

NOTE 1: EXTERNAL PULL-UP RESISTOR (USER SUPPLIED) 220 OHMS MINIMUM WHEN USING THE MODULE'S EXCITATION SUPPLY.

NOTE 2: RETURNS SHOULD BE CONNECTED TO EARTH GROUND AT THE SAME POINT TO AVOID CIRCULATING GROUND CURRENTS.

WARNING:
FOR COMPLIANCE TO APPLICABLE SAFETY AND PERFORMANCE STANDARDS, THE USE OF SHIELDED CABLE IS RECOMMENDED AS SHOWN IN THIS DRAWING. FAILURE TO ADHERE TO SOUND WIRING AND GROUNDING PRACTICES MAY COMPROMISE SAFETY AND PERFORMANCE.

SAFETY GUIDELINES MAY REQUIRE THAT THIS DEVICE BE HOUSED IN AN APPROVED METAL ENCLOSURE OR SUB-SYSTEM, PARTICULARLY FOR APPLICATIONS WITH VOLTAGES GREATER THAN OR EQUAL TO 75V.

EIGHT INPUTS WITH COMMON RETURN

MODEL 541L3-420-16DI-10
ELECTRICAL CONNECTIONS

4501-666
"T" RAIL DIN MOUNTING
DIN EN 50022, 35mm

RESET
SERVICE

PWR
STAT.
SERV.

(59.4)
2.34

(118.9)
3.75

(99.1)
4.35

(110.5)

SCREWDRIVER SLOT FOR
REMOVAL FROM "T" RAIL

NOTE: ALL DIMENSIONS ARE IN INCHES (MILLIMETERS)

MODEL 4925/4926
ENCLOSURE DIMENSIONS

4501-661