

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Woodward

PRODUCT MODEL

9905-971

16-Channel Discrete Input Module

OFFICIAL SOURCE

723PLUS Performance Control Manual and LinkNet Final Production Stop Notification

Manual 26043 / PCN 06988

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The two communication ports (J2 and J3) and the LON # 1 data channel allow for digital communications between external Modbus compatible devices and Woodward LinkNet I/O modules. Up to 9 LinkNet modules have been designated for use and can be connected to the LON # 1 channel. The inputs and outputs of these modules can be read and controlled with Modbus compatible devices connected to communication ports J2 and J3. The number and types of LinkNet modules available:

Description	Nodes Available	Total Channels Available	Network Address	Module Part Numbers
J Thermocouple In-Fail High OR J Thermocouple In-Fail Low	4	24	1, 2, 3, or 4	9905-967
100 Ω Am RTD Input	1	6	5	9905-970
4-20 mA Input	1	6	6	9905-968
Discrete Input	1	16	7	9905-971
Relay Output	1	8	8	9905-973
4-20 mA Output	1	6	9	9905-972
TOTAL	9	66		

Table 1-1. LinkNet Modules (Summary)

Addr.	Description	Channels	Notes
1	J TC-Fail High	6	
2	J TC Input	6	
3	J TC Input	6	
4	J TC Input	6	
5	100 Ω Am RTD Input	6	
6	4-20 mA Input	6	
7	Discrete Input	16	
8	Relay Output	8	
9	Analog Output	6	
Total		66	

Table 1-2. LinkNet Modules (Address)

2. **AI "x" CH "x" - AI OFFSET** sets the **minimum value** for the Channel "x" mA input current of the selected AI module.
3. **AI "x" CH "x" - AI SPAN** sets the **maximum value** of the Channel "x" mA input current of the selected AI module.

DI Module 1

This is a **display only** menu which displays the state of LinkNet Discrete Inputs of Module 1. FALSE = Open and TRUE = Closed. The control automatically updates the display. The LinkNet Module must be connected and properly addressed for this menu to come into view.

IMPORTANT

LinkNet nodes only reset their hardware switch addresses on power-up.

1. **CH "x" CONTACT CLOSED** displays the state of the Channel "x" discrete input for the selected DI module. **This state value is sent to Modbus.**

DO Module 1

This is a **display only** menu which displays the state of LinkNet Discrete Outputs of Module 1. The LinkNet Module must be connected and properly addressed for these menus to come into view.

IMPORTANT

LinkNet nodes only reset their hardware switch addresses on power-up.

1. **CH "x" ENERGIZED** displays the state of the Channel "x" discrete output for the selected DO module. FALSE = De-energized and TRUE = Energized. **This state value is also the value** received from Modbus or from the FORCE DO 1 menu.

AO Module 1

This menu displays and allows calibration of LinkNet Analog Output Module 1. The **offset** and **span** should be adjusted to produce the correct mA output for the input value (scaled in engineering units). The LinkNet Module must be connected and properly addressed for this menu to come into view.

IMPORTANT

LinkNet nodes only reset their hardware switch addresses on power-up.

1. **AO1 CH "x" - mA OUT** is a **display only** of the Channel "x" value, in engineering units, which drives the output current for the AO1 Module. **This value times 1000 is also the value received from Modbus.**
2. **AO1 CH "x" OFFSET** sets the **minimum current** at the AO1 Module Channel "x" minimum input value, in engineering units.
3. **AO1 CH "x" SPAN** sets **maximum current** at the AO1 Module Channel "x" maximum input value, in engineering units.

Appendix B.

LinkNet[®] I/O Network

Introduction

The LinkNet[®] option provides distributed I/O capabilities for the 723PLUS control system through LON #1. The LinkNet I/O modules, while slower and less powerful than on-board I/O, are well suited for functions which are not time-critical, such as sequencing and monitoring.

Network Architecture

An I/O network consists of the 723PLUS LON #1 channel, which provides independent network trunks of up to 9 I/O modules. The LinkNet I/O modules, or nodes, on each trunk are attached to the 723PLUS via a single twisted-pair wire (see end of this Appendix for correct wiring geometry).

Each LinkNet I/O module has two rotary switches that are used to set its network address. On installation, these switches must be dialed so that the I/O module's network address of 1–9 matches the network address defined for this I/O module in the application program. The I/O modules may be placed in any order on the network, and gaps are allowed in the address sequence.

Hardware

Each network consists of one LinkNet channel of a 723PLUS and many I/O modules. The I/O modules include thermocouple inputs, RTD inputs, 4–20 mA inputs, and discrete inputs as well as 4–20 mA and relay outputs. All of the analog modules consist of six channels per module. The Relay Output module contains eight channels, and the Discrete Input module has 16 channels.

Each I/O module is housed in a plastic, field-termination-module-type package for DIN rail mounting. The LinkNet I/O modules can be mounted in the control cabinet or in any convenient location in the vicinity of the engine that meets the temperature and vibration specifications.

I/O Module Specifications

Accuracy

1% at 25 °C without field calibration

Power Supply Input

18 to 32 Vdc

Isolation

Network to I/O channel: 277 Vac

Power supply input to network: 277 Vac

I/O channel to I/O channel: 0 V

Power supply input to I/O channel: 500 Vdc except for discrete inputs, discrete input power comes directly from power supply input

Troubleshooting Flowchart

If a problem occurs with the LinkNet network, use Figure B-15 (Troubleshooting Flowchart) as a guide to find and repair the problem.

Follow the flowchart down from the title block to the next block. This block may be a rectangular suggestion block, or a diamond shaped decision block. When a suggestion block is entered, do the check suggested. A suggestion block may refer you to the control wiring diagram, the application program, or the module field wiring.

If this check does not find the problem, continue down the flowchart.

When a decision block is entered, the question asked inside it must be answered. This answer then determines the proper exit from that block. The exit taken will lead you to another point on the flowchart.

By following the flowchart in this manner, you should be able to determine a course of action for most problems.

Wiring and Proper Cable

All LinkNet I/O modules communicate with the 723PLUS through shielded twisted pair wiring. The specifications for the LinkNet system require that listed level V type cable be used. The network may be wired directly from I/O module to I/O module, as shown in Figure B-16, or the I/O modules may be connected to the network via stubs as in Figure B-17. A termination network must be installed at the last LinkNet I/O module on the network. There is no polarity associated with the network wiring. For optimum EMC performance, the network cable shield should be landed at each I/O module, and the exposed wire length limited to 25 mm (1 inch). At the 723PLUS, the outer insulation should be stripped and the bare shield landed to the chassis.

All field wiring should be shielded. The shield should be landed in the terminal block provided, and the exposed wiring, after the shield is separated, should be limited to one inch.

IMPORTANT

The LinkNet modules should always be mounted in a cabinet, or be otherwise operator inaccessible. The modules should be accessed only for maintenance purposes, in which case, the ESD procedures on page iv should be followed.



LON-based LinkNet™ Modules Final Production Stop Notification

Product Change

Subsequent to the notifications "LinkNet Support Statement" dated December 2012 and "LINKnet™ Nodes & I/O Controller Module Obsolescence" dated October 2016, Woodward announces final production stop to the first-generation LON-based LinkNet product line. The part numbers listed as "Obsolete Modules" in the table below will be marked inactive in Woodward's ERP system in January 2024. Both notifications are embedded below for information continuity.

Obsolete Modules and Remaining Inventory

The LON LinkNet nodes have been replaced by CANopen-based LINKnet HT nodes. Some inventories of the LON LinkNet obsolete modules are held at Woodward facilities globally. Woodward is offering a final Last Time Buy opportunity for this inventory on as-is and first come first served basis until the inventory is depleted.

Obsolete LON LinkNet Modules

Product	Upper Level	Description	Quantity on Hand
LinkNet	9905-678	6-Ch Analog Input 200 Ohm RTD	5
LinkNet	9905-970	6-Ch Analog Input 100 Ohm RTD	1
LinkNet	9905-966	6-Ch Analog Input T/C Fail-high	24
LinkNet	9905-967	6-Ch Analog Input T/C Fail-low	2
LinkNet	9905-968	6-Ch Analog Input 4–20 mA w/o 24 V Loop Power	21
LinkNet	9905-969	6-Ch Analog Input 4–20 mA w/ 24 V Loop Power	0
LinkNet	9905-971	16-Ch Discrete Input 24 Vdc	0
LinkNet	9905-972	6-Ch Analog Output 4–20 mA	1
LinkNet	9905-973	8-Ch Discrete Output 5 A	1
LinkNet	9905-760	Link Termination Resistor	2
MicroNet	5466-031	NETCON I/O CONTROLLER	19

Customer Action

Prior to December 2023, contact your local Woodward representative for a final Last Time Buy opportunity and/or to discuss available replacement/upgrade products. Beginning January 2024, Woodward will finally and permanently stop production and clear inventories of above-mentioned upper levels.