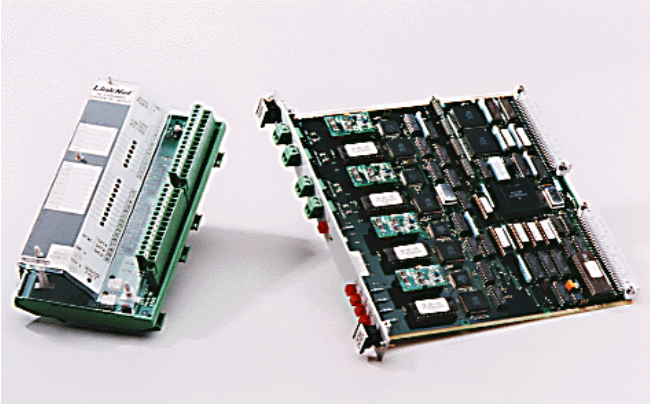
LINKnet*

Distributed I/O Network

Description

The LINKnet* distributed I/O network provides low cost, easy to implement distributed I/O capabilities for the NetCon* control system. The LINKnet I/O modules, while slower and less powerful than NetCon I/O modules, are well suited for non-turbine control functions like sequencing and monitoring.



Network Architecture

The network consists of a single NetCon module which provides four independent network trunks of up to 60 I/O modules each. The LINKnet modules, or nodes, on each trunk are all attached to the NetCon controller module via a single twisted pair wire. One NetCon controller module can, therefore, interface with as many as 240 LINKnet modules, each having multiple I/O channels, through four twisted pair wires.

Each of the four channels on the NetCon controller module may run in a different rate group. The rate group for each channel will be defined in the MOE* coder application. All nodes on a network will run at the same rate.

Each LINKnet module has two rotary switches that are used to set the network address. On installation, these switches must be dialed so that the module's number (1 to 60) matches the network address defined for this node in the MOE coder.

Hardware

Each network consists of one standard, plug-in NetCon module and many I/O modules. The I/O modules include thermocouple, RTD, (4 to 20) mA, and discrete input modules, as well as (4 to 20) mA and relay output modules. 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, Phoenix field termination module type package for DIN rail mounting. The modules can be mounted in the control cabinet or in any convenient location in the vicinity of the turbine that meets the temperature and vibration specifications.

A LINKnet Termination Module must be installed as the last LINKnet module on the network.

- Low cost distributed I/O network
- I/O modules are hot replaceable
- Easy to implement
- Seamless interface with the NetCon* control
- Well suited for non-turbine functions such as sequencing and monitoring

I/O Module Specifications

Accuracy: 1 % at 25 °C without field calibration

Power Supply Input: (18 to 32) V (dc)

Isolation:
Network to I/O channel: 277 V (ac)
Power supply input to network: 277 V (ac)
I/O channel to I/O channel: 0 V (rms)
Power supply input to I/O channel: 500 V (dc) (except for discrete inputs; discrete input power comes directly from power supply input)

Field Wiring: 2 mm² (14 AWG) maximum wire size

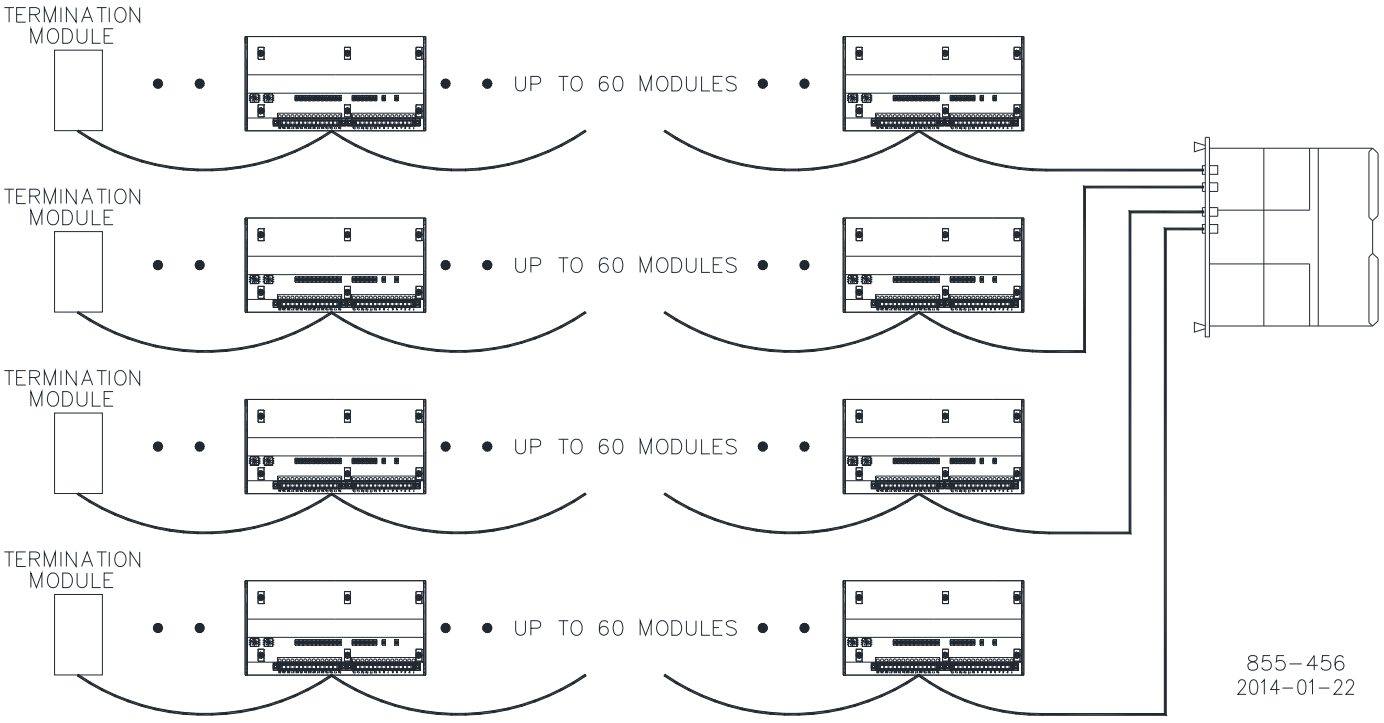
Temperature Range: (–40 to +55) °C

UL Listed: Class I, Division 2, Groups A, B, C, and D

Shock and Vibration:
US MIL-STD-810, 30 Gs sine wave at 11 ms
US MIL-STD-167, (18 to 50) Hz

EMC:
Emissions: EN 55011, Class A, Group 1
ESD immunity: IEC 801-2 (1991) 8 kV air and 4 kV contact, HCP and VCP tests
Radiated RF immunity: IEC 801-3, 10 V/m +80 % 1 kHz AM, (80 to 1000) MHz
Fast transient immunity: IEC 801-4 (1988) 2 kV directly coupled onto power lines and 2kV capacitively coupled onto I/O network lines

Scan Rate:
Less than 7 output modules:
(# of I/O modules x 6 + 75) ms typical
(# of I/O modules x 6 + 100) ms maximum
7 or more output modules:
(# of I/O modules x 6 + # of outputs)



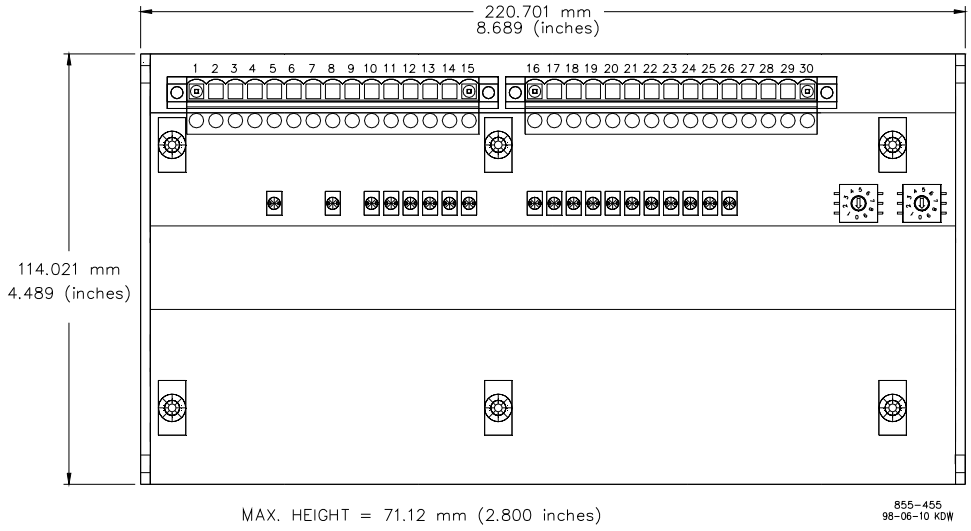
Schematic of I/O Network

Individual Module Specifications

Module Type	Number of Channels	Resolution (bits)	Contact Rating	Temperature Coefficient (ppm/°C)	Input Impedance	Power Required (W)
Discrete Input	16	N/A	N/A	N/A	N/A	6.5
Relay Output	8	N/A	5 A at 28 V (dc)	N/A	N/A	5.3
(4 to 20) mA Input	6	12	N/A	235	250 Ω	2.6
(4 to 20) mA Output	6	12	N/A	250	N/A	7.3
RTD Input	6	12	N/A	290	2.2 MΩ	3.6
Thermocouple Input (J or K type +1 AD590)	+1 cold junction	12	N/A	235	2 MΩ	2.6

Cable Length and Number of I/O Modules

Temperature Range	(0 to 55) °C	(–20 to +55) °C	(–40 to +55) °C
Worst case maximum cable length	150 m	150 m	50 m
Maximum number of nodes	60	32	20
Maximum stub length	300 mm	300 mm	300 mm



Outline Drawing of I/O Module
(Do not use for construction)

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