MicroNode™ I/O

Compact Fieldbus and Ethernet I/O with cLogic™ Control Engine

The MicroNode™ I/O product line provides high density, compact and economical I/O solutions for popular DeviceNet™, Profibus®, EtherCAT®, and Ethernet Networks. In addition, the Ethernet versions contain cLogic™, an on-board C-compiler to handle the distribution of real-time logic tasks. No longer are you limited by network bandwidth, as you designate time critical tasks to your I/O modules, where they belong.

To best meet applications requirements, a variety of models are available with a mix of digital I/O, analog inputs, and analog outputs. In addition, the digital I/O is available in either sinking or sourcing configuration. To ensure quick installation, the MicroNode™ I/O package provides flexible side or front mounting and easy access to I/O through a standard 37-pin D-Sub connector. Specific attributes of the MicroNode configurations include:

Networks

- **Fieldbus:** DeviceNet, EtherCAT, and Profibus
- **Ethernet:** Modbus/TCP™ and Ethernet/IP™

I/O Configurations

- **MicroNode DIDO:** 16 digital I/O points (optically isolated), each can be used as either an input or an output
- **MicroNode Combo**: Combination of digital I/O points, analog input points, and analog output points

Product Features

- High density analog, digital, or combination of I/O points in a compact and economical package
- Digital I/O points available in either sink or source versions
- Digital I/O points individually configurable for input or output
- Analog Input points are single-ended, 12-bit resolution, configurable for 0-10V or ±5V input ranges
- Analog Output points are single-ended, 12-bit resolution, ±10V output range
- High density D-Sub 37-pin I/O connector to secure interface with field I/O wiring

Key Benefits

- cLogic™ distributed real-time logic capability
- Easy to install and configure, with monitoring LED of status and all digital points
- Rotary switches for network address and data rate

Ethernet I/O Modules

Using standard TCP/IP protocols, the MicroNode Ethernet modules can provide reliable, high speed connectivity at up to 2msec output update timing. Units are ordered as Modbus/TCP or Ethernet/IP versions and utilize standard CAT 5 network cables. All Ethernet models contain web browser user interface for debug, manual control and data collection.

cLogic™ Real-Time Control Engine

Modularize and distribute time critical tasks where they belong. MKS cLogic allows you to overcome TCP/IP network bandwidth concerns by distributing logic to the I/O modules. You designate your logic using standard C code, and then activate the MicroNodes on-board C-compiler. cLogic is only available on Ethernet models.

Examples of control logic include:

- Distributed sequences
- PID control
- Signal filtering and analysis
- Frequency, pulse width, count

DeviceNet I/O Modules

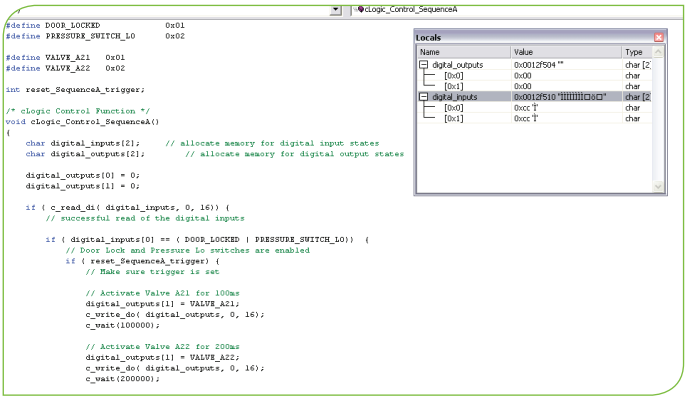
MicroNode DeviceNet is ODVA Semi SIG compliant, implementing all required object models, connectivity and configuration. Supports Explicit Messaging and Polled I/O. Connect using 5 pole microfast type connection, and set MAC ID/Baud rate using rotary switches located on the front panel. DeviceNet units also have the option of powering the I/O directly from the network bus power, via end user jumper configuration. See the user manual for instructions.

Profibus I/O Modules

MicroNode Profibus is PTO compliant, implementing all required object models, connectivity and configuration for Profibus DP. Node address is set using rotary switches located on the front panel.

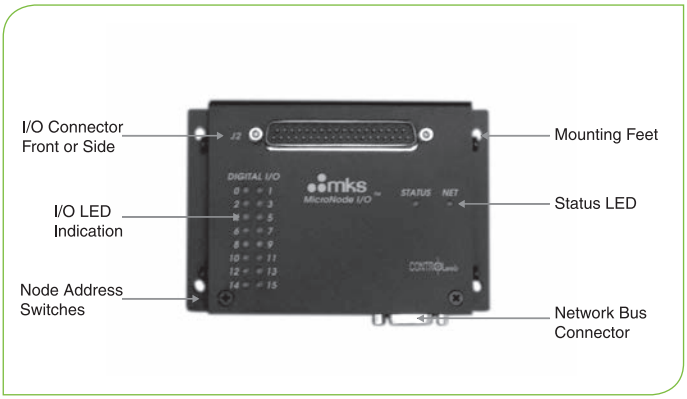
Mounting and Connection

Each MicroNode contains options for I/O connector placement and mounting feet. The D-sub 37 I/O connector is located on the front face or on the side, whichever configuration best meets your requirements. Mounting feet can be located to face front or back. Package size is only 80 x 120 x 29 mm.



cLogic™ Control Engine
Add real-time control to each module

MicroNode Modules
DeviceNet Module - top; Profibus Module - bottom



Module Features
DeviceNet Module - top; Profibus Module - bottom

Specifications

Model	DIDO	Combo	Combo	Specification
Network	**DN, E**	**DN, E, ECAT**	**PB**	**DN = DeviceNet, PB = Profibus, E = Ethernet, ECAT = EtherCAT**
Dimensions (HxWxD)	x	x	x	3.150 x 4.724 x 1.142 inches (80 x 120 x 29 mm)
Weight	x	x	x	0.44 lb (200 g)
Environmental				
Operating Temperature	x	x	x	0 to +55°C
Storage Temperature	x	x	x	-40 to +85°C
Humidity	x	x	x	5 to 95% non-condensing
Front Panel Indicators				
Network, Module	x	x	x	DeviceNet bi-color (red/green) status LEDs, EtherCAT Run & Error Status LEDs
Digital I/O Points	16	8	16	Green status LEDs
Rotary Switches	x	x	x	Node Address, Baud Rate (DeviceNet only)
Power				
Minimum for Network + CPU	x	x	x	24VDC, 120mA
AIO Power		x	x	Internal ±15VDC; 50mA.
Digital I/O Points				
Number of DIDO	16	8	8/8	Each point either digital input or output (except for Profibus Combo)
Inputs	x	x	x	Optocoupler, 1.5mA minimum, 1.5 msec filtering
Outputs	x	x	x	Open collector, 200mA maximum/channel
Max Output Current	x	x	x	800 mA maximum on DIO 0-7, 800mA maximum on DIO 8-15
Isolation	x	x	x	500V optical isolation between CPU and digital I/O
Analog Input Points (AI)				
Number of Inputs		8	7	Single-ended analog inputs
Input Range		x	x	Software selectable (0V to 10V), (-5V to +5V)
Resolution		x	x	12-bit
Filtering		x	x	16 Hz
Protection		x	x	±15V over-voltage protection
Non-linearity		x	x	±3 bit (0.0732%)
Offset Error		x	x	±10mV (0.2%)
Gain Error		x	x	±0.5%
Impedance		x	x	10 kohm minimum at 10V
Analog Output Points (AO)				
Number of Outputs		4	4	Single-ended analog outputs
Output Range		x	x	-10V to +10V
Resolution		x	x	12-bit
Output Current		x	x	5mA / channel into a 2 kohm load
Offset Error		x	x	±2 LSB (~5mV)
Gain Error		x	x	±0.4%

Ordering Information

Pin-Outs

DIDO Model Connector			
Pin	Signal	Pin	Signal
1	+24V IN	20	24V GND
2	DIO9	21	24V GND
3	DIO8	22	+24V IN
4	24V GND	23	+24V IN
5	+24V IN	24	
6	DIO7	25	24V GND
7	DIO6	26	+24V IN
8	24V GND	27	DIO15
9	+24V IN	28	DIO14
10	DIO5	29	24V GND
11	DIO4	30	+24V IN
12	24V GND	31	DIO13
13	+24V IN	32	DIO12
14	DIO3	33	24V GND
15	DIO2	34	+24V IN
16	24V GND	35	DIO11
17	+24V IN	36	DIO10
18	DIO1	37	24V GND
19	DIO0		

Combo Model Connector			
Pin	Signal	Pin	Signal
1	24V GND	20	A GND
2	24V GND	21	A GND
3	24V GND	22	AO0
4	24V GND	23	AO1
5	24V GND	24	AO2
6	DIO7	25	AO3
7	DIO6	26	AI0
8	DIO5	27	AI1
9	DIO4	28	AI2
10	DIO3	29	AI3
11	DIO2	30	AI4
12	DIO1	31	AI5
13	DIO0	32	AI6
14	+24V IN	33	AI7
15	+24V IN	34	+15V REF
16	+24V IN	35	+15V REF
17	+24V IN	36	-15V REF
18	+24V IN	37	-15V REF
19	+24V IN		

Ethernet Combo Connector			
Pin	Signal	Pin	Signal
1	A GND	20	A GND
2	AO0	21	AO1
3	AO2	22	AO3
4	-15V REF	23	-15V REF
5	AI0	24	AI1
6	AI2	25	AI3
7	AI4	26	AI5
8	AI6	27	AI7
9	+15V REF	28	+15V REF
10	24V GND	29	24V GND
11	24V GND	30	24V GND
12	24V GND	31	DIO7
13	DIO6	32	DIO5
14	DIO4	33	DIO3
15	DIO2	34	DIO1
16	DIO0	35	+24V IN
17	+24V IN	36	+24V IN
18	+24V IN	37	+24V IN
19	+24V IN		

Ordering Information

Ordering Information - Fieldbus Models						
Model Number	Part Number	Analog		Digital		Connector
		IN	OUT	I/O	Type	Position
DeviceNet Combo	AS00124-01	8	4	8	SNK	FRONT
DeviceNet Combo	AS00127-01	8	4	8	SRC	FRONT
DeviceNet Combo	AS00612-01	16	8	16	SRC	FRONT
Profibus Combo	AS00160-02	7	4	16	SRC	FRONT
EtherCAT	AS02232G-01	8	4	8	SNK	FRONT

Ordering Information - Ethernet Models						
Model Number	Part Number	Analog		Digital		Connector
		IN	OUT	I/O	Type	Position
Ethernet MB DIDO	AS00239-01	0	0	16	SNK	FRONT
Ethernet MB DIDO	AS00249-01	0	0	16	SRC	FRONT
Ethernet MB DIDO	AS00246-01	8	4	8	SNK	FRONT

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