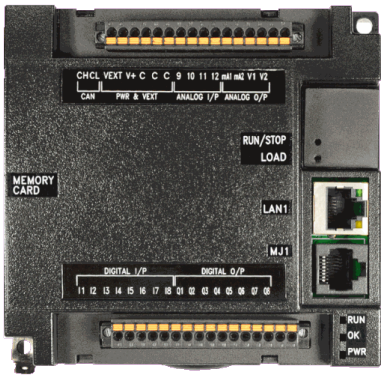
i3N100/08D12-SEHF
Remote Compact Controller

IMO

Technical Datasheet

Key Features

- Built-in Ethernet, CAN, RS-232 and MicroSD
- 8 Digital Inputs
- 8 Digital Outputs
- 4 Analog Inputs
- 2 Analog Outputs
- Advanced Ladder Logic
- 2x Serial Ports



General Data

Required Power (steady state)	120mA at 24VDC
Required Power (inrush)	25A for 1ms at 24VDC switched
Primary Power Range	10-32VDC
Real Time Clock	Yes
Clock Accuracy	±8 seconds/month at 25°C
Relative Humidity	5 to 95% non-condensing
Operating Temperature	-10°C to +60°C
Storage Temperature	-10°C to +60°C
Altitude	Up to 2000m
Battery	Li-Ion polymer battery charging range 0-50°C
Weight	283.5g / 10oz
Mounting	35mm DIN Rail or Panel Surface
Housing Type	Plastic (UL 50 rated, flame retardant, UV resistant)

Control & Logic

Control Language Support	Advanced Ladder Logic Full IEC 61131-3 Langauages
Logic Size & Scan Rate	128kB, 0.013ms/kB
Online Programming Changes	Supported in Advanced Ladder
PID Support	Up to 6
Digital Inputs (%I)	2048
Digital Outputs (%Q)	2048
Analog Inputs (%AI)	512
Analog Outputs (%AQ)	512
General Purpose 16-bit Registers (%R)	4096 Retentive
General Purpose 1-bit Registers (%T)	2048 Non-Retentive
General Purpose 1-bit Registers (%M)	2048 Retentive

Connectivity

Serial	2 (1x RS-232, 1x 2-wire RS-485)
CAN	1x 125kbps - 1 Mbps
Ethernet	1x 10Mbps / 100Mbps
microSD	1x SD, SDHC, SDXC in FAT32 format
USB	No
Communication Support	WebMI
	Web Portal
	Outgoing Email with Attachments
	TCP/IP and Modbus TCP/IP
	FTP
	Data Logging

Digital DC Inputs

Inputs per Module		8
Commons per Module		1
Addressing		%I1 to %I14
Input Voltage Range		0VDC or 10-30VDC
Absolute Max. Voltage		35VDC Max.
Input Impedance		10kΩ
Input Current	Positive Logic	Negative Logic
Min. "On" Current	0.8mA	-1.6mA
Max. "Off" Current	0.3mA	-2.1mA
Min. "On" Input		8VDC
Max. "Off" Input		3VDC
OFF to ON Response		100µs min.*
ON to OFF Response		100µs min.*
Galvanic Isolation		None
Logic Polarity		Pos. or Neg. Based on Configuration
I/O Indication		LED
High Speed Counter (HSC)		None
Connector Type		5.08mm & 3.5mm Pluggable Cage Clamp

Digital DC Outputs

Outputs per Module	8
Commons per Module	1
Addressing	Inputs: %I1 to %I8, Outputs: %Q1 to %Q8
Output Type	Sourcing
Absolute Max. Voltage	30VDC Max.
Output Protection	Short Circuit & Overvoltage
Max. Output Current per Point	0.5A
Max. Total Current	2A Total Current
Max. Output Supply	30VDC
Min. Output Supply	10VDC
Max. Voltage Drop at Rated Current	0.25VDC
Min. Load	None
I/O Indication	LED
Galvanic Isolation	None
OFF to ON Response	500ns min.*
ON to OFF Response	500ns min.*
PWM Out	None
Output Characteristics	Current Sourcing (Pos. Logic)

* All values updated 1x per scan

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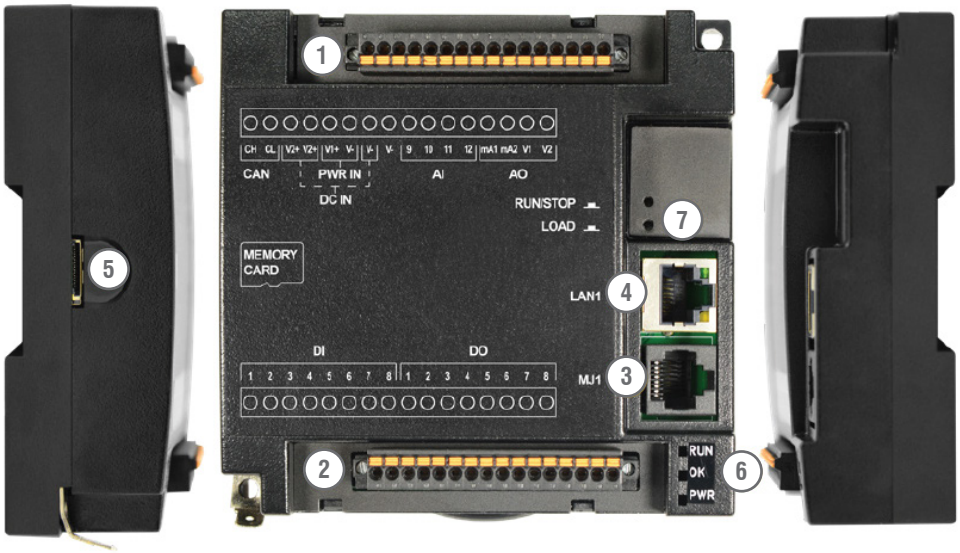
Analog Inputs

Inputs per Module	4
Input Ranges	0-10VDC, 0-20mA DC
Addressing	%A1 to %A14
%AI Full Scale Value	32,000
Max. Input Voltage	-0.5 to 12VDC (±30VDC)
Galvanic Isolation	None
Input Impedance (clamped @ -0.5 to 10.23VDC)	mA: 15kΩ ±1.5V V: 1.1MΩ
Nominal Resolution	12 bits
Conversion Rate	All channels once per OCS scan
Max. Error at 25°C (excludes 0°C)	1.5% of full scale 0-10V - 1.5% of full scale
Filters	160Hz hash (noise) 1-128 scan digital running average

Analog Outputs

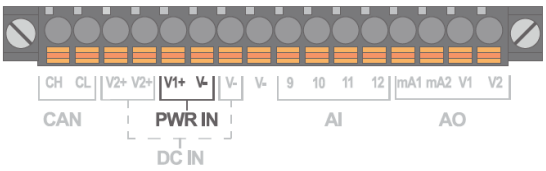
Number of Channels	2
Output Ranges	0-10VDC, 0-20mA DC
Addressing	%AQ1 to %AQ2
%AI Full Scale Value	32,000
Galvanic Isolation	None
Nominal Resolution	12 bits
Max. Current Load	500Ω
Conversion Rate	One Update / Ladder scan
Response Time	One update / Ladder scan
Max. Error at 25°C (excludes 0°C)	0-20mA 0.25% of full scale 0-10V



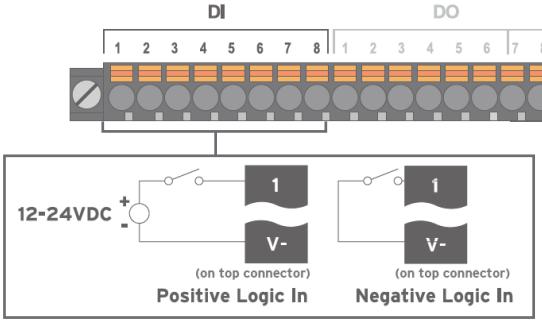
1. Power, CAN & Analog I/O Connector
2. Digital Connector
3. Serial Port
4. Ethernet Port
5. microSD Slot
6. Status LEDs
7. Buttons

Power Wiring

To power up the i3N, supply 10-32VDC to the V+ and V- connections on the Power, CAN and Analog Connector.

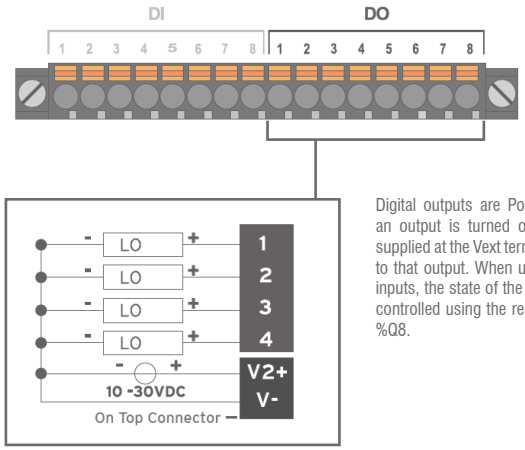


Digital Input Wiring



The i3N8842's digital inputs can be wired for Positive Logic or Negative Logic. Settings for the Digital Inputs must match the wiring used in order for the correct input states to be registered. The state of the input is reflected in registers %I1 - %I8. The common connections are found on the top connector

Digital Output Wiring



Digital outputs are Positive Logic. If an output is turned on, the voltage supplied at the Vext terminal is applied to that output. When used as normal inputs, the state of the output may be controlled using the registers %Q1 to %Q8.

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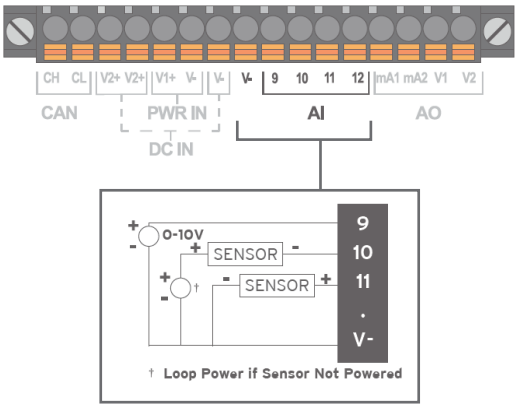
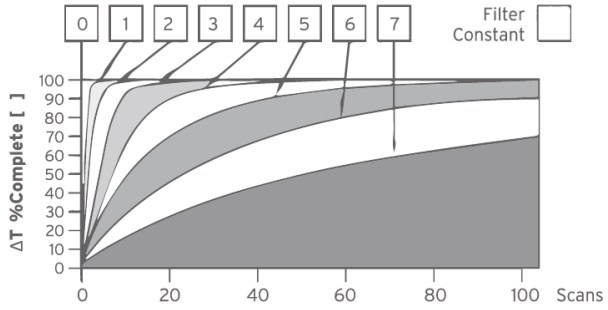
Digital Input Wiring

CAN, PWR & Analog I/O Connector



Raw input values for channels 1-4 are found in the registers as Integer-type data with a range from 0 – 32000.
Analog inputs may be filtered digitally with the Filter Constant found in the i3 Hardware Configuration for Analog Inputs. Valid filter values are 0 – 7 and act according to the following chart:

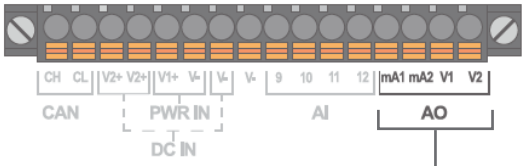


Data Values

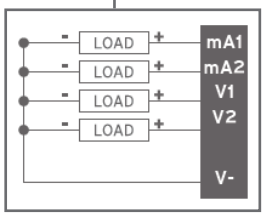
Input Mode	Data Format, 12-bit INT
0-20mA, 4-20mA	0-32000
0-10V	0-32000

Analog Output Wiring

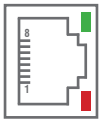
CAN, PWR & Analog I/O Connector



Each Analog Output may be specified for a range of 0-10VDC, 0-20mA DC or 4-20mA DC. For whichever range is configured, the Analog Output registers %AQ1 - %AQ4 may be used to control the output by placing a value between 0 – 32000 into the register. This may be directly from a PID loop output or a conversion from a desired output from the touchscreen, for example.



Ethernet Communications



Modular jack (8 posn RJ45)

10/100 Ethernet port with automatic MDI-X (crossover detection) is provided via the single 8-position modular jack labelled "LAN". Several features are available for use over Ethernet, such as WebMI, Modbus TCP/IP, Ethernet/IP, SMTP (E-mail), expansion I/O to SmartRail and more.

Ethernet configuration is done via the i3 Configurator Hardware Configuration.

For more information on Ethernet, available features and protocols, refer to the i3Ni User Manual.

Serial Communications

MJ1/2 Serial Ports

MJ1: RS-232 with Full Handshaking
MJ2: RS-485 Half-Duplex

	MJ1 Pins		MJ2 Pins	
Pin	Signal	Direction	Signal	Direction
8	TXD	OUT	-	-
7	RXD	IN	-	-
6	0 V	Ground	0 V	Ground
5	+5V@60mA	OUT	+5V@60mA	OUT
4	RTS	OUT	-	-
3	CTS	IN	-	-
2	-	-	RX- / TX-	IN / OUT
1	-	-	RX+ / TX+	IN / OUT

Status LEDs

Three LEDs provide general status of the i3N:

LED Type	When OFF	When ON	When FLASHING (1Hz)
PWR	No power applied	10-30VDC applied	N/A
OK	Self-test fail	Self-test pass	I/O forcing enabled
RUN	Stop mode	Run mode	Do I/O mode

LED DIAGNOSTIC FUNCTIONALITY
When the OK and RUN are flashing alternately, a download is in progress. When the flashing stops, the download is complete and the unit will reboot (allow 30 seconds). When flashing together, the download has failed, and the number of flashes indicates the error. There will be a 2 second gap and the pattern will be repeated. The number of flashes and the associated error are as follows:

2 Flashes - The MAC ID is empty
3 Flashes - The internal MAC file is corrupt
4 Flashes - The MAC ID TXT file is invalid
5 Flashes - The MAC ID file is not found or the microSD card is empty or missing system files

Built-In I/O

Registers	Description
%I1 to %I8	Digital Inputs
%I9 to %I15	Reserved
%I16	%Q Fault Status
%Q1 to %Q4	Digital Outputs
%AI1 to %AI8	Analog Inputs
%AQ1 to %AQ4	Analog Outputs

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Dimensions