*i*³C Lite Intelligent Control Station

IMO

Technical Datasheet

Key Features

- 480 x 272 colour LCD display
- MicroSD™ data storage
- Real time clock
- 1 CAN Port, 1 RS-232, 1 RS-485
- IP65 (NEMA 4X)
- USB port for programming
- Free configuration software
- 1 x Ethernet port

CE

Options & Ordering Codes

Standard Options	DI	DO	AI	AO
i3CL12Y/10D12-SEHF	12	6 Relay+2	4	2
i3CL12Y/10D14-SEHF	12	12	4	2

i3 CL 12 Y / 10 D 1 2 - S E H F

Colour Display
480 x 272 px — CL

Comms Ports
RS-232, RS-485 — 12

Programmable Keys
4 Virtual Programmable Keys — Y

Digital Input
12 Digital Inputs — 10

Analogue Input
4 (12 Bit) — D

Analogue Output
1 — 2 (12 Bit)

Digital Output
2 — 6 (Relay) + 2 (DC)
4 — 12 (DC)

S — Serial
E — CAN plus Ethernet
H — *i*CAN
F — MicroSD™ Flash Card

NOTE: This controller is expected to be UL approved by April 2019

i^3C Lite Intelligent Control Station

IMO

Technical Datasheet

Technical Specifications

General Specifications

Required Power (Steady State)	120mA @ 24VDC
Primary Voltage Range	24VDC ± 20%
Inrush Current	30A for <1ms
Relative Humidity	5 to 95% Non-Condensing
Clock Accuracy	+/-90 seconds per month at 20°C
Operating Temperature	-10°C to +60°C
Storage Temperature	-20°C to +70°C
Weight	0.360kg

Display Specifications

Display Type	4.3" Colour LCD
Resolution	480 x 272 Pixels
Keys	4 Virtual Slide Keys (touch)
Screen Memory	256kB
User-Programmable Screens	250 (max. 30 objects per screen)
Backlight	LED - 20,000 hours to reach 50% brightness
Screen Update Rate	User configurable within the scan time (perceived as instantaneous in many cases)

Control & Logic Specifications

Control Language Support	Advanced Ladder Logic, Full IEC 61131-3
Logic Program Size & Logic Scan Rate	256kB Maximum, 1.2ms/kB
I/O Support	Digital Inputs - 1024
	Digital Outputs - 1024
	Analogue Inputs - 256
	Analogue Outputs - 256
General Purpose Registers	5,000 (words) Retentive 1,024 (bits) Retentive 1,024 (bits) Non-retentive
Non-Retentive Memory	128kB

Connectivity

Serial Ports	1 RS-232, 1 RS-485
USB mini-B	USB 2.0 (480MHz) Programming & Data Access
CAN	CAN 2.0; Remote I/O, Peer-to-Peer Comms, i3 Configurator
Remote I/O	Modbus RTU, Modbus TCP, iCAN; IOS, Smart I/O, iSmart
Removable Memory	MicroSD™ (support for 32GB max) Application updates, Datalogging, more

I/O Specifications

Digital DC Inputs

Inputs per Module	12 including 4 configurable HSC inputs	
Commons per Module	1	
Input Voltage Range	24 VDC	
Absolute Max. Voltage	35 VDC Max	
Input Impedance	10 kΩ	
Input Current Upper Threshold Lower Threshold	Positive Logic 0.8mA 0.3mA	Negative Logic -1.6mA -2.1mA
Max. Upper Threshold	8 VDC	
Max. Lower Threshold	3 VDC	
OFF to ON Response	0.1 ms	
ON to OFF Response	0.1 ms	
HSC Max. Switching Rate	10kHz - Totalize 2.5kHz - Quadrature 5kHz - Per Frequency	
Modes Supported	Totalizer, quadrature, pulse measurement, frequency measurement, set point controlled outputs	

Digital Relay Outputs

Outputs per Module	6 Relay
Commons per Module	6
Max. Switching Current per Relay	3A @ 60 VAC, Resistive 3A @ 30 VDC, Resistive
Max. Total Output Current	5A Continuous
Max. Switching Voltage	60 VAC, 30 VDC
Max. Switched Power	150W
Contact Isolation to Ground	1000 VAC
Max. Voltage Drop at Rated Current	0.5V
Expected Life (see below for detail)	No Load: 5,000,000 100,000 at rated load
Max. Switching Rate	300 CPM at no load 20 CPM at rated load
Type	Mechanical Contact
Response Time	One update per ladder scan plus 10ms

Digital DC Outputs - Sinking PWM

Outputs per Module	2 PWM or HSC Out
Commons per Module	1
Type	Sinking w/optional 10kΩ pull-up
Absolute Max. Voltage	28VDC
Output Protection	Short Circuit
Max. Output per Point: Sinking	500mA
Max. Voltage Drop at Rated Current	0.25VDC
Max. Inrush	650mA
OFF to ON Time	20μs
ON to OFF Time	10μs
PWM Out	65kHz
Rise Time	10μs
Fall Time	20μs

Digital DC Outputs - Sourcing

Outputs per Module	12 Including 2 Configurable PWM Outputs
Commons per Module	2
Type	Sourcing / 10kΩ pull-down
Absolute Max. Voltage	28VDC
Output Protection	Short Circuit
Max. Voltage Drop at Rated Current	0.25VDC
Max. Inrush	650mA
Max. Output per Point: Sourcing	2.4mA @ 24VDC
OFF to ON Time	1μs
ON to OFF Time	1μs
PWM Out	65kHz
Rise Time	150ns
Fall Time	150ns

i^3C Lite Intelligent Control Station

Technical Datasheet

Technical Specifications continued

Analogue Inputs

Number of Channels	4
Safe Input Voltage Range	-0.5V to 12V, protection up to 24V
Nominal Resolution	12 Bits
Max. Over Current	35 mA
Max. Error at 25°C (excluding zero) Adjusting filtering may tighten	<1.50% of FS

Input Ranges	0-20 mA, 4-20 mA, PT100 RTD
Input Impedance (clamped @ -0.5VDC to 12VDC)	Current Mode: 100 Ω
%AI Full Scale	32,000
Conversion Speed	Once per Ladder Scan
Filtering	160 Hz hash (noise) filter 1-128 scan digital running average filter

Analogue Outputs

Number of Channels	2
Output Ranges	0-20mA
Nominal Resolution	12 Bits
Response Time	One update per scan

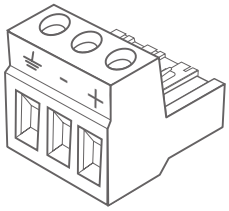
Minimum Current Load	500Ω
Protection	Protection against miswire up to 24VDC
%AQ Full Scale	32,000
Max. Error at 25°C (excluding zero)	0-20mA < 1.5% of FS

Approvals

Certifications	CE, UL, cUL, FCC
Shock Tested	IEC 60068-2-27
Vibration Tested	IEC 60068-2-6
IP Protection Degree	IP65 (NEMA 4X)

Port Connectors

Power Wiring



Primary Power Port Pins

Pin	Signal	Description
1	Ground	Frame Ground
2	DC -	Power Supply Common
3	DC+	Power Supply Voltage

DC Input / Frame

Solid/Stranded wire; 12-24AWG (2.5-0.2mm). Strip length - 0.28" (7mm)
Torque rating: 4.5-7.0 in/lbs (0.50-0.78Nm)
DC- is internally connected to I/O 0V
Class 2 power supply must be used to meet UL requirements

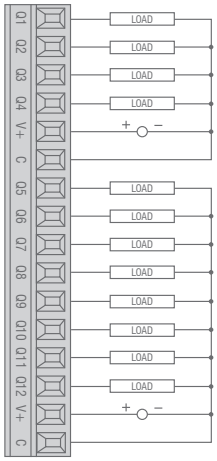
i^3C Lite Intelligent Control Station

Technical Datasheet

Wiring Connectors

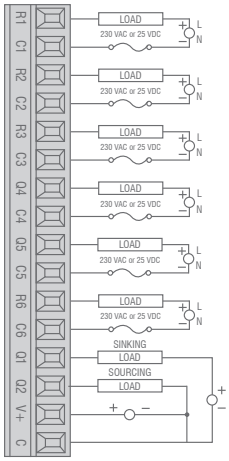
Model -10D14 Digital Out

Position / Pin		Digital Model
1	Q1	Output 1 (PWM)
2	Q2	Output 2 (PWM)
3	Q3	Output 3
4	Q4	Output 4
5	V+	External V+
6	C	Common
7	Q5	Output 5
8	Q6	Output 6
9	Q7	Output 7
10	Q8	Output 8
11	Q9	Output 9
12	Q10	Output 10
13	Q11	Output 11
14	Q12	Output 12
15	V+	External V 2+
16	C	Common



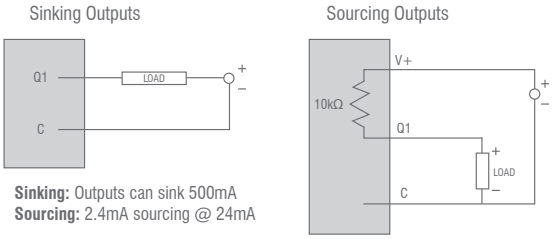
Model -10D12 Relay & Digital Out

Position / Pin		Digital Model
1	R1	Relay 1 NO
2	C1	Relay 1 C
3	R2	Relay 2 NO
4	C2	Relay 2 C
5	R3	Relay 3 NO
6	C3	Relay 3 C
7	R4	Relay 4 NO
8	C4	Relay 4 C
9	R5	Relay 5 NO
10	C5	Relay 5 C
11	R6	Relay 6 NO
12	C6	Relay 6 C
13	Q1	Output 1 (PWM)
14	Q2	Output 2 (PWM)
15	V+	External V+
16	C	Common



NOTE: Internal 10kΩ resistors between: V+ and Q1; V+ and Q2

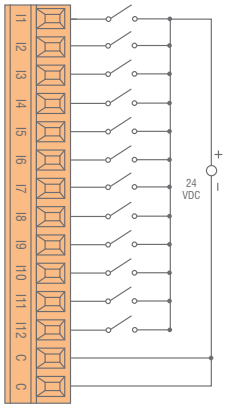
Model -10D14 Sinking & Sourcing Outputs



Sinking: Outputs can sink 500mA
Sourcing: 2.4mA sourcing @ 24mA

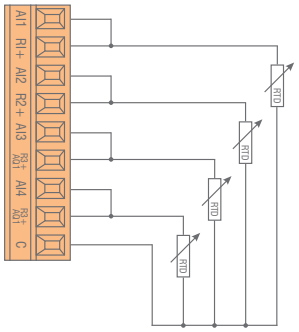
Digital Input

Position / Pin		Digital Model
1	I1	Input 1 (HSC)
2	I2	Input 2 (HSC)
3	I3	Input 3 (HSC)
4	I4	Input 4 (HSC)
5	I5	Input 5
6	I6	Input 6
7	I7	Input 7
8	I8	Input 8
9	I9	Input 9
10	I10	Input 10
11	I11	Input 11
12	I12	Input 12
13	C	Common
14	C	Common



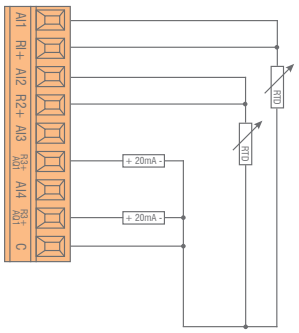
RTD: 4x2-Wire RTD Connection J3 Wiring

Pin	Digital Model
1	AI1
2	RTD1+
3	AI2
4	RTD2+
5	AI3
6	RTD3+/AQ1
7	AI4
8	RTD4+/AQ2
9	Common



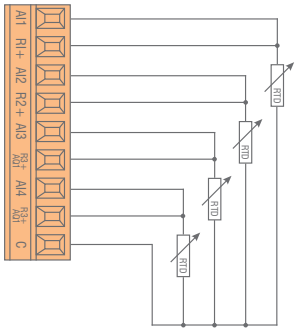
RTD: 2x3-Wire RTD Connection & 2x4-20mA Output J3 Wiring

Pin	Digital Model
1	AI1
2	RTD1+
3	AI2
4	RTD2+
5	AI3
6	RTD3+/AQ1
7	AI4
8	RTD4+/AQ2
9	Common



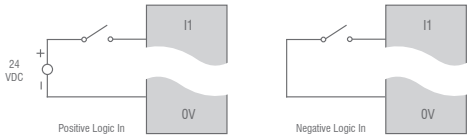
RTD: 4x3-Wire RTD Connection J3 Wiring

Pin	Digital Model
1	AI1
2	RTD1+
3	AI2
4	RTD2+
5	AI3
6	RTD3+/AQ1
7	AI4
8	RTD4+/AQ2
9	Common



Positive Logic Vs. Negative Logic Wiring

The i3 can be wired for positive logic inputs or negative.

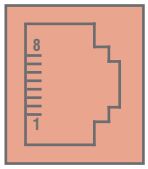


*i*³C Lite Intelligent Control Station

IMO

Technical Datasheet

CAN Communication



Modular jack (8 posn RJ45)

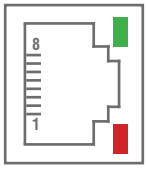
CAN Pin Assignments

Pin	Signal
8	No Connection
7	Ground
6	Shield
5	No Connection
4	No Connection
3	Ground
2	CAN Data Low
1	CAN Data High

The CAN port is provided via the single 8-position modular jack labelled "CAN". It may be used to communicate with other i3 modules using *i*CAN protocol. Additionally, remote expansion I/O such as Smart I/O may be implemented using the *i*CAN protocol.

Termination for the CAN port may be enabled from the System Menu or System Register. This should only occur if the i3CL is at one end of the CAN network or the other. Only the two devices on either end of the CAN network should be terminated.

Ethernet Communication



Link Indicator

Activity Indicator

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 i3RMI, Modbus TCP/IP, Ethernet/IP, SMTP (E-mail), and more.

Ethernet configuration is done via the i3 Configurator Hardware Configuration, though temporary Ethernet configuration may be done through the System Menu directly on the i3C Lite.

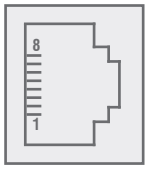
For more information on the Ethernet, available features and protocols, refer to the i3C Lite User Manual.

Built-in I/O

Both i3CL models feature built-in I/O. The I/O is mapped into i3 register space, in three separate areas – Digital/Analog I/O, High-Speed Counter I/O, and High-speed Output I/O. Digital/Analog I/O location is fixed starting at 1, but the high-speed counter and high-speed output references may be mapped to any open register location. For more details on using the high-speed counter and high-speed outputs, see the i3CL User Manual.

Fixed Address	Digital/Analogue I/O Function	10D12	10D14
%I	Digital Inputs	1-12	1-12
	Reserved	13-23	13-32
%Q	Digital Outputs	1-6	1-12
	Reserved	7-16	13-16
%AI	Analogue Inputs	1-4	1-4
	Reserved	5-12	5-12
%AQ	Analogue Outputs	1-2	1-2
	Reserved	3-6	3-6
Reserved areas maintain backward compatibility with other models			

Serial Communication



MJ1: RS-232 w/full handshaking
MJ2: RS-485 half-duplex
RS-485 termination and biasing via System Menu or System Register

Modular jack (8 posn RJ45)

	MJI Pin		MJ2 Pin	
Pin	Signal	Direction	Signal	Direction
8	TXD	OUT	--	
7	RXD	IN	--	
6	0V	Common	0V	
5	+5VDC @ 60mA	OUT	+5VDC @ ± 60mA	OUT
4	RTS	OUT	--	--
3	CTS	IN	--	--
2	--	--	RX– / TX–	IN / OUT
1	--	--	RX+ / TX+	IN / OUT

Installation Dimensions