## **Series** <sup>1</sup>/<sub>8</sub> DIN Temperature, Process and Strain PID Controllers

**i8 Series** 



- High Quality
- ✓ 5-Year Warranty
- High Accuracy: ±0.5°C (±0.9°F), 0.03% Reading
- User-Friendly, Simple to Configure
- Free Software
- ✓ Full Autotune PID Control
- Universal Inputs: RTD, Thermocouple, Process Voltage/Current, Strain
- Totally Programmable Color Displays Standard
- Built-In Excitation Standard
- 2 Control or Alarm Outputs: DC Pulse, Mechanical Relays, Analog Voltage and Current

#### Embedded Internet Connectivity Available

The NEWPORT® i8 is a 1/8 DIN size [96 x 48 mm (3.7 x 1.9")] digital panel meter featuring the big Series color-changing display. The digits are twice the size of typical 1% DIN panel meters. The iSeries meters feature the only LED displays that can be programmed to change color between GREEN, AMBER, and RED at any setpoint or alarm point. The "i8" model is available as an extremely accurate programmable digital panel meter with no outputs or with dual outputs for controlling or alarming functions. Other options include isolated programmable analog output, serial communications, Modbus and Ethernet. The user can easily program the i8 for any control or alarming requirement from simple on/off to full autotune PID with a choice of form C SPDT relays, solid state relays, DC pulse, and analog (voltage and current) outputs.

Fully isolated analog output for retransmission of the process value is available in addition to the control and alarm relays (specify model i8A33). shown smaller than actual size.

The i8 covers a broad selection of transducer and transmitter inputs with 2 input models.

The universal temperature and process instrument (i models) handles 10 common types of thermocouples, multiple RTDs, and several process (DC) voltage and current ranges. This model also features built-in excitation, 24 Vdc @ 25 mA. With its wide choice of signal inputs, this model is an excellent choice for measuring or controlling temperature with a thermocouple, RTD, or 4 to 20 mA transmitter.

The strain and process instruments (iS models) measure inputs from load cells, pressure transducers, and most any strain gage sensor as well as process voltage and



current ranges. The iS has built-in 5 or 10 Vdc excitation for bridge transducers, 5 Vdc @ 40 mA or 10 Vdc @ 60 mA (any excitation voltage between 5 and 24 Vdc is available by special order). This iS model supports 4- and 6-wire bridge configurations, ratiometric and non-ratiometric measurements.

The iS features fast and easy "in process" calibration/scaling of the signal inputs to any engineering units. This model also features 10-point linearization which allows the user to linearize the signal input from extremely nonlinear transducers of all kinds.

Input Type		Range	Accuracy		
Universal Process					
Process Voltage		0 to 100 mV, 0 to 1 V, 0 to 10 Vdc	0.03% rdg		
Process Current		0 to 20 mA (4 to 20 mA)	0.03% rdg		
	Excitation	24 V @ 25 mA			
Universal Strain/Process					
Process Voltage		0 to 100 mV, -100 to 1 V, 0 to 10 Vdc	0.03% rdg		
Process Current		0 to 20 mA (4 to 20 mA)	0.03% rdg		
Excitation		5 V @ 40 mA, 10 V @ 60 mV	_		
Nickel RTD Input (FS Required)					
RTD-1N (Nickel MIL-T-7990B)		0 to 200°C (32 to 392°F)	0.1°C (0.2°F)		
RTD-2N (Nickel MIL-T-7990B)		-40 to 300°C (-40 to 572°F)	0.3°C (0.5°F)		
Temperature					
J	Iron - Constantan	-210 to 760°C (-346 to 1400°F)	0.4°C (0.7°F)		
K	CHROMEGA™- ALOMEGA™	-270 to -160°C/-160 to 1372°C (-454 to -256°F/-256 to 2502°F)	1.0°C/0.4°C (1.8°F/0.7°F)		
Т	Copper - Constantan	-270 to -190°C/-190 to 400°C (-454 to -310°F/-310 to 752°F)	1.0°C/0.4°C (1.8°F/0.7°F)		
E	CHROMEGA™ - Constantan	-270 to -220°C/-220 to 1000°C (-454 to -364°F/-364 to 1832°F)	1.0°C/0.4°C (1.8°F/0.7°F)		
R	Pt / 13%Rh-Pt	-50 to 40°C/40 to 1768°C (-58 to 104°F/104 to 3214°F)	1.0°C/0.5°C (1.8°F/0.9°F)		
8	Pt / 10%Rh-Pt	-50 to 100°C/100 to 1768°C (-58 to 212°F/212 to 3214°F)	1.0°C/0.5°C (1.8°F/0.9°F)		
в	30% Rh-Pt / 6%Rh-Pt	100 to 640°C/640 to 1820°C (212 to 1184°F/1184 to 3308°F)	1.0°C/0.5°C (1.8°F/0.9°F)		
C	5% Re-W / 26%Re-W	0 to 2320°C (32 to 4208°F)	0.4°C (0.7°F)		
N	Nicrosil - Nisil	-250 to -100°C/-100 to 1300°C (-418 to -148°F/-148 to 2372°F)	1.0°C/0.4°C (1.8°F/0.7°F)		
L	J DIN	-200 to 900°C (-328 to 1652°F)	0.4°C (0.7°F)		
RTD	Pt, 0.00385, 100, 500, 1000 $\Omega$	-200 to 900°C (-328 to 1652°F)	0.4°C (0.7°F)		
RTD	Pt, 0.00392, 100, 500, 1000 Ω	-200 to 850°C (-328 to 1652°F)	0.4°C (0.7°F)		



### Totally Programmable Color Displays

The NEWPORT<sup>®</sup> **i**/8, **i**/16, and **i**/32 are the first complete series of 1/8, 1/16 and 1/32 DIN process control instruments with totally programmable color displays. The display

can be programmed to change color at any setpoint or alarm point.



#### Options

Ordering Suffix	Description			
-AL	Limit alarm version (alarms only, no PID control) <sup>314</sup>			
-SM	Simplified menu (on/off control or alarms, no PID)' <sup>6</sup>			
Networks Options				
-EIT	Ethernet with embedded Web server			
-C24	Isolated RS232 and RS485/422, 300 to 19.2 Kb <sup>2</sup>			
-C4EIT	Ethernet with embedded Web server + isolated RS485/422 hub for up to 31 devices'			
Power Supply				
-DC	12 to 36 Vdc, 24 Vac*2*5			
Factory Setup				
,FS	Factory setup and configuration			
,FS(RTD-1N)	Customized "iS" Model for MIL-T-7990B nickel RTD input, 0 to 200°C (32 to 392°F)			
,FS(RTD-2N)	Customized "iS" Model for MIL-T-7990B nickel RTD input, -40 to 300°C (-40 to 572°F)			
Software (Requires Network Option)				
OPC-SERVER LICENSE	OPC server/driver software license			

\*1 Ethernet options are not available for the **i8A** controller.

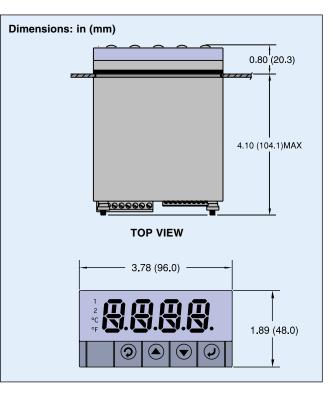
\*2 "-DC", "-C24", and "-C4EIT" not available with excitation.

\*3 Analog output is not available with "-AL" units.

\*4 i8A0x-AL contains 1 alarm and 1 analog retransmission.

\*5 20 to 36 Vdc for i8A, i8-C4EIT, i8-EIT.

\*6 "-SM" option not available on iS strain models.



Model No.	Output 1	Output 2
2 Control Outputs		
i833	Relay	Relay
i844	DC pulse	DC pulse
i843	DC pulse	Relay
i842	DC pulse	0.5 A SSR
i822	0.5 A SSR	0.5 A SSR
i823	0.5 A SSR	Relay
i824	0.5 A SSR	DC pulse
i853	Analog	Relay
i854	Analog	DC pulse
i852	Analog	0.5 A SSR
2 Control Outputs	and Isolated Analog Out	tput
i8A33	Relay	Relay
i8A44	DC pulse	DC pulse
i8A43	DC pulse	Relay
i8A42	DC pulse	0.5 A SSR
i8A22	0.5 A SSR	0.5 A SSR
i8A23	0.5 A SSR	Relay
i8A24	0.5 A SSR	DC pulse
Strain/Process Inp	ut with 2 Control Output	S
iS833	Relay	Relay
iS834	Relay	DC pulse
iS844	DC pulse	DC pulse
iS843	DC pulse	Relay
iS842	DC pulse	0.5 A SSR
iS822	0.5 A SSR	0.5 A SSR
iS823	0.5 A SSR	Relay
iS824	0.5 A SSR	DC pulse
iS853	Analog	Relay
iS854	Analog	DC pulse
iS852	Analog	0.5 A SSR

Comes with complete operator's manual.

Ordering Examples: i8A22, ½ DIN temperature/process controller with isolated analog output and 2 SSR outputs. i8833, ½ DIN strain/process controller with 2-relay outputs.

# **Series** Common Specifications (All i/8, i/16, i/32 DIN)

#### Universal Temperature and Process Input ("i" Models)

Accuracy: ±0.5°C temp; 0.03% rdg Resolution: 1°/0.1°; 10 µV process

#### **Temperature Stability:**

RTD: 0.04°C/°C TC @ 25°C (77°F): 0.05°C/°C Cold Junction Compensation Process: 50 ppm/°C

#### NMRR: 60 dB

CMRR: 120 dB

A/D Conversion: Dual slope Reading Rate: 3 samples/s

#### Digital Filter: Programmable

Display: 4-digit 9-segment LED 10.2 mm (0.40"); i32, i16, i16D, i8DV 21 mm (0.83"); i8 10.2 mm (0.40") and 21 mm (0.83"); i8DH RED, GREEN, and AMBER programmable colors for process variable, setpoint and temperature units

Input Types: Thermocouple, RTD, analog voltage, analog current

Thermocouple Lead Resistance:  $100 \Omega \max$ 

Thermocouple Types (ITS 90): J, K, T, E, R, S, B, Č, N, L (J DÍN) **RTD Input (ITS 68):** 100/500/1000 Ω

Pt sensor, 2-, 3- or 4-wire; 0.00385 or 0.00392 curve

Voltage Input: 0 to 100 mV, 0 to 1V, 0 to 10 Vdc

Input Impedance:  $10 M\Omega$  for 100 mV1 M $\Omega$  for 1 or 10 Vdc

**Current Input:** 0 to 20 mA (5  $\Omega$  load) **Configuration:** Single-ended

Polarity: Unipolar

Step Response: 0.7 sec for 99.9% **Decimal Selection:** 

Temperature: None, 0.1 Process: None, 0.1, 0.01 or 0.001

Setpoint Adjustment: -1999 to 9999 counts

Span Adjustment:

0.001 to 9999 counts

Offset Adjustment: -1999 to 9999

#### **Excitation (Not Included with**

Communication): 24 Vdc @ 25 mA (not available for low-power option)

#### Universal Strain and Process Input ("iS" Models)

Accuracy: 0.03% reading Resolution: 10/1µV Temperature Stability: 50 ppm/°C NMRR: 60 dB CMRR: 120 dB A/D Conversion: Dual slope Reading Rate: 3 samples/s **Digital Filter:** Programmable Input Types: Analog voltage and current Voltage Input: 0 to 100 mVdc, -100 mVdc to 1 Vdc, 0 to 10 Vdc

Input Impedance:  $10 M\Omega$  for 100 mV; 1 MΩ for 1V or 10 Vdc

**Current Input:** 0 to 20 mA (5  $\Omega$  load)

Linearization Points: Up to 10 **Configuration:** Single-ended

#### Polarity: Unipolar

Step Response: 0.7 sec for 99.9% Decimal Selection: None, 0.1, 0.01 or 0.001

#### Setpoint Adjustment:

-1999 to 9999 counts

Span Adjustment: 0.001 to 9999 counts

Offset Adjustment: -1999 to 9999 **Excitation (Optional In Place Of** 

Communication): 5 Vdc @ 40 mA; 10 Vdc @ 60 mA

#### Control

Action: Reverse (heat) or direct (cool) Modes: Time and amplitude proportional control; selectable manual or auto PID, proportional, proportional with integral, proportional with derivative and anti-reset Windup, and on/off

Rate: 0 to 399.9 s

Reset: 0 to 3999 s

Cycle Time: 1 to 199 s; set to 0 for on/off Gain: 0.5 to 100% of span; setpoints 1 or 2

Damping: 0000 to 0008 Soak: 00.00 to 99.59 (HH:MM), or OFF

Ramp to Setpoint:

00.00 to 99.59 (HH:MM), or OFF Auto Tune: Operator initiated from

front panel

#### Control Output 1 and 2

Relay: 250 Vac or 30 Vdc @ 3 A (resistive load); configurable for on/off, PID and ramp and soak

Output 1: SPDT, can be configured as alarm 1 output

Output 2: SPDT, can be configured as alarm 2 output

SSR: 20 to 265 Vac @ 0.05 to 0.5 A (resistive load); continuous

DC Pulse: Non-isolated; 10 Vdc @ 20 mA Analog Output (Output 1 Only):

Non-isolated, proportional 0 to 10 Vdc or 0 to 20 mA; 500 Ω max

Output 3 Retransmission: **Isolated Analog Voltage and Current** Current: 10 V max @ 20 mA output Voltage: 20 mA max for 0 to 10 V output

#### Network and Communications

Ethernet: Standards compliance IEEE 802.3 10 Base-T

Supported Protocols: TCP/IP, ARP, HTTPGET

RS232/RS422/RS485: Selectable from menu; both ASCII and Modbus protocol selectable from menu; programmable 300 to 19.2 Kb; complete programmable setup capability; program to transmit current display, alarm status, min/max, actual measured input value and status

RS485: Addressable from 0 to 199 Connection: Screw terminals

#### Alarm 1 and 2 (Programmable)

Type: Same as output 1 and 2

Operation: High/low, above/below, band, latch/unlatch, normally open/ normally closed and process/deviation; front panel configurations

Analog Output (Programmable):

Non-isolated, retransmission 0 to 10 Vdc or 0 to 20 mÅ, 500  $\Omega$  max (output 1 only); accuracy is ±1% of FS when following conditions are satisfied: input is not scaled below 1% of input FS, analog output is not scaled below 3% of output FS

#### General

Power: 90 to 240 Vac ±10%. 50 to 400Hz\*. 110 to 375 Vdc, equivalent voltage

Low Voltage Power Option: 24 Vac\*\* 12 to 36 Vdc for i/iS; 20 to 36 Vdc for dual display, ethernet, and isolated analog output from qualified safety approved source

#### Isolation

Power to Input/Output: 2300 Vac per 1 minute test

For Low Voltage Power Option: 1500 Vac per 1 minute test

Power to Relay/SSR Output: 2300 Vac per 1 minute test

Relay/SSR to Relay/SSR Output: 2300 Vac per 1 minute test

RS232/485 to Input/Output: 500 Vac per 1 minute test

#### **Environmental Conditions:**

All Models: 0 to 55°C (32 to 131°F) 90% RH non-condensing **Dual Display Models:** 0 to 50°C (32 to 122°F), 90% RH non-condensing (for UL only)

#### Protection:

i/iS32, 16, 16D, 8C: NEMA 4X/Type 4 (IP65) front bezel i/iS8.8DH.8DV: NEMA 1/Type 1 front bezel Approvals: UL, C-UL, CE per EN61010- 1:2001, FM (temperature units only)

#### Dimensions

i/8 Series: 48 H x 96 W x 127 mm D (1.89 x 3.78 x 5")

i/16 Series: 48 H x 48 W x 127 mm D

(1.89 x 1.89 x 5")

- i/32 Series: 25.4 H x 48 W x 127 mm D
- (1.0 x 1.89 x 5")

#### Panel Cutout

i/8 Series: 45 H x 92 mm W (1.772 x 3.622"), 1/8 DIN

i/16 Series: 45 mm (1.772") square, 1/16 DIN

i/32 Series: 22.5 H x 45 mm W

(0.886 x 1.772"), 1/32 DIN

#### Weight

i/8 Series: 295 g (0.65 lb) i/16 Series: 159 g (0.35 lb) i/32 Series: 127 g (0.28 lb)

\* No CE compliance above 60 Hz.

\*\* Units can be powered safely with 24 Vac power, but no certification for CE/UL are claimed.

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