

# 1/8 DIN Dual Display, Temperature, Process and Strain PID Controllers



## iSeries

### CNi8D Series



- ✓ Embedded Ethernet Connectivity (Optional)
- ✓ Dual Display with Bright Color-Changing Feature
- ✓ Programmable Digital Filter
- ✓ 2 Control or Alarm Outputs (Choice of DC Pulse, Solid State Relays, Mechanical Relays, Analog Voltage and Current)
- ✓ Full Autotune PID Control
- ✓ Built-In Excitation
- ✓ Front Removable

The OMEGA™ CNi8DH and CNi8DV are high-quality, highly accurate single loop autotune PID temperature and process controllers for 1/8 DIN (92 x 45 mm) horizontal or vertical panel cutouts. Both devices feature the same state-of-the-art technology, uncompromising accuracy, and quality backed by an extended 5-year warranty.

The CNi8DH and CNi8DV are simple to configure and use, while providing tremendous versatility and a wealth of powerful features.

The CNi8DH and CNi8DV come standard with your choice of 2 control or alarm outputs in almost any combination: solid state relays rated at 0.5 A @ 120/240 Vac; Form "C" SPDT relays rated at 3 A @ 120/240 Vac; pulsed 10 Vdc output for use with an external SSR; or analog output (0 to 10 Vdc or 0 to 20 mA) selectable for control or retransmission of the process value.



CNi8DH33, shown smaller than actual size.



CNi8DV33, shown smaller than actual size.

The universal temperature and process instrument (CNi8 models) offer a selection of 10 thermocouple types as well as 2-, 3- or 4-wire RTDs, process voltage and current. The CNi8DH and CNi8DV are ideal controllers for use with transmitters and amplified transducers. Built-in excitation is standard (24 Vdc @ 25 mA). The units handle 0 to 20 mA process current and process voltage in 3 scales: 0 to 100 mV, 0 to 1V, and 0 to 10V.

As with all iSeries devices, the process value display can be programmed to change color between **GREEN**, **AMBER**, and **RED** at any setpoint or alarm point. The LEDs displaying the process value on the CNi8DH (horizontal 1/8 DIN) are the largest digits of any 1/8 DIN controller.

The strain/process instrument (model iS) meters and controllers measure inputs from load cells, pressure transducers, and most any strain gage sensor. Input ranges include 0 to 100 mVdc; -100 mVdc to 1 Vdc; 0 to 10 Vdc in addition to 0 to 20 mA. Excitation for transducers of 5 V and 10 V is standard.

The highly recommended networking and communications options include direct Ethernet LAN connectivity with an embedded Web server, and serial communications. The C24 serial communications option includes both RS232 and RS485 which can be selected from the menu as well as both a

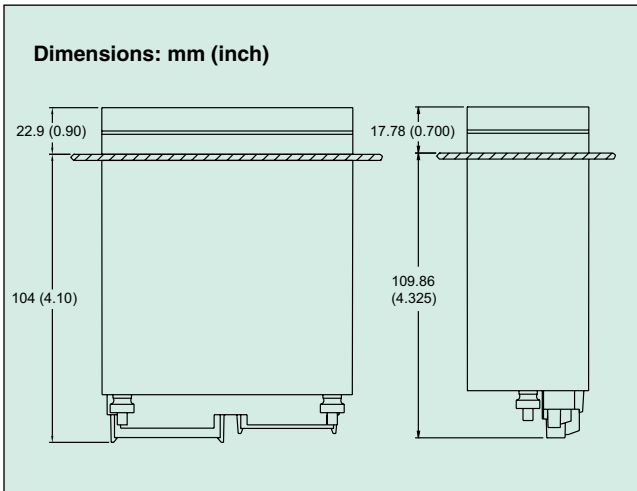
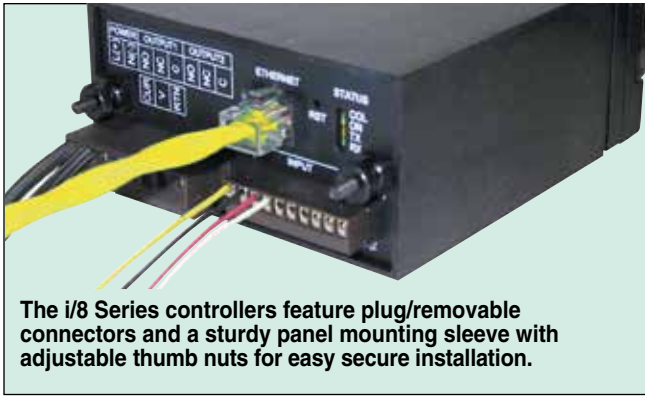
straightforward ASCII protocol. The C4EIT option includes Ethernet and RS485 ASCII on 1 device. The iSeries, with the network options, are designed for easy integration with popular industrial automation and control programs as well as Microsoft Visual Basic® and Excel®. OMEGA provides free configuration software which makes it fast and easy to get up and running with many applications. Available for download off the Internet.

## iSeries

### change color

at any setpoint

Totally Programmable Color Displays **PATENTED**



### Options

Ordering Suffix	Description
-AL	Limit alarm version (alarms only, no PID control) <sup>2</sup>
-SM	Simplified menu (on/off control or alarms, no PID) <sup>3</sup>
<b>Network Options</b>	
-EIT	Ethernet with embedded Web server
-C24	Isolated RS232 and RS485/422, 300 to 19.2 Kb <sup>*1</sup>
-C4EIT	Ethernet with embedded Web server + isolated RS485/422 hub for up to 31 devices <sup>*1</sup>
<b>Power Supply</b>	
	Standard power input: 90 to 240 Vac, 50 to 400 Hz (no entry required)
-DC	20 to 36 Vdc, 24 Vac <sup>*1</sup>
<b>Factory Setup</b>	
-FS	Factory setup and configuration
<b>Software (Requires Network Option)</b>	
Omega-Enterprise-Gateway	Logging/Alarming/Monitoring with Integration Capabilities

<sup>\*1</sup>"-DC", "-C24", and "-C4EIT" not available with excitation.

<sup>\*2</sup>Analog output is not available with "-AL" units.

<sup>\*3</sup>"-SM" option not available on CNI8 strain models.

### To Order

Model No.	Output 1	Output 2
<b>Dual Display Horizontal with 2 Control Outputs</b>		
CNI8DH33	Relay	Relay
CNI8DH34	Relay	DC pulse
CNI8DH44	DC pulse	DC pulse
CNI8DH43	DC pulse	Relay
CNI8DH42	DC pulse	0.5 A SSR
CNI8DH22	0.5 A SSR	0.5 A SSR
CNI8DH23	0.5 A SSR	Relay
CNI8DH24	0.5 A SSR	DC pulse
CNI8DH53	Analog	Relay
CNI8DH54	Analog	DC pulse
CNI8DH52	Analog	0.5 A SSR
<b>Dual Display Vertical with 2 Control Outputs</b>		
CNI8DV33	Relay	Relay
CNI8DV34	Relay	DC pulse
CNI8DV44	DC pulse	DC pulse
CNI8DV43	DC pulse	Relay
CNI8DV42	DC pulse	0.5 A SSR
CNI8DV22	0.5 A SSR	0.5 A SSR
CNI8DV23	0.5 A SSR	Relay
CNI8DV24	0.5 A SSR	DC pulse
CNI8DV53	Analog	Relay
CNI8DV54	Analog	DC pulse
CNI8DV52	Analog	0.5 A SSR
<b>Strain/Process Input, Dual Display Horizontal with 2 Control Outputs</b>		
CNI8DH33	Relay	Relay
CNI8DH44	DC pulse	DC pulse
CNI8DH43	DC pulse	Relay
CNI8DH42	DC pulse	0.5 A SSR
CNI8DH22	0.5 A SSR	0.5 A SSR
CNI8DH23	0.5 A SSR	Relay
CNI8DH24	0.5 A SSR	DC pulse
CNI8DH53	Analog	Relay
CNI8DH54	Analog	DC pulse
CNI8DH52	Analog	0.5 A SSR
<b>Strain/Process Input, Dual Display Vertical with 2 Control Outputs</b>		
CNI8DV33	Relay	Relay
CNI8DV44	DC pulse	DC pulse
CNI8DV43	DC pulse	Relay
CNI8DV42	DC pulse	0.5 A SSR
CNI8DV22	0.5 A SSR	0.5 A SSR
CNI8DV23	0.5 A SSR	Relay
CNI8DV24	0.5 A SSR	DC pulse
CNI8DV53	Analog	Relay
CNI8DV54	Analog	DC pulse
CNI8DV52	Analog	0.5 A SSR

Comes with complete operator's manual.

**Ordering Examples:** CNI8DH43, horizontal 1/2 DIN dual display with pulse control and relay. CNI8DV53, 1/2 DIN dual display vertical controller with analogue output and relay. CNI8DH22, 1/2 DIN dual display horizontal controller with 2 SSR outputs.

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

## Universal Temperature and Process Input (DPi/CNi Models)

**Accuracy:**  $\pm 0.5^{\circ}\text{C}$  temp; 0.03% rdg

**Resolution:**  $1^{\circ}/0.1^{\circ}$ ; 10  $\mu\text{V}$  process

**Temperature Stability:**

RTD:  $0.04^{\circ}\text{C}/^{\circ}\text{C}$

TC @  $25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ ):  $0.05^{\circ}\text{C}/^{\circ}\text{C}$

Cold Junction Compensation

Process: 50 ppm/ $^{\circ}\text{C}$

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, C, N, L (J DIN)

**RTD Input (ITS 68):** 100/500/1000  $\Omega$   
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 mV  
1 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 (DPiS/CNiS Models)

**Accuracy:** 0.03% reading

**Resolution:** 10/1  $\mu\text{V}$

**Temperature Stability:** 50 ppm/ $^{\circ}\text{C}$

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 M $\Omega$  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  $\Omega$  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 mA, 500  $\Omega$  max (output 1 only);  
accuracy is  $\pm 1\%$  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  $\pm 10\%$ , 50 to 400  
Hz\*, 110 to 300 Vdc, equivalent voltage

**Low Voltage Power Option:** 24 Vac\*\*,  
12 to 36 Vdc for DPi/CNi/DPiS/CNiS;  
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  $55^{\circ}\text{C}$  (32 to  $131^{\circ}\text{F}$ )

90% RH non-condensing

**Dual Display Models:**

0 to  $50^{\circ}\text{C}$  (32 to  $122^{\circ}\text{F}$ ), 90% RH

non-condensing (for UL only)

## Protection:

**DPi/CNi/DPiS/CNiS32,16,16D, 8C:**

NEMA 4X/Type 4 (IP65) front bezel

**DPi/CNi/DPiS/CNiS8, 8DH, 8DV:**

NEMA 1/Type 1 front bezel

**Approvals:** UL, C-UL, CE per

2014/35/EU, 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"),  $\frac{1}{8}$  DIN

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

$\frac{1}{16}$  DIN

**i/32 Series:** 22.5 H x 45 mm W

(0.886 x 1.772"),  $\frac{1}{32}$  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.