iSeries PID Controllers and Signal Conditioners

iDR Series

5 YEAR WARRANTY | CE | c UL us LISTED | FM APPROVED For Temp. Units

Universal Inputs

- Thermocouple
- RTD
- Process Voltage
- Process Current
- Strain

Multiple Outputs

- Ethernet TCP/IP
- Serial RS232/RS485
- Autotune PID Control
- 2 Form "C" Relays
- 2 Solid State Relays
- 2 DC Pulse
- Programmable: Scalable Analog Voltage, 0 to 10 Vdc; Analog Current, 0 to 20 mA
- High Accuracy: ±0.5°C (0.9°F), 0.03% Rdg
- Full Autotune PID Control
- User Friendly, Simple to Configure
- Built-In Excitation
- Plug Connectors
- Free Software

The NEWPORT® iDR DIN rail iSeries is a family of microprocessor-based instruments offered in 3 sizes. The instruments have a similar setup and configuration menu and method of operation, which is a tremendous time saver for integration of a large system.

The iDR instruments offer a broad selection of signal inputs. The choices are easily selected from the remote programmer menu with 4 front-panel pushbuttons, or by serial or Ethernet communications.

The iDR handles 10 common types of thermocouple, 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 (iSDR 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 model supports 4- and 6-wire bridge communications, ratiometric measurements.

The iSDR 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.

The iDR offers either simple manual on/off operation or full autotune PID control (selectable preset tune, adaptive tune, PID, PI, PD control modes). The dual control outputs can be configured for a variety of independent control and alarm applications, such as heat/heat, heat/cool, heat/alarm, cool/cool, cool/alarm, or alarm/alarm. The ramp-to-setpoint feature allows the user to define the rate of rise to setpoint, minimizing thermal shock to the load is during start-up. For those who only need simplified menus and no PID control, a limit alarm (**-AL**) option is available.

Users have a choice of 2 control or alarm outputs in almost any combination: solid state relays (SSRs) form “C” SPDT relays and pulsed 10 Vdc output for use with an external SSR.

The optional analog output can be programmed within a range of 0 to 10 Vdc or 0 to 20 mA. It is selectable as either a control output or as a calibrated retransmission of the process value—a unique feature among controllers.

The remote programmer/display can be programmed to change color at any setpoint or alarm point. For example, the instrument can be programmed to display the process value in **GREEN** during warm-up, in **AMBER** to signal the normal operating range, and in **RED** to signal an alarm condition.

Embedded Web Server option allows you to connect directly to an Ethernet network and transmit data in standard TCP/IP packets, or serve Web pages over a LAN or the Internet. With the serial communication option, the user can select from the pushbutton menu between RS232, RS422, and RS485, with straightforward ASCII commands or MODBUS.

Specifications

Universal Temperature and Process Input Model (iDR)

Accuracy:
±0.5°C temp; 0.03% rdg process

Resolution: 1°/0.1°; 10 µV process

Temperature Stability:
RTD: 0.04°C/°C
T/C @ 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 per second

Digital Filter: Programmable

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

Thermocouple Lead Resistance:
100 Ω max

Thermocouple Type (ITS 90):
J, K, T, E, R, S, B, C, N, L

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 1 V, 0 to 10 Vdc

Input Impedance: 10 MΩ for 100 mV, 1 MΩ for 1 or 10 Vdc

Current Input: 0 to 20 mA (5 Ω load)

Configuration: Single-ended

Polarity: Unipolar

Step Response: 0.7 s for 99.9%

Decimal Selection: None, 0.1 for temperature; none, 0.1, 0.01 or 0.001 for process

Setpoint Adjustment:
-1999 to 9999 counts

Span Adjustment: 0.001 to 9999 counts

Offset Adjustment: -1999 to 9999

Excitation: 24 Vdc @ 25 mA (not available with “-DC”, “-C24” or “-C4EIT” option)

Universal Strain and Process Input Model (iSDR)

Accuracy: 0.03% rdg

Resolution: 10/1 µV

Temperature Stability: 50 ppm/°C

NMRR: 60 dB

CMRR: 120 dB

A/D Conversion: Dual-slope

Reading Rate: 3 samples per second

Digital Filter: Programmable

Input Types:
Analog voltage, analog current

Voltage Input: 0 to 100 mVdc, -100 mVdc to 1 Vdc, 0 to 10 Vdc

Input Impedance: 10 MΩ for 100 mV; 1 MΩ for 1 or 10 Vdc

Current Input: 0 to 20 mA (5 Ω load)

Linearization Points: Up to 10

Configuration: Single-ended

Polarity: Unipolar

Step Response: 0.7 s 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: 5 Vdc @ 40 mA; 10 Vdc @ 60 mA (not available with “-DC”, “-C24” or “-C4EIT” option

Control

Action: Reverse (heat) or direct (cool)

Modes: Time and amplitude proportional control modes; selectable manual or auto PID, proportional, proportional with integral, proportional with derivative with anti-reset windup and on/off

Rate: 0 to 399.9 seconds

Reset: 0 to 3999 seconds

Cycle Time: 1 to 199 seconds; set to 0 for on/off operation

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

Autotune:
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 type, can be configured as alarm 1 output

Output 2: SPDT type, 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

Analog Output (Optional Output 3):
Isolated, retransmission, 0 to 10 Vdc or 0 to 20 mA, 500 Ω max; accuracy is 1% of FS, for scaling gain from 0.03 to 100 mV per count. Isolation is 1000 Vdc; linearity is 0.2%

Network and Communications Options (-C24, -C4EIT, -EIT)

Ethernet: Standards compliance IEEE 802.3 10 Base-T

Supported Protocols:
TCP/IP, ARP, HTTPGET

RS232/RS422/RS485/MODBUS:
Selectable from menu; both ASCII and MODBUS protocol selectable from menu. Programmable 300 to 19.2K baud; 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

Analog Output (Programmable):
Non-isolated, retransmission, 0 to 10 Vdc or 0 to 20 mA, 500 Ω max (output 1 only); accuracy is ±1% of FS when the following conditions are satisfied:
1. Input is not scaled below 1% of input FS
2. Analog output is not scaled below 3% of output FS

General

Line Voltage/Power: 90 to 240 Vac ±10%, 50 to 400 Hz*, 110 to 375 Vdc, equivalent voltage.
No CE compliance above 60 Hz.

Low-Voltage/Power Option: 24 Vac**; 12 to 36 Vdc; 20 to 36 Vdc for Ethernet and isolated analog output from qualified safety approved source
*** Units can be powered safely with 24 Vac power, but no certification for CE/UL is claimed.*

Insulation

Power to Input/Output:
2300 Vac per 1-minute test
1500 Vac per 1-minute test (for low-voltage power option)

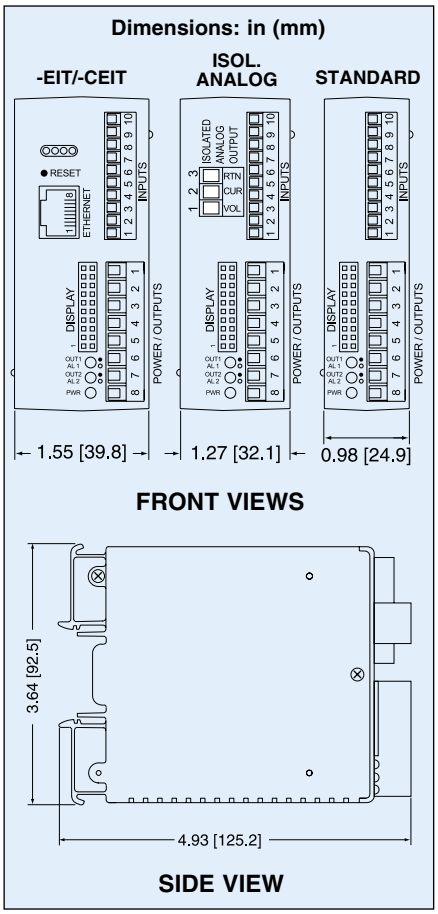
Power to Relays/SSR Outputs:
2300 Vac per 1-minute test

Relays/SSR to Relay/SSR Outputs:
2300 Vac per 1-minute test

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

Environmental Conditions:
0 to 55°C (32 to 131°F) (0 to 50°C for UL), 90% RH (non-condensing)

Approvals:
UL, C-UL, CE per EN61010-1:2001, FM (temperature units only)



Options

Ordering Suffix	Description
-AL	Limit alarm version (alarms only, no PID control)*3,*4
Networks Options	
-EIT	Ethernet with embedded Web server*3
-C24	Isolated RS232 and RS485/422, 300 to 19.2 Kb*1
-C4EIT	Ethernet with embedded Web server + isolated RS485/422 hub for up to 31 devices*1,*3
Power Supply	
*	Standard power input: 90 to 240 Vac/dc, 50 to 400 Hz (no entry required)
-DC	12 to 36 Vdc, 24 Vac*1, *5
Factory Setup	
,FS	Factory setup and configuration
Accessories	
iDRP	Remote programmer/ display, 4-digit, 9-segment LED 21 mm (0.83")
Software (Requires Network Option)	
OPC-SERVER LICENSE	OPC server/driver software license

1 "-DC**", "**-C24**" or "**-C4EIT**" not available with excitation.*

2 Analog output (option 5) is not available with "-AL**" units.*

3 Ethernet options are not available for the **iDRA controller.*

4 "iDRA0*-AL**": 1 analog retransmission and 1 alarm.*

5 20 to 36 Vdc for "-C4EIT**" and "**-EIT**"*

To Order *Visit newportUS.com/idr for Pricing and Details*

Model No.				Description
iDR				Temperature/process (no outputs); 90 to 240 Vac/dc standard power; use with iDRP for split meter/display
Control Outputs #1 and 2 Direct (Cool) or Reverse (Heat) Acting				
iDR	**(*)**	**(*)**		Temperature/process with 2 control outputs
	2	**2**		2 solid state relays (SSRs): 0.5 A @ 120/240 Vac continuous
	2	**3**		SSR and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	2	**4**		SSR and pulsed 10 Vdc @ 20 mA (for use with external SSR)
	3	**3**		2 relays: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**2**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and SSR
	4	**3**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**4**		2 pulsed 10 Vdc @ 20 mA (for use with external SSR)
	5	**2**		Analog output selectable as either control or retransmission of process value; 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and SSR
	5	**3**		Analog output 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and relay
	5	**4**		Analog output 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and pulse 10 Vdc
			-AL	Limit alarm version (alarm menu; no PID control)*2
Model No.				**Isolated Analog Output (Medium Case)**
iDRA				(no outputs) w/ isolated analog output *3
Control Outputs #1 and 2 Direct (Cool) or Reverse (Heat) Acting				
iDRA	**(*)**	**(*)**		Temperature/process with 2 control outputs *3
	2	**2**		2 solid state relays (SSRs): 0.5 A @ 120/240 Vac continuous
	2	**3**		SSR and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	2	**4**		SSR and pulsed 10 Vdc @ 20 mA (for use with external SSR)
	3	**3**		2 relays: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**2**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and SSR
	4	**3**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**4**		2 pulsed 10 Vdc @ 20 mA (for use with external SSR)
Limit Alarm (*Select One Combination)				
iDRA	**0**	**(*)**	**-AL**	Temp/process with 1 output for isolated analog output, 1 output for limit alarm (alarm menu; no PID control)*3,*4
		2		Solid state relays (SSRs): 0.5 A @ 120/240 Vac continuous
		3		Relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
		4		Pulsed 10 Vdc @ 20 mA (for use with external SSR)
Model No.				**Isolated Analog Output (Medium Case)**
iSDR				Strain/process (no outputs); 90 to 240 Vac/dc standard power use with iDRP for split meter/display
Control Outputs #1 and 2 Direct (Cool) or Reverse (Heat) Acting				
iSDR	**(*)**	**(*)**		Strain/process with (no outputs)
	2	**2**		2 solid state relays (SSRs): 0.5 A @ 120/240 Vac continuous
	2	**3**		SSR and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	2	**4**		SSR and pulsed 10 Vdc @ 20 mA (for use with external SSR)
	3	**3**		2 relays: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**2**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and SSR
	4	**3**		Pulsed 10 Vdc @ 20 mA (for use with external SSR) and relay: form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
	4	**4**		2 pulsed 10 Vdc @ 20 mA (for use with external SSR)
	5	**2**		Analog output selectable as either control or retransmission of process value; 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and SSR
	5	**3**		Analog output 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and relay
	5	**4**		Analog output 0 to 10 Vdc or 0 to 20 mA @ 500 Ω max and pulse 10 Vdc
			-AL	Limit alarm version (alarm menu; no PID control)*2

Comes with complete operator's manual.

***Ordering Examples: iDR33-EIT,** controller with 2 form "C" relays and Ethernet.*
***iDRA03-C24-AL,** limit alarm meter with isolated analog output, form "C" relay and serial communications.*