

## START HERE

### DRN-RTD RTD INPUT

#### General Description:

The DRN Series of DIN rail-mountable signal conditioners are available for Thermocouple, RTD, Strain, Process, AC Voltage, AC Current and Pulse/Totalizer input types.

The factory calibrated signal conditioners are ideal for all process and power monitoring applications, they feature 3-way isolation, high accuracy input, programmable outputs, and are excellent front end interfaces for programmable logic controllers or data acquisition systems. For maximum user configurability the signal conditioners allow complete input-output scaling via a RS-232 connection to any PC or PLC.

#### Software Description:

The signal conditioner configuration program is a MS DOS/Windows program (this manual is for the Windows version). It is designed especially for the DRN Series Signal Conditioner. This program will run on any PC with Windows application and will start automatically.

#### What You need:

- Your choice of the signal conditioner
- IBM PC or compatible
- Windows software 3.1 or higher, or Windows 95
- RJ12 connector with telephone cable
- Adapter (DB9/25 to RJ12)

#### Setting up your System



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#### SPECIFICATIONS:

100, 500, 1000 Ohm platinum RTD with both European (alpha=0.00385) and American (alpha=0.00392) curves.

#### INPUT TYPE:

100 Ohm	-328 to 1562 °F	-200 to 850 °C
500 Ohm	-328 to 1562 °F	-200 to 850 °C
1000 Ohm	-328 to 1562 °F	-200 to 850 °C

#### ISOLATION:

Three way isolation up to 1800 V Peak for 1 minute, 345 V Peak continuous per IEC spacing. Common mode rejection 100 dB

#### INPUT OVER-VOLTAGE PROTECTION:

250 V AC for 1 Minute

#### ANALOG TO DIGITAL TECHNIQUE:

Dual slope

#### READ RATE:

3 readings/second, automatic polarity

#### ACCURACY AT 25 °C:

±0.5 °C for platinum RTD's

#### TEMPERATURE STABILITY:

0.05 °C/°C

#### STEP RESPONSE FOR RS232 OUTPUT:

2 seconds to 99% of the final value (Filter time constant = 64)

#### RESPONSE TIME:

To verify the response time, check the carriage return <CR>, it will be sent at the end of the response. You can send another command after you receive the <CR>.

i.e. send: \*X01  
response: X01<DATA><CR>

#### WARM UP TO RATED ACCURACY:

30 minutes

#### ANALOG OUTPUT SIGNAL TYPE:

Voltage: 0-10 Volt, maximum current 10mA

Current: 0-20 mA or 4-20 mA, maximum compliance voltage 10 Volts (maximum loop resistance 500Ω)

#### ANALOG OUTPUT LINEARITY:

0.1% of FS

#### ANALOG OUTPUT STEP RESPONSE TIME:

2 seconds to 99% of final value

#### INPUT POWER:

10 to 32 Volt DC

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#### POWER CONSUMPTION:

2.4 Watts (100 mA at 24 V DC)

#### OPERATING AMBIENT:

-5 to +55 °C

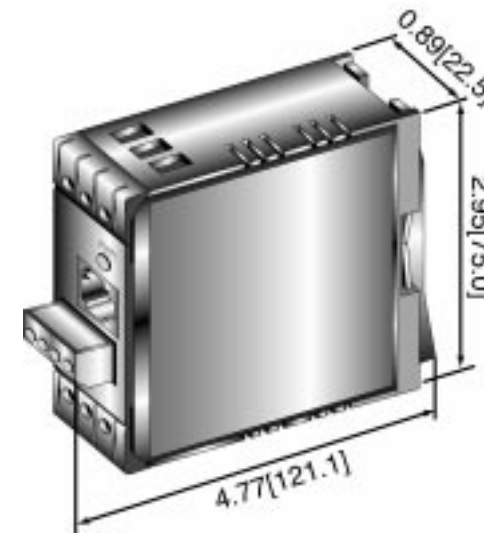
#### STORAGE TEMPERATURE:

-40 to +85 °C

#### RELATIVE HUMIDITY:

90% at 40 °C non-condensing

#### DIMENSIONS:



#### INTRODUCTION:

The RTD input signal conditioners are high performance instruments used to measure temperature supporting a variety of different RTD probes. The following RTD types may be used with the RTD input signal conditioners: 100, 500, and 1000 Ohms RTD with either 0.00385 or 0.00392 curves.

Key features to the signal conditioners are 3 or 4 wire RTD connections to minimize errors due to lead resistance, low 200 µA excitation current to prevent self heating, patented algorithm for linearization of RTD's to conform to NIST and DIN tables, and a built-in RS232 interface for easy custom scaling. The RS232 interface may also be used for digital transmission of input signal to a computer or a PLC. Additional features include three way isolation between DC power, signal input and analog output/RS232.

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#### OPERATION:

**Note:** When connecting RTD probe using three wires ensure that the three lead lengths are equal for higher accuracy. Signal conditioners provide certain degree of protection against high voltage spikes(250 V ac for 1 minute) which may be induced accidentally on the RTD wires. To ensure signal integrity and safe operation never run the signal inputs wires in the same conduit with ac power lines.

#### POWER INPUT AND ANALOG OUTPUT SETUP:

To connect the signal input proceed as follows:

1. Connect a DC power supply with an output voltage between 10 to 32 Volt DC to the signal conditioner (J1). **Note:** If power supply used has current limiting, it may not be able to power the signal conditioners if the available output voltage is around 10Volt, since the peak current may reach 1 to 5 Amp for a few milliseconds.
2. Determine the RTD type used to measure the temperature.



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3. Determine whether you will use 2, 3, or 4 wire RTD connection. If the probe lead is less than or equal to 3 feet you may use 2 wire connection. However, if the probe lead is longer than 3 feet and you want to obtain high accuracy then make it 3 or 4 wire connection. Usually 3 wire RTD is acceptable in most applications.

4. Ensure that if the selected RTD type and the connection method 2, 3, or 4 wire is different from the default then change the internal settings in the EEPROM. This can only be done via the RS232 communication and using the configuration software explained later in this manual.

5. Connect the RTD probe to the screw terminal, and ensure that the screws are tight.

6. To verify that the set up is correct, you may connect a DVM to the analog output. Once connected, power the signal conditioner. If you have a RTD simulator then select a resistance corresponding to the desired temperature. Measure and compare the analog output with expected values. If you are running the configuration software then the temperature corresponding to the RTD input resistance may be displayed.

7. To view/change the scaling that relates the analog output to signal input: Connect the RS232 output of the signal conditioner to an available serial port of a computer. The cable and the DB9 or DB25 connectors are available as an option.

8. Turn on the computer, start Windows 3.0 or higher and run the Signal Conditioner Configuration Setup Program. If the program has not been installed, then insert the 3.5" floppy disk in either drive A or B. From the Program Manager choose File, Run; in the command box type either A: setup or B: setup according to your drive designation. The program will create an icon for the signal conditioner. You may start the program by clicking on this icon.

9. To start the configuration program, you need to indicate which serial port is to be used for serial communication by checking the appropriate check box on the opening menu.

**Note:** It is not necessary to know the serial communication protocol, i.e. baud rate, parity, 7/8 data bit and stop bit; the program will determine this information automatically. However, it is a good practice to mark the protocols used on the signal conditioner label if different from default.

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10. Once the program starts it will automatically detect the signal conditioner configuration and will display a window of available options. To view the signal input click on the display on/off.

11. To change analog output scaling choose Analog Output Scaling and enter the desired values.

12. Once the custom scaling is finished, **ensure that Send Configuration is clicked**, otherwise the changes will not take effect.

13. The input/output scaling may be fine tuned, while both communication and analog output are active. You may make a change to the analog output in the configuration program, and watch the DVM connected to analog output of the signal conditioner follow the new settings.

14. You may save or print a particular configuration by selecting the file menu. It's always a good practice to both print and save the scaling of each signal conditioner.

15. If the program is not able to establish communication then an error message is displayed. This happens either when the wrong serial port is specified or when the cable is accidentally disconnected.

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## DRN-RTD

### RTD Input Signal Conditioner



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