

# MINIMUX® II TEMPERATURE & PROCESS SCANNER



**MINIMUX® II**

## Minimux II • Model PD138

- 8 Inputs per Unit, Eliminates Need for 7 Displays
- Unlimited Number of Units per System
- Free Custom Message Labels
- Thermocouples, RTDs, Process, AC & DC Inputs
- Adjustable Dwell Time for Each Channel
- Independent Alarm Input for Each Channel
- First-Out Alarm Indication
- Alarms Indicated by LEDs, Built-in Horn, and Relay
- Built-in 85 dB Horn with Silence Pushbutton
- Stop-On-Alarmed Channel (Field Select)
- Non-Interruptible 4-20 mA Inputs
- Sunlight Readable Indication
- NEMA 4X/IP65 Front
- Shallow Depth 1/8 DIN Enclosure
- -40 to 65°C Operating Temperature Range

## SCAN MOST SIGNALS/SENSORS

The Minimux II is a microprocessor-based eight channel analog input scanner/multiplexer and annunciator that provides low-cost automatic switching for multi-point display and alarm systems. Each Minimux II can automatically switch up to eight inputs to another device such as a digital panel meter, controller, or PLC. Signal switching is done via reed relays making the Minimux II ideal for switching thermocouples, RTDs, control loops, and AC & DC signals.

## USES FOR MINIMUX II

### Automatic Switching

In its most basic form, the PD138 is the electrical equivalent of a double-pole, eight position automatic switch. Whatever input is brought into the PD138 is dwelled on for a certain amount of time while being channeled/switched out to another device. For example, a typical application may involve channeling/switching eight type J thermocouples into a single digital panel meter.

### Temperature Scanning

One of the most popular uses for the PD138 is temperature monitoring, especially the monitoring of bearing and stator winding temperatures. Any of the many different style thermocouples, RTDs, or thermistors can be used with the PD138 - right out of the box.

### Automatic or Manual Scan

The PD138 automatically scans through each active channel, dwells on that channel for an independently programmed dwell time, while at the same time switching the signal to an external device. The scanning can be stopped, or scanned manually via the front panel stop/go pushbutton.








## Alarm Annunciator

One of the key features of the PD138 is its ability to indicate and process alarms that are generated by an external device. Each channel of the Minimux II has an independent 'Alarm-in' terminal that allows an external device to trigger an alarm on the Minimux II. The external device may be the relays on a digital panel meter, such as the PD765, or the digital output from a PLC.

## First-Out (Sequence F2A)

The PD138 can be configured to recognize first-out alarms. On the PD138, these are one or more alarms that occur during the first complete scan where an alarm is present on one or more channels.

## FRONT PANEL

						
Silence Horn	Ack Alarm	Stop/Go Inputs	Channel Alarm Status	Current Channel	Current Channel in Alarm	Power On

## Self Test

When the PD138 is powered, the LEDs are turned on one channel at a time until all green and then all red LEDs have been tested. The internal horn will sound at the end of the LED test.

**APPLICATION**

**PD138 and PD765 to Scan Thermocouples**

In the following application example, four oven thermocouples are scanned and channeled to a PD765 Temperature Meter where the PV is displayed and checked for low or high alarm conditions. All four ovens share the same low and high alarms, so the alarm inputs are joined together on the PD138.

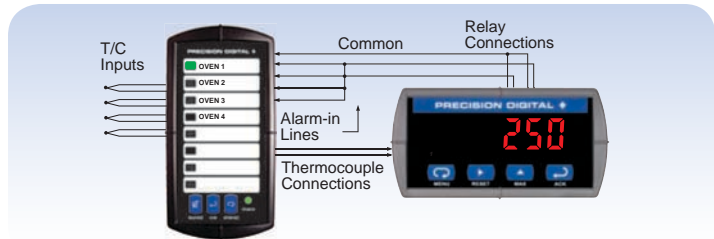
The PD138 Minimax II is programmed in the following manner to satisfy this application:

- Select alarm Sequence A
- Stop-on-alarm is off
- Program dwell times:
  - Channel 1 for ten seconds
  - Channel 2 for five seconds
  - Channel 3 for fifteen seconds
  - Channel 4 for five seconds
  - Channels 5-8 are disabled

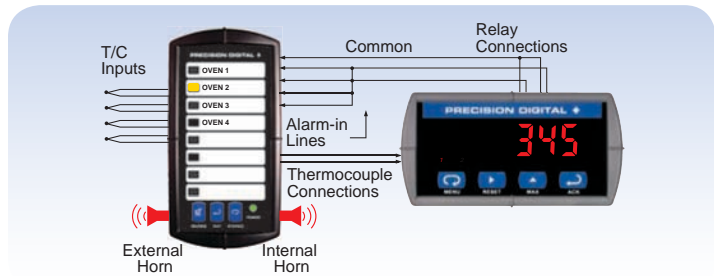
The PD765-6R2-00 Trident is programmed in the following manner to satisfy this temperature application:

- Select T/C
- Select °F
- Program alarm set and reset points:

ALARM	TYPE	SET POINT	RESET POINT
1	Low Alarm	225	230
2	High Alarm	325	320



The Minimax II scans each input and reflects the alarm state. The PD138 shown above is scanning channel 1 (Green LED) allowing the Trident to display the current temperature of 250°. No alarm is present since the temperature is within limits. The Minimax II only responds to new alarm conditions detected in the currently active channel. The PD138 also avoids false alarms by detecting alarm conditions only after dwelling on a channel for 2 seconds, or 0.05 seconds before it has been programmed to go onto the next channel if the dwell time had been programmed for less than 2 seconds. This gives the PD765 time to stabilize and accurately display the temperature and to check for alarm conditions.



The Minimax II switches to (scans) input 2 channeling it to the PD765-6R2-00 where a temperature of 345° is found to cause a high alarm condition. The PD138 is programmed for Sequence A, so the channel 2 LED alternately flashes yellow and green, the internal horn sounds, and the PD138's alarm relay transfers causing an external horn to sound. After acknowledging the alarm the channel LED will glow a steady yellow (while selected), or steady red (when not selected) until reset.



The Minimax II switches to (scans) input 3 channeling it to the PD765-6R2-00 where a temperature of 220° is found to cause a low alarm condition 2 seconds into the dwell time. Channel 3 LED alternately flashes yellow and green (shown yellow), the internal horn sounds and the PD138's alarm relay transfers causing an external horn to sound.

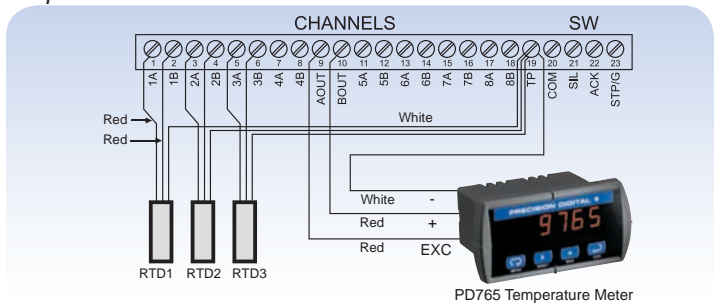
**SIGNAL CONNECTIONS**

**Three-Wire RTD Inputs**

Three-wire inputs such as thermistors and RTDs can be handled by switching the two common wires and connecting the third wire of each sensor to the TP terminal and to the temperature meter.

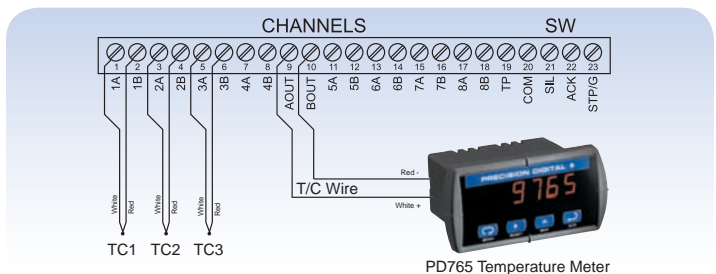
- Connect like color leads to terminals 1A & 1B, 2A & 2B, 3A & 3B, etc.
- Connect odd color leads to terminal TP.
- Connect outputs A, B and TP to the temperature meter.

The example below shows three 3-wire RTDs multiplexed into one temperature meter.



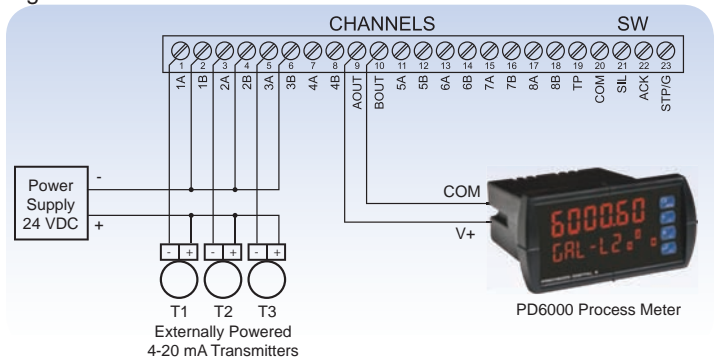
**Thermocouple Inputs**

This example shows 3 type J thermocouples multiplexed into one temperature meter. Thermocouple wire must also be used between the Minimax II and the meter.

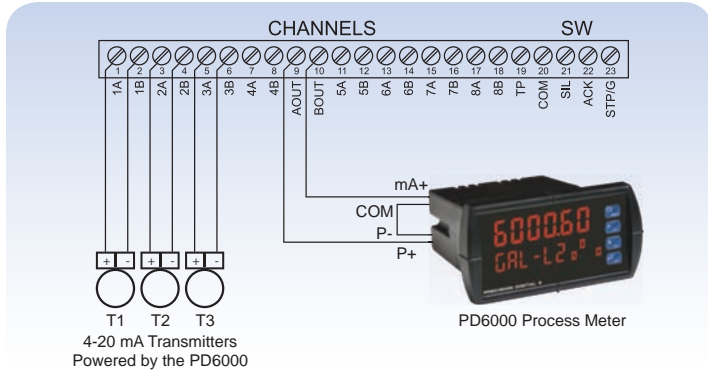


**4-20 mA Inputs**

A special version of the Minimax II is used to switch 4-20 mA signals. The PD138-X-CL (X = power), has a built-in resistor network that eliminates loop interruptions. The process meter must be setup for 1-5 V input and the complete system should be calibrated together.



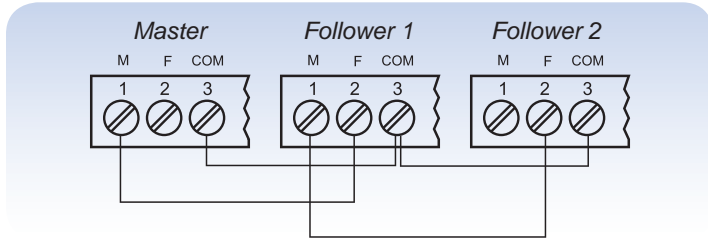
The PD6000's internal transmitter power supply may be used to power the transmitters. However, only the transmitter that is currently selected will be powered and all others will not be powered. Care should be taken to provide the transmitter with sufficient time to stabilize to provide an accurate output.



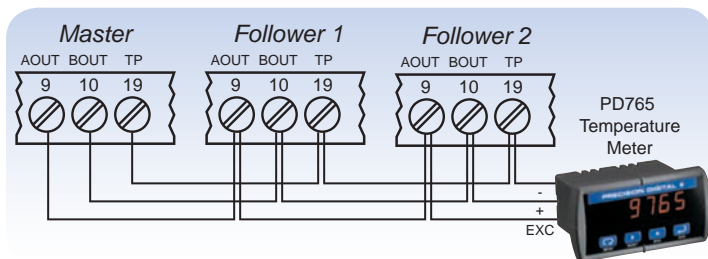
**MULTIPLE PD138 CONNECTIONS**

Multiple Minimux IIs can be connected together to increase multiplexing capacity for an unlimited number of points. When connecting several units together, one unit of the group is designated the master unit and all other units function as follower units. Multiple unit configuration is simply done by connecting the units together as shown below. The system will self-determine if there are two or more Minimux IIs connected together.

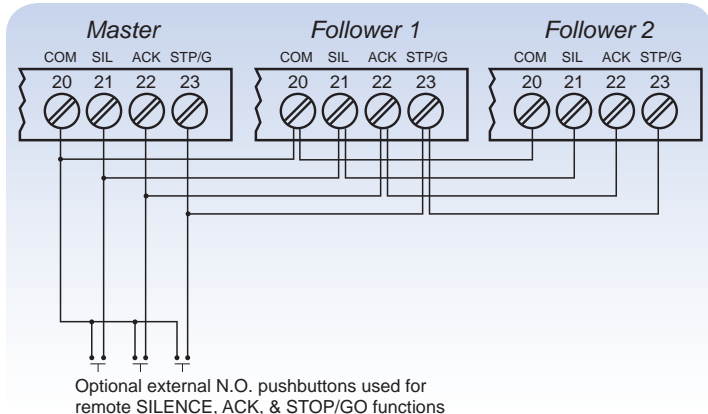
**Master/Follower Connections**



**Multiplexer Output Signal Connections**

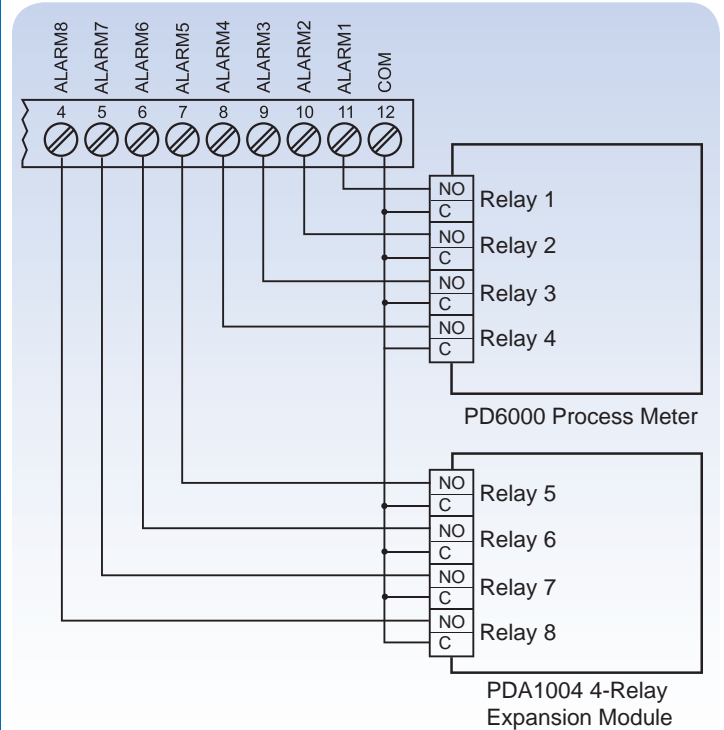


**Silence, Acknowledge, & Stop/Go Connections**



**ALARM-IN CONNECTIONS**

Each channel on the PD138 has its own Alarm-In line that provides independent alarm indication capability for each channel. The alarm input lines of the PD138 are normally high (pull-up to 5V). Relay contacts from a Precision Digital meter or a low level logic output from a PLC can be used to drive the PD138 alarm input lines.



**PDS178 TEMPERATURE & PROCESS SCANNING & ALARM SYSTEM**

We packaged our most popular PD138 product combination for you at a significant savings vs. buying these components separately. The PDS178 is a kit that includes a PD765-6R2-00 Trident and PD138 Minimux II in a PDA2821 NEMA 4X enclosure. The PDS178 is a Temperature or Process Scanning and Alarm System ready to wire into your application. You can't beat the discounted package price!



**PDS178 Temperature & Process Scanning & Alarm System**

Kit Components	
PD765-6R2-00	Process & Temperature Meter with 2 Relays
PD138-3	Minimux II 115 VAC Power
PDA2821	Plastic NEMA 4X Enclosure

**SPECIFICATIONS**

Except where noted all specifications apply to operation at +25°C.

**General**

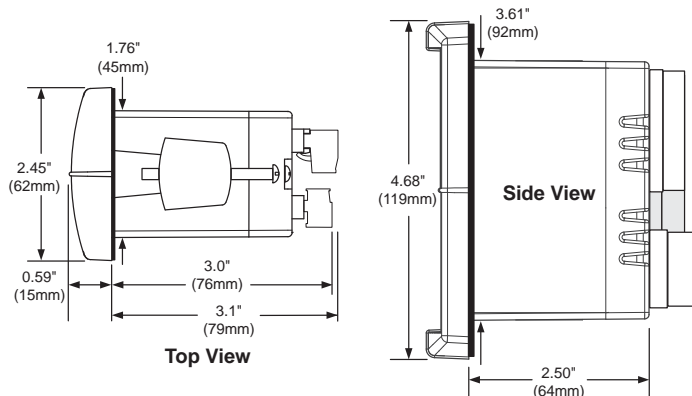
- Number Of Channels:** 8 double-pole channels per unit
- Number Of Channels Per System:** Unlimited
- Signals Switching:** DPST reed relays
- Contact Resistance:** 0.2 Ω maximum
- Maximum Input Voltage:** 200 VAC/DC (switched or common mode)
- Maximum Current Switched:** 0.5 A
- Maximum Power Switched:** 10 W
- Dwell Time:** Each channel adjustable from 0.6 to 30 seconds
- Non-Volatile Memory:** All programming values are stored in non-volatile memory for ten years if power is lost
- Scan Method:** Internally or manually controlled
- Channel Indication:** Green LED on front panel
- Disabling Channels:** Any channel may be disabled
- Scan Stop:** The scan may be stopped by pressing and holding the STOP/GO button for more than 0.5 seconds. The scan may be resumed by pressing and releasing the STOP/GO button quickly (less than 0.5 seconds)
- Alarm Input:** Independent alarm input for each channel. Input Impedance; 25 Kohm, typical pull-up to 5 V
- Alarm Sequence:** Sequence A or Sequence F2A (first out)
- Alarm Outputs:** Alarm condition indicated by:
  1. Front panel red LED for each channel.
  2. Relay, 1 SPDT (form C); rated 2 Amp @ 30 VDC or 2 Amp @ 250 VAC resistive load; 1/14 HP @ 125 / 250 VAC for inductive loads. For failsafe operation, the relay is energized in the non-alarm state. In the case of a power failure, the relay will go to the alarm state, (NC contact is connected to common).
  3. Built-in Horn, 85 dB.
  4. Stop-on-alarmed-channel (user select)
- Alarm Acknowledge:** Front panel ACK and rear connector terminals
- External Switch Functions:** The functions of the front panel buttons are available at screw terminals at the rear of the instrument
- Message Labels:** Free, custom printed, 2 lines per message at 14 characters per line. Factory or field printable. See manual for details.
- Connections:** Removable screw terminal connectors provided: Power + Relay: 22 to 12 AWG; Alarm Input, Analog Signal, External Switches, I/O: 30 to 16 AWG
- Operating Temperature:** -40°C to 65°C
- Storage Temperature:** -40°C to 85°C
- Relative Humidity:** 0 to 95% non-condensing
- Power Options:** 115 VAC, ± 10%, 50/60 Hz, 4 VA; 230 VAC, ± 10%, 50/60 Hz, 4 VA; 12-24 VDC (9-18 VAC, 50/60 Hz) 2 W
- Led Test:** All LEDs are tested on power-up
- Enclosure:** 1/8 DIN, high impact plastic, UL94V-0
- Front Panel:** NEMA 4X, panel gasket provided
- Weight:** 9.9 oz (280 g)
- Warranty:** 3 years parts and labor

**Disclaimer**

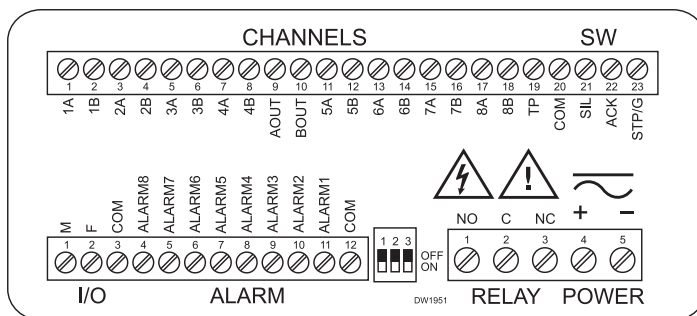
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**MOUNTING DIMENSIONS**



**CONNECTIONS**



**ORDERING INFORMATION**

Minimux II • Model PD138			
Model	With Loop Resistor	Description	Power
PD138-2	PD138-2-CL	8 Chan. Temp & Process Scanner	24 VDC
PD138-3	PD138-3-CL	8 Chan. Temp & Process Scanner	115 VAC
PD138-4	PD138-4-CL	8 Chan. Temp & Process Scanner	230 VAC

Accessories			
Model	Units	Description	Mounting
PDA25XX-V	1-10*	Plastic NEMA 4X Enclosure	Through Door
PDA26XX-V	1-6*	Stainless Steel NEMA 4X	Through Door
PDA27XX-V	1-6*	Steel NEMA 4 Enclosure	Through Door
PDA2801	1	Low-Cost Plastic NEMA 4X	Through Cover
PDA2821	2	Low-Cost Plastic NEMA 4X (1 vertical + 1 horizontal)	Through Cover

Note: XX = the last two digits of the model number  
 \* Go to www.predig.com to find individual model numbers.

Systems			
Model	Description	Kit Components	
PDS178	Temperature Scanning & Alarming System	PD765-6R2-00 PD138-3 PDA2821	Process & Temp Meter Minimux II Plastic NEMA 4X Encl.



LDS138\_A 02/09