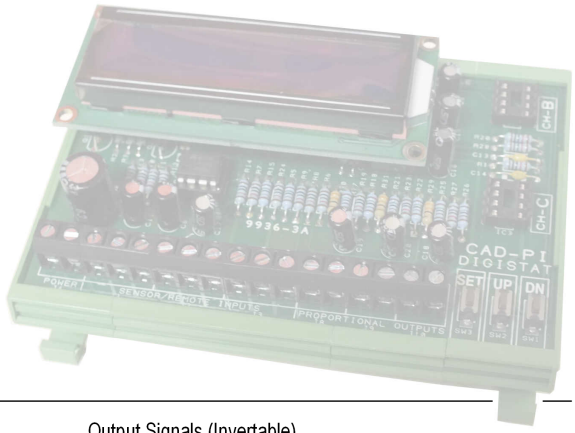
DATASHEET 9936-3 CAD-PI

A versatile Din-rail Mounted electronic control module. Monitors air or liquid temperature, and controls from one to (optionally) three Proportional Analogue Channels.

1-3 CHANNEL PROPORTIONAL ELECTRONIC CONTROLLER



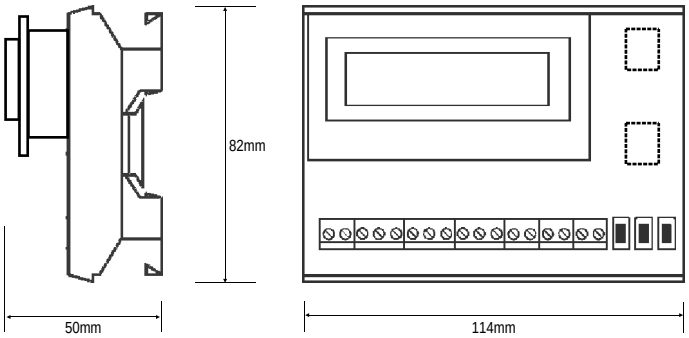
Features

- One Proportional Control Channel standard, two optional
- One unit covers entire -5°C to +95°C Range
- Separate Day, Night and Low-Level Set-Points
- Up to 0.25°C Accuracy
- 1-20°C Proportional Band (Span)
- 0-50°C Dead Band
- Heating, Cooling (or optionally both) Function
- Digital Display with Temperature, Set-Point and Status
  'Cool-Blue' Backlight for operation in zero light conditions
- Connections for External Temperature Controls and Displays
- DIN-Rail Mountable, small compact footprint

SPECIFICATIONS

Type	Input Supply +/- 15%	Sensor Type	Temp Range	Output Signals (Invertable)	Mounting	Enclosure
CAD-PI	**24V AC/DC 75mA (max)**	**CAD...**	**-5°C to +95°C -9°C to +99°C w/Ext Pot 1-20°C Span 0-50°C Adjust.**	**1 x 0-10v Proportional Channel Standard 2 x 10v Optional**	**DIN Rail (included)**	**IP00**

DIMENSIONS



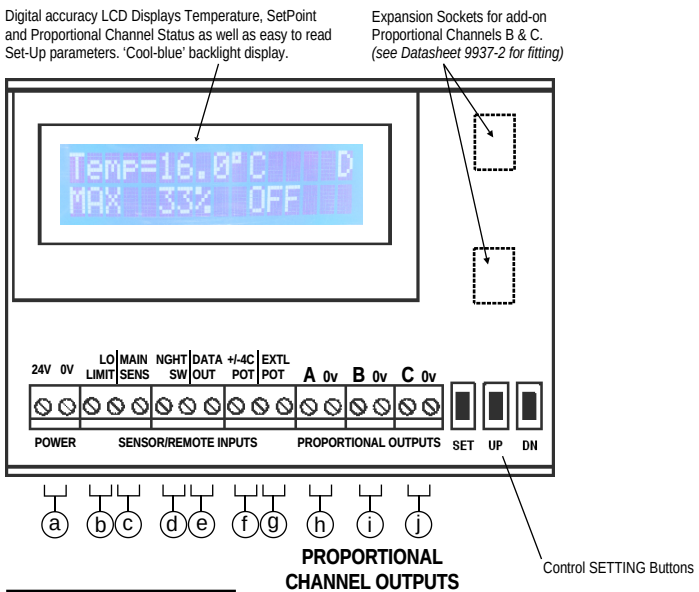
DIAGNOSTIC CODES

SENSOR ERROR. The Temperature Sensor readings are outside acceptable parameters. Check (a) that the Sensor is properly connected, or (b) that the Sensor or it's Cable is not Short-Circuit or Open-Circuit.

L/L-SENSOR ERROR. The Low-Limit Temperature Sensor readings are outside acceptable parameters. Check (a) that the Low-Limit Sensor is properly connected, or (b) that the Low-Limit Sensor or it's Cable is not Short-Circuit or Open-Circuit.

CALL SERVICE - FAULT CODE = nn. This message is only displayed if an internal error is detected - Call for Assistance.

CONNECTION/SETUP



ⓐ **24V AC/DC SUPPLY.** If DC is used, then connect the Negative rail to 0V, and Positive to 24V Terminal.

ⓑ **LO LIMIT.** If used, connect Low-Limit Temperature Sensor to these two Terminals. Sensor type is CAD...

ⓒ **MAIN SENSE.** Connect the Main Temperature Sensor to these two Terminals only. Sensor type is CAD...

ⓓ **NIGHT SWITCH.** This must be a Volt-Free contact. Connect between Centre and Outer Terminal as marked. When Open, the *DIGISTAT* uses the DAY Set-Point. When closed, the NIGHT Set-Point is used.

ⓔ **DATA OUT.** This is a Digital Data stream compatible with the *SamTalk* protocol. Connect Remote Displays or other protocol compatible devices to this port.

ⓕ **+/- 4°C POT.** Connect the POT between the Centre and Outer Terminal. If fitted, allows +/-4°C adjustment away from the DAY Set-Point. This allows the range of the *DIGISTAT* to be extended from -9°C to +99°C.

ⓖ **EXTL (EXTERNAL) POT.** Connect the POT between the Centre and Outer Terminal. If fitted, allows the DAY Set-Point to be over-ridden by the POT setting. Ensure the correct RANGE for the attached Pot is programmed into the *DIGISTAT* Set-Up presets *(see overleaf).*

NOTES

Min Sensor Cable 7/0.2mm. Keep away from Power Cables or sources of interference. Screened cable is recommended to eliminate electrical interference.
Terminals 0.5-2.5mm2 with wire clamps. Max cable length 100m.
This module is designed for LOW VOLTAGE isolated supply connection.
If connecting to DC supply, -ve supply to 0v, +ve supply to 24v.
Ambient Temp -20ºC/+50ºC dry bulb.

For Technical Support in the first instance contact your distributor.
Installation should be checked by qualified electrician before applying any voltage.
Always ensure devices switches correctly at the desired temperature.
If failure of device can cause damage, ensure a suitable safety backup is fitted.
Observe all relevant safety precautions, regulations and electrical ratings.
Observe all precautions for handling electrostatic sensitive devices.
Specifications for guidance only and subject to change without notice. E&OE.

PROGRAMMING

The CAD-PI *DIGISTAT* is factory shipped with the following defaults preset:, each of which can be reprogrammed with new settings:-

Day Set-Point	**22°C**	adjustment Range -5°C to +95°C in 0.25°C steps
Night Set-Point	**16°C**	adjustment Range -5°C to +95°C in 0.25°C steps
Mode	**STANDARD**	Select between Standard, Integral, Low-Limit or Low-Limit+Integral operational modes
Cooling/Heating Mode	**ALL HEATING**	Select any combination of Heating or Cooling
External Pot Range	**LOW**	Low Range covers -5°C to +45°C, High Range covers +25°C to +95°C
Integral Timer	**1 SECOND**	select from 1-600 seconds
Low-Limit Temperature	**12°C**	adjustment Range -5°C to +95°C in 0.25°C steps
Low-Limit Band	**3°C**	adjustment Range 1°C to 20°C in 0.25°C steps
Prop Band (A-C)	**A=3°C, B=3°C, C=3°C**	adjustment Range 1°C to 20°C in 0.25°C steps
Dead Band (A-C)	**A=2°C, B=5°C, C=8°C**	adjustment Range 0°C to 50°C in 0.25°C steps
Invert Channel (A-C)	**No**	Yes=Invert Channel Output, No=Normal Channel Output
Communications	**OFF**	OFF, Master (Talk Mode)
LCD Contrast Level	**2**	select Levels 0 (darkest) to 5 (lightest)
Security PIN	**Disabled (Spaces)**	Any password up to 4 characters long using full alphanumeric alphabet

SET

Depress and HOLD-DOWN the SET Button until the display blanks - (depending on what the *DIGISTAT* is doing this can take a few seconds). This will cause the *DIGISTAT* to jump into Menu Set-Up Mode. *(Note: Whilst in the Menu Mode, Temperature sensing and the Output Proportional Channels will be switched OFF).*

Pressing SET after any Set-Up entry causes that entry to be saved and the user advanced to the next item. After saving the last item, (PIN Code), the *DIGISTAT* will return to Normal Operation. *Note: If at any time the DIGISTAT is left in Menu Mode for more than 20 seconds without any Buttons being pressed, it will revert automatically to Normal Operation WITHOUT SAVING the* current *entry being edited.*

`Enter PIN:`
`****`

If PIN (Password) protection has been set, you will need to enter a valid PIN to gain access to the SET-UP's. Use the Up/Down Buttons to scroll through selecting the individual character for each of the four possible characters making up the PIN. Press the SET button to advance from one character to the next. For security purposes, your previous character will change to a '*' for your protection. A successful PIN entry (pressing SET after the fourth character) will gain you access to the SET-UP's, otherwise you will be greeted with "**`INVALID PIN`**". If you have forgotten or lost your PIN, call your master distributor for assistance - a charge may be made for this service.

`Set-Point Day` Allows setting of the **DAY SET-POINT**. Use the UP and DN (Down) Buttons to change the value to your desired setting. Once complete, press SET. This will SAVE the value and advance to the next item.

`Set-Point Night` Allows setting of the **NIGHT SET-POINT**.

`Mode` Permits changing the OPERATIONAL **MODE**.

`Cooling|Heating` Change the Cooling/Heating combination from **HE=ABC** which is all channels HEATING, through to **CO=ABC** which is all COOLING. The letters represent the individual Proportional Channels A, B and C.

`External Pot` Allows selection of the scale of the External Pot that is connected (if any). If no External Pot is connected, then this setting is not relevant.

`Integral Timer` Allows entry of an INTEGRAL TIMER which will act on the SPAN of any Proportional Channel. If control action is sluggish, reduce the individual channel proportional Span, or the Integral Time. If control action is hunting, then increase these settings. If Integral is not selected within the Operational MODE, this option will not be displayed.

`Low-Limit Temp`
`Low-Limit Band` Allows the setting of the Low-Limit Temperature Set-Point, along with the Low-Limit operating BAND (Span). During Low-Limit, only HEATING Output Signals are produced, and any COOLING channels are switched OFF. The Low-Limit Heating Output over-rides the first available HEATING Channel. Normal operation resumes once the temperature rises above the Low-Limit setting. If Low-Limit is not selected within the Operational MODE (see above), these options will not be displayed.

`Prop Band` ***a*** This is the Proportional Band (Span) for each *individual* CHANNEL. The channel produces a 0-10v output signal proportional across it's BAND.

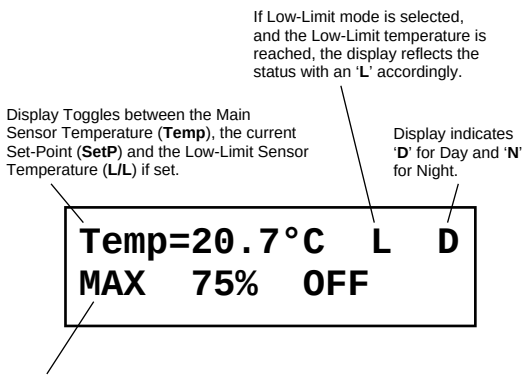
`Dead-Band` ***a*** Selects the DEAD-BAND (offset) between the current Set-Point and the *start* of the Proportional Band. Each of the three proportional channels are *independent*, so that their Dead-Band only affects that one particular channel. Channels can be set to sequence or overlap as required.

`Invert Channel` ***a*** Inverts the voltage Output of that channel (ie 0v becomes 10v, 10v becomes 0v). Channel A is best suited for Inversion although it is also possible with Channels B and C subject to limitations (see next column).

`Communications` Switches the *DIGISTAT* into communication mode. OFF disables Communications. MASTER selects Talk (host) Mode, which allows that unit to talk to other devices such as Remote Displays or another *DIGISTAT*.

`LCD Contrast` Changes the CONTRAST Setting of the LCD *(as you make the adjustment)*. Press the SET button to make the setting permanent.

`PIN Code:` Allows the setting of a User PIN (Password). Up to four characters can be entered which need not be numeric. The PIN is case sensitive, so 'abcd' is NOT the same as 'ABCD'. Do NOT forget any PIN that you set. A setting of 'all spaces' (blanks), disables the PIN.



The status of the three Proportional Channels (A, B & C) are represented by three sections on the 2nd line of the two-line LCD Display. The above example shows Channel-A operating at Maximum, Channel-B is operating at 75% whilst Channel-C is OFF.

Note: Channels B and C are optional. If these channels are not fitted, then their corresponding displays will be blank and the channel outputs preset to zero.

Figure 1. Example of *DIGISTAT*'s LCD Display.

***DIGISTAT* Limitations**

Display: Please note that although the *DIGISTAT* has a quarter Celcius (0.25°C) resolution, this is displayed to only one significant decimal place. For example 17.25°C would be displayed as 17.2°C, and 17.75°C would be displayed as 17.7°C accordingly.

Channel Output Inversion: Use of Inversion on Channels B and C is subject to the Safety Shutdown protocols of the *DIGISTAT* which clamps Channel B and Channel C outputs to ZERO volts (0v) when either in PIN Code entry, Menu (Setup) Mode, or if any defect is detected. Installers should be aware of this limitation and where operational integrity is paramount at all times, restrict the connection of those devices requiring Inversion Protocols to Channel A where those limitations do not apply.

NOTES

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