Honeywell

UDC 700 Micro-Pro Universal Digital Controller

Product Manual

Contents

ELECTROMAGNETIC INTERFERENCE AND SAFETY

EMI Susceptibility:	Certified to EN50082-1:1992 and EN50082-2:1995. NOTE: For line-conducted disturbances induced by RF fields (10V 80% AM 1kHz), the product is self-recoverable in the frequency band 9.4MHz to 1.5MHz.
EMI Emissions:	Certified to EN50081-1:1992 and EN50081-2:1994.
Safety Considerations:	Complies with EN61010:1993/A2:1995.

1   FRONT PANEL

1.1.   INDICATORS


Green: OFF = PV < SP; ON = PV = SP; Flashing = PV > SP

Yellow: OFF = Normal operation; ON = Control Setup; Flashing = Instrument Configuration

Red: Flashes when alarm(s) active.

1.2.   KEYS

|	
Scroll key	**All Modes except Calibration:** If parameter value is displayed, shows parameter legend (for 1.5 seconds). If legend displayed, shows value of next parameter. **Calibration:** Starts calibration phrase.
Down key	**Normal Operation:** Decrements parameter value. With PV displayed, dis-engages Pre-Tune. Also confirms request for entry into *Instrument Configuration*. **Control Setup/Instrument Configuration:** Decrements parameter value. **Calibration:** Steps to previous calibration phase.
Up key	**Normal Operation:** Increments parameter value. With PV displayed, requests Pre-Tune. **Control Setup/Instrument Configuration:** Increments parameter value. **Calibration:** Steps to next calibration phase.
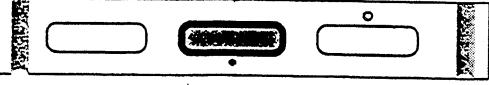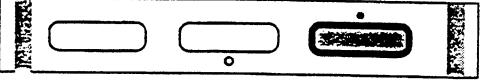
Scroll and Down keys
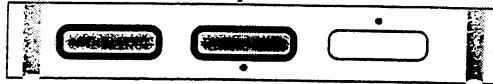
Normal Operation:
Enters *Calibration Mode*.

Scroll and Up keys
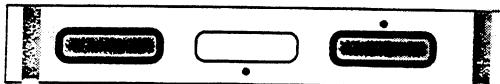
Normal Operation:
Requests entry into *Instrument Configuration*

Down and Up keys
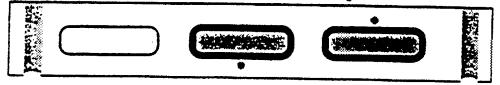
Normal Operation:
Enters *Control Setup*.

Control Setup/Instrument Configuration/Calibration:
Returns to *Normal Operation*.

2 INSTALLATION - PANEL-MOUNTING

2.1. UNPACKING THE INSTRUMENT

1. Remove the Controller from its packing. A panel gasket and a "no tools required" clamp are supplied. Retain the packing for future use (e.g. moving the Controller to a different site).

2. Examine the delivered items for damage or deficiencies. If any is found, notify the carrier immediately.
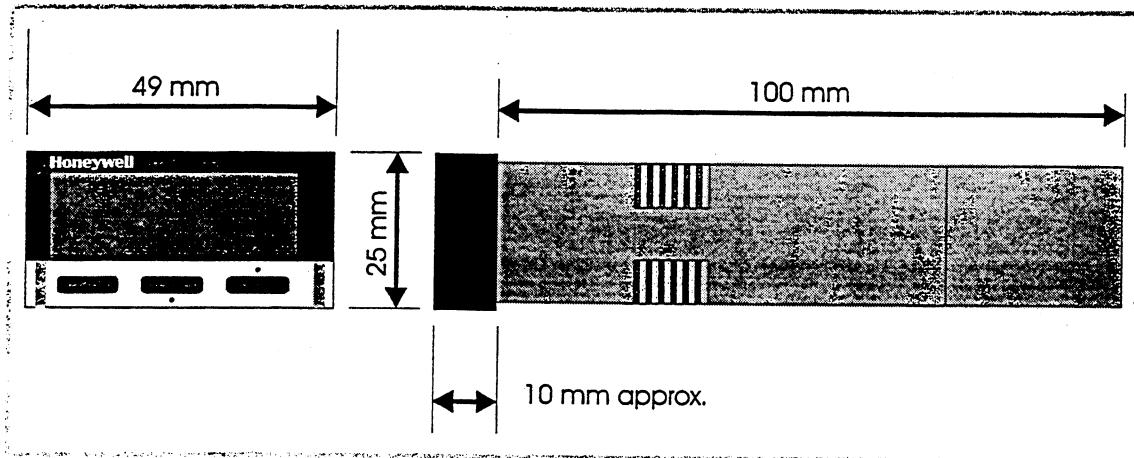
Figure 2-1   Main Dimensions

Max. panel thickness = 6mm.
Panel must be rigid.

45 mm +0.6 -0.0

22mm +0.3 -0.0
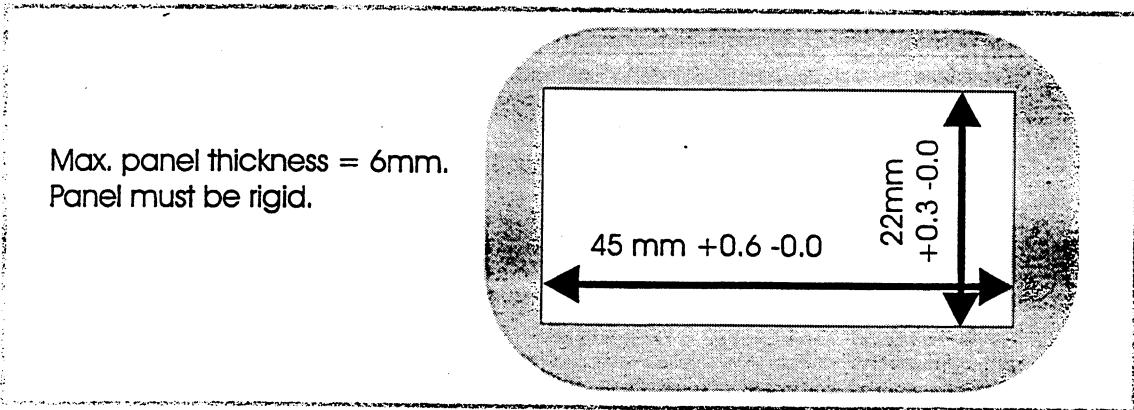
Figure 2-2   Cut-out Dimensions

2.2. INSTALLING THE CONTROLLER IN THE MOUNTING PANEL

1 Gasket / Mounting Panel / Controller / Cut-out

2 Clamp

3
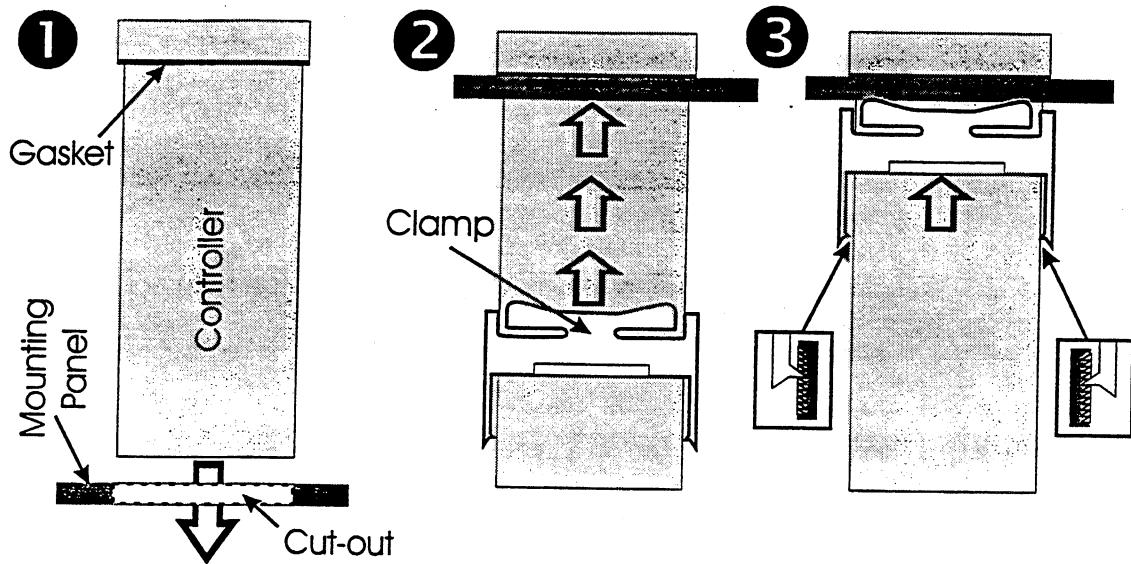
CAUTION: Do not remove the front panel gasket from the Controller, as this may cause inadequate clamping of the Controller to the mounting panel. Ensure that this gasket is not distorted and that the Controller is positioned squarely against the mounting panel. Apply pressure to the front panel bezel only.

3 INSTALLATION - WIRING CONNECTIONS

Output 2a ❸
(Relay)
N/C C N/O

RS485 Comms. ➤ A B
Relay ➤ C N/C C N/O

(Relay)

(SSR Drive)
— +

| 12 | 11 | 10 | 9 | 8 | 7 |

Output 3 ❸ **Output 2b ❸** **Output 1**

RECOMMENDED POWER CONNECTION

6 ──o o─N or -

5 ─o o o─L or +

See Subsection 3.1 or 3.2 (as appropriate) for fuse rating.

| 1 | 2 | 3 | 4 | 5 | 6 |

RTD (Pt100) ➤
Thermocouple & DC (mV/V) ❶ ➤ + —
DC (mA) ❷ ➤ + — + —

Universal Input

L N ⬅ **Mains (Line) Supply**
~ ⬅ **24V AC Supply (Option)**
+ — ⬅ **12 - 30V DC Supply (Option)**

❶ The DC (mV) input may serve as a DC (V) input using an external attenuator.

❷ If the DC (mA) input is used, Terminals 2 & 4 must be linked externally.

❸ Output 2a is available only if Output 3 is not fitted.

Figure 3-1   Rear Terminal Connections

Table 3-1   Output Usage

Output	Control Output	Alarm 1 Output	Alarm 2 Output	Serial Comms.
Output 1	*	*		
Output 2a	*	*		
Output 2b	*	*		
Output 3			*	*

3.1. MAINS (LINE) SUPPLY

This version will operate on a 96 - 264V AC 50/60Hz mains supply. The power consumption is approximately 4W.

> CAUTION: This equipment is designed for installation in an enclosure which provides adequate protection against electric shock. Local regulations regarding electrical installation should be rigidly observed. Consideration should be given to prevention of access to the power terminations by unauthorised personnel. Power should be connected via a two-pole isolating switch (preferably situated near the Controller) and a 1A fuse, as shown in Figure 3-1.

If the contacts of the relay output(s) are used to carry mains voltage, it is recommended that the relay contacts mains supply should be switched and fused in a similar manner but should be separate from the Controller mains supply.

3.2. LOW VOLTAGE (24V AC/DC) SUPPLY

This version operates on 12 - 24V AC 50/60Hz or 12 - 30V DC supply. The power consumption is approximately 4W. Connection should be made via a two-pole isolating switch and a 315mA slow-blow (anti-surge Type T) fuse (see Figure 3-1).

3.3. THERMOCOUPLE INPUT

The correct type of thermocouple extension leadwire or compensating cable must be used for the full distance between the Controller and the thermocouple, ensuring that the correct polarity is observed throughout. Joints in the cable should be avoided, if possible.

> NOTE: Do not run thermocouple cables adjacent to power-carrying conductors. If the wiring is run in a conduit, use a separate conduit for the thermocouple wiring. If the thermocouple is grounded, this must be done at one point only. If the thermocouple extension lead is shielded, the shield must be grounded at one point only.

3.4. RTD INPUTS

The compensating lead should be connected to Terminal 3. For two-wire RTD inputs, Terminals 2 and 3 should be linked. The extension leads should be of copper and the resistance of the wires connecting the resistance element should not exceed 5 ohms per lead (the leads should be of equal length).

3.5. DC INPUTS

DC (mV) inputs are connected to Terminals 2 and 3 in the polarity shown in Figure 3-1; DC (V) inputs are connected to the same terminals with the same polarity but require an external attenuator. DC (mA) inputs are connected to Terminals 3 and 4 in the polarity shown in Figure 3-1 with Terminals 2 and 4 linked externally.

3.6. RELAY OUTPUTS (OUTPUTS 2 & 3)

The contacts are rated at 2A resistive at 120/240V AC.

3.7. SSR DRIVE OUTPUT (OUTPUT 1)

This output produces a time-proportioned non-isolated DC signal (0 - 10V nominal, into 500Ω minimum).

3.8. RS485 COMMUNICATIONS

The "A" terminal (Terminal 12) on the Controller should be connected to the "A" terminal on the master device; the "B" terminal (Terminal 11) on the Controller should be connected to the "B" terminal on the master device. This instrument uses standard RS485 devices, isolated from all other inputs and outputs. The devices present a ¼-unit load to the RS485 line. Generally, termination will not be required but may be necessary for line lengths greater than 100 metres. Where termination is necessary, it is recommended that a 120Ω resistance in series with a 0.1μF capacitor be used at each end of the line (see Figure 3-2).
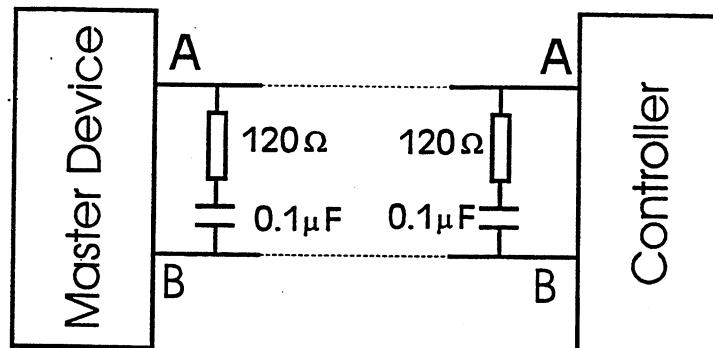

Figure 3-2   RS485 Line Termination

4   INSTRUMENT CONFIGURATION

4.1.   ENTRY

To enter Instrument
Configuration mode,
use the key
sequence shown on
the right.

....Then....

**Hold down until
display starts to flash**

Press
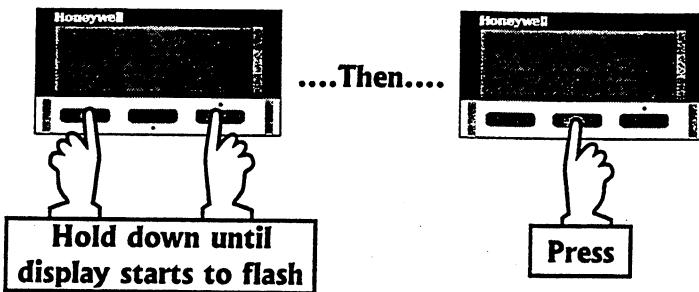
4.2.   PARAMETER SEQUENCE

Use the Scroll key to step
through the parameters,
as shown on the right.
Use the Up/Down keys to
adjust the displayed
value. The parameter
sequence is shown in
Figure 4-1. Adjustment
ranges are shown in
Table 4-1 and default
values are show in Table
4-4.

*After 1.5 seconds
with no key activity*

**Parameter
Name**

**Parameter
Value**

Press Scroll key

*Press Scroll key for
next Parameter Name*
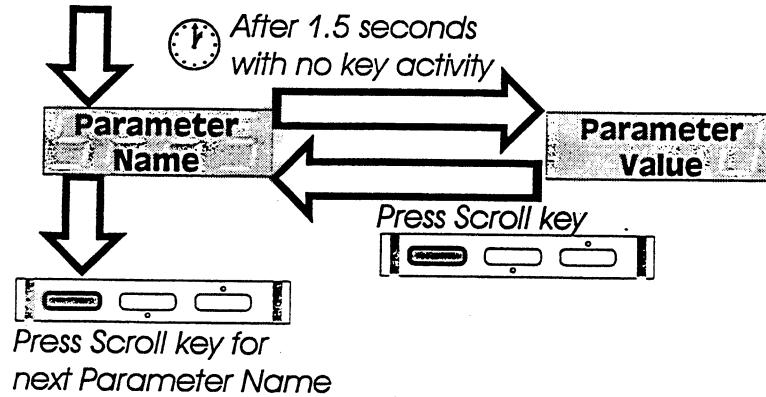
4.3.   EXIT

To exit from Instrument Configuration mode, select display
of a parameter name, then hold down the Up and Down
keys for three seconds (see right). The instrument will then
return to Normal Operation Mode via an instrument reset
and self-test sequence.

> NOTE: If there is no key activity for five minutes in
> Instrument Configuration Mode, an automatic return is
> made to Normal Operation Mode (via an instrument
> reset and self-test sequence).

**Parameter Name
displayed**

**Hold down for
3 seconds**

Use Scroll key to select parameter

Use Up/Down keys to adjust displayed value

Display	Parameter
SEnS	Sensor Select
rLO	Input Range Min.
rHi	Input Range Max.
rPnt	Input Decimal ① Point Position
OutS	Output Select
Addr	Communications ② Address

Display	Parameter
bAUd	Communications ② Baud Rate
PAr	Communications ② Parity
SPS	Single/Dual Setpoint Select
ALIt	Alarm 1 Type
AL2t	Alarm 2 ③ Type
CntL	Control Select
tunE	Tuning ④ Select

① Appears only if sensor selected is DC (ma, mV or V)

② Appears only if Communications option is configured and fitted

③ Appears only if Output 3 is configured and fitted

④ Appears only if PID control is configured

Figure 4-1   Instrument Configuration Parameter Sequence

4-2

Table 4-1   Parameter Functions and Adjustment Ranges

Parameter	Function	Adjustment Range
Sensor Select	Selects input sensor type, resolution and input units (°F or °C) by means of a code number.	See Table 4-2.
Input Range Min.	Defines minimum value of input range	Thermocouple/RTD inputs: Range Min. Value for selected sensor (see Table 4-2) to 100 LSDs less than current Input Range Max. setting. DC Inputs: –1999 to 9999 with decimal point set according to *Input Range Decimal Point Position* parameter.
Input Range Max.	Defines maximum value of input range	Thermocouple/RTD inputs: 100 LSDs greater than current Input Range Min. Setting to Range Max. For selected sensor (see Table 4-2). DC Inputs: –1999 to 9999 with decimal point set according to *Input Range Decimal Point Position* parameter.
Input Range Decimal Point Position	For DC inputs only, determines decimal point position.	0 (xxxx), 1 (xxx.x), 2 (xx.xx) or 3 (x.xxx)
Output Selection	Links outputs to required functions by a 3-digit code (see Figure 4-2).	See Figure 4-2.
Comms. Address	Defines unique communications address of controller	1 to 128.
Comms. Baud Rate	Selects Baud rate for serial communications	[12] 1200 [24] 2400 [48] 4800 [96] 9600
Comms. Parity	Defines parity for serial communications	[odd] Odd [EuEn] Even [nOnE] None
Single/Dual Setpoint Select	Selects Single Setpoint or Dual Setpoint operation	[1] Single [2] Dual

Table 4-1 (Cont.) Parameter Functions and Adjustment Ranges

Parameter	Function	Adjustment Range	
Alarm 1 Type	Selects type of alarm for Alarm 1.	`PHd`	Process High, direct-acting
		`PLd`	Process Low, direct-acting
		`dEd`	Deviation, direct-acting
		`bAd`	Band, direct-acting
		`PHr`	Process High, reverse-acting
		`PLr`	Process Low, reverse-acting
		`dEr`	Deviation, reverse-acting
		`bAr`	Band, reverse-acting
Alarm 2 Type	Selects type of alarm for Alarm 2.	As for Alarm 1 Type.	
Control Select	Selects the control action and algorithm	`r_P`	Reverse-acting PID
		`d_P`	Direct-acting PID
		`r_o`	Reverse-acting ON/OFF
		`d_o`	Direct-acting ON/OFF
Tuning Select	Selects Manual Tuning or Hands-Off Tuning (Easy Tune)	`EASY`	Easy Tune
		`MAn`	Manual Tuning (with Pre-Tune)

Table 4-2   Sensor Selection Codes

Input Type	Code	Range Min.	Range Max.
Thermocouple			
Type J	100 (°C) 101 (°F) 110 (°C) 111 (°F)	−200°C −328°F −128.0°C −198.4°F	1200°C 2191°F 537.0°C 998.5°F
Type T	200 (°C) 201 (°F) 210 (°C) 211 (°F)	−240°C −400°F −128.0°C −198.4°F	401°C 753°F 400.6°C 753.0°F
Type K	300 (°C) 301 (°F) 310 (°C) 311 (°F)	−240°C −400°F −128.0°C −198.4°F	1371°C 2499°F 536.7°C 998.0°F
Type N	400 (°C) 401 (°F)	0°C 32°F	1399°C 2550°F
Type B	500 (°C) 501 (°F)	100°C 211°F	1824°C 3315°F
Type R	600 (°C) 601 (°F)	0°C 32°F	1759°C 3198°F
Type S	700 (°C) 701 (°F)	0°C 32°F	1770°C 3217°F
RTD (Pt100)			
	800 (°C) 801 (°F) 810 (°C) 811 (°F)	−199°C −327°F −127.9°C −198.3°F	802°C 1475°F 537.0°C 998.5°F
DC Linear			
0 - 20mA	900	−1999	9999
4 - 20mA	1000	−1999	9999
0 - 50mV	2000	−1999	9999
10 - 50mV	3000	−1999	9999

| Process Output		Alarm 1 Output		Option	
Code	**Meaning**	**Code**	**Meaning**	**Code**	**Meaning**
0	Not fitted	0	Not fitted	0	Not fitted
1	Relay	1	Relay	1	Second relay output fitted
2	SSR Drive	2	SSR Drive	2	Comms. (MODBUS) fitted
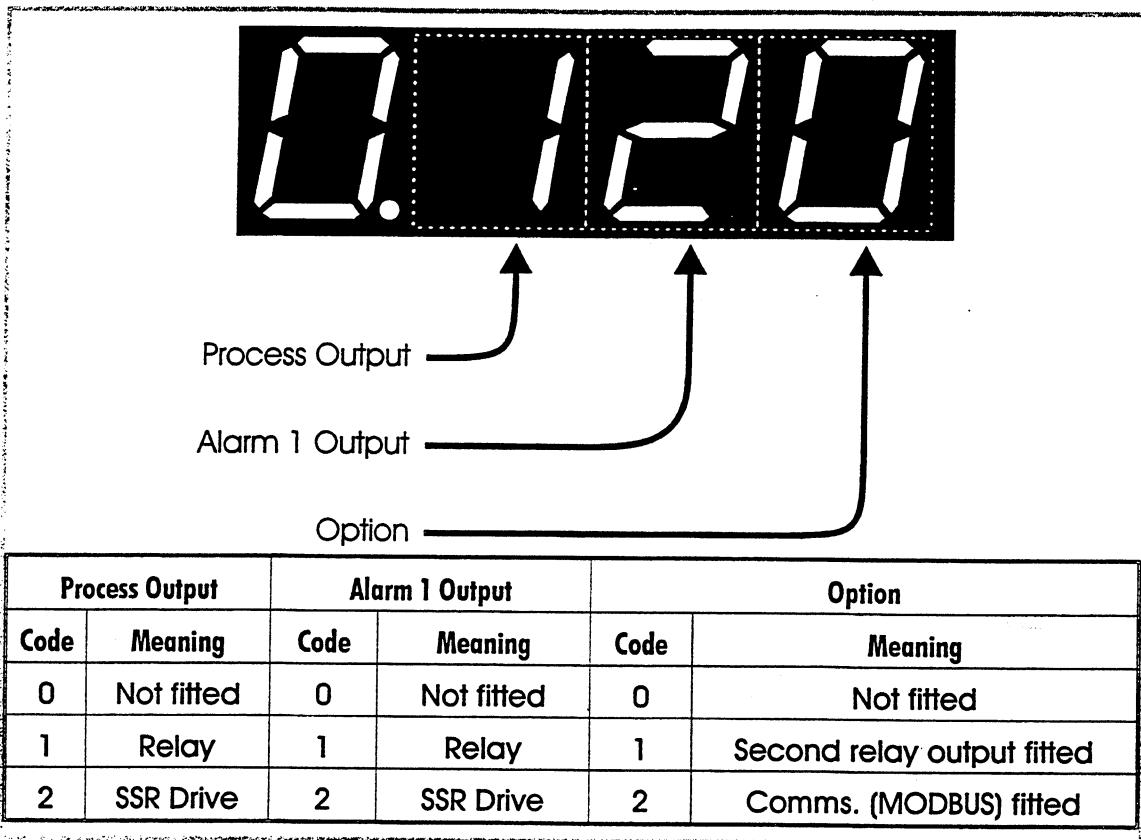
Figure 4-2   Display of Output Selection Code

Table 4-3   Parameter Default Values

Parameter	Default Value
Sensor Select	100 - Thermocouple "J" (–200°C to 1200°C)
Input Range Min.	Thermocouple/RTD - Input Range Min.; DC Linear - 0
Input Range Max.	Thermocouple/RTD - Input Range Max.; DC Linear - 1000
Decimal Point Posn.	0
Output Selection	1200 - Relay control output, SSR Drive, no option
Comms. Address	1
Comms. Baud Rate	4800
Comms. Parity	None
Single/Dual SP Select	1 - Single Setpoint operation
Alarm 1 Type	Process High Alarm
Alarm 2 Type	Process Low Alarm
Control Select	Reverse-acting PID control
Tuning Select	Easy Tune

5   CALIBRATION MODE

The Controlller is shipped from the factory ready-calibrated and normally does not need further calibration. However, some users may have a legal requirement for annual calibration. The procedures set out in this Section serve that purpose.

> NOTE: These procedures should be implemented only by personnel competent and authorised to do so.

Table 5-1   Calibration Mode Pre-requisites

Phase 1: DC mV Linear Input	50mV DC across Terminals 2 & 3 in the polarity shown in Figure 3-1.
Phase 2: RTD Input	200Ω across terminals 1 & 2 with compensating lead connected to Terminal 3.
Phase 3: DC mA Input	20mA source current connected to Terminals 3 & 4 in the polarity shown in Figure 3-1.
Phase 4: Thermocouple Input/CJC	0°C reference facility, Type K thermocouple leads (or equivalent) connected to Terminals 2 & 3.

5.1   ENTRY INTO CALIBRATION MODE

To enter Calibration Mode, proceed as shown on the right.

Power-up the Controller, then:

To display

Indicates that first calibration phase is ready to be executed.

Hold down for at least 6 seconds
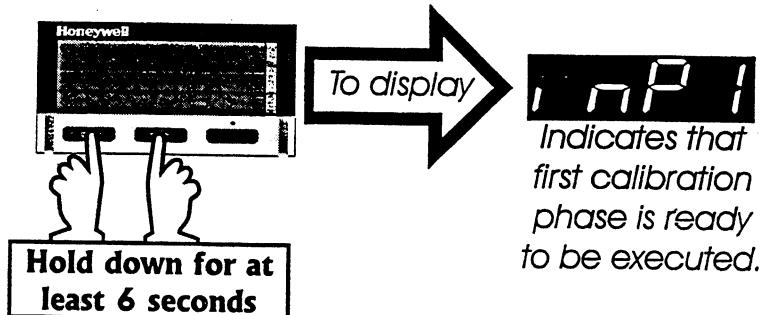
5.2   CALIBRATION PROCEDURE

Use Up or Down key
to select phase

Phase running

PASS

inP1

Press Scroll key
to start phase

Phase running

PASS

inP2

Press Scroll key
to start phase

Phase running

PASS

inP3

Press Scroll key
to start phase

Phase running

PASS

inP4

Press Scroll key
to start phase
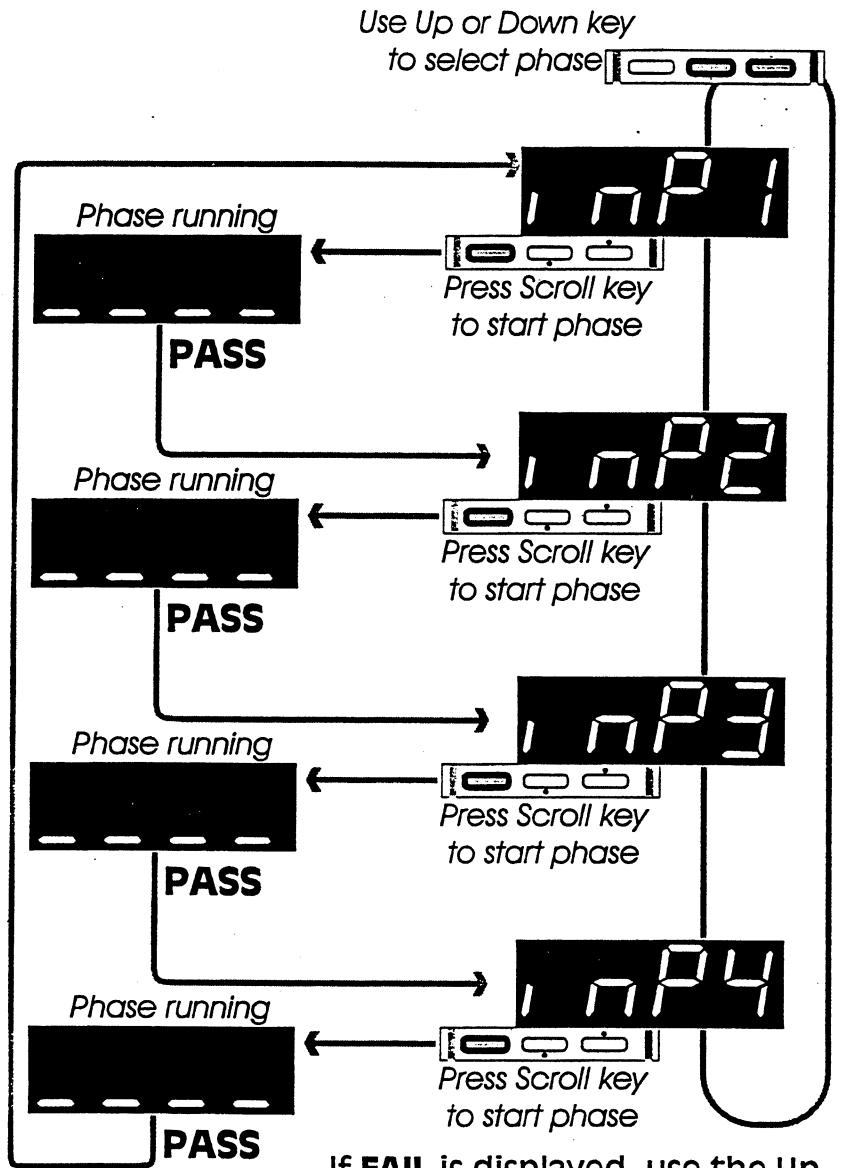
If **FAIL** is displayed, use the Up
and Down keys to re-start the
phase in question.

5.3   TO EXIT CALIBRATION MODE

NOTE: If there is no key activity for five minutes
in Calibration Mode, an automatic return is
made to Normal Operation Mode.

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**Hold down for
3 seconds**
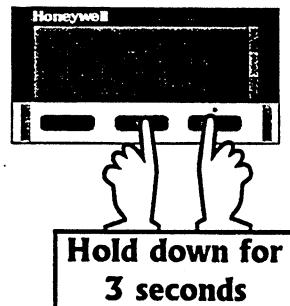
A   MODBUS COMMUNICATIONS

A.1   FUNCTIONS SUPPORTED

The following MODBUS functions are supported, (JBUS names - where such an equivalence exists - in italics):

Read Coil Status *(Read n Bits)*   - 01/02
Read Holding Registers *(Read n Words)* - 03/04
Force Single Coil *(Write 1 Bit)* - 05
Preset Single Register *(Write 1 Word)* - 06
Loopback Diagnostic Test - 08
Preset Multiple Registers *(Write n Words)* - 16

The instrument will identify itself in reply to a Read Holding Registers message which enquires the values of parameter numbers 121 and 122.

A.2   PARAMETER NUMBERS

Bit Parameters are summarised in Table A-1 and Word Parameters are summarised in Table A-2.

Table A-1   Bit Parameter Numbers

Parameter	Number	Notes
Reserved	1 - 3	
Pre-Tune	4	To enable Pre-Tune, write a non-zero value; to disable Pre-Tune, write zero. Enable Pre-Tune will fail if the process variable is within 5% of input span from the setpoint. This failure will not be signalled by communications.
Alarm 1 Status	5	Read Only
Alarm 2 Status	6	Read Only
Reserved	7 - 16	

Table A-2   Word Parameter Numbers

Parameter	Number	Notes
Process Variable value	1	Read Only
Current Setpoint value	2	Read Only
Output Power	3	Read Only
Deviation	4	Read Only
Proportional Band	5	
Reset	6	
Rate	7	
Bias	8	
ON/OFF Differential	9	
Output Cycle Time	10	
Input Filter Time Constant	11	
Alarm 1 value	12	
Alarm 2 value	13	
Selected Setpoint (1 or 2)	14	
Setpoint 1 value	15	
Setpoint 2 value	16	
Process Variable Offset	17	
Range Decimal Point Position	18	
Manufacturer ID	121	Read Only - 231 (representing "W1")
Equipment ID	122	Read Only - number 2300

TECHNICAL ASSISTANCE

If you encounter a problem with your unit, please review all the configuration data to verify that your selections are consistent with your application (i.e. inputs, outputs, alarms, limits etc.). If the problem persists after checking the above parameters, you can get technical assistance by calling the following:

In the U.S.A.:	1-800-423-9883
In other countries:	See following Honeywell Service Center addresses

HONEYWELL SERVICE CENTERS

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2800 LYNGBY
DENMARK
Tel.: 45 45 93 56 56

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Parc Technologique de St. Aubin
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Tel. from France: 01 60 19 80 00
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Volgy U 30
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HUNGARY
Tel.: 36 1 116 76 59

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COL. LOMAS ALTAS
11950 MEXICO CITY
MEXICO
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HONEYWELL ASIA PACIFIC
Room 3213-3225
Sun Kung Kai Centre
No. 30 Harbour Road
WANCHAI
HONGKONG
Tel.: 852 829 82 98

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HONEYWELL AUSTRIA G.m.b.H.
Handelskai 388
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AUSTRIA
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Budejovicka 1
140 00 Praha 4
Czech Republic
Tel.: 42-2-6112-2777

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Ruukintie 8
FIN-02320 ESPOO 32
FINLAND
Tel.: 358 0 3480101

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Kaiserleistrasse 39
Postfach 10 08 65
D-63067 OFFENBACH/MAIN
GERMANY
Tel.: 49 69 80 640

ITALY
HONEYWELL S.p.A.
Via P. Gobetti, 2/b
20063 Cernusco Sul Naviglio
ITALY
Tel.: 39 02 92146 1

NETHERLANDS
HONEYWELL BV
Laaderhoogtweg 18
NL-1101 EA AMSTERDAM ZO
THE NETHERLANDS
Tel.: 31 20 56 56 911

HONEYWELL SERVICE CENTERS

NORWAY
HONEYWELL A/S
Askerveien 61
PO Box 263
N-1371 ASKER
NORWAY
Tel.: 47 66 90 20 30

PORTUGAL
HONEYWELL PORTUGAL LDA
Edificio Suecia II
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PORTUGAL
Tel.: 351 1 4172 602

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SWITZERLAND
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FORT WASHINGTON, PA 19034-3260
U.S.A.
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http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

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http://auto.somanuals.com

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