

Multi-Rack Controller

Installation and Programming of Presscon Multi-Rack Version 1.1 Cards

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NOTE: throughout the text keys referred to are:

- ▲ increment value key
- ▼ decrement value key
- cancel key (move back to previous menu)
- ▶ select, accept key



1. INTRODUCTION

The Multi-Rack Controller is a Presscon control unit with pressure, power, gas and humidity control and monitoring. The four individual rack systems can each control up to eight compressor stages and eight discharge outputs, as well as analogue control and 20 alarm inputs.

The four power monitoring channels include the option of load shedding for greater power savings.

The six gas channels can be programmed individually to monitor a range of gases including ammonia and to control an output. i.e. ventilation fan.

The two humidity channels can each be programmed for alarms and standard or anti-sweat humidity control.

All readings and status information is available on the large 4 line display.

Versatile and simple programming in plain English makes the Controller a breeze to use.

A separate sheet reference PN401_1 gives a general overview of the controls capabilities.

Note: This version Multi-Rack controller is supported by Phasefale's PIN Version 1.64 and above. Free updates to registered users of earlier software are available from our web site www.phasefale.com.au but you must ring us for the password to download.

2. INSTALLATION

The Multi-Rack Controller is supplied as a PR/MULTI and has DIP switches set and factory settings loaded ready for use as a Multi-Rack controller.

Mounting is accomplished by removing the lid using a flat blade screwdriver, the two holes through the circuit board and back of the box can then be used to mount the assembly. Do not put excessive force on the circuit board. The 20 mm hole can be used to pass wiring through the box.

The Multi-Rack Controller requires 12Vdc 160 mA. (Refer to Presscon Network - Wiring Specification & Startup for complete wiring details).

3. OPERATION

Function	Keys
Cancel (any function); Previous Channel	■
Scroll	▲ or ▼
Select; Next Channel	▶


The information shown on the screen will vary depending on the way the Controller has been programmed. Typically displayed is the description of the control, the date and time, the alarm status, and the option to view the Event Log for historical information.

For example;

```
Mul ti Rack Control : 01
) 17/08/02      14: 26
All OK      No Alarms
View Event Logs
```

The description on the top line can be changed in programming.

The cursor (on the left of the screen) can be moved between lines with the ▲ and ▼ keys.

If the cursor is shaped , an option relevant to the displayed line is available by pressing the ▶ key.

Examples of these options are:

```
>ALARM 2 ACTIVE
```

Press **▶** to get the option to acknowledge the alarm.
Use **▲** and **▼** to select the desired option.
Press **▶** to activate the option or **■** cancel and make no change.

```
>View Event Logs
```

Press **▶** to gain access to log of the last 200 events.

```
)R1 HP/F 5:14 19/06
```

Indicating a high discharge pressure fault on Rack 1.
When the fault clears or is reset from Rack 1 screen, the log entry will be :

```
)R1 (HP/F) 15:29 19/06
```

If the cursor is shaped **)**, no option is available for this line and the **▶** key will move the display on to the next rack or channel.

The **■** key will move the display back to the previous rack or channel.

When viewing rack systems the first information that appears is the system description and it's number, the control status, the alarm status and the suction and discharge pressures on that system. For Example:

```
01 : RACK 1
)Rack OK No Al arms
Suct 132kPa 50 %
Di sch 1275kPa 80 %
```

To view more information use the **▲** and **▼** keys to move the cursor. For each rack or channel you can view the cut in and out settings, the alarm settings, the status of each of the used fault inputs or the event logs.

```
01 : RACK 1
Rack OK No Al arms
*Comp [ ** ] 50 %
Di sch 1275kPa 80 %
```

To view the rack cut in and cut out move the cursor down to the Suct display line and press **▶**, to then view the status of each compressor output press **▶** again. Similarly the discharge cut in and cut out and fan output status is available from the Disch display line.

```
View Event Logs
Control Norm
Overload ok
Phase ok
Oil Fail ok
Hi Temp not used
HP ok
LP ok
>1: Comp 5°C on
2: not used
. . .
8: not used
Anal og Comp 25%
Anal og Fan 50%
```

The compressor run hour meters can be viewed by moving the cursor to the desired compressor display line, and pressing **▶**.

```
*1: Run Hours 00076
```

The run hour meter can be reset by pressing the **▲** or **▼** followed by **▶**.

4. PROGRAMMING

The Multi-Rack Control is programmed via its 4 keys and screen. The screen will describe the setting to be adjusted and the current value.

The programming method is the same as for other modules, except the menu items vary.

To begin programming, press and hold both the **■** and **▶** keys for a few seconds until the following is displayed;

```
PROGRAMMI NG MODE
*ACCESS CODE 0000
SOFTWARE 1.10
CHECKSUM 211228
```

The Software Version of the control is displayed here, as is the memory checksum which can verify the memory integrity. Entry into the programming mode can be locked via the access code.

To enter the access code press the select key, then use the scroll keys to choose a number and the select key to accept and enter programming. If the wrong access code is chosen an error message will appear and the system will leave the programming mode.

Once access has been granted then the following menu will appear.

```
SELECT MENU GROUP
>RACK SETTINGS
POWER SETTINGS
GAS SETTINGS
HUMI DI TY SETTI NG
GENERAL OPTI ONS
HARDWARE SETTI NG
NETWORK CARDS
LOAD DEFAULTS
EXI T PROGRAMMI NG
```

Select the group you wish to program with ▲ and ▼, then select with ►.

Pressing ■ at any time while in programming will return you to the previous menu and leave the current setting unchanged.

The menus are described below in the recommended programming order for setting up a new controller. If you only wish to make an alteration you may skip to a setting and make the desired change.

To change settings move the cursor to the desired menu line. Press the ► key to enable editing. Edit mode is indicated by * next to the selection. Use the ▲ and ▼ keys to change the setting. Store the new setting with the ► key or press ■ to cancel and revert to the original setting.

4.1 GENERAL OPTIONS

This selection will allow the following settings to be altered.

```
Mul ti Rack
```

The name of the controller, which is shown during normal operation, can be altered for ease of identification. All 16 characters can be altered.

```
PRESSURE UNIT kPa
```

Set kPa or psi display mode for pressure.

```
TEMPERATURE UNIT °C
```

Set °C or °F display mode for temperature.

```
TIME 15/04/98 15:42
```

Set the date and the time.

```
ALARM ACK 10 mi n
```

The alarm acknowledge sets the time period that the alarm is turned off in order to rectify the fault. If the fault has not been remedied before the acknowledge time is up the system will switch back into alarm mode.

```
ACCESS CODE 0000
```

This option enables an access code to be implemented to provide security for the programming mode.

```
CUSTOM 1V = -100kPa
CUSTOM 6V = 590kPa
```

The above settings allow a custom pressure transducer to be used by setting the expected pressure for 1V and 6V. The custom sensor should be a linear voltage type. If it is a 0 to 5 volt type then calculate the expected pressures at 1 and 6 volts and enter them.

```
DATE FORMAT DDMMYY
```

This option selects either DDMMYY or MMDDYY date format.

EVENT MESSAGES ON

This option enables the event information to be printed.

All that is required is a clock/modem card and a serial printer. Events can also be saved to a logger card if available and recalled via PIN software. Refer to the PIN instruction manual for details about this function.

4.2 HARDWARE SETTINGS

```
SELECT HARDWARE
01: RACK 1
02: RACK 2
03: RACK 3
04: RACK 4
01: POWER 1
02: POWER 2
03: POWER 3
04: POWER 4
01: GAS 1
02: GAS 2
03: GAS 3
04: GAS 4
05: GAS 5
06: GAS 6
01: HUMI D 1
02: HUMI D 2
ALARMS
USE VALID CARDS YES
DONE
```

NOTE: the programmed descriptions for each of the rack, power, gas and humidity systems will be shown in this menu. The above example shows the factory set descriptions.

This menu allows the user to edit the use and physical card addresses for each of the controller functions and alarm outputs. Select the group to edit using the ▲ ▼ and ► keys. The Controller checks the network and will only allow you to use valid hardware it finds on the network. If you want to program the Controller with cards which are not yet connected or for Virtual inputs and outputs change the setting “USE VALID CARDS” to NO.

4.2.0 VIRTUAL INPUTS AND OUTPUTS

The controllers (Multi Rack, System Control and DDC only) may transfer on/off control signals using Virtual inputs and outputs. Up to 8 Virtual outputs can be assigned per controller (Vo:1 to Vo:8). The action of virtuals can also be reversed by using the opposite sense output- Vo:1/o versus Vo:1/c. To accept a virtual as a input, use the controller number plus the input- e.g. input 92:3 would take the third virtual output form controller 93. Virtual input/outputs are only suitable for digital signals (i.e. ON or OFF only).

**** Important**** To use Virtuals, in Hardware menu (at the bottom) change the setting “USE VALID CARDS” to NO. The use valid cards setting must be set each time it is to be used (not a permanent setting).

4.2.1 RACK 1 to 4

Each rack has the following hardware settings:

```
RACK 1 HARDWARE
>RACK USED
RACK OUT 1 C 11: 1o
RACK OUT 2 C 11: 2o
RACK OUT 3 U1 11: 3o
. . .
RACK OUT 8 N
ANALOG OUT Y 11
ANALOG RLY Y 12: 1o
SUCTION L 21: 01
COMP 1 TEMP Y 22: 01
```

```

COMP 2 TEMP Y 22: 02
. . .
COMP 8 TEMP N
CONTROL      Y 22: 03
RACK FLT 1 AC 22: 04
. . .
RACK FLT 4 A0 22: 05
COMP 1 FLT AC 22: 06
. . .
COMP 8 FLT A0 22: 07
COMP 1 IDLE Y 22: 08
. . .
COMP 8 IDLE Y 22: 09
SUCTION OFFSET Y 22: 10
DI S CHARGE   H 21: 02
DI S. OFFSET Y 22: 11
RECLAIM IN   Y 22: 12
FAN 1        Y 13: 10
. . .
FAN 8        Y 13: 80
RECLAIM RLY Y 14: 20
FAN AN OUT   Y 13
FAN AN RLY   Y 14: 10
DONE

```

NOTE: in the above table not all items are shown for simplicity, as indicated with . . .

The rack can be set to USED or NOT USED.

If NOT USED, the rack is not displayed in normal operation and it's settings are not able to be edited.

4.2.1.1 RACK OUTPUTS

The RACK OUT outputs (1 to 8) can be programmed as

N not used

C used as a Compressor and the card address and relay number entered, "o" is normally open and "c" is normally closed.

U1 used as an Unloader on compressor 1 and the card address and relay number entered, "o" is normally open and "c" is normally closed. When Unloader outputs are used it is necessary for stage tables to be utilised (see Rack Settings).

It is highly recommended that Compressors be programmed to the first outputs followed by unloaders, that way the number after the U will always refer to the right compressor i.e. U3 refers to unloader on compressor 3 that is on RACK OUT 3.

4.2.1.2 ANALOG OUTPUT

Each rack has the capability of controlling a variable speed compressor through this output and the ANALOG RELAY output.

N not used

Y used and the relay card address of the analog output to be used.

4.2.1.3 ANALOG RELAY

This output can be used to provide a start signal to a VSD.

N not used

Y used and the card address and relay number entered, "o" is normally open and "c" is normally closed.

4.2.1.4 SUCTION

The suction transducer type and input can be defined here [Sensor Card input switch=Pressure].

N not used

L used as a 0-100 psi transducer and the card address and input number entered.

H used as a 0-500 psi transducer and the card address and input number entered.

S used as a custom transducer with the settings defined in General Options and the card address and input number entered.

4.2.1.5 COMP TEMP

Each compressor can have head temperature monitoring if enabled here [Sensor Card input switch=Temperature].

N not used

Y used and the card address and input number entered.

4.2.1.6 COMP CONTROL (CONTROL)

Each rack can have a control input allocated to it, which will allow the following functions to be operated via a switch. The state of the control input by switching resistances between a sensor card input set as a temperature input and the G terminal [Sensor Card input switch=Temperature]..

Resistance	Control
Open circuit	Norm
22 k	Tab 2
10 k	Tab 1
6k8	Dec
4k7	Max
2k7	Fans
1 k	Hold
0 R	Off

Norm(al) is control by programmed settings. *Tab(le)* number forces the control to use the selected table. While this is on the tables will not rotate. *Dec(rease)* forces the control to decrease capacity with time delay. *Max(imum)* forces the control to increase capacity with time delay. *Fans* causes the condenser fans to turn on with time delay. *Hold* forces the control to ignore readings and maintain the current outputs. *Off* causes all compressors, condenser fans and the analogue outputs to turn off without time delay.

N not used

Y used and the card address and input number entered.

4.2.1.7 RACK FLT

Each rack can have up to 4 fault inputs, which will cause the rack outputs to turn off if enabled here [Sensor Card input switch=Temperature]..

N not used

AO used and faults when open circuit, and the card address and input number entered.

AC used and faults when closed circuit, and the card address and input number entered.

4.2.1.7 COMP FLT

Each compressor can have a fault input, which will cause that compressor and any unloader outputs to turn off if enabled here [Sensor Card input switch=Temperature]..

N not used

AO used and faults when open circuit, and the card address and input number entered.

AC used and faults when closed circuit, and the card address and input number entered.

4.2.1.8 COMP IDLE

Each compressor can have an idle input to monitor the state of the compressor, if enabled here. If used any unloader associated with the compressor in question will not load unless the compressor starts causing this input to open, closed circuit equals idle [Sensor Card input switch=Temperature]..

N not used

Y used and the card address and input number entered.

4.2.1.9 SUCT OFFSET

Used to offset the rack CUT IN and CUT OUT according to the value programmed in RACK SETTINGS and the state of this input as follows [Sensor Card input switch=Temperature].:

Open circuit - No Offset;

Short circuit - Full Offset;

Between 0 & 100k Ohm resistance – proportional Offset.

4.2.1.10 DISCHARGE

The discharge transducer type and input can be defined here [Sensor Card input switch=Pressure]..

N not used

L used as a 0-100 psi transducer and the card address and input number entered.

H used as a 0-500 psi transducer and the card address and input number entered.

S used as a custom transducer with the settings defined in General Options and the card address and input number entered.

4.2.1.11 DIS. OFFSET

Used to offset the FAN CUT IN and CUT OUT according to the value programmed in RACK SETTINGS and the state of this input as follows [Sensor Card input switch=Temperature].:

Open circuit - No Offset;

Short circuit - Full Offset;

Between 0 & 100k Ohm resistance – proportional Offset.

4.2.1.12 RECLAIM IN

Each rack may operate a RECLAIM RLY output for heat reclaim according to the RECL ABOVE setting programmed in RACK SETTINGS and the state of this input as follows [Sensor Card input switch=Temperature].:

Open circuit - No heat reclaim;
Short circuit - Heat reclaim possible;

4.2.1.13 FAN

Up to eight condenser fans can be controlled if enabled here.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.1.14 RECLAIM RLY

This output will switch according to the state of the RECLAIM IN input and the RECL ABOVE setting, if enabled here.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.1.15 FAN AN OUT

Each rack has the capability of controlling a variable speed condenser through this output and the FAN AN RLY output.

N not used

Y used and the relay card address of the analog output to be used.

4.2.1.16 FAN AN RLY

This output can be used to provide a start signal to a VSD.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.2 POWER 1 to 4

Each power channel has the following hardware settings:

```
POWER 1 HARDWARE
POWER          USED
TRANSDUCER Y 21: 04
RELAY          Y 12: 6o
DONE
```

The power channel can be set to USED or NOT USED.

If NOT USED, the channel is not displayed in normal operation and its settings cannot be edited.

4.2.2.1 TRANSDUCER

The location of the power transducer can be programmed here[Sensor Card input switch=Temperature].

N not used

Y used and the address and input number entered.

4.2.2.2 RELAY

This output can be controlled via the power cutin and cutout settings.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.3 GAS 1 to 6

Each gas channel has the following hardware settings:

```
GAS 1 HARDWARE
GAS           USED
TRANSDUCER Y 22: 01
RELAY        Y 12: 7o
DONE
```

The gas channel can be set to USED or NOT USED.

If NOT USED, the channel is not displayed in normal operation and its settings cannot be edited.

4.2.3.1 TRANSDUCER

The location of the gas sensor can be programmed here[Sensor Card input switch=Temperature].

N not used

Y used and the card address and input number entered.

4.2.3.2 RELAY

This output can be controlled via the gas cutin and cutout settings.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.4 HUMIDITY 1 and 2

Each humidity channel has the following hardware settings:

```
HUMI D 1 HARDWARE
HUMI DI TY   USED
TRANSDUCER  Y 22: 02
RELAY       Y 12: 8o
DONE
```

The humidity channel can be set to USED or NOT USED.

If NOT USED, the channel is not displayed in normal operation and its settings cannot be edited.

4.2.4.1 TRANSDUCER

The location of the humidity sensor can be programmed here[Sensor Card input switch=Temperature].

N not used

Y used and the card address and input number entered.

4.2.4.2 RELAY

This output can be controlled via the humidity cutin and cutout settings.

N not used

Y used and the card address and relay number entered, “o” is normally open and “c” is normally closed.

4.2.5 ALARMS

The following alarm outputs can be used:

```
ALARM HARDWARE
LI GHT       Y 11: 7o
DI ALER      Y 11: 8c
CLOCK        Y 61
ALARM ACKN   Y 22: 15
DONE
```

Light : select Y or N for a light output on alarm. In this example “11” is the card address, “7” is the relay number and the “o” (default setting) and the “c” indicate whether normally open or closed contacts.

Dialler: enables an automatic dialler or security system to be operated in the case of an alarm In this example “11” is the card address, “8” is the relay number and the “o” (default setting) and the “c” indicate whether normally open or closed contacts. Setting the dialler to “o” gives an output which will open circuit on alarm or power loss.

NOTE: this controller supports double addressing light and dialler relays when used with a version 3.5 or later relay card. ie multiple 4 line controllers can be set to operate a common light relay and a common dialler. This function is not available with Alarm or Rack controller cards.

Clock Card: set if a clock card is installed, it’s card address is to be entered if this is the case.

Alarm Acknowledge: set to Y and allocate an input address if a remote alarm acknowledge push button is to be used. The push button must be depressed for approximately 2 seconds (on sensor/8 330; sens32 32_110 or later cards) to be detected.

4.3.1 RACK SETTINGS

The following menu items set the running parameters for each of the 4 rack systems. If a rack is set to not used in the hardware settings section, its system settings will be unavailable.

SELECT RACK
01: RACK 1
02: RACK 2
03: RACK 3
04: RACK 4
DONE

NOTE: the programmed description for each of the 4 racks will be shown in this menu. The above example shows the factory set descriptions.

Select the rack to be programmed and the following menu will appear. For example rack 1 is selected.

RACK SETTING	Default Val.	Units	Low Limit	High Limit
RACK 1	RACK 1	16 character description		
CUT IN	100kPa	kPa	-140	5000
CUT OUT	40kPa	kPa	-140	5000
LP FAULT	0kPa	kPa	-140	5000
INC DELAY	30	sec	5	995
DEC DELAY	30	sec	5	995
INC UNLOADER	30	sec	5	995
DEC UNLOADER	30	sec	5	995
ANALOG INC	1	Vol t/mi n	1	250
ANALOG DEC	1	Vol t/mi n	1	250
ANALOG STEP	2	Vol t	0	10
ANALOG HOLD	OFF	ON/OFF	OFF	ON
LIMIT START	1	mi n	0	99
SUCT OFFSET	20	kPa	-500	500
HEAD FAULT	120	°C	0	200
HEAD RESTART	80	°C	0	200
HEAD DELAY	1	mi n	0	99
COMP FAULT	1	mi n	0	99
COMP RESTART	5	mi n	0	99
COMP ACTION	Stop	Stop, Latch, Al arm		
FLT 1 DELAY	1	mi n	0	99
FLT 1 RESTART	5	mi n	0	99
FLT 1 ACTION	Stop	Stop, Latch, Al arm		
FLT 1 DESC	Overload	8 character Decsription		
FLT 2 DELAY	1	mi n	0	99
FLT 2 RESTART	5	mi n	0	99
FLT 2 ACTION	Stop	Stop, Latch, Al arm		
FLT 2 DESC	Phase	8 character Decsription		
FLT 3 DELAY	1	mi n	0	99
FLT 3 RESTART	5	mi n	0	99
FLT 3 ACTION	Stop	Stop, Latch, Al arm		
FLT 3 DESC	Oil Fail	8 character Decsription		
FLT 4 DELAY	1	mi n	0	99
FLT 4 RESTART	5	mi n	0	99
FLT 4 ACTION	Stop	Stop, Latch, Al arm		
FLT 4 DESC	Hi Temp	8 character Decsription		
CT SCALE	100	/5 Amp	5/5	1250/5
NO OF TABLES	0	0, 1, 2	0	2
NO OF STEPS	1	Steps	1	16
ROTATE PERIOD	24	Hours	0	99
T1: STEP 1:				
T1: STEP 2:				
T1: STEP 3:				
T1: STEP 16:				

T2: STEP 1:				
T2: STEP 2:				
T2: STEP 3:				
T2: STEP 16:				
FAN CUT IN	1200	kPa	-140	5000
FAN CUT OUT	1100	kPa	-140	5000
FAN ALL ON	1600	kPa	-140	5000
HP FAULT	2000	kPa	-140	5000
FAN INC	20	sec	5	995
FAN DEC	20	sec	5	995
AN FAN INC	1	V/minute	1	250
AN FAN DEC	1	V/minute	1	250
AN FAN STEP	0	Volt	0	10
AN FAN HOLD	Off	On/Off	Off	On
ROTATE FANS	On	On/Off	Off	On
FAN OFFSET	100	kPa	-500	500
RECL ABOVE	1000	kPa	-140	5000
RECL HALF FANS	No	On/Off	No	Yes
DONE				

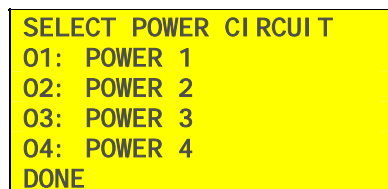
Each of the above items maybe programmed as follows.

- "RACK 1": is a user programmable description up to 16 characters long..
- CUT IN: the pressure at which a compressor or unloader output turns on after any time delays programmed <-140 to 5000kPa>
- CUT OUT: the pressure at which a compressor or unloader output turns off after any time delays programmed. Set this to less than the CUT IN pressure. (When the pressure is between the CUT IN and CUT OUT values, the output can be ON or OFF depending on conditions) <-140 to 5000kPa>
- LP FAULT: if the suction pressure falls below this value the compressors are switched off without time delay and the alarm outputs operate. Compressors will restart automatically according to the CUT IN and any time delays if the pressure returns to normal. <-140 to 5000kPa>
- INC DELAY: the time delay for each increase of compressor capacity. <5 to 995sec>
- DEC DELAY: the time delay for each decrease of compressor capacity. <5 to 995sec.>
- INC UNLOADER: the time delay for each increase of unloader capacity. <5 to 995sec>
- DEC UNLOADER: the time delay for each decrease of unloader capacity. <5 to 995sec.>
- ANALOG INC: the rate at which the output increases when the suction pressure is higher than half way between the CUT IN and the CUT OUT. <1 to 250V/min.>
- ANALOG DEC: the rate at which the output decreases when the suction pressure is lower than half way between the CUT IN and the CUT OUT. <1 to 250V/min.>
- ANALOG STEP: the change in analogue output voltage each time a fixed capacity compressor is switched on or off. The output decreases by this amount when a compressor is switched on and increases by this amount when a compressor is switched off. <0 to 10V>
- ANALOG HOLD: if turned on, fixed capacity compressors will only switch on if the analogue output is at 10V, and only switch off if the analogue output is at 0V. <OFF,ON>
- LIMIT START: each compressor requires at least this time to elapse since its previous start. <0 to 99min>
- SUCT OFFSET: the maximum amount by which the rack CUT IN and CUT OUT settings will change while the SUCT OFFSET input is active. <-500 to 500kPa>
- HEAD FAULT: the high temperature fault setting for the compressors. <0 to 200°C >
- HEAD RESTART: the temperature at which the compressors will automatically restart. <0 to 200°C >
- HEAD DELAY: a single compressor will switch off and the alarm output will operate if the head fault setting is exceeded for this period. <0 to 99min>
- COMP FAULT: the action programmed for "COMP ACTION" will occur to the relevant compressor if the fault input is in fault for this period. <0 to 99min>
- COMP RESTART: a STOPped compressor will be free to restart if its fault input returns to normal for this period. <0 to 99min >
- COMP ACTION: the programmed action will occur if a compressor fault is present for the fault period. STOP will switch off the compressor, operate the alarm output and allow the compressor to automatically restart. LATCH will switch off the compressor, operate the alarm output but require the compressor to be manually restarted. ALARM will operate the alarm output only and not stop the compressor. <STOP,LATCH,ALARM>
- FLT 1(to 4): the action programmed for "FLT ACTION" will occur to all compressors if the fault input is in fault for this period. <0 to 99min>
- FLT 1(to 4) RESTART: STOPped compressors will be free to restart if the fault input returns to normal for this period.

- <0 to 99min >
- FLT 1(to 4) ACTION: the programmed action will occur if a rack fault is present for the fault period. STOP will switch off the compressors, operate the alarm output and allow the compressors to automatically restart. LATCH will switch off the compressors, operate the alarm output but require the compressors to be manually restarted. ALARM will operate the alarm output only and not stop the compressors. <STOP,LATCH,ALARM>
- FLT 1(to 4) DESC: user programmable description up to 8 characters long for describing the fault input.
- CT SCALE : sets the CT ratio for monitoring the compressor current if the idle input is used. <5/5 to 1250/5Amp>
- NO OF TABLES : sets the number of stage tables to be used. Tables must be used if unloaders are being controlled <0 to 2>
- NO OF STEPS : the number of steps in each table. Usually equals the number of Rack (compressor and unloader) Outputs plus one, however can be more or less if necessary. <1 to 16>
- ROTATE PERIOD : if two stage tables are being used, they will rotate according to the period programmed here. <0 to 99HR>
- T1(2): STEP 1 (to 16) : allows the state of each rack output to be programmed for each step of the table. Step 1 is the lowest stage. A “_” means the output is off, a “C” means the output is a compressor and it is on, a number means an unloader relating to that compressor (i.e. “3” is an unloader on compressor 3). NOTE : When a compressor is off due to a fault or idle input, the unloaders for that compressor are switched to their step one state until after the compressor starts.
- FAN CUT IN: the pressure at which a condenser fan output turns on. <-140 to 5000kPa>
- FAN CUT OUT: the pressure at which a condenser fan output turns off. <-140 to 5000kPa> Set this to less than the FAN CUT IN setting. When the pressure is between the FAN CUT IN and FAN CUT OUT values, the output can be ON or OFF depending on conditions)
- FAN ALL ON: the pressure at which all condenser fan outputs turn on without time delay. <-140 to 5000kPa>
- HP FAULT: if the discharge pressure rises above this value the compressors are switched off without time delay and the alarm outputs operate. The compressors will restart automatically after 15 minutes, according to the CUT IN and any time delays if the pressure returns to normal. <-140 to 5000kPa>
- FAN INC: the time delay between switching fans on. <5 to 995sec>
- FAN DEC: the time delay between switching fans off. <5 to 995sec.>
- AN FAN INC: the rate at which the output increases when the discharge pressure is higher than half way between the FAN CUT IN and the FAN CUT OUT. <1 to 250V/min.>
- AN FAN DEC: the rate at which the output decreases when the discharge pressure is lower than half way between the FAN CUT IN and the FAN CUT OUT. <1 to 250V/min.>
- AN FAN STEP: the change in analogue output voltage each time a fan is switched on or off. The output decreases by this amount when a fan is switched on and increases by this amount when a fan is switched off. <0 to 10V>
- AN FAN HOLD: if turned on, fans will only switch on if the analogue output is at 10V, and only switch off if the analogue output is at 0V. <OFF, ON>
- ROTATE FANS : select whether or not to rotate the fans for even wear. <OFF, ON>
- FAN OFFSET: the maximum amount by which the FAN CUT IN and FAN CUT OUT settings will change while the DIS. OFFSET input is active. <-500 to 500kPa>
- RECL ABOVE: if the RECLAIM IN input is short circuit and the discharge pressure is above this setting then heat reclaim will be active and the RECLAIM RLY output will switch. <-140 to 5000kPa>
- RCL HALF FANS: if set to ON only the odd condenser fans will operate when heat reclaim is active unless the discharge pressure is above the FAN ALL ON setting. <OFF, ON>

4.3.2 POWER SETTINGS

The following menu items set the parameters for each of the 4 power channels. If a channel is set to not used in the hardware settings section, its settings will be unavailable.



NOTE: the programmed description for each of the 4 channels will be shown in this menu. The above example shows the factory set descriptions.

Select the power channel to be programmed and the following menu will appear.
For example:

```

POWER 1 SETTINGS
DESC POWER 1
CT SCALE 200/5Amp
POWER CUTIN 100kW
POWER CUTOUT 50kW
POWER ALARM OFF
DONE

```

- DESC : is a user programmable description up to 8 characters long..
- CT SCALE : sets the CT ratio for the power monitoring channel. <5/5 to 1250/5Amp>
- POWER CUTIN: the power level above which the power relay will switch on. <0 to 1250kW>
- POWER CUTOUT: the power level below which the power relay will switch off. <0 to 1250kW>
- POWER ALARM: if turned on the alarm outputs will operate if the power level rises above the POWER CUTIN setting. <OFF, ON>

4.3.3 GAS SETTINGS

The following menu items set the parameters for each of the 6 gas channels. If a channel is set to not used in the hardware settings section, its settings will be unavailable.

```

SELECT GAS SYSTEM
01: GAS 1
02: GAS 2
03: GAS 3
04: GAS 4
05: GAS 5
06: GAS 6
DONE

```

NOTE: the programmed description for each of the 4 channels will be shown in this menu. The above example shows the factory set descriptions.

Select the gas channel to be programmed and the following menu will appear. For example gas 1 is selected.

```

GAS 1 SETTINGS
DESC GAS 1
ALARM POINT 100ppm
ALARM DELAY 10min
CUTIN 100ppm
CUTOUT 50ppm
SENSOR TYPE R134a
CUSTOM CODE 1 200
CUSTOM CODE 2 170
CUSTOM CODE 3 140
CUSTOM CODE 4 110
CUSTOM CODE 5 80
CALIBRATE 0ppm
DONE

```

- DESC : is a user programmable description up to 8 characters long..
- ALARM POINT : sets the alarm level for this gas monitoring channel. If set to 0 the gas alarm is off. <0 to 2500ppm>
- ALARM DELAY: the alarm delay for this gas monitoring channel. <0 to 99min>
- CUTIN: the gas level above which the gas relay will switch on. <10 to 2500ppm>
- CUTOUT: the gas level below which the gas relay will switch off. <10 to 2500ppm>
- SENSOR TYPE: sets the type of gas to be monitored from either a pre-defined type or as a custom setup. <R134a, R404a, AMMONIA, GAS Tx, CUSTOM>
- CUSTOM CODE 1 (to 5) : sets the sensor response characteristics for a particular gas if Sensor Type has been set to Custom. Refer to the sensor instruction for a list of codes.
- CALIBRATE : turn this to ZERO to set the current gas reading to be the zero concentration point. This must be done when there is no gas being sensed.

4.3.4 HUMIDITY SETTINGS

The following menu items set the parameters for each of the 2 humidity channels. If a channel is set to not used in the hardware settings section, its settings will be unavailable.

```

SELECT HUMID SYSTEM
01: HUMID 1
02: HUMID 2
DONE

```

NOTE: the programmed description for each of the 2 channels will be shown in this menu. The above example shows the factory set descriptions.

Select the humidity channel to be programmed and the following menu will appear. For example humidity 1 is selected.

```

HUMIDITY 1 SETTINGS
DESC HUMID 1
TYPE CONTROL
CUTIN          60%
CUTOUT         40%
ALARM HIGH     90%
ALARM LOW      10%
ALARM DELAY    10min
DONE

```

- DESC : is a user programmable description up to 8 characters long..
- TYPE : sets the type of humidity control for the channel. <CONTROL, ANTI SWEAT>
- CUTIN: the humidity level above which the humidity relay will switch on. <0 to 100%>
- CUTOUT: the humidity level below which the humidity relay will switch off. <0 to 100%>
- ALARM HIGH : sets the high humidity alarm point for this channel. If set to 100 the high alarm is off. <0 to 100%>
- ALARM LOW : sets the low humidity alarm point for this channel. If set to 0 the low alarm is off. <0 to 100%>
- ALARM DELAY : the alarm delay for this humidity channel. <0 to 99min>

4.4 NETWORK CARDS

The following items relate to the network system of the MultiRack controller.

```

NETWORK CARDS
>EXAMINE NETWORK
NETWORK STATS  99%
LAST ERROR CARD 12
DONE

```

4.4.1 EXAMINE NETWORK

Examine Network: identifies the cards connected to the Presscon Network and presents a list of them with itself at the top and the other cards in address order, for example:

```

NETWORK CARDS
THIS CONTROL 01
RACK/CON     02
RELAY/8      11
RELAY/8      12
SENSOR/8     21
SENSOR32     22
COM/CLK      61
SYSCON       91
DONE

```

NOTE: the contents of the above menu will depend entirely on the cards connected to the Presscon network.

The address number of each card can be edited and must be unique.

4.4.2 NETWORK STATS

Network Stats: percentage of successful network communications. If this falls below 99% it indicates a programming or

wiring problem may be occurring.

4.4.3 LAST ERROR

Last error card: identifies the last card that caused an unsuccessful network communication.

4.5 LOAD DEFAULTS

Selecting the load defaults brings up the following screen.

```
LOAD DEFAULTS
FACTORY SETTING      NO
ARE YOU SURE?       NO
DONE
```

4.5.1 FACTORY SETTINGS

To return all settings to the factory settings set both FACTORY SETTING and ARE YOU SURE to YES.

All Rack Systems, Power, Gas and Humidity channels will be NOT USED. The address number will be set to 01. The following shows factory settings for rack 1;

```
RACK 1 SETTINGS
RACK 1
CUT IN      100kPa
CUT OUT     50kPa
LP FAULT    0kPa
INC DELAY   30sec
DEC DELAY   20sec
INC UNLOADER 20sec
DEC UNLOADER 10sec
ANALOG INC  1V/mi n
ANALOG DEC  1V/mi n
ANALOG STEP 0V
ANALOG HOLD OFF
LIMIT START 1mi n
SUCTION OFFSET 0kPa
HEAD FAULT  120°C
HEAD RESTART 80°C
HEAD DELAY  1mi n
COMP FAULT  1mi n
COMP RESTART 5mi n
COMP ACTION STOP
FLT 1 DELAY 1mi n
FLT 1 RESTART 5mi n
FLT 1 ACTION STOP
FLT 1 DESC  Overload
FLT 2 DELAY 1mi n
FLT 2 RESTART 5mi n
FLT 2 ACTION STOP
FLT 2 DESC  Phase
FLT 3 DELAY 1mi n
FLT 3 RESTART 5mi n
FLT 3 ACTION STOP
FLT 3 DESC  Oil Fall
```

```
FLT 4 DELAY 1mi n
FLT 4 RESTART 5mi n
FLT 4 ACTION STOP
FLT 4 DESC  Hi Temp
CT SCALE 100/5Amp
NO OF TABLES 0
NO OF STEPS 1
ROTATE PERIOD 24HR
T1: STEP 1: _ _ _ _ _
. . .
T1: STEP16: _ _ _ _ _
T2: STEP 1: _ _ _ _ _
. . .
T2: STEP16: _ _ _ _ _
FAN CUT IN 1200kPa
FAN CUT OUT 1100kPa
FAN ALL ON 1600kPa
HP FAULT 2000kPa
FAN INC 20sec
FAN DEC 20sec
AN FAN INC 1V/mi n
AN FAN DEC 1V/mi n
AN FAN STEP 0V
AN FAN HOLD OFF
ROTATE FANS ON
FAN OFFSET 0kPa
RECL ABOVE 1000kPa
RECL HALF FANS NO
DONE
```

4.5.2 GENERAL OPTIONS

```
GENERAL OPTIONS
Multi Rack
PRESSURE UNIT kPa
TEMPERATURE UNIT °C
TIME DD/MM/YY HH:MM
ALARM ACK 10 mi n
ACCESS CODE 0000
```

CUSTOM1V=	-100kPa
CUSTOM6V=	590kPa
DATE FORMAT	DDMMYY
DONE	

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