Parasense
A BACHARACH. COMPANY


# 3300RM2
# REFRIGERANT MONITOR

## OPERATION & MAINTENANCE MANUAL

Model 3300RM2

Doc. Ref. MN3300RM2 Revision 5, March 2020

reliability ° efficiency ° performance

**3300RM2**
**Refrigerant Monitor**

**Models 3300RM2**

## Approvals

This product has been accredited with the following:-

• Vibration MIL-STD-167-1A • Shock Grade A MIL-S-901D • EMC MIL-STD-461F

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‘Caution, Risk of Electric Shock’ Please isolate elsewhere before opening Monitor door.

Please read this manual before installing or servicing the equipment.

# TABLE OF CONTENTS

| Revision | Details | Checked |
|---|---|---|
| 2-3:<br>September 2013 | System fault and fault messages section revised. Various changes to module replacement instructions | |
| 2-4:<br>November 2013 | System test updated. Calibration details removed, photos updated. | |
| 2-5:<br>November 2013 | Page 3-9: area mode: configurable number of samples changed to (between 1 and 9) | |
| 2-6:<br>December 2013 | Multiple changes throughout entire manual | |
| 2-7:<br>March 2014 | All display screenshots updated | |
| 2-8:<br>October 2014 | Styx replacement procedure updated. Appendix: PM1940 and PM1951 revised | |
| 2-9:<br>October 2015 | Page numbers corrected. Appendix PM1940 and PS0716 updated to latest revision | |
| 3-0:<br>9th Nov 2015 | Appendix: PS0716 revised. Door and network module replacement procedure updated. Photos updated to show correct wiring configuration on J17 of network module. Checked box added to this table. Multiple corrections | AK |
| 3-1:<br>17th May 2016 | Quality Management logo added | AK |
| 4-0:<br>1st Feb 2017 | System Test information re-worded to clarify its purpose and changed number of reservoir bag valve turns from 2 to 1. Updated Parasense Inc. address details. Stepwise branding removed. | JB |
| 4-1:<br>9th March 2017 | Calibration check section added. | AK |
| 4-2:<br>21st March 2018 | Parasense logo updated throughout manual and drawings | JB |
| 4-3<br>25th October 2018 | Webpage screen shot updated | TS |
| 5<br>March 2020 | Updated addresses | JH |

# 1 INTRODUCTION

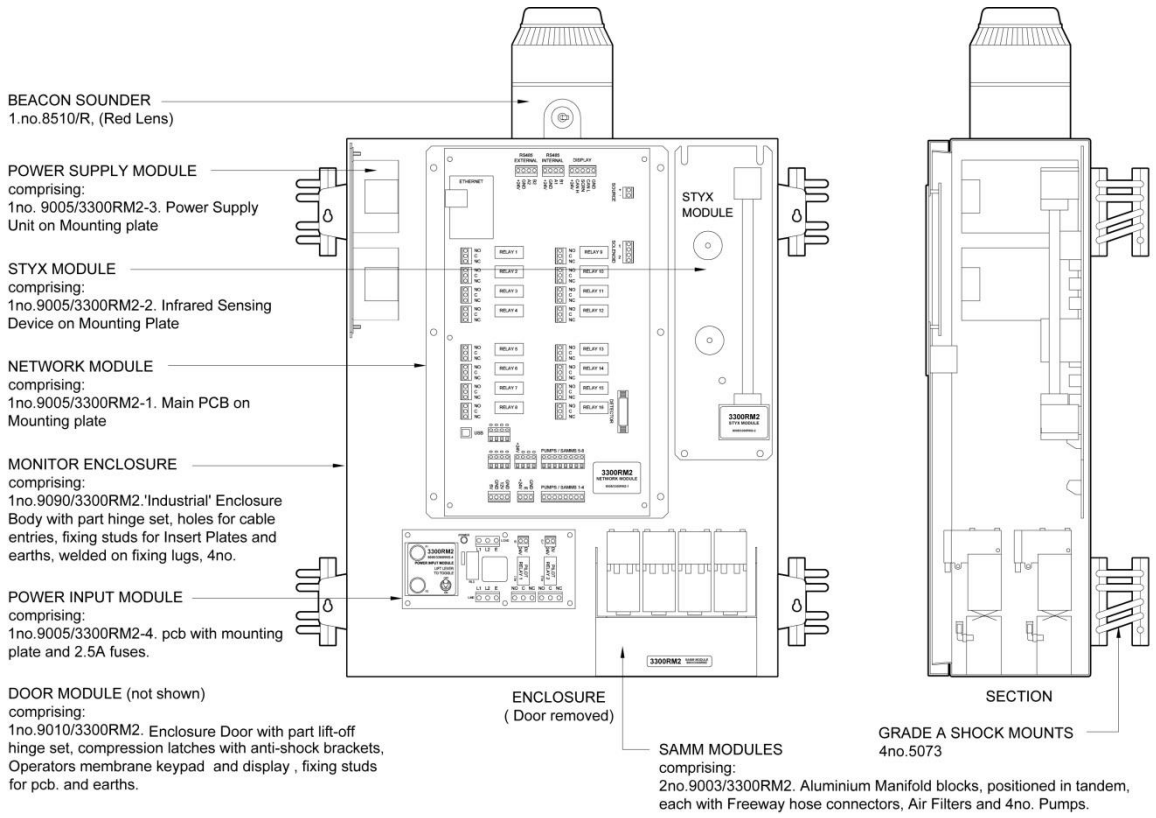
The Parasense 3300RM2 monitor is an advanced refrigerant leak detection device. Utilising infrared absorption sensors, the 3300RM2 automatically collects and analyses samples of air to report and record the time, presence and concentration of refrigerant, in accordance with the system configuration.

The monitor has 8 individual SAMMs (sampling channels), each having their own pump and filter. Each SAMM is connected to the location to be sampled by semi-rigid nylon pipework, referred to as freeway. The specific location can then be further subdivided into small regions using a manifold and multiple sampling pipes known as spur kits (refer to the Installation Guide within this manual).

Each SAMM on the 3300RM2 can be used to monitor refrigerant gas in one of two ways. Option 1 is to configure the 3300RM2 to monitor the overall area where refrigerant equipment is contained. This ensures the level of refrigerant concentration is kept within specified limits. Option 2 is to configure the 3300RM2 to monitor a specific piece of refrigeration equipment, directly targeting the source of any refrigerant leaks.

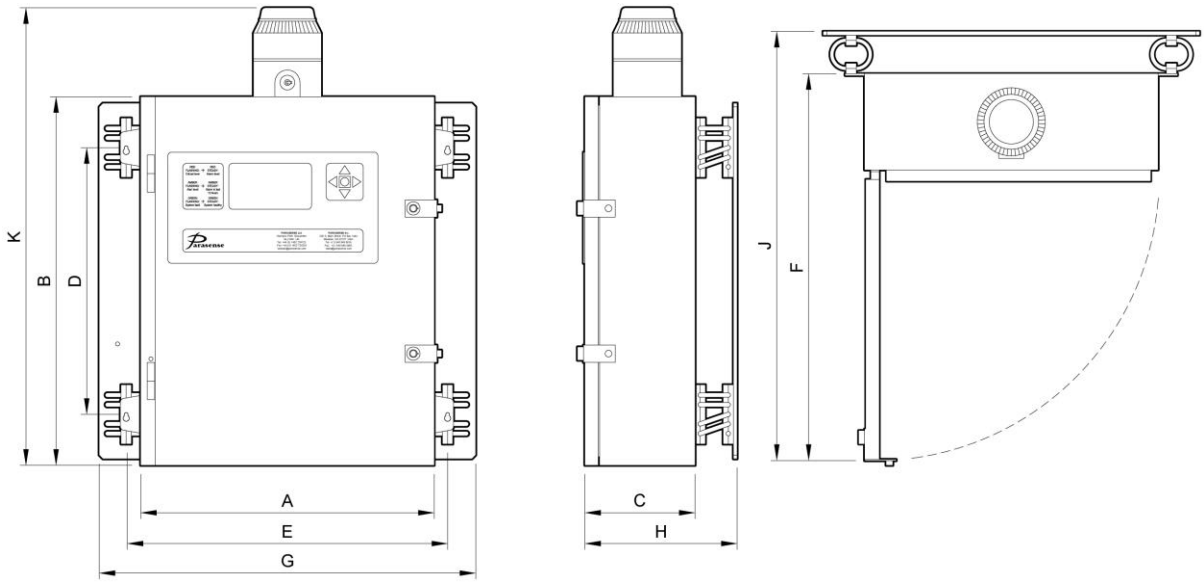
Alarms can be generated at three different levels described as 'Alert', 'Alarm' and 'Critical'. These alarms can be signalled to other devices using the 16 configurable relays. The current alarm status is indicated on the 169mm (6.5") TFT LCD display.

## GENERAL ARRANGEMENT



# 2 INSTALLATION GUIDE

## ENCLOSURE DIMENSIONS



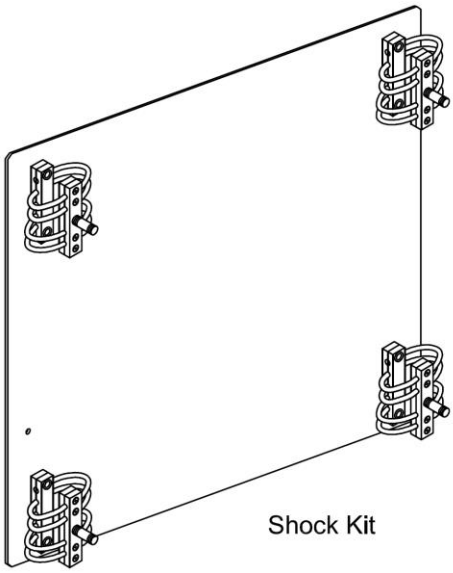

| 3300RM2 | A | B | C | D | E | F | G | H | J | K | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric (mm) | 400 | 500 | 150 | 360 | 434 | 550 | 510 | 208 | 758 | 620 | 16.2Kg (exc. Shock kit) |
| Imperial (In) | 15.7 | 19.7 | 5.9 | 14.2 | 17.1 | 21.7 | 20.1 | 8.2 | 29.9 | 24.4 | 35.6lb (exc. Shock kit) |

(note: Parasense beacon/sounders are approximately 120mm high x 95mm diameter (4.7” x 3.74”) )
(Shock kit finished weight: 6.3kg/14lb)

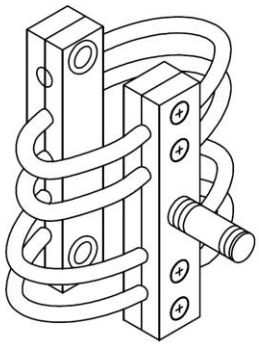
The monitor enclosure has been designed to comply with IP54. This is not intended for external use. Where possible the enclosure and Freeway should be positioned in areas with similar environmental conditions.

# MONITOR FITTING INSTRUCTIONS

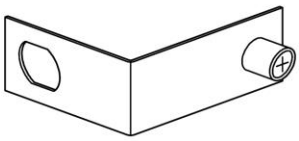
Fix the shock isolator mounting plate onto a solid vertical surface, where the top is approximately 1800mm / 6ft above floor level, in a position where the monitor's LCD can be easily accessed. Space should be left around the plate to allow the opening of the monitor door and fitting of freeway, power and communications cables.



Shock Kit



Shock Isolator



Door Bracket

Push the monitor onto the four mounting pins of the shock isolators and secure in place using the fixings supplied with the mounting kit.

# DETAILED FIXINGS INFORMATION

**These items are used to fix the shock isolator to the mounting plate**

| | |
|---|---|
| **Nut Type** | Locknuts, Flange Nuts |
| **Flange Nut Type** | Nylon Insert |
| **Locknut Type** | Nylon Insert with Flange |
| **Steel Insert Style** | Hex |
| **Material Type** | Steel |
| **Finish** | Zinc-Plated |
| **Grade/Class** | Grade F |
| **Steel Type** | Plain Steel |
| **System of Measurement** | Inch |
| **Inch Thread Size** | 1/4"-20 |
| **Thread Type** | Standard Threads |
| **Thread Direction** | Right-Hand Thread |
| **Width** | 7/16" |
| **Flange Diameter** | .56" |
| **Flange Height** | .056" |
| **Overall Length** | 5/16" |
| **Specifications Met** | Not Rated |
| **Note** | Locking element is effective up to +250° F. |

| | |
|---|---|
| **Head Style** | Flat |
| **Flat Style** | Flat |
| **Material Type** | Steel |
| **Finish** | Zinc-Plated |
| **Steel Type** | Plain Steel |
| **Self-Locking Element** | None |
| **Drive Style** | Star |
| **System of Measurement** | Inch |
| **Inch Thread Size** | 1/4"-20 |
| **Thread Length** | Fully Threaded |
| **Length** | 1" |
| **Head Angle** | 82 Degrees |
| **Decimal Size** | .250" |
| **Head Diameter** | .477" |
| **Head Height** | .153" |
| **Drive** | T27 |
| **Rockwell Hardness** | Minimum B60 |
| **Minimum Tensile Strength** | 60,000 psi |
| **Thread Fit** | Class 2A |
| **Specifications Met** | Not Rated |
| **Matching Driver** | 5756A18 |
| **Matching Bit** | 7013A28 |
| **Screw Quantity** | Individual Screw |
| **Notes** | Star drive is compatible with Torx drivers and bits. Use a countersink to create a recess. The body diameter of your countersink should be equal to or larger than your screw's head diameter and its included angle should match your screw's head angle. |

**These items are used to fix the monitor to the shock isolators**

| | |
|---|---|
| **Nut Type** | Machine Screw and Hex Nuts |
| **Machine Screw and Hex Nut Type** | Hex |
| **Material Type** | Steel |
| **Finish** | Zinc-Plated |
| **Grade/Class** | Grade 5 |
| **Steel Type** | Plain Steel |
| **System of Measurement** | Inch |
| **Inch Thread Size** | 3/8"-16 |
| **Thread Type** | Standard Threads |
| **Thread Direction** | Right-Hand Thread |
| **Width** | 9/16” |
| **Height** | 21/64" |
| **Rockwell Hardness** | Maximum C32 |
| **Specifications Met** | American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME) |
| **ANSI Specification** | ANSI B18.2.2 |
| **ASME Specification** | ASME B18.2.2 |

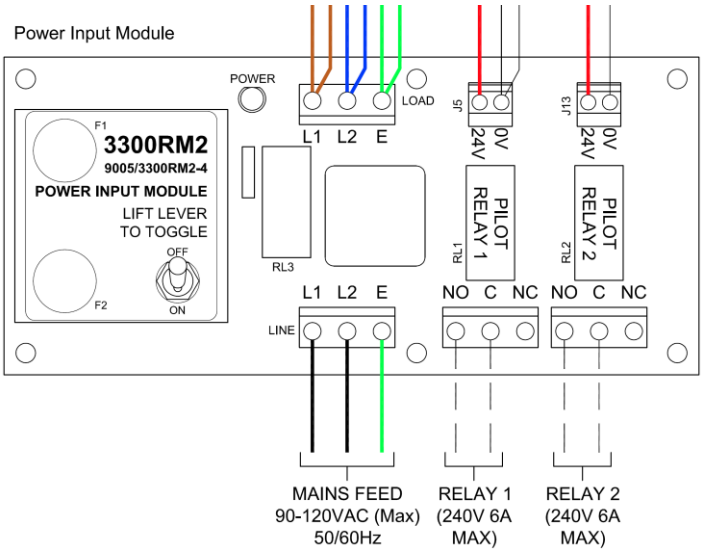
| | |
|---|---|
| **Shape** | Round Hole |
| **For Screw Size** | 3/8" |
| **Material Type** | Steel |
| **Finish** | Zinc-Plated |
| **Steel Type** | High Strength Steel |
| **Inside Diameter** | .406" (13/32") |
| **Outside Diameter** | .813" (13/16") |
| **Minimum Thickness** | .055" |
| **Maximum Thickness** | .08" |
| **Rockwell Hardness** | C38-45 |
| **Specifications Met** | American National Standards Institute (ANSI), Society of Automotive Engineers (SAE) |
| **ANSI Specification** | ANSI B18.22.1 |

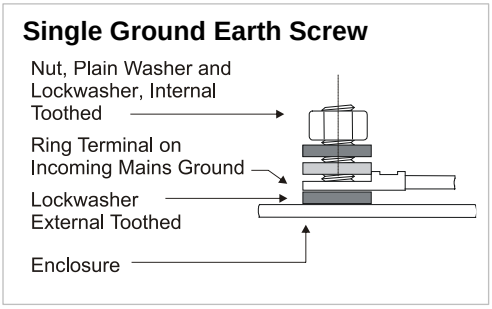
| | |
|---|---|
| **Shape** | Spring Lock |
| **For Screw Size** | 3/8" |
| **Material Type** | Steel |
| **Finish** | Zinc-Plated |
| **Spring Lock Type** | Heavy Duty |
| **Inside Diameter** | .385" |
| **Outside Diameter** | .68" |
| **Minimum Thickness** | .094" (3/32") |
| **Application** | Locking Washer |
| **Rockwell Hardness** | C35-C46 |
| **Specifications Met** | American Society of Mechanical Engineers (ASME) |
| **ASME Specification** | ASME B18.21.1 |

# ELECTRICAL REQUIREMENTS

Each monitor requires an earthed, AC single phase mains supply in the range 90-120V AC, 260VA, 50/60Hz. The 3300RM2 is protected by 2 x 2.5A anti-surge fuses on the power input module.

The final connection should be made as indicated, incorporating a water tight strain relief bush with a smoothly rounded opening, through the detector enclosure.




Cable used shall be rated for the maximum current of the equipment, and shall be certified or approved by a recognized testing authority.

The cable anchorage shall relieve the conductors of the cable from strain, including twisting, where they are connected within the equipment, and shall protect the insulation of the conductors from abrasion. The protective earth conductor, if any, shall be the last to take the strain if the cable slips in its anchorage.

Cable anchorages shall meet the following requirements:

**a)** The cable shall not be clamped by a screw which bears directly on the cable.

**b)** Knots in the cable shall not be used.

**c)** It shall not be possible to push the cable into the equipment to an extent which could cause a hazard.

**d)** Failure of the cable insulation in a cable anchorage which has metal parts shall not cause accessible conductive parts to become hazardous live.

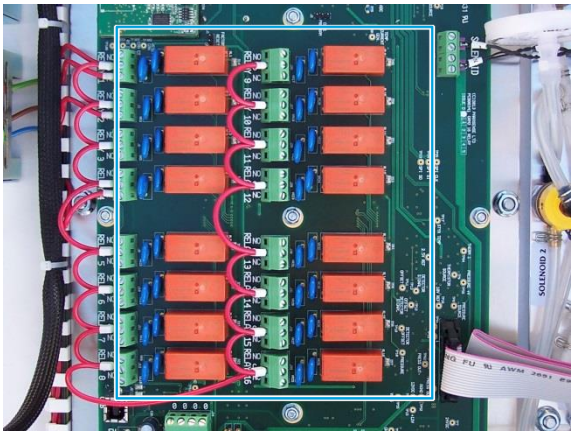
**e)** It shall not be possible to loosen the cable anchorage without the use of a tool.

**f)** It shall be designed so that cable replacement does not cause a hazard, and it shall be clear how the relief from strain is provided.

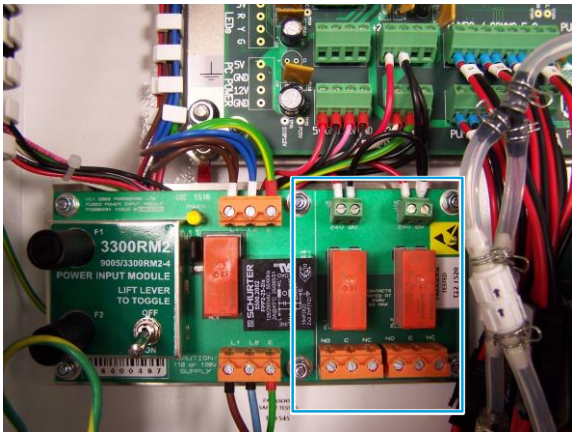
A compression bushing shall not be used as a cable anchorage unless it is suitable for use with the mains supply cable supplied with it or specified for it by the manufacturer.

## RELAY CONNECTIONS

16 separate volt-free configurable changeover relays are fitted to the network module, rated at 16A (resistive). Contact voltages should not exceed 24V DC.



16 Configurable Relays on Network Module




Pilot Relays on Power Input Module

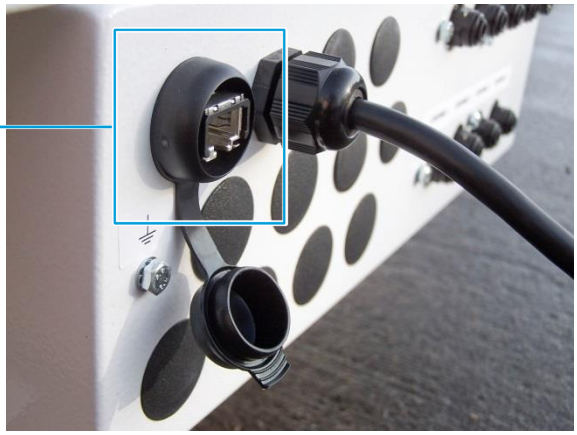
Two pilot relays are also provided on the power input module, rated at 6A (resistive). Voltages should not exceed 250V. These are factory wired to activate using relays 1 & 2 on the network module in conjunction with the 24V DC auxiliary supply.

The relays are configured via the door mounted display. Refer to the Monitor Setup section of this manual for more information.

Relays on the network module become energised when the monitor is powered up, pilot relays are energised when 24V DC is applied across the 24V and 0V terminals. i.e. C and NO are linked, C and NC are open circuit. On loss of power or an alarm situation occurs, the relays become de-energised, i.e. C and NC are linked, C and NO are open circuit.

## EXTERNAL COMMS

An RJ45 Ethernet socket is located at the base of the 3300RM2. This provides access to a local area etwork (LAN) or wide area network (WAN).




Bottom view of enclosure

# SETTING A WINDOWS PC TO COMMUNICATE WITH A 3300RM2

Communication with the 3300RM2 utilises the Ethernet socket mounted on the network module. A Cat5/Ethernet cable can then be plugged into the Ethernet socket, with the other end plugged into the Ethernet port of a PC running Windows XP or later.

The PC must have its local area network information configured to a range that will allow it to communicate with the 3300RM2. The exact terminology varies slightly between different versions of the Windows operating system. The instructions below are for Windows 10/Windows 8 with variations for Windows 7. Windows XP is covered separately.

**WINDOWS 10, 8 and WINDOWS 7**

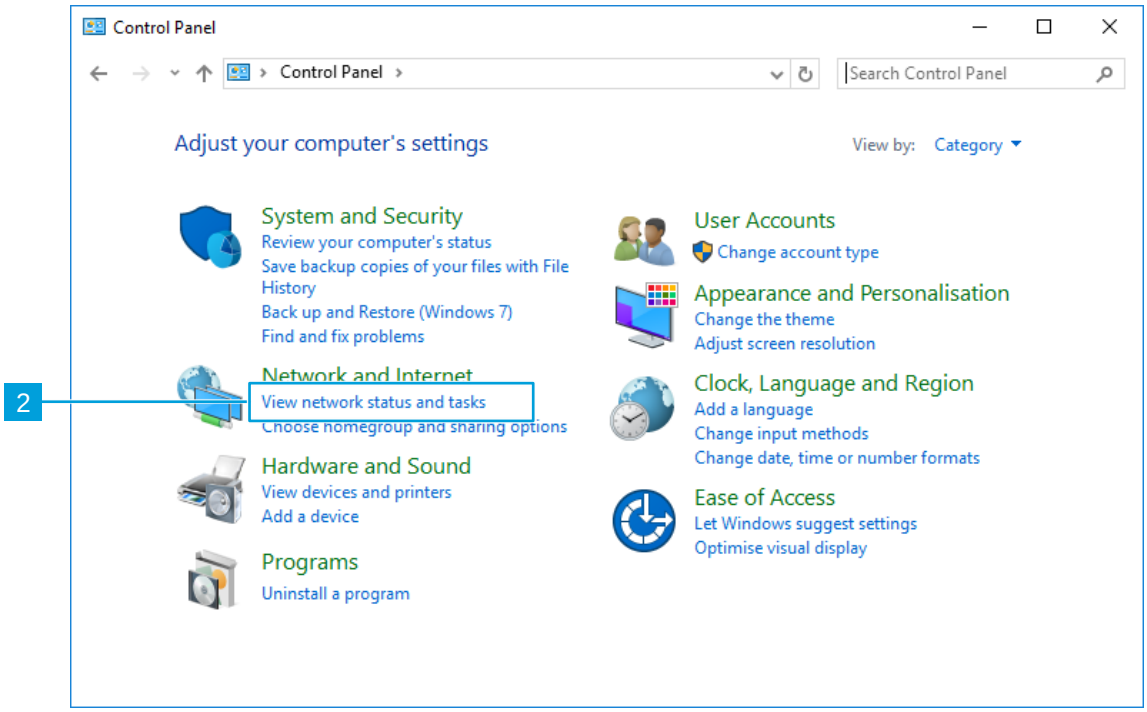
**1)** Take a note of the current network settings of the GRM2 system (please refer to the Network Settings menu of the Monitor Setup/Management Menu section for information).

**2)** From the PC Desktop, access the control panel:-

Using Windows 10 or 8: Press and release both the 'Windows' key and 'X' key at the same time. Click 'Control Panel'.

Using Windows 7: Click 'Start', 'Control Panel'.

**3)** Under 'Network and Internet' of the control panel, click 'View network status and tasks'.

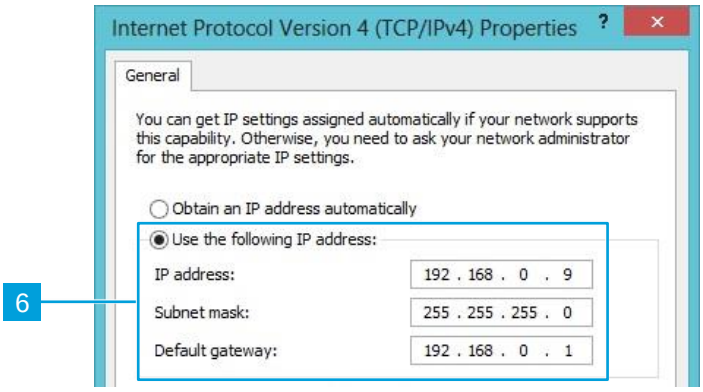



**4)** Click 'Change adapter settings' in the left hand menu. Right-click 'Ethernet' or 'Local Area Connection' and choose 'Properties' from the popup menu.

**5)** From the list shown, select 'Internet Protocol Version 4 (TCP/IPv4)' then click the 'Properties' button.

**6)** The existing settings for your PC will be shown. If the option 'Use the following IP address' is set, take a note of the values that are shown onscreen. This information will be required at step 9 of these instructions.

**7)** Click on 'Use the following IP address'. Enter the Gateway setting noted in step 1 into the Default Gateway field. Enter the first 3 parts of the Address setting noted in step 1 into the first 3 parts of the IP address field (e.g. if the Address noted was 192.168.0.50, then enter 192.168.0). In the 4th IP address field, enter a value which is different to the 4th value of the Address noted in step 1 (e.g. if the Address noted in step 1 was 192.168.0.50, then enter any value other than 50).




**Note: there must be no other device connected to the same network with the same IP address you have used (e.g. using the above screenshot as an example, there must be no other device connected to the same network with an IP address of 192.168.0.9).**

**8)** Click 'OK', and close all previously opened windows.

**9)** Once all communication with the 3300RM2 is complete, change the PC settings back to the previous settings by following the instructions above from step 2 to 7. The information noted in step 6 must replace the data in step 7.

**WINDOWS XP**

**a)** Take a note of the current network settings of the 3300RM2 system (please refer to the Network Settings menu of the Monitor Setup/Management Menu section for information).

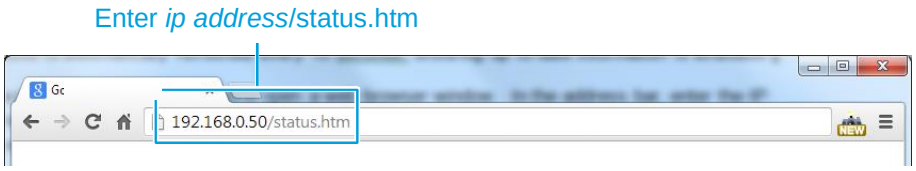
**b)** From the PC Desktop, access the control panel by clicking 'Start', 'Control Panel'.

**c)** Click 'Network and Internet Connections' followed by 'Network Connections'.

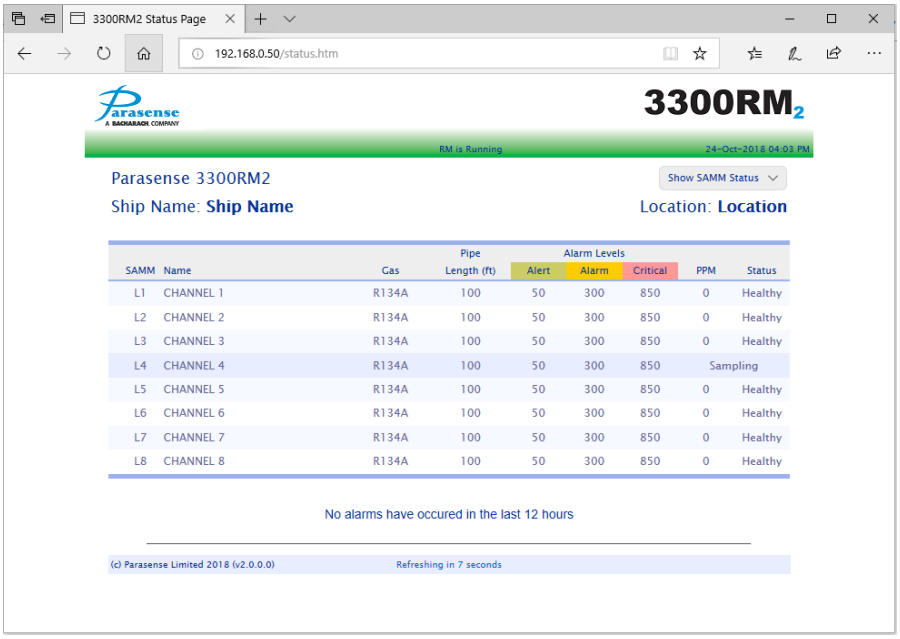
# 3300RM2 STATUS WEBSITE

The 3300RM2 status website offers remote access to the monitor's current status. The status website is automatically refreshed every 10 seconds, ensuring up to date information is available.

To access the status website, first open a web browser window. In the address bar, enter the IP address of the monitor, followed by /status.htm. For example, using the monitor's factory default IP address, you would enter 192.168.0.50/status.htm.

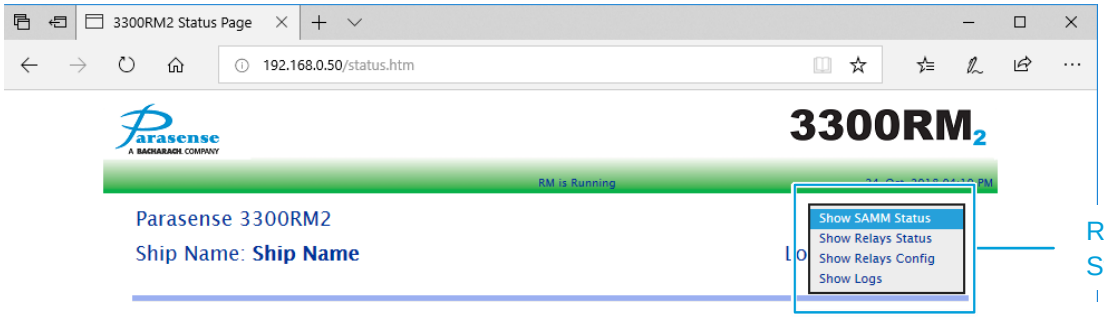



The following screen will be displayed. This page shows the current status of all channels currently being monitored by the 3300RM2. If a channel has encountered an alert, alarm or critical event, it will be highlighted using the relevant colour.




| SAMM | Name | Gas | Pipe Length (ft) | Alarm Levels Alert | Alarm | Critical | PPM | Status |
|---|---|---|---|---|---|---|---|---|
| L1 | CHANNEL 1 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L2 | CHANNEL 2 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L3 | CHANNEL 3 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L4 | CHANNEL 4 | R134A | 100 | 50 | 300 | 850 | Sampling | |
| L5 | CHANNEL 5 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L6 | CHANNEL 6 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L7 | CHANNEL 7 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |
| L8 | CHANNEL 8 | R134A | 100 | 50 | 300 | 850 | 0 | Healthy |

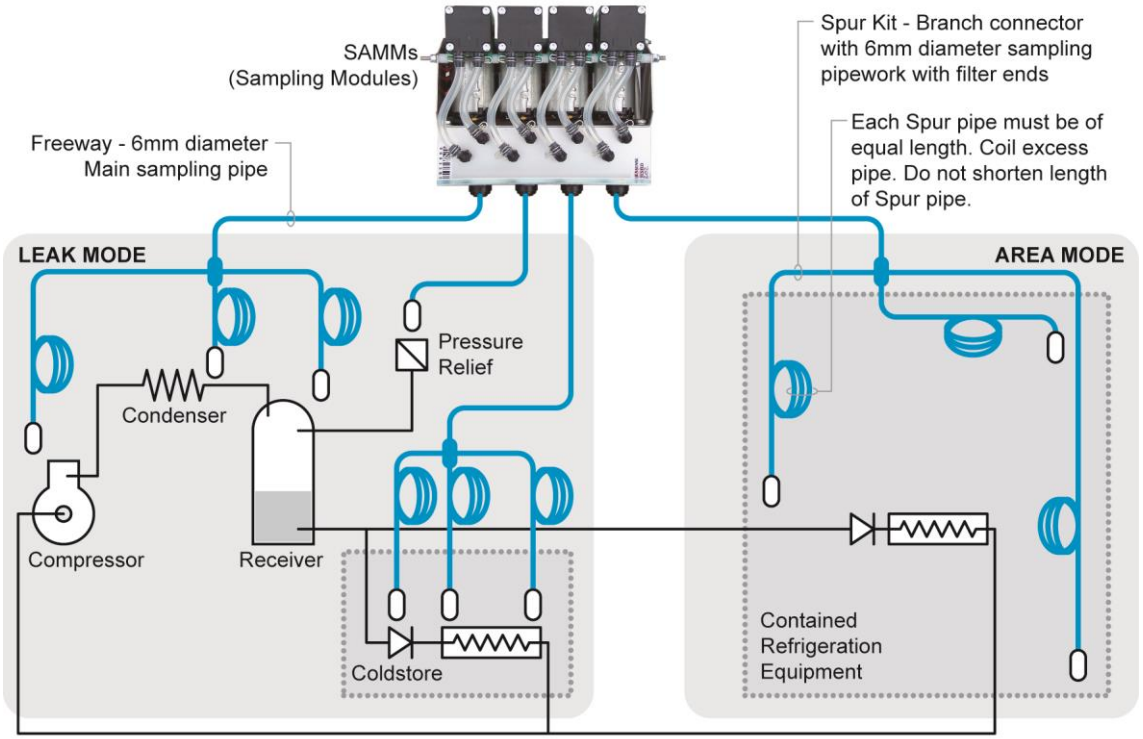
The drop-down menu to the right of the screen gives access to the monitors Relay status and configuration. You can also view the monitor's alarms, events, and alerts log pages. To return to the Status page from the logs page, select Show SAMM Status from the drop-down menu.



# FREEWAY INSTALLATION GUIDELINES

Parasense sampling pipework, known as freeway, is used to draw samples of air from areas of potential leakage to the respective SAMM within the 3300RM2 monitor. A typical system installation is shown below.

Note: leak mode sample points should be located as close as possible to the potential leakage point. area mode sample points to be located in general airflow of space at heights of between 1.5m/5ft and 2.4m/8ft, preferably away from potential leakage points.



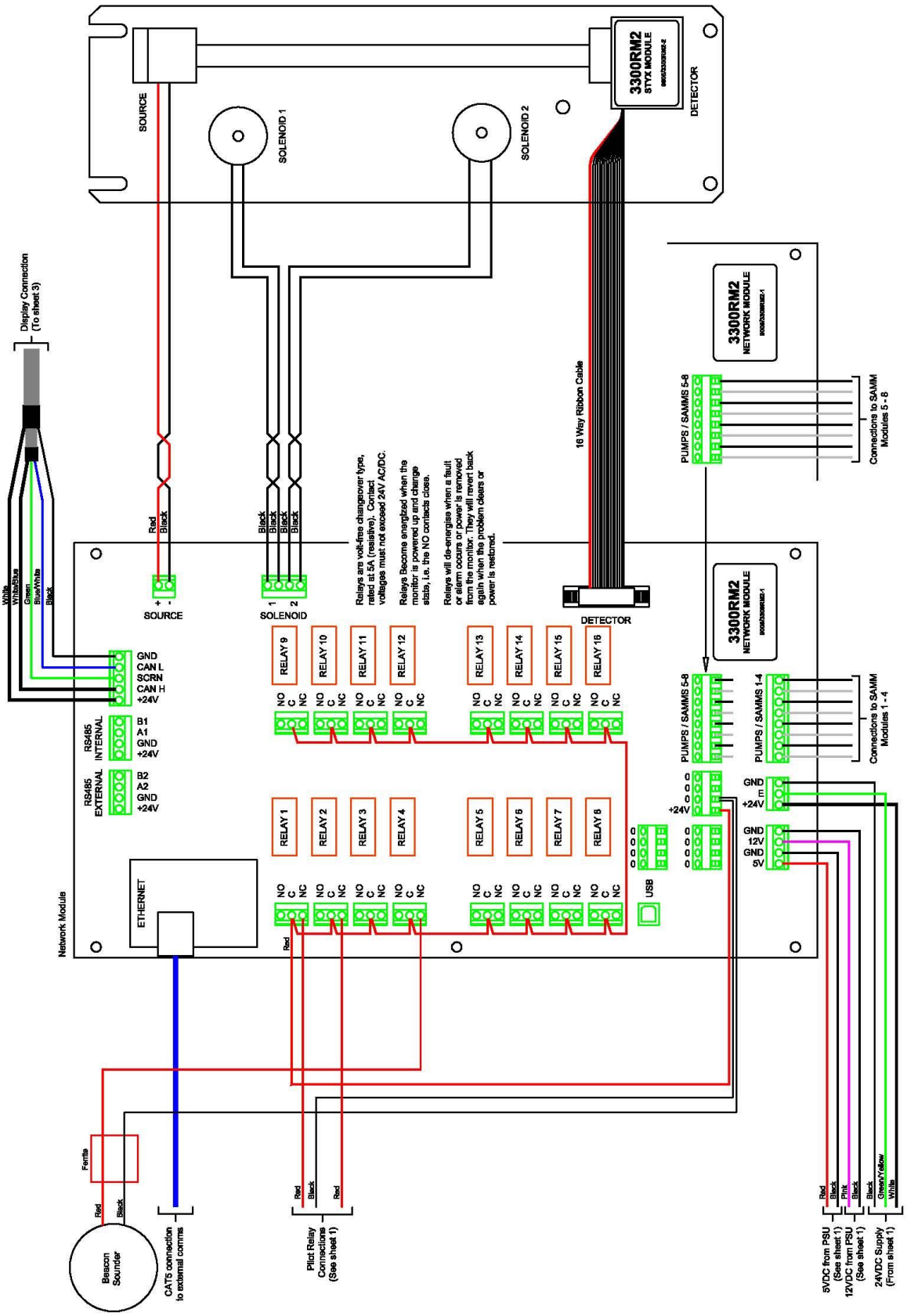
## INSTALLATION - DO

- Maximum of one spur kit per SAMM.
- Maximum of 4 way split.
- Spur kit freeway lengths must always be the same length and never shortened (coil excess freeway). No exceptions.
- Ensure that the freeway is pushed fully into the connectors on the SAMM and spur kit branch connectors.
- Support and clip all freeway and spur kit branch connectors.
- Ensure that the freeway filters always point downwards.
- Attach identity markers to both ends of the freeway, including A (area) or L (leak) prefix.
- Use continuous lengths of freeway (DO NOT JOIN).
- Sample points from a single SAMM must all be in the same room.
- Leak mode sample points to be located as close as possible to the potential leakage point.
- Area mode sample points to be located in general airflow of space at heights of between 1.5m/5ft and 2.4m/8ft, preferably away from potential leakage points.
- Cut the freeway straight using the correct cutter (supplied by Parasense).

## INSTALLATION - DO NOT

- Exceed 150m/500ft of freeway (including all spur freeway; E.g. for an installation with 100m/330ft of freeway + 4-way 5m/16ft spur kit, the length would be 120m/394ft).
- Flatten or kink the freeway.
- Bend the freeway at a radius of less than 150mm/6".
- Run the freeway from a warm place through a very cold space.
- Expose the freeway or spur kit to temperatures in excess of 60°C/140°F, or less than -30°C/-22°F.
- Let the spur kit filters ever be immersed in water or any other liquids.
- Mix spur kit freeway of different lengths on the same SAMM.
- Run freeway in areas where they may be stood on or where they may restrict access to other equipment.

# NETWORK MODULE CONNECTIONS

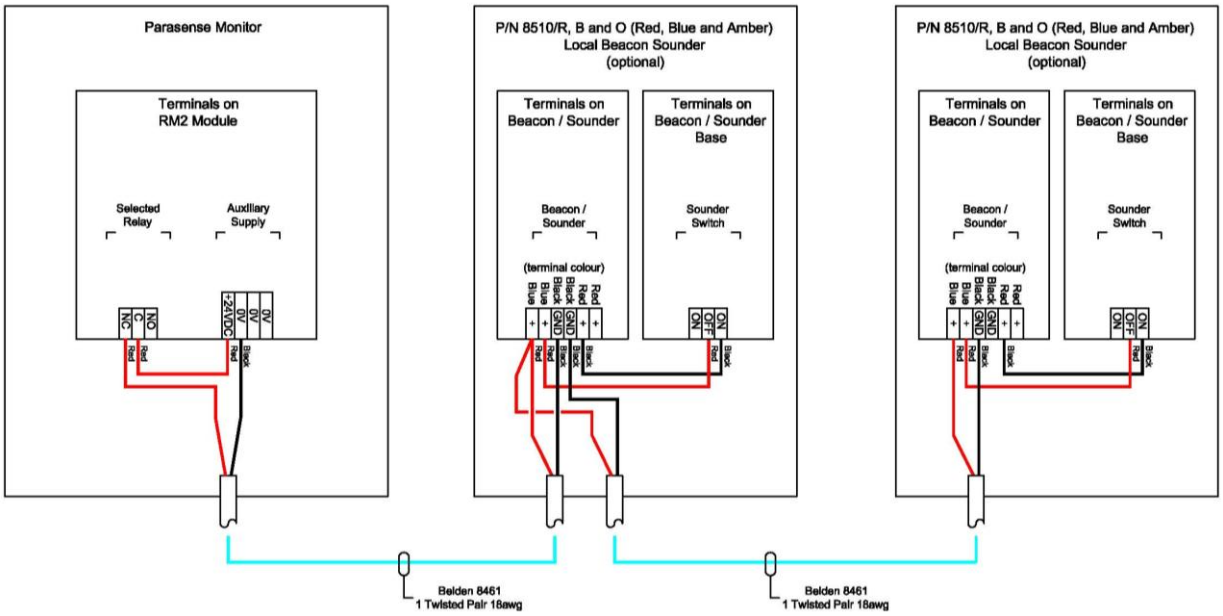


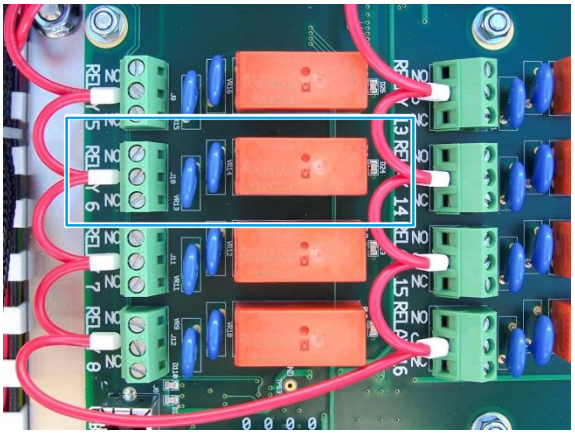
# MULTIPLE BEACON / SOUNDER WIRING

In addition to the local beacon/sounder fitted to the top of the monitor, further remote beacon/sounders may be installed. The maximum number of beacon/sounders that can be powered by the 3300RM2 is determined by the following information:-

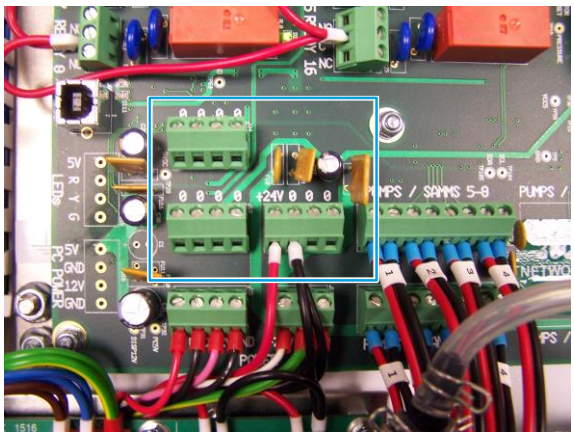
| | |
|---|---|
| Internal 24V DC PSU spare capacity: | 1.2A up-to 50°C enclosure temperature (max 10 Parasense Beacon/sounders)<br><br>0.6A between 50-60°C enclosure temperature (max 5 Parasense Beacon/sounders)<br><br>No spare capacity above 60°C |
| Parasense Beacon/sounder Imax at 24V DC: | When wired C-NC = 110mA |

**Beacon/Sounder connection details**



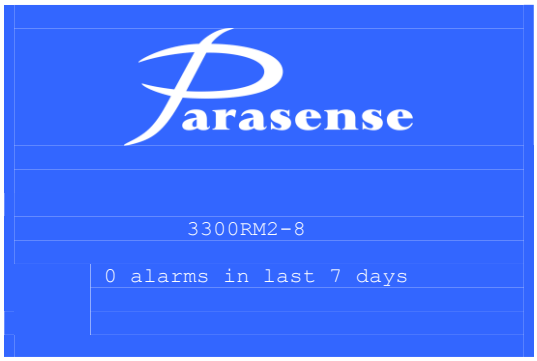
Individual Relay Connection on Network Module



Auxiliary Supply and additional 0V landing points on network module

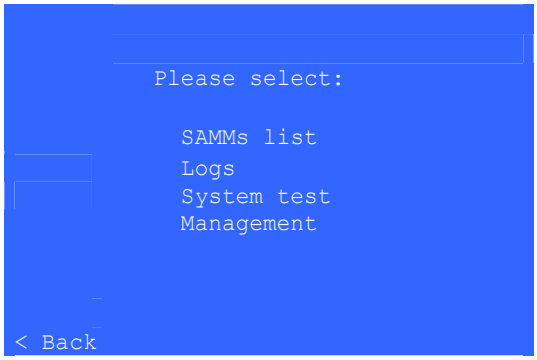
# 3 MONITOR SETUP

## HOME SCREEN



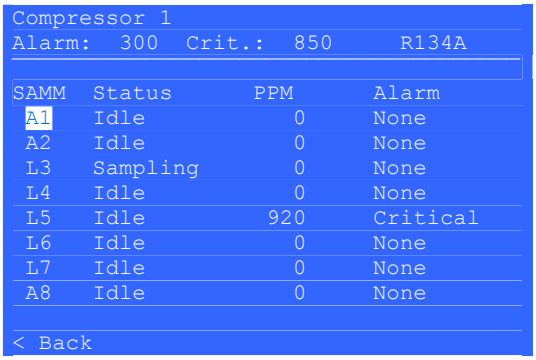

The home screen is shown when the system is first accessed, or if no buttons have been pressed for 3 minutes. The home screen displays the product name and number of working SAMMs. Also displayed is the number of alarms (maximum of 100) that have occurred over the recording period (1 to 14 days as set during configuration). Pressing the ◯ button on the keypad accesses a primary selection menu:

There are four menu options available:




- **SAMMs List** : Shows a summary list of all SAMMs.
- **Logs** : Allows you to view alarms, faults and events logs of the 3300RM2.
- **System Test** : Enables you to carry out a sample of a chosen SAMM.
- **Management** : Gives access to system maintenance tools.

# SAMMS LIST




The SAMMs list shows each of the SAMMs along with its ID, status, most recent PPM reading and it's condition. The top two lines of this screen give a summary of the highlighted SAMMs configuration. The first line is the name assigned to the SAMM, and the second line shows the alarm & critical set points, and the chosen gas type. If a custom gas is chosen, the word 'Custom' is displayed.

The SAMM ID's are prefixed with a single character. This indicates the mode in which the SAMM has been configured. This will be A (area mode) or L (leak mode). Refer to SAMM Settings within this manual for information on area and leak functionality.

If a SAMM has been inhibited, this will be indicated by an asterisk character immediately preceding the 'A' or 'L' designation character.

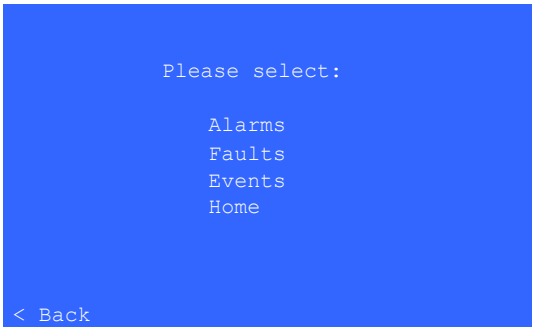
**NOTE:** From initial switching on of the 3300RM2, there is a period of time where the monitor needs to warm up to operating temperature. During this time, the current status of each enabled SAMM will show as 'Warming'. Sampling operations are disabled until the system is up to temperature. Once the status has changed from 'Warming', the system is ready to use.

Select a SAMM using the △▽ buttons to move the cursor. The summary information at the top of the screen will change to display the currently highlighted SAMMs configuration.

Pressing the ◎ button while a SAMM is highlighted displays a pop-up menu offering the choice 'Manual Sample: Yes/No'. Selecting 'Yes' initiates a manual sample and the status, ppm and alarm fields update accordingly as the sampling process takes place.

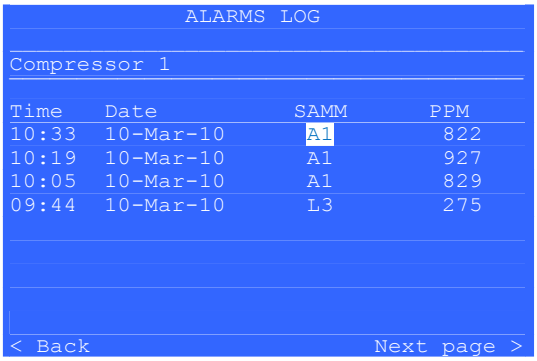
Choosing 'No' will close the pop-up window and return to the SAMM list page.

## LOGS MENU



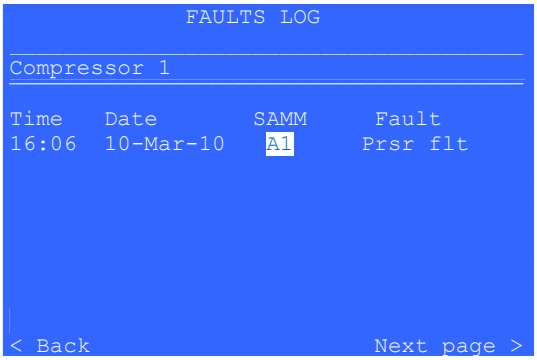

The logs menu enables you to view all logs that are held on the 3300RM2. There are 3 types of log; alarms, faults, and events. Use the △▽ buttons to select the log to view, then press the ◎ button to access the information.

## ALARMS LOG




The last 100 alarm events are stored on the 3300RM2, and may be viewed through this menu. Eight entries are displayed on each page. Use the △▽ buttons to highlight the desired SAMM. The name of the selected SAMM is displayed at the top of the screen. The ◁ and ▷ buttons carry out the function of 'Back' and 'Next page'. These may be used to move between pages. When the first page is shown, 'Back' will return to the logs menu.

## FAULTS LOG



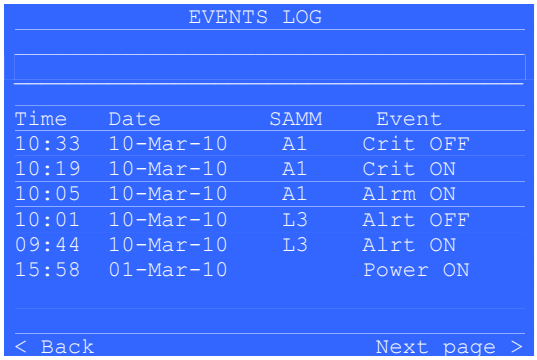

The 3300RM2 stores the last 100 faults, which are available to view by the user. Function buttons perform in the same way as the alarms log.

# FAULT MESSAGES

Because of the restricted space available on-screen, all fault descriptions are given in an abbreviated format. A full list of fault abbreviations and their description is listed below:

| Abbreviation | Full Description |
|---|---|
| **PrsrLeak** | System pressure leak |
| **OverTemp** | Ambient temperature too high (>50°C) |
| **Src flt** | Styx source fault (no output) |
| **Overheat** | Styx above operating temperature (>57°C) |
| **STYXExch** | Styx exchange required |
| **STYXCold** | Styx not at working temperature (<40°C) |
| **STYX flt** | Styx detector fault |
| **Prsr flt** | Styx did not reach target pressure |

# EVENTS LOG




The last 100 events may be viewed for the 3300RM2. Function buttons perform in the same way as the alarms log. Because of the restricted space available on-screen, each event description is shown in an abbreviated format. For example:-

Entry 10:19 10-Mar-10: Area SAMM 1 exceeded the critical threshold at 10:19 on 10th March 2010.

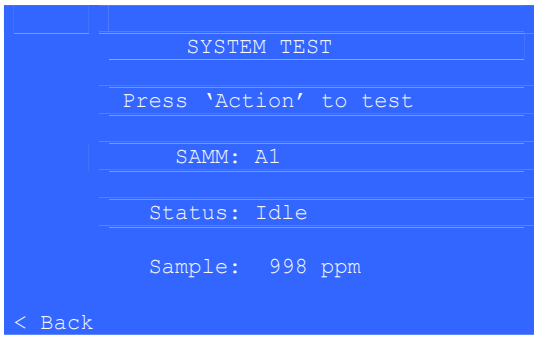
Entry 09:44 10-Mar-10: Leak SAMM 3 exceeded the alert threshold at 09:44 on 10th March 2010.

## SYSTEM TEST

System test will enable you to carry out a test sample (this function requires a Parasense service kit, incorporating a 1000PPM concentration of R134A gas and a sample bag). The purpose of the system test is to check the correct operation of the monitor, alarm relays, associated field wiring and annunciators.

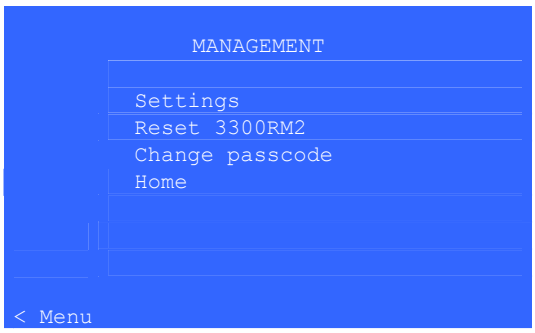
Selecting this option from the main menu will forward you to the system test screen. Pressing the ◯ button will start a sample sequence lasting up to 90 seconds. The '< Back' function is not available during the sample process, and the buttons have no effect. When the sample is complete, the '< Back' function re-appears and the sample value is displayed. If the sample exceeds the alarm thresholds, the associated relays will be activated. For in-depth instructions for system test, refer to the Service & Maintenance section of this manual.

**NOTE:** From initial switching on of the 3300RM2, no system test can be carried out until the system has warmed up (as shown on the SAMM list screen).



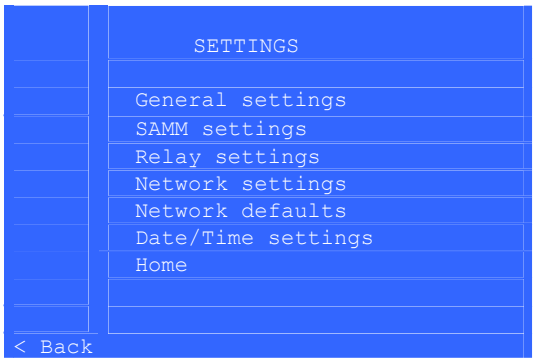

## MANAGEMENT FUNCTIONS

Selecting 'Management' from the menu displays a passcode entry keypad. If a passcode has been entered within the previous 10 minutes, this will still be active, so the passcode keypad will not be shown. Enter the passcode by highlighting each character using the △▽ and ◁▷ buttons. Select a number by pressing ◯. If you wish to delete the characters, highlight 'C' (clear) and press the ◯ button. All characters entered will be deleted. Once you have entered the passcode, highlight 'E' and press the ◯ button. You will now have access to the management menu.



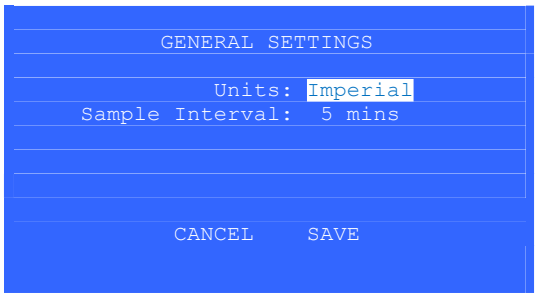
# MANAGEMENT – SETTINGS

From here you can view and adjust settings for the 3300RM2.




# MANAGEMENT – SETTINGS – GENERAL SETTINGS

The general settings screen displays the current units and sample interval settings.




Highlight the field to be edited and press the ◯ button. Use the △▽◁▷ buttons to change the values, pressing the ◯ button again to set and exit edit mode of that field.

**Units:** Choose between metric and imperial.

**Sample Interval:** Set the frequency of samples taken by all enabled SAMMs.

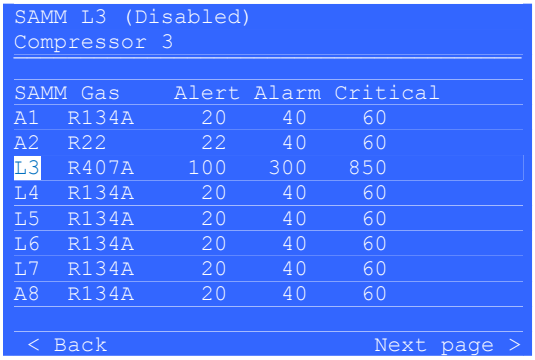
The sample interval can be set from 0 to 60 minutes. The default setting is 5 minutes. When setting sample interval, you can adjust the time in 1 and 10 minute increments:-

◁ Decrease value by 1 ▷ Increase value by 1 △ Increase value by 10 ▽ Decrease value by 10

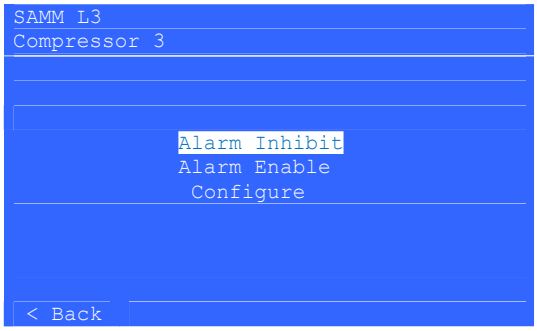
Changes are only confirmed to the RM device when the SAVE field is highlighted and the ◯ button is pressed. The display will return to the Settings menu. If CANCEL is highlighted and the ◯ button pressed, any changes made will be discarded and the display will return to the Settings menu.

# MANAGEMENT – SETTINGS – SAMM SETTINGS

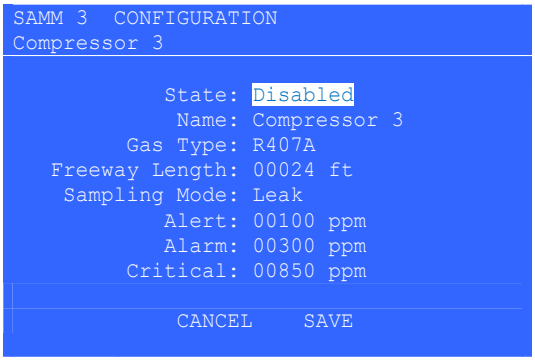
Within this menu, you can change the settings of each SAMM to suit your requirements.



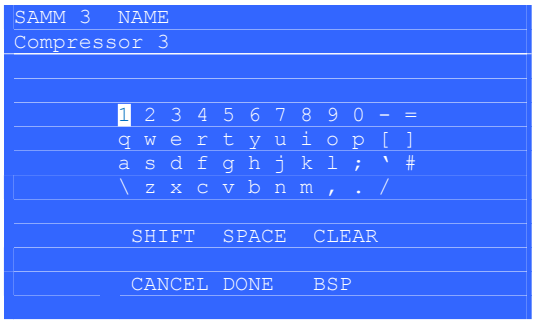

Use the △▽ buttons to highlight the desired SAMM. The ◁▷ buttons are used to move between pages. Pressing ▽ when at the bottom of the list (or △ when at the top of the list) will also cause the display to show the following (or preceding) page of SAMMs. Pressing the ◯ button on a highlighted SAMM displays the intermediate configuration screen, as follows (Note: if the selected SAMM has been disabled, the intermediate configuration screen will not be shown):



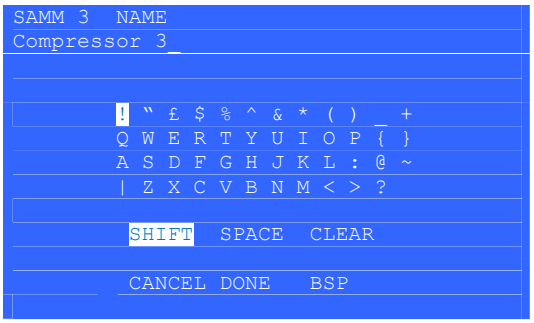

Highlighting 'Alarm Inhibit' and pressing the ◯ button will prevent the chosen SAMM from activating a relay upon an alarm or fault condition. The inhibit remains in place for a maximum of 12 hours, after which the SAMM returns to the enabled state. The inhibited state can be cancelled at any time by selecting 'Alarm Enable'. Whilst inhibited, the SAMM will continue to sample as normal and both the display and the log files will continue to show the measured PPM and any threshold/fault conditions. An inhibited SAMM is indicated by the presence of 'Inhibited' alongside the SAMM number text at the top of the screen, also a '*' prefix character will be shown against the SAMM in the SAMMs list screen. Highlighting 'Configure' and pressing the ◯ button will confirm the alarm selection and continue to the configuration screen where the SAMM settings can be edited.



To edit the settings, use the △▽ buttons to highlight a field then press ◯ to access. For fields where a menu selection is to be made, use the △▽ buttons to highlight the required setting then press ◯ to confirm. For fields where text is to be entered, an alphanumeric keyboard will be displayed upon accessing the field (as shown below), allowing you to input the information.




Primary Keyboard




Additional Keyboard (SHIFT)

Use the △▽◁▷ buttons to highlight a character, press ◯ to make the selection. Selecting SHIFT will display an additional keyboard. Selecting SHIFT again will return to the previous keyboard.

Once all details have been entered, highlight DONE and press ◯ to close the keyboard. You will see the Configuration screen as before. Select SAVE to confirm all changes. Selecting CANCEL will remove any details that you have changed and revert to the existing settings.

**State:** Here you can enable or disable the SAMM. Once disabled, the SAMM will no longer take a sample reading. The previous sample reading will continue to display onscreen until that SAMM has been re-enabled and taken another sample.

**SAMM Name:** Set a name to identify the SAMM. The name of the SAMM can be up to 22 characters in length.

**Gas Type:** Choose the gas to be monitored by the selected SAMM. Selecting 'Custom' allows you to configure the monitor to recognise a gas that is not currently listed within the Gas Type menu.

**Freeway Length:** Set the length of the freeway connected to the SAMM. The length is limited to a maximum of 150m or 500ft (including all spur freeway; E.g. for an installation with 100m of freeway + 4-way 5m spur kit, the length would be 120m/394ft).

**Alert, Alarm, Critical:** Set the PPM thresholds for each of the alarm types. The threshold range is limited to the characteristics of the gas chosen to be monitored.

**Sampling Mode:** There are 2 sampling modes available for monitoring; area mode and leak mode. The functionality of each sampling mode is described below. Each SAMM displayed onscreen will have a prefix character to indicate which sampling mode has been assigned to it:

A = Area Mode (averaging). L = Leak Mode (conventional leak detection).

The monitor samples each channel sequentially from the first SAMM to the last, restarting again at the first SAMM no sooner than *X* minutes after it was last sampled (where *X* is the configured sample interval).

**Area Mode**

Area mode is used to monitor the area where refrigerant equipment is contained, to ensure that the atmosphere within that area has a concentration of refrigerant below the relevant threshold.

When set to area mode, the SAMM will calculate the average gas concentration over a configurable number of samples (between 1 and 9). The number of samples chosen will be taken over a period of time governed by the configured sample interval period (Refer to Management – General Settings), number of enabled channels and freeway length of each channel.

If the rolling average sample of the area reaches or exceeds the alert level, the amber traffic light on the monitor will continuously flash and the event will show as alert, along with the corresponding rolling average sample reading.

If the rolling average sample of the area reaches or exceeds the alarm level, the red traffic light on the monitor will illuminate and the event will show as alarm, along with the corresponding rolling average sample reading.

If the rolling average sample of the area reaches or exceeds the critical level, the red traffic light on the monitor will continuously flash and the event will show as critical, along with the corresponding rolling average sample reading.

During the rolling averaging, if any one of the individual samples exceeds the critical level, a verification sample will be taken. If the verification sample also exceeds the critical level, the red traffic light on the monitor will continuously flash and the event will show as critical, along with the corresponding single sample reading.

**Leak Mode**

Leak mode is used to directly target the source of a refrigerant leak, helping to quickly respond and resolve the issue causing the leak. Resolving these issues quickly and efficiently is essential in preventing future operational, maintenance and safety issues.

When set to leak mode, the SAMM will take one sample during the system sampling sequence.

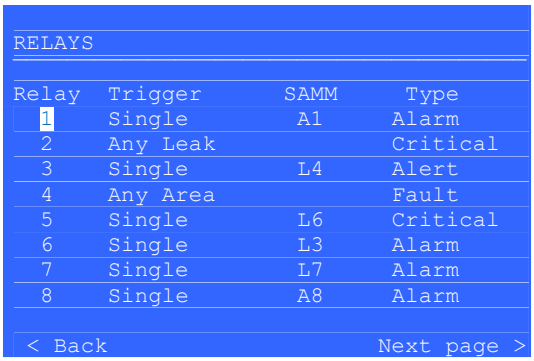
If the SAMM sample reaches or exceeds the alert level, the amber traffic light on the monitor will continuously flash and the event will show as alert, along with the corresponding sample reading.

If the SAMM sample reaches or exceeds the alarm level, a verification sample will be taken. If the verification sample also exceeds the alarm level, the red traffic light on the monitor will illuminate and the event will show as alarm, along with the corresponding sample reading.

If the SAMM sample reaches or exceeds the critical level, a verification sample will be taken. If the verification sample also exceeds the critical level, the red traffic light on the monitor will continuously flash and the event will show as critical, along with the corresponding sample reading.

# MANAGEMENT – SETTINGS – RELAY SETTINGS

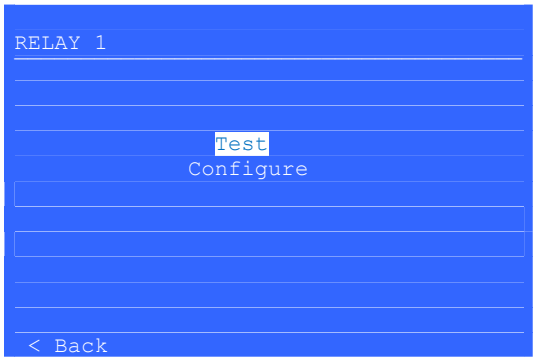
Within the relay settings menu, you can test and configure individual relay functions. The relay settings screen displays a list of 3300RM2 relays and their current setting.

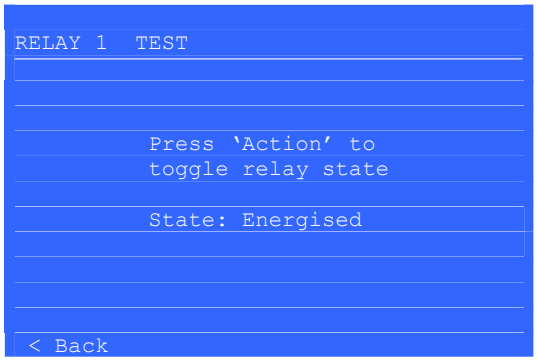



The △▽ buttons move the relay selection up and down. The ◁▷ buttons are used to move between pages. Pressing ▽ when at the bottom of the list (or △ when at the top of the list) will also cause the display to show the following (or preceding) page of relays. Pressing the ◁ button while viewing relays 1 to 8 will send you back to the 'Management-Settings' menu.

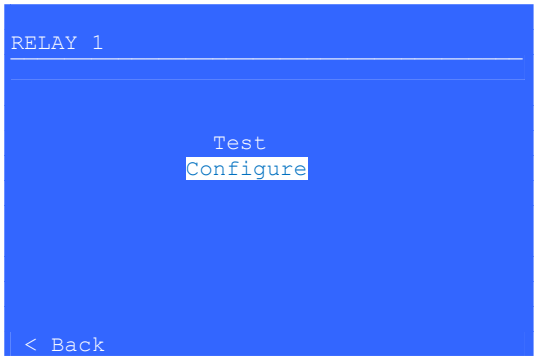
Pressing the ◯ button on a highlighted relay displays the relay test/configure screen:

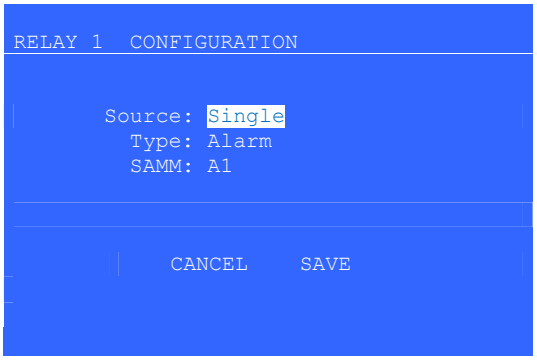
Selecting 'Test' from the chosen relay's menu will allow you to toggle the relay state and check for correct operation. Toggle the state by pressing the ◯ button. The ◁ button will return to the relay menu screen.




Selecting 'Configure' from the chosen relay's menu will allow you to change the functionality of that specific relay.



Use the △▽ buttons to navigate the screen, pressing the ◯ button to access edit mode of the highlighted field. Use the △▽ buttons to change the values, pressing the ◯ button again to finish editing that field.

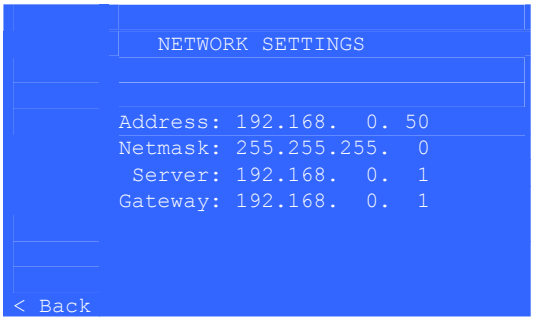
**Source** will allow you to configure the relay function. The relay can be set to react to a Single SAMM, Any Leak SAMM or Any Area SAMM. If Source is set to Single, the SAMM option will allow you to assign the relay to any one configured SAMM. When the Source is set to Any Leak or Any Area, the SAMM field will be blank. To disable the relay operation, select None. For each relay that isn't being used, Source should be set to 'None'.

**Type** will allow you to set the activation level to alert, alarm, critical or fault.

Once all details have been entered, highlight SAVE and press ◯ to save and return to the relay settings page. CANCEL will remove any details that you've just changed, and revert to the existing settings.

## MANAGEMENT – SETTINGS – NETWORK SETTINGS

'Network Settings' will display the current IP network settings of the 3300RM2. Select 'Network Settings' from the Management - Settings menu. The following Page will display the IP network settings. By pressing the ◁ button, you will return to the Management - Settings menu.

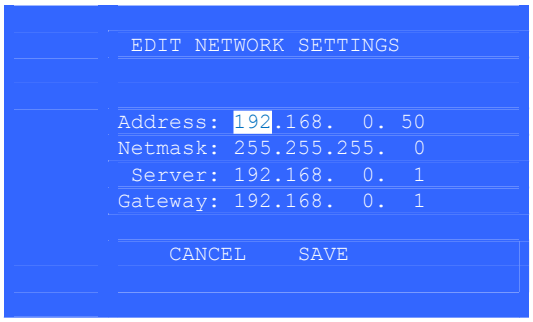



If the 3300RM2 is to be connected to a network, it must be configured with the correct parameters for that particular network. It is recommended that the system is NOT connected to the network until this configuration has been done, so that there is no danger of a network conflict.


From the management menu, highlight the 'Network settings' option. Press ◯ and ▷ buttons at the same time to display the current network settings. Notice that the IP address is highlighted.

Each field can be highlighted by using the △▽ buttons. To edit a highlighted field, press the ◯ button. The selected field will start to blink. The arrow buttons can be used to increase/decrease the value of the chosen field:

◁ Decrease value by 1 ▷ Increase value by 1 △ Increase value by 10 ▽ Decrease value by 10

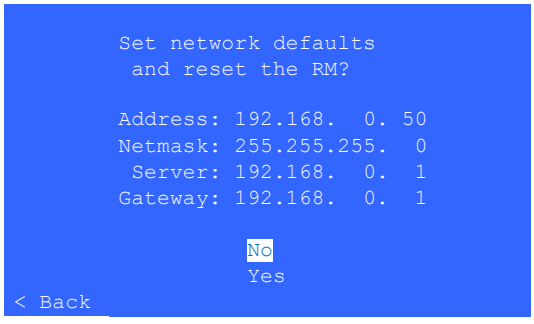



Press the ◯ button again to close the editing function. When all values have been set up, scroll to the SAVE option and press the ◯ button. The display will show 'please wait' and the RM will be rebooted. If you do not wish to save the changes, highlight CANCEL and press the ◯ button.

## MANAGEMENT – SETTINGS – NETWORK DEFAULTS

Selecting the network defaults reverts the 3300RM2 to its original IP address setting and reboots the system. Default settings can be found in the 'Factory Default Configuration Settings' page.

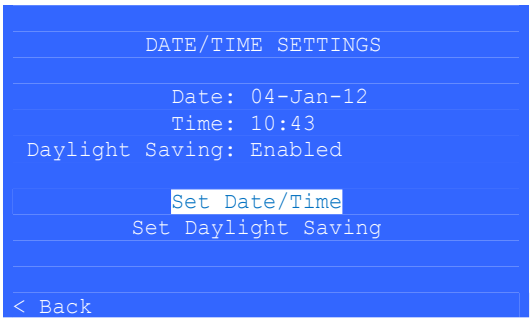
From the Management-Settings menu, select 'Network Defaults'. Confirm that you want to set the IP address as displayed on the screen by selecting 'Yes'. If you wish to abort this function, select No and press the ◯ button to return to the Management-Settings menu, leaving the network settings unchanged. Pressing the ◁ button will also abort this function and return to the Management-Settings menu without making any changes to the network settings.



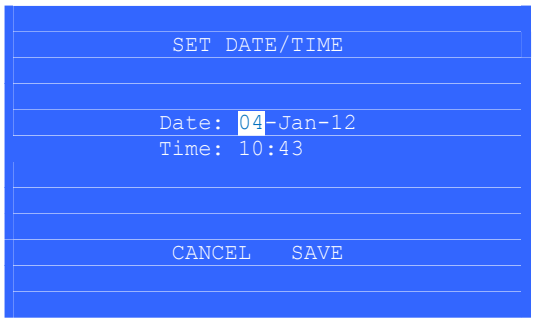
# MANAGEMENT – SETTINGS – DATE/TIME SETTINGS

This screen displays the current date and time settings for the 3300RM2. From this screen you can adjust these settings to suit your location, as well as daylight saving settings.

Use the △▽ buttons to highlight 'Set Date/Time' or 'Set Daylight Saving' and press the ◯ button to access.

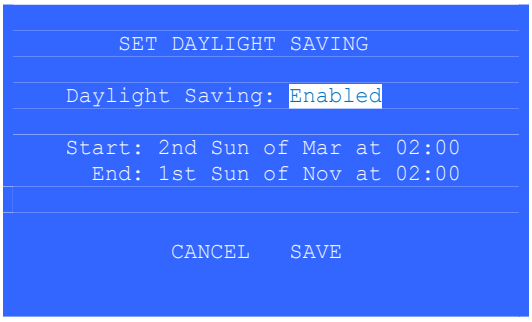



Use the △▽◁▷ buttons to select a field, press the ◯ button to access edit mode (the field will blink to indicate edit mode). Use the △▽ buttons to increment / decrement in steps of 10 and ◁▷ to decrement / increment in steps of 1 (on numeric fields, otherwise simply use △▽ to change the value). Press the ◯ button to exit edit mode on that field.




Once all details have been entered, highlight SAVE and press ◯ to save and return to the Date/Time Settings page. CANCEL will remove any details that you've just entered, and revert to the existing settings.

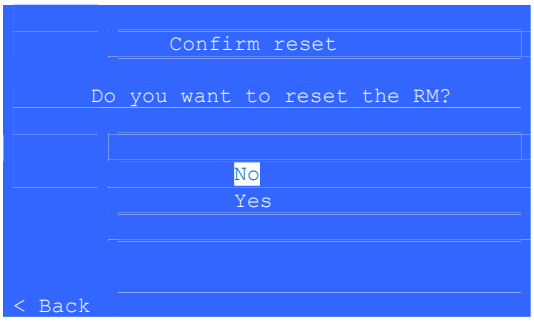
Selecting 'Set Daylight Saving' displays the current daylight saving time settings. Editing is carried out in the same way as Date/Time settings.



## MANAGEMENT – RESET 3300RM2

If required, you can reboot the 3300RM2 from here (note: this function does not change any settings, but simply reboots the 3300RM2).

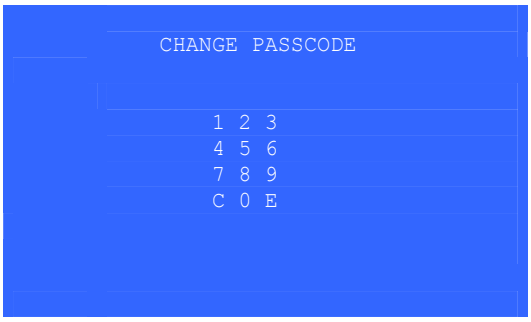
From the management menu, select ‘Reset 3300RM2’. Highlight ‘Yes’ using the △▽ buttons and press the ◯ button. The 3300RM2 will now reboot. If you do not wish to continue with this function, highlight No and press the ◯ button, or press the ◁ button. This will cancel the reset and return to the management menu.




## MANAGEMENT – CHANGE PASSCODE

From the management menu, select ‘Change Passcode’.

On the ‘Change Passcode’ keypad, set the new passcode by highlighting each character and pressing the ◯ button to select. If you wish to delete the characters, highlight ‘C’ (clear) and press the ◯ button. All characters entered will be deleted.

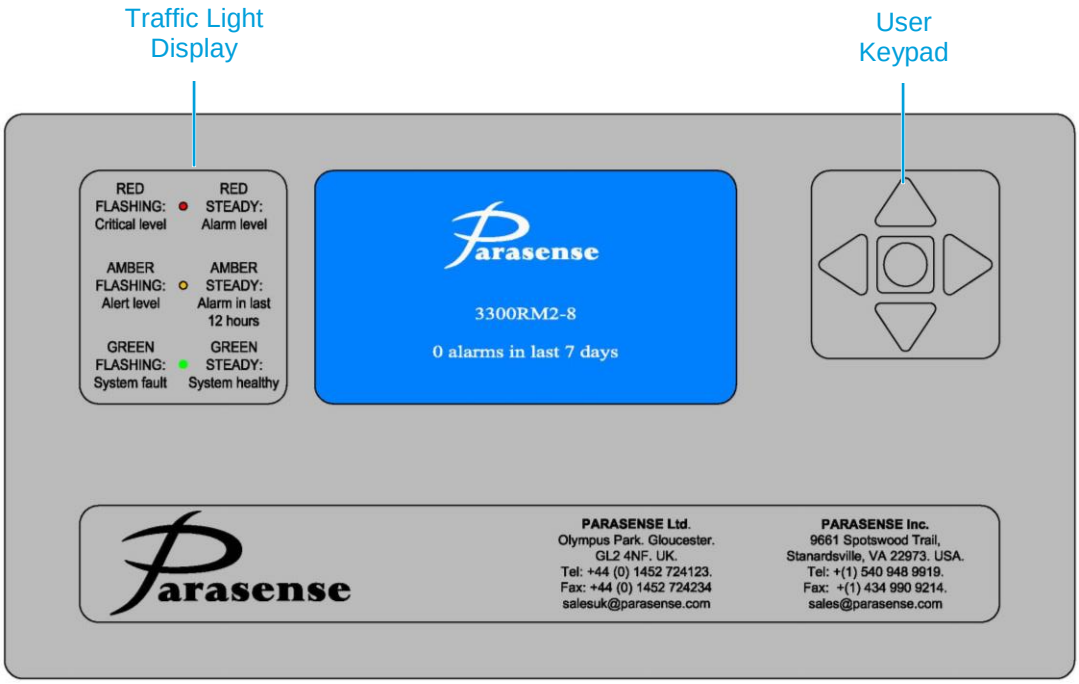



Once you have entered the new passcode, highlight ‘E’ and press the ◯ button. From now on, the new passcode will be used to access the management menu.

If it is decided not to continue with the passcode change, simply enter the current passcode and highlight ‘E’ to confirm.

# 4 USER GUIDE

The 3300RM2 monitor is operated via a door mounted user interface. This includes a display, 5 button keypad and a traffic light alarm system.




## POWER UP

On power up of the monitor, self-diagnostics are carried out. This will cause the traffic lights to flash and some messages may appear on the screen. If the monitor is starting from cold, it is suggested that it is left to warm up for 24 hours to ensure correct readings. Following power up, you are presented with the Home screen where the current status of the monitor is shown.

## KEYPAD FUNCTIONS

Navigate the information onscreen by use of the 5 button keypad. There are four directional buttons and one action button. Use the △▽ buttons to highlight the required item. Press the action button◎ of the Keypad to select. The ◁▷ buttons will move the cursor to the left and right where applicable, but can also be used to view the previous and next page of data where available.

If the keypad is inactive for 3 minutes or longer, the LCD backlight will deactivate and the screen will go black. Keypad activity will reactivate the backlight.

## CONTRAST ADJUSTMENT

To adjust the LCD contrast, simultaneously press and hold the △ & ▽ buttons. All three of the display LED's will flash to indicate that you are in contrast mode. Using the △ & ▽ buttons, you may now adjust the contrast of the LCD to the desired level. If the screen is completely blue, press the △ button until text is visible. If the screen is white, press the ▽ button. Once complete, press the ◎ button to confirm and close the contrast menu.

## SYSTEM ALARM OR FAULT INDICATION

The traffic light display gives an ‘at a glance’ system status of the monitor. This will indicate any alarm conditions that arise. The significance of each traffic light is shown below:

| Traffic Light Reference | |
|---|---|
| **Red Flashing Light:** | A measurement of refrigerant from the most recent cycle has exceeded the ‘Critical’ threshold. |
| **Red Steady Light:** | A measurement of refrigerant from the most recent cycle has exceeded the ‘Alarm’ threshold. |
| **Amber Flashing Light:** | A measurement of refrigerant from the most recent cycle has exceeded the ‘Alert’ threshold. |
| **Amber Steady Light:** | A measurement of refrigerant exceeding one of the alarm thresholds has been detected during the last 12 hours. |
| **Green Steady Light:** | The refrigerant monitor is operating to design specification. |
| **No Green Light or Flashing:** | A fault exists on the refrigerant monitor. |

If a reading has been detected in excess of the configured alarm thresholds, the traffic light display will indicate the level of that alarm. The alarm count on the Home screen will be incremented, and the alarm will be logged.

If multiple alarms have been triggered, the traffic lights will indicate the highest alarm level. Individual alarm information can be obtained from the SAMM list and alarms Log.

## RELAY FUNCTION

Relays become energised when the monitor is ‘powered up’ i.e. ‘C’ and ‘NO’ are linked. On loss of power or, an alarm/fault situation occurs, the relays become de-energised, i.e. ‘C’ and ‘NC’ are linked, ‘C’ and ‘NO’ are open circuit.

If configured for alert or fault conditions, the relays will de-energise immediately and the beacon/sounder will operate. For alarm or critical situations, the relays will de-energise after 2 consecutive samples (with no delay between each sample) read greater than the alarm thresholds set.

# FACTORY DEFAULT CONFIGURATION SETTINGS

Monitors are supplied programmed with default configuration data. Modification can only be carried out via the management menu of the door-mounted display.

**Network settings:**

| | |
|---|---|
| **IP Address** | 192.168.0.50 |
| **Netmask** | 255.255.255.0 |
| **Server** | 192.168.0.1 |
| **Gateway** | 192.168.0.1 |

**Relay Settings:**

| | |
|---|---|
| **Relay 1 - 8** | Any Critical |
| **9** | Any Alert |
| **10** | Any Alarm |
| **11** | Any Critical |
| **12** | Any Fault |
| **13 - 16** | Any Critical |

**SAMM Name/State:**

| | |
|---|---|
| **SAMM 1** | Enabled, Leak Mode |
| **thru to** | |
| **SAMM 8** | Enabled, Leak Mode |

**SAMM Settings:**

| | | | |
|---|---|---|---|
| **Alert Level** | 50ppm | **Max Pipe Length** | 100ft |
| **Alarm** | 300ppm | **Refrigerant** | R134A |
| **Critical** | 850ppm | | |

**Daylight Savings:**

| | |
|---|---|
| **DST** | Enabled |
| **DST Begins** | 2nd Sunday in March |
| **DST Ends** | 1st Sunday in November |

**General Settings:**

| | |
|---|---|
| **Units** | Imperial |
| **Sample Interval** | 5 Minutes |

# 5 SERVICE AND MAINTENANCE

Parasense warrants the monitor for a period of one year from the date of purchase against defects in materials and workmanship. This warranty will not apply to defects resulting from the non-compliance with this manual, over voltage, physical abuse, ingress of water or tampering with individual items. Use of equipment in a manner not specified by the manufacturer may impair the protection afforded by the equipment.

Parasense offers a wide range of service and maintenance contracts, remote access software and management reporting packages. Details and cost of service exchange units can be obtained from Parasense or an approved distributor.

The monitor has no user serviceable components, but comprises of seven basic building blocks:-

**1)** **Monitor Enclosure** incorporating Fused Power Input Module.

**2)** **Enclosure Door** incorporating Operator Keypad, LCD Display and secondary locking clips.

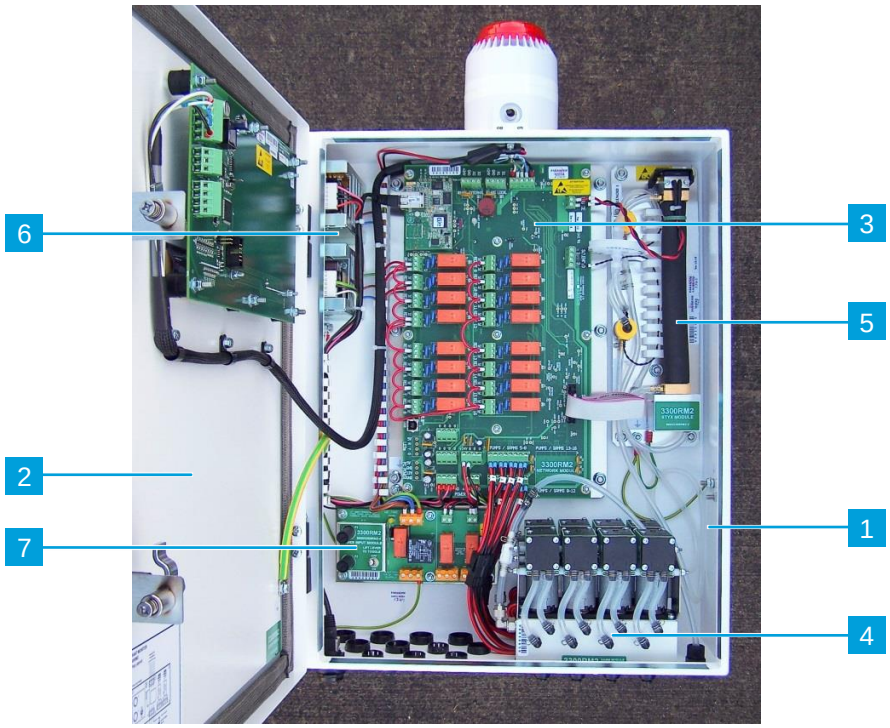
**3)** **Network Module** incorporating Mounting Plate and PCB with connectors for remote communications, data storage and processing capabilities for the SAMM Modules.

**4)** **SAMM Module** (Sampling Module) having four individual SAMMs, each with their own pump and filter.

**5)** **Styx Module** incorporating Mounting Plate, Infrared Absorption Sensor, Pneumatic Solenoids with associated pipework and filter.

**6)** **Power Supply Module**.

**7)** **Power Input Module**



# SYSTEM FAULT DIAGNOSIS

In the event of a fault occurring with the system, the Green LED will flash. The SAMMS List will show which SAMM is involved and the nature of the fault. Bear in mind that more than one SAMM may have a fault. The faults log will also show faults with the most recent shown first. During the course of checking the system it may be necessary to switch off the system. When this is done the relays will change to their 'alarm/fault' state. It may be necessary to isolate these alarm systems or make others aware that an alarm will occur.

**For all faults** A visual check on all screw-in terminals, ribbon cables and pneumatic hoses may provide the solution.

The pneumatic hoses within the monitor should be clean and clear. Should there be excessive dark-coloured contamination within the pneumatic hoses, there may be a problem with contamination. Water ingress will also have a detrimental effect on the Styx module. In either case, this will need to be investigated.

Prior to carrying out these checks, switch off the external mains supply to the monitor and wait for a few seconds while the power supply to discharges. Unscrew the door side locking screws, open the door with the key provided and switch off at the internal power input module (lift and move toggle switch to the 'Off' position).

Having checked all connections are secure, lift and move the toggle switch to the 'On' position, close and lock the door, tighten the door side locking screws and reinstate the mains power supply.

If the fault does not clear, refer to the following fault messages and procedures;

Note: only a suitably qualified person observing the relevant safety precautions should carry out work on this equipment.

**The green "Healthy" display LED is not on or flashing/the display does not illuminate**

It is possible that no flashing green LED is indicated on the Display due to a failure of the electrical supply to the display. This can first be identified if none of the LEDs are illuminated.

Fault finding steps:

**1)** Press the action key (round central button on the display). The display backlight should normally come on. If the backlight does not come on then follow the steps below with external power still present to the monitor. If the backlight does come on cycle the power to the monitor and check the monitor.

**2)** Open the door to the monitor and check the status of the "POWER" Amber LED [D3] on the power input module. If D3 is not illuminated measure the V AC between L1 & L2 at the bottom of the power input module. If the voltage is less than 90V AC check the external supply breaker and cabling.

**3)** If the incoming voltage across the lower L1 & L2 terminals is between 90~120V AC measure the V AC between L1 & L2 at the top of the power input module. If the voltage is still not between 90~120V AC switch off the mains supply externally and wait for a few seconds for the power supply to discharge. Switch off at the internal power input module (lift and move toggle switch to the 'Off' position). Check both fuses [F1 & F2] on the power input module. If either fuse is open circuit replace the fuse for an identical fuse (Parasense P/N:8295. Description: 2.5A/415V Anti-surge; 6.3mmx32mm/0.25"x1.25").

4) Reinstate the power, move the internal power input module toggle switch to the 'On' position and confirm there is between 90~120V AC across the top L1 & L2 terminals – LED D3 should be illuminated. Measure the DC voltage across the "POWER" terminals [J17 24V & GND] at the lower left of the network module. If 24V DC is found then proceed to the next step. If 24V DC is not present, disconnect the 24V DC relay supply [J3 +24V], cycle the mains power and measure the 24V DC at J17 again. If 24V DC is found the problem is with the 24V DC wiring from the relays to the device being activated by that relay. Reconnect the relay supply at J3 when proved. If 24V DC is found, switch off at the internal power input module, reconnect the relay supply at J3 and at J17 remove the 24V & GND wires and place them in an insulated terminal strip. Switch on the monitor and measure the DC voltage across the wires in the terminal strip. If the voltage is less than 22V DC replace the PSU, whilst the monitor is switched off reconnect the 24V & GND wires to J17.

5) Measure the DC voltage across J13 terminals [+24V & GND] at the top of the network module. If the voltage is less than 22V DC then switch off at the internal power input module and disconnect the cables connected at J13, making sure the terminal colours are noted. Switch on the monitor and measure the DC voltage across J13 terminals [+24V & GND] again. If the voltage is still less than 22V DC replace the network module.

6) Measure the DC voltage on the display module across J1 [V+ & V-] at the top left of the PCB. If 24V DC is still not detected the display wiring loom is faulty. If 24V DC is found then the display module will need to be replaced.

## FAULT MESSAGES

In the event of a fault occurring as well as the flashing green LED, a fault message will be displayed on the SAMMs List. The faults list will show all fault messages with the most recent first.

**Overrange**

'Overrange' is not shown in the faults log as it is a result of a PPM reading. If the upper PPM limit has been reached 'Overrange' will be logged in the alarm log indicating the measured PPM concentration was beyond the measuring range of the monitor. If only one SAMM is showing 'Overrange' then that area has a higher refrigerant leak than the system is designed to monitor. In exceptional circumstances it is possible that the network module AND the PSU have developed a fault. All fault finding steps must be followed to confirm the exact nature of the problem.

Fault finding steps:

1) Check all screw-in terminals and ribbon cable connections are secure.
2) Check that 5V DC exists across the 'SOURCE' terminals [J14 **+** and **-**] at the top right of the network module. This may modulate between 4.5V DC and 5.5V DC, this is expected.
3) If 5V DC is present then the Styx module will require replacement.
4) If there is no 5V DC but there IS 5V DC across the 'POWER' terminals [J25 5V & GND] at the lower left of the network module then the network module will require replacing.
5) If there is also no 5V DC across the 'POWER' terminals [J25 5V & GND] at the lower left of the network module, then the PSU is faulty.
6) Measure the AC voltage across L1 & L2 of the power input module. This should be approximately 110V AC. Switch off the mains supply externally and wait for a few seconds for the power supply to discharge. Switch off at the internal power input module (lift and move toggle switch to the 'Off' position). Measure across the L1 & L2 terminals of the power input module again to confirm no AC voltage is present. Remove the conductors on the 'POWER' terminals [J25 5V & GND] and measure the resistance across J25 5V & GND. A reading of 400-450 Ω is expected. If the resistance is lower than this then contact Parasense for further assistance.

**PrsrLeak**

This message is shown if the Styx was successfully pressurised to the required high pressure, but within 15-20 seconds the pressure had dropped by more than 60mBar.

If the message is shown for all SAMMs on the same SAMMs module, the SAMMs module may be faulty.

If the message is shown for all SAMMs, except one specific SAMMs module, the fault may be with the module that is not reporting a fault.

If all SAMMs indicate 'PrsrLeak' then check all internal pipework/clamps on the Styx module for leaks. If none can be found then the problem is probably with the Styx module.

Fault finding steps:

**1)** Check all screw-in terminals and ribbon cable connections are secure.
**2)** If no internal leaks can be found clamp the inlet pipe just after the non-return valve on the SAMMs module as soon as the pump stops.
If this solves the problem the Styx module will need to be replaced. Otherwise clamp the Styx outlet pipe just before the exhaust port as soon as the pump stops. If this solves the problem the Styx module will need to be replaced.
**3)** If only one SAMM Module is not showing a fault, clamp the outlet pipe of the 'healthy' SAMM module whilst a full sample is taking place. If the fault clears then the clamped SAMM module is faulty.
**4)** Check that solenoid 1 is energised (24V DC) from the beginning of a sample until the pump stops (The Styx is pressurised). It should then remain de-energised (0V DC) for approximately 30seconds before energising (24V DC) for approximately 3 seconds at the end of the sample cycle. If this does not occur then the network module will require replacing.
**5)** Check that solenoid 2 is only energised (24V DC) for 5-10 seconds at the end of the purge stage (the pump should be heard to struggle just prior to it stopping and the voltage returns to 0V DC). If this is not the case then the network module will require replacing. If it is being energised correctly then the Styx module will need to be replaced.

**Prsr Flt**

This message is shown if the Styx could not be pressurised to the required high pressure.

If all SAMMs are affected it is probably the Styx or network module.

If the four SAMMs on the same SAMMs module are indicated it is probably the SAMMs module. Replace the SAMMs module.

If the message is shown for all SAMMs, except one specific SAMMs module, the fault may be with the SAMMs module that is not reporting a fault.

If an individual SAMM is showing a fault it could be a blockage in either the freeway or spur else an individual pump could be the cause.

Fault finding steps:

**1)** Check all screw-in terminals and ribbon cable connections are secure.
**2)** Remove the freeway for the affected SAMM and initiate a manual sample. If this rectifies the problem check/replace the freeway or spur for kinks or blockages.

**3)** With the freeway disconnected use the airflow gauge to check the airflow for the SAMM. If it is <3 l/min, measure across the relevant pump terminals [J21- J22] to confirm 24V DC is present when the pump is requested. If 24V DC is not found the network module will need to be replaced. If 24V DC is found but the pump is not running the fault is with the SAMMs module.

**4)** If only one SAMM module is not showing a fault, clamp the outlet pipe of the 'healthy' SAMM module whilst a full sample is taking place. If the fault clears then the clamped SAMM module is faulty.

**5)** If the airflow gauge is showing >3 l/min check the internal pipework for leaks. If none can be found it will be necessary to initiate a manual sample with the door open before making the following additional checks.

**6)** Confirm solenoid 1 has 24V DC across it when the pump is running and that solenoid 2 is only energised for 5-10 seconds at the end of the purge stage (the pump should be heard to struggle just prior to it stopping and the voltage returns to 0V DC). If the voltages are incorrect then the network module will need to be replaced. If the voltages are correct then the Styx module will need to be replaced.

**Src Flt**

'Src Flt' is shown if the infrared source on the Styx module is operating incorrectly. It would usually be shown for all SAMMs. All Fault finding steps must be followed to confirm the exact nature of the problem.

Fault finding steps:

**1)** Check all screw-in terminals and ribbon cable connections are secure.

**2)** Check that 5V DC exists across the 'SOURCE' terminals [J14 **+** and **-**] at the top right of the network module. This may modulate between 4.5V DC and 5.5V DC, this is expected.

**3)** If 5V DC is present then the Styx module will require replacement.

**4)** If there is no 5V DC but there IS 5V DC across the 'POWER' terminals [J25 5V & GND] at the lower left of the network module then the network module will require replacing.

**5)** If there is also no 5V DC across the 'POWER' terminals [J25 5V & GND] at the lower left of the network module, then the PSU is faulty.

**6)** Measure the AC voltage across L1 & L2 of the power input module. This should be approximately 110V AC. Switch off the mains supply externally and wait for a few seconds for the power supply to discharge. Switch off at the internal power input module (lift and move toggle switch to the 'Off' position). Measure across the L1 & L2 terminals of the power input module again to confirm no AC voltage is present. Remove the conductors on the 'POWER' terminals [J25 5V & GND] and measure the resistance across J25 5V & GND. A reading of 400-450 Ω is expected. If the resistance is lower than this then contact Parasense for further assistance.

**STYXCold / Warming**

The monitor is not at its minimum operating temperature (40°C). This will normally appear if the unit has been switched off for a while. When the monitor is operating correctly, this fault will clear once the required temperature is achieved.

**Note:** The monitor door must be kept closed and locked to maintain the correct operating temperature.

Fault finding steps:

**1)** Check all screw-in terminals and ribbon cable connections are secure.
**2)** If the fault persists the Styx module will need to be replaced.

**STYX Flt**

The Styx assembly is not functioning.

Fault finding steps:

**1)** Check all screw-in terminals and ribbon cable connections are secure.
**2)** If the fault persists, the Styx module will need to be replaced.

# REPLACING THE ENCLOSURE DOOR

**IMPORTANT:** Before powering off the system to remove the door:

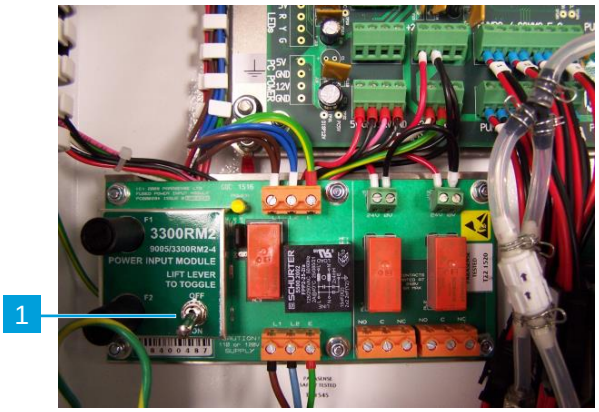
1. If you have changed the default passcode, make a note of your passcode.
2. Using the latest version of the 3300RM2 configuration tool, 'Load' the configuration from the 3300RM2. In order to do this you will need a working network connection to the 3300RM2 (refer to section 2-7) and you will need to know the IP address of the 3300RM2 (refer to section 3-11)

You can now follow the below procedure for removal and refitting. When the door replacement is finished, and the system is powered back on:

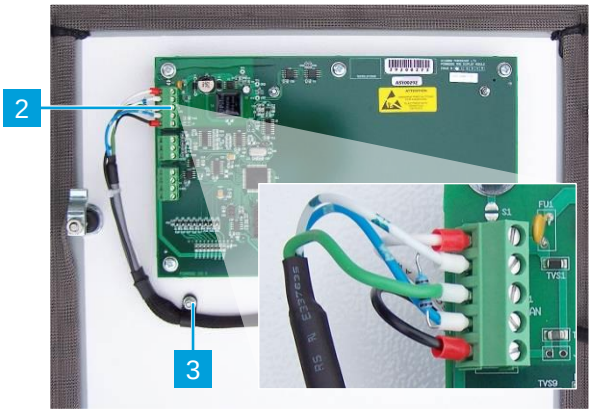
3. Adjust the display contrast as required (refer to section 4-1)
4. Using the latest version of the 3300RM2 configuration tool, 'Load' the configuration obtained in step 2 above and send this to the 3300RM2. You will need a working network connection to the 3300RM2. The IP address of the 3300RM2 should be unchanged from that used in step 2 above.
5. Using the 3300RM2 display, enter the management menu and change the default passcode to your passcode (as noted in step 1), refer to section 3-14

**Procedure for removal and refitting:**

Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the Enclosure Door with the key provided. Switch off at the main isolator (lift and move toggle switch **(1)** to the 'Off' position).



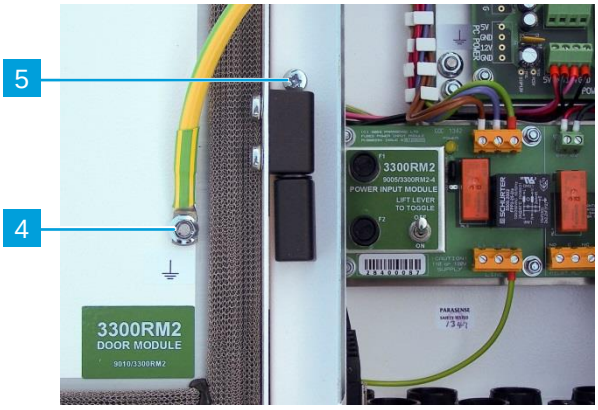

Disconnect the display lead **(2)**. Unscrew the 3 clips **(3)** holding the cable in position and remove cabling from the enclosure door.



Disconnect the earth strap **(4)** from the enclosure door.

Remove the anti-lift peg **(5)** located above the lower hinge. The enclosure door can now be lifted off and a new one hung in place.

Replace the anti-lift peg **(5)**. Reconnect the earth strap **(4)**, display lead **(2)** and clips **(3)**. Check all connections are secure. Switch the main isolator **(1)** to the 'On' position. Close the enclosure door and secure with the locking bolts. Reinstate the mains supply.




In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators. Refer to the System Test section of this manual.

# REPLACING THE NETWORK MODULE (INC. INSERT PLATE)

**IMPORTANT:** Before powering off the system to change the network module:

1. Using the latest version of the 3300RM2 configuration tool, 'Load' the configuration from the 3300RM2. In order to do this you will need a working network connection to the 3300RM2 (refer to section 2-7) and you will need to know the IP address of the 3300RM2 (refer to section 3-11)

You can now follow the below procedure for removal and refitting. When the network module replacement is finished, and the system is powered back on:

2. Using the latest version of the 3300RM2 configuration tool, 'Load' the configuration obtained in step 1 above from your local file system and send this to the 3300RM2. You will need a working network connection to the 3300RM2. The IP address of the 3300RM2 should be unchanged from that used in step 1 above.

**Procedure for removal and refitting:**

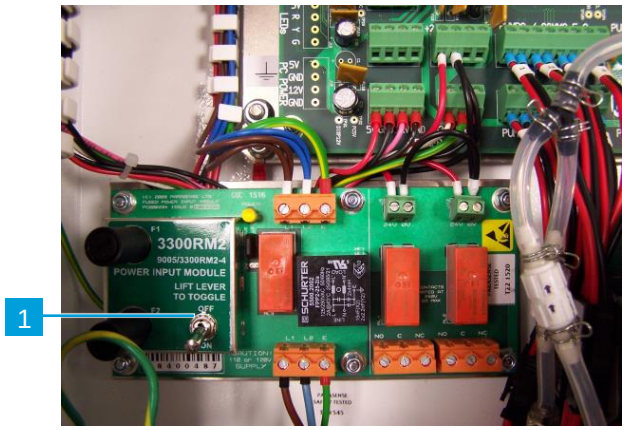
Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the enclosure door with the key provided. Switch off at the main isolator **(1)** (lift and move toggle switch to the 'Off' position).

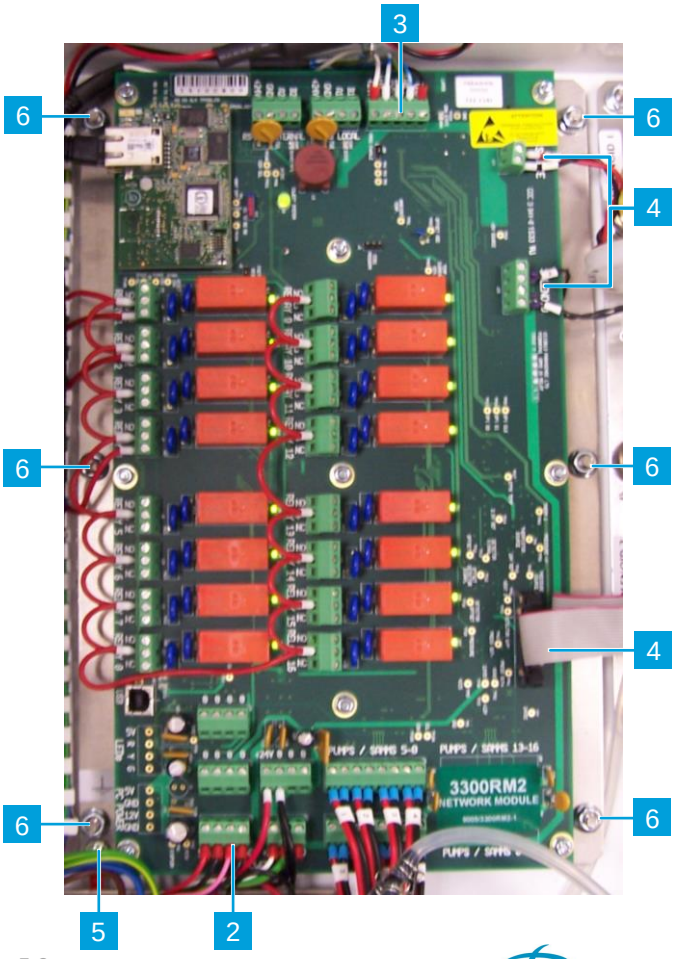
**WARNING!!! Connections to the relays may have power even though the detector is switched off. Check with a meter and isolate elsewhere if necessary.**

*Noting the sequence* - Disconnect the power supply cables **(2)**, connections to the enclosure door **(3)**, the Styx module connections **(4)**, then any other wired in connectors, e.g. relays. Remove the ground wire **(5)**. Unscrew the six nuts holding the network module in position **(6)**, located around the edge of the insert plate. Remove the network module.

Position the new network module assembly and tighten the securing nuts **(6)**, including new shake-proof washers. Reconnect all cables previously disconnected. Check all connections are secure. Switch the main isolator **(1)** to the 'On' position. Close the enclosure door and secure with locking bolts. Reinstate the mains supply.

In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators.

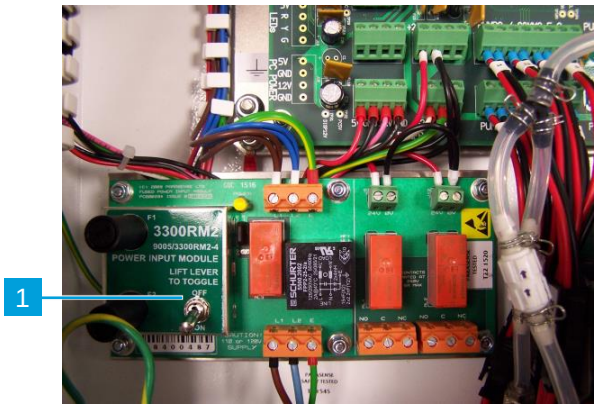


Refer to the System Test section of this manual.

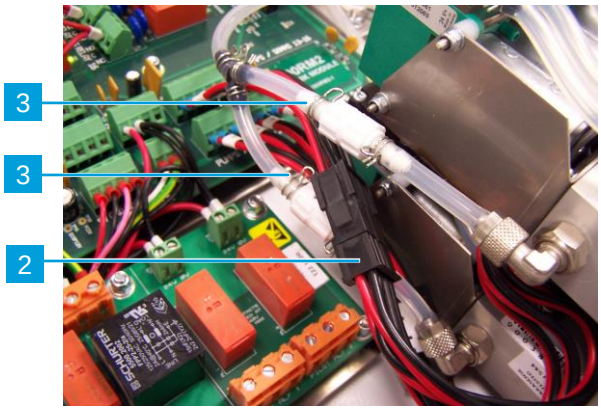
## REPLACING A SAMM MODULE

Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the enclosure door with the key provided. Switch off at the main isolator **(1)** (lift and move toggle switch to the 'Off' position).




Disconnect the SAMM module wiring from the network module by unclipping the relevant connector **(2)**.

Disconnect the hose from the SAMM Module **(3)**, leaving the white valve assembly connected to the SAMM module.




Remove the four fixing screws **(4)** that are holding the SAMM module to the base of the enclosure, being careful not to damage the gasket between the SAMM and the inside of the enclosure.


To install the new SAMM module, locate in the vacant position. (Note: It will only fit with the 8 short sampling pipes facing out of the enclosure). Tighten the fixing screws **(4)** including new shake-proof washers. Re-attach the hose **(3)** to the new SAMM module and connect the cables **(2)** to the network module. Switch the main isolator **(1)** to the 'On' position. Close the enclosure door and secure with locking bolts. Reinstate the mains supply.

In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators. Refer to the System Test section of this manual.

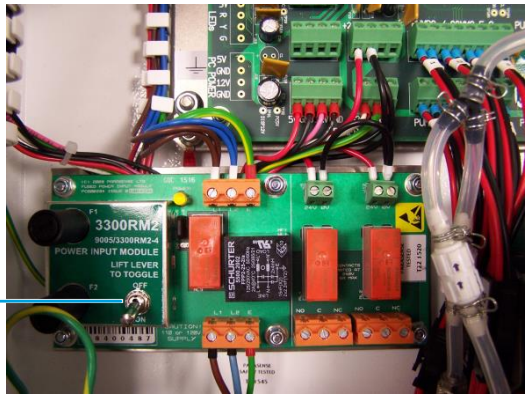
# REMOVING THE STYX MODULE

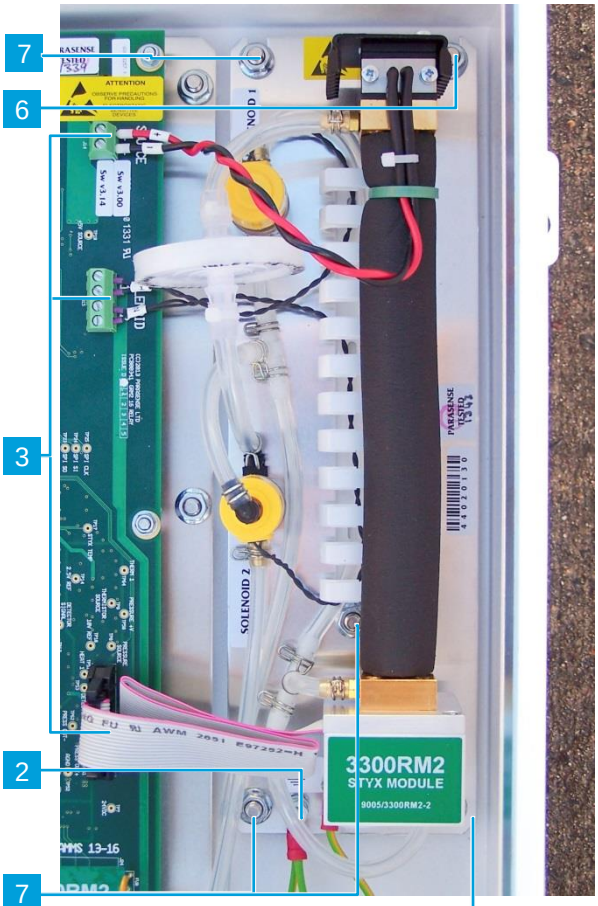
Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the enclosure door with the key provided. Switch off at the main isolator **(1)** (lift and move toggle switch to the 'Off' position).

Disconnect the earth cable from the Styx module **(2)**. Unplug the ribbon cable and wired connections from the network module **(3)**.

Disconnect the hose from the SAMM modules, leaving the white check valve assembly connected to the SAMM module **(4)**. Disconnect the air exhaust fitting by unscrewing the cap to release the pipe **(5)**.

Loosen the two fixing nuts on the right of the Styx module **(6)** and remove the remaining three fixing nuts **(7)**. Slide the Styx module out of the monitor.

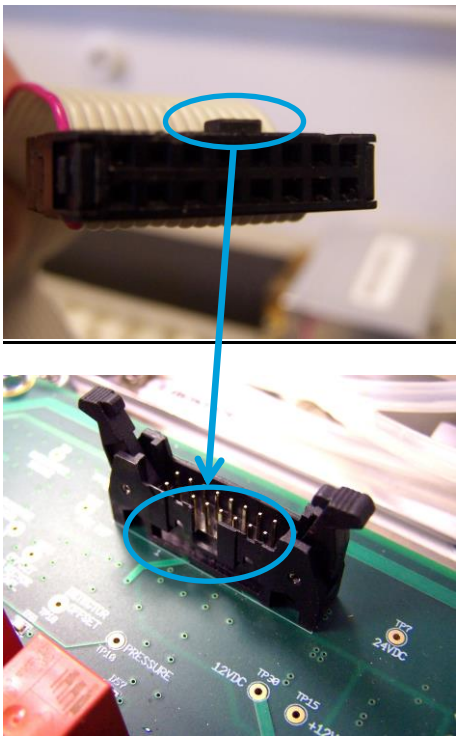



# REPLACING THE STYX MODULE

Fit the new Styx module in the vacant position by sliding under the loose fixing nuts **(6)** and refit the three fixing nuts **(7)**, including new shake-proof washers.

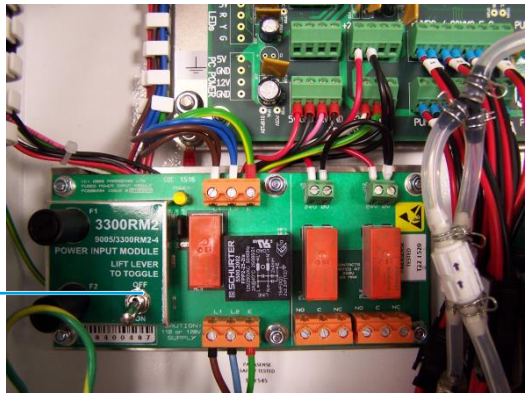
It is imperative to the functioning of the monitor that the Styx ribbon cable be installed in the correct orientation. The circled block must be aligned with the circled recess:

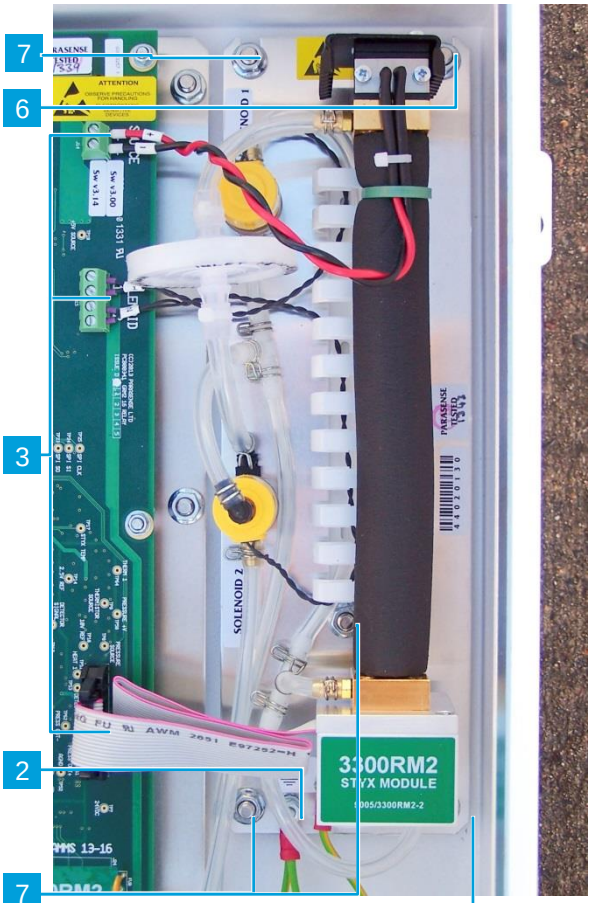



NB: If the ribbon cable is installed incorrectly, the monitor will not power up although some LEDs may light up. In this instance, correct the connector orientation and the monitor should power up properly.

Securely reconnect all other cables and hoses previously disconnected **(2,3,4 and 5)**. Switch the main isolator **(1)** to the 'On' position. Close the enclosure door and secure with locking bolts. Reinstate the mains supply.

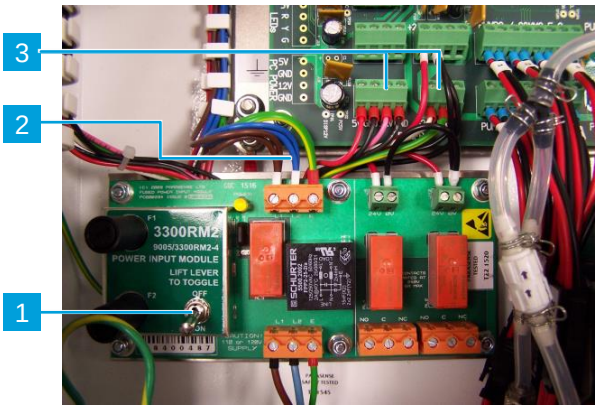
In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and enunciators. Refer to the System Test section.



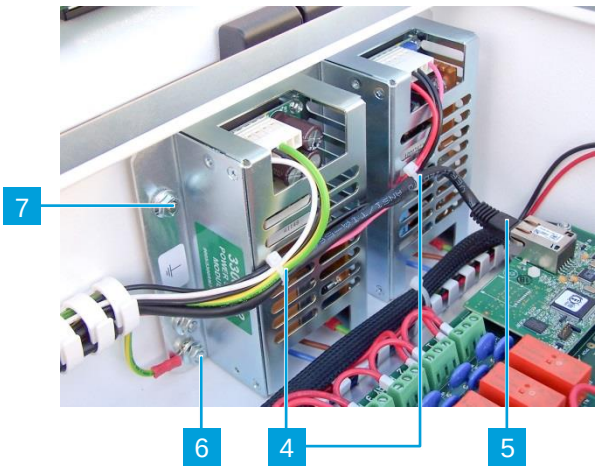




# REPLACING THE POWER SUPPLY MODULE

Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the enclosure door with the key provided. Switch off at the main isolator **(1)** (lift and move toggle switch to the 'Off' position).




*Noting the sequence* - Disconnect the mains supply cables to the power supply **(2)** and release them from the cable trunking. Disconnect the output cables from the power supply **(3)** and remove them from the cable trunking. Unplug the CAT5 connector **(5)** adjacent to the PSU. Disconnect the Eerth strap **(6)**. Unscrew the four fixing nuts **(7)** that hold the power supply in place. Remove the power supply and cables.

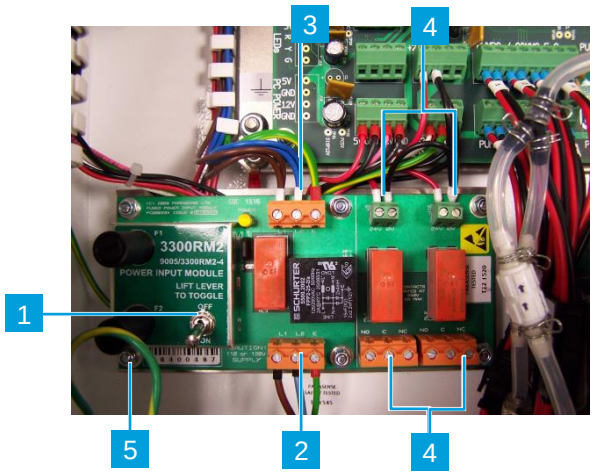



Secure the new power supply in place with fixing nuts **(7)**, including new shake-proof washers. Connect the new cables **(2)(3)** and route through the cable trunking. Check all connections are secure. Switch the main isolator **(1)** to the 'On' position. Close the enclosure door and secure with locking bolts. Reinstate the mains supply.

In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators. Refer to the System Test section of this manual.

# REPLACING THE POWER INPUT MODULE

Switch off the mains supply to the 3300RM2 and wait for a few seconds while the power supply discharges. Unscrew the locking bolts on the side and open the enclosure door with the key provided. Switch off at the main isolator **(1)** (lift and move toggle switch to the 'Off' position).




Using a test meter, check the mains incoming supply **(2)** is not live. **Do not proceed further until this has been confirmed.**

Disconnect the mains incoming connections **(2)**, followed by the power output connections **(3)**. Now disconnect any relay connections **(4)**.

**WARNING!!! Connections to the relays may have power even though the detector is switched off. Check with a meter and isolate elsewhere if necessary.**

Remove the six fixing nuts **(5)**. The power input module can now be removed.

Fit the new power input module assembly, tightening the fixing nuts including new shake-proof washers. Reconnect all the cables previously disconnected. Check all connections are secure. Switch the main isolator to the 'On' position. Close the enclosure door and secure with locking bolts. Reinstate the mains supply.

In order to ensure full functionality, Parasense recommends that a system test be carried out (using the calibration gas provided) at the time of remedial maintenance to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators. Refer to the System Test section of this manual.

# TESTING MODES

The test equipment described in the following tests is available in the Parasense service kit.

# CALIBRATION CHECK

Contact your RMC for the Calibration Passcode to implement the Calibration Check

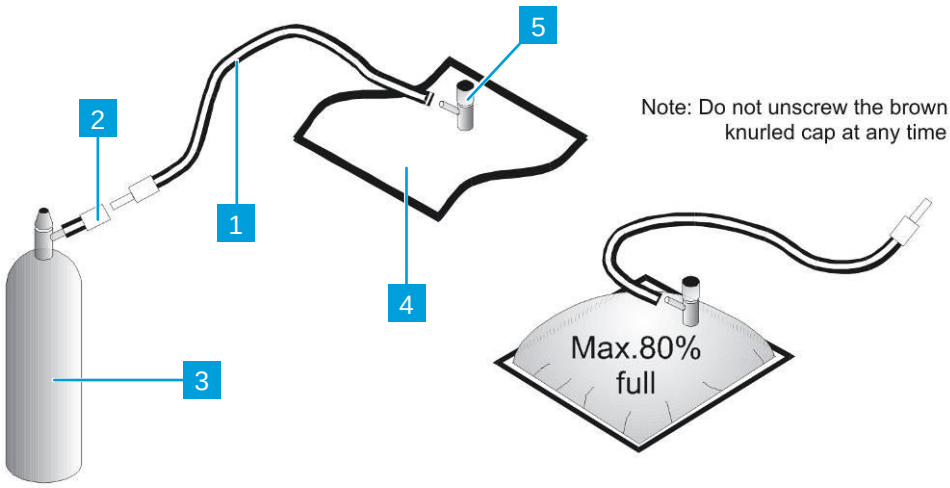
To maintain a high degree of accuracy, Parasense recommends that a Calibration Check is carried out after approximately 18 months initial run time or when changing out a Styx Module as part of routine maintenance at 18 months thereafter.

The Calibration Check should only be used to check the integrity of the Styx Module after approximately 18 months run time and always when implementing maintenance. In the event that PMS/Maintenance is carried out, like a Styx Module and or Network Module exchange, the Calibration Check should always be implemented.

Air Flow Tests must be carried out on all SAMM Modules at a maximum of 18 month intervals. Information regarding maintenance packages and service exchange modules are available from Parasense.

Before commencing a Calibration Check, confirm that the Monitor has been running continuously for a period of **at least four hours**, with the Enclosure Door closed and locked. This will ensure that the system is operating at the correct temperature. **The Enclosure Door must be kept closed throughout the Calibration Check**.

The procedure is as follows: -




Remove the white plastic cap from the Parasense calibration gas cylinder **(3)**. Ensure the knurled knob on valve **(2)** is fully unwound (anti-clockwise) and screw valve on to the gas cylinder **(3),** aiming valve away from your face and pointing at the floor. Open the Calibration Reservoir **(4)** by unwinding the upper white section of valve **(5)** one revolution counterclockwise and expel any air present, then close by turning one revolution clockwise (note: do not unscrew the black/brown knurled cap at any time). Insert the plug end of hose **(1)** in to the open end of valve **(2)**. Unwind the upper white section of valve **(5)** one revolution, counterclockwise.

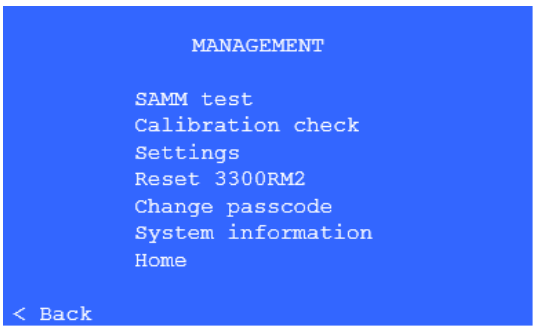
Open valve **(2)** clockwise on the Parasense calibration gas cylinder and allow sufficient gas flow to inflate the reservoir to approximately 80% capacity. Close valve **(2)** anti-clockwise. Turn the upper section of valve **(5)** clockwise to close. Disconnect hose **(1)** from the gas cylinder valve **(2)** using the pipe release tool. Unscrew valve **(2)** from the gas cylinder and safely store the cylinder in the service kit case.

From the main menu on the Parasense 3300RM2 monitor, use the △▽ buttons to select ‘Management’.

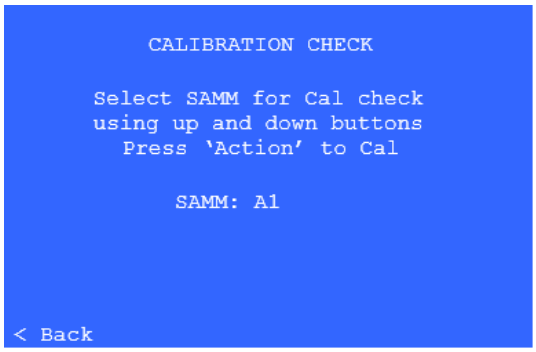
*NOTE: If you have entered the normal management passcode in the last 10 minutes, you will be presented with the Management menu, which does not contain the Calibration Check option. In this case, you must press the*

*<Back button to exit the Management menu and wait for 10 minutes before attempting to access the Management option again or select ‘Reset 3300RM2’ from the management screen.*

When you have reached the Enter Passcode screen, enter the Calibration passcode. If the correct Calibration passcode has been entered, you will be presented with the following screen:




Select the Calibration Check option to reach the main screen for this feature




The SAMM will reflect A1 or L1 as configured. Calibration Check is performed using SAMM #1.

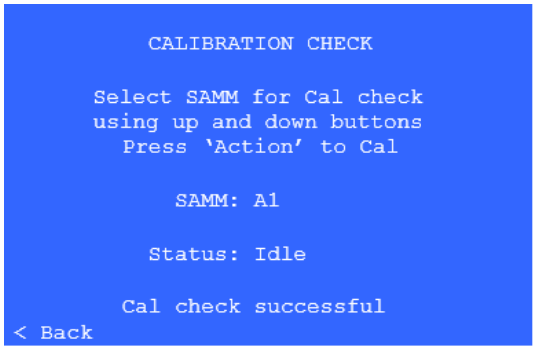
Disconnect the Freeway from SAMM channel #1 using the pipe release tool, and insert the plug end of the pipe from the Parasense calibration reservoir. Ensure the pipe has been securely inserted fully into in SAMM Channel # 1 pipework adaptor to prevent the ingress of fresh air and dilution of the calibrated sample. Turn the upper section of valve **(5)** one revolution, counterclockwise.

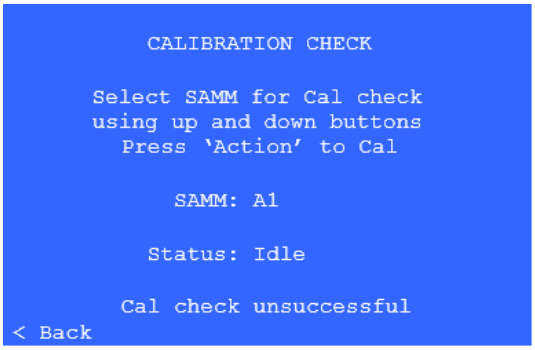
Start the calibration check by pressing the ◯ button.

While the calibration check is in progress, the ‘< Back’ function is unavailable and a message ‘Cal check in progress’ is shown. While the calibration check is in progress, the buttons have no effect.

If required, the system will be automatically re-calibrated.

When the calibration check has finished, the ‘< Back’ function re-appears and a calibration result message will appear on-screen indicating a successful or unsuccessful calibration check.




When the calibration check has completed successfully, pressing the <Back button will take you to the SAMM Test screen, where you must perform a SAMM Test to verify the correct operation of the monitor, alarm relays, associated field wiring and annunciators. If unsuccessful, see below for further instructions.

Ensure the calibration reservoir bag is still inflated to approximately 50% capacity (follow inflation procedure if required to refill the bag) and connected to SAMM #1.

Start the SAMM Test by pressing the ◯ button.

While the SAMM Test is in progress, the '< Back' function is unavailable and the buttons have no effect.

Once complete, the SAMM Test will return a value validating the efficacy of the 3300RM2 system and the Relays should de-energize, activating the local Beacon Sounder and any connected peripheral devices. Prior to exiting, it is important to close the reservoir bag by turning the upper white section of valve **(5)** one revolution clockwise. Using the pipe release tool to remove the reservoir bag and re-insert the freeway, before exiting the management menu.

Exit the Management Menu using the < Back button. The Monitor will then start sampling SAMM #1. All relays will remain de-energized until SAMM # 1 cycles through a healthy sample, which will clear all Alarms and de-activate the Beacon Sounder.

If Unsuccessful:

If the calibration check was unsuccessful, select the '< Back' function twice to return to the Management Menu and select 'Reset 3300RM2' and 'Yes' to action a reboot. Prior to resetting the system, it is important to close the reservoir bag by turning the upper white section of valve **(5)** one revolution clockwise. Use the pipe release tool to remove the reservoir bag from SAMM #1 as the system will start to Purge SAMM #1 following the reboot. Carefully check that you have followed the above procedure correctly and repeat the procedure again from the beginning.

On Completion, ensure the Parasense Calibration Reservoir is removed from the monitor and the Freeway is replaced and fully inserted into the SAMM fitting.

If the repeated calibration check is also unsuccessful, the Styx module will need to be replaced. Refer to the Service and Maintenance section of the 3300RM2 Operation and Maintenance manual for instructions on replacing the Styx module.

## SYSTEM TEST

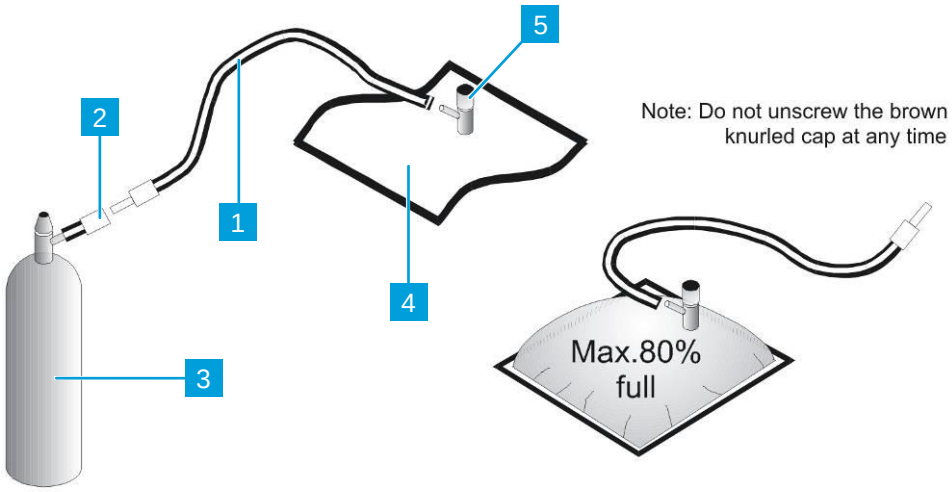
In order to ensure full functionality, Parasense recommends that a system test be carried out after initial installation of the equipment and annually thereafter. The system test should also be carried out at the time of any remedial maintenance. The 3300RM2 refrigerant monitor shall successfully measure a sample of calibration gas and then immediately indicate a Critical alarm condition and activate all relays

Information regarding maintenance packages and replacement modules are available from Parasense.

The reservoir bag should be filled with the calibration gas only and attached to channel 1. When the 'Start' selection is made the monitor will start sampling. During this test the Styx module is automatically configured for R134A and the minimum sample time, to suit the calibration gas sample tube and reservoir within the service kit.

**NOTE:** From initial switching on of the 3300RM2, no system test can be carried out until the system has warmed up (as shown on the SAMM List screen).

The routine is as follows: -




Before commencing a system test, confirm that the monitor has been running continuously for a period of at least four hours, with the enclosure door closed and locked. This will ensure that the system is operating at the correct temperature. The enclosure door must be kept closed throughout the system test.

Remove the plastic cap from the Parasense calibration gas cylinder **(3)**. Ensure the knurled knob on valve **(2)** is fully unwound (anti-clockwise) and screw valve on to the gas cylinder.

Open the calibration reservoir **(4)** by unwinding the upper white section of valve **(5)** one revolution anticlockwise and expel any air present, then close (note: do not unscrew the Brown knurled cap at any time).

Insert the plug end of hose **(1)** into the open end of the valve **(2)**. Unwind the upper white section of valve **(5)** one revolution, anticlockwise.

Open valve **(2)** clockwise on the Parasense calibration gas cylinder and allow sufficient gas flow to inflate the reservoir to approximately 80% capacity. Close valve **(2)** anti-clockwise. Turn the upper section of valve **(5)** clockwise to close. Disconnect hose **(1)** from the gas cylinder valve **(2)**. Unscrew valve **(2)** from the gas cylinder **(3)** and safely store the gas cylinder in the service kit case.

From the main menu on the 3300RM2 monitor, use the △▽ buttons to highlight and select System Test.

Disconnect the freeway from the required SAMM inlet using the pipe release tool and insert the plug end of the pipe from the Parasense calibration reservoir. Unwind the upper section of valve **(5)** two revolutions, anticlockwise.

At the system test screen, press the ◯ button to activate the test. The monitor will start to sample the refrigerant gas from the connected calibration reservoir.

If the concentration is above the configured SAMM 1 critical threshold, the system will indicate that a Critical alarm condition is present on SAMM 1, the front door traffic light display will indicate a Critical condition is present and ALL relays will be activated (de-energised). This provides a means of proving all devices attached to the relay outputs are functioning. The relay activation is cancelled when: (a) The user navigates away from the "System test" page; (b) The display inactivity timeout expires and the display automatically returns to the home page; (c) The user performs another system test which results in a measured concentration below the configured critical threshold for SAMM 1.

When the test is complete, remove the Parasense calibration reservoir and reconnect the freeway to SAMM channel 1.

## AIR FLOW

Remove the freeway from SAMM channel 1 using the Parasense pipe release tool. Insert the disconnected freeway into the connector on the pipe from the lower port of the gauge supplied with the 'Parasense Air Flow Kit'. Insert the pipe from the upper port on the gauge into SAMM channel 1. Attach the gauge in a vertical position on the monitor using the magnetic pad.

Initiate a manual sample of SAMM channel 1 (refer to the Monitor Setup - SAMM List section of this manual for instructions). This will cause the monitor to start sampling from SAMM channel 1. The gauge should indicate air flow greater than 2 litres per minute. If the reading is satisfactory, disconnect the gauge and reconnect the freeway to the monitor. Repeat the exercise for the remainder of the SAMM channels.

If the pump is running but the air flow reading is less than 2 litres per minute, disconnect the freeway from the lower port on the gauge and repeat the test. If the gauge now reads in excess of 4 litres per minute, check the freeway, fittings and filters for kinks or blockage. If lower readings persist with freeway connected, the SAMM module should be changed.

# 6 SPECIFICATION

| Model 3300RM2 | |
|---|---|
| **Power** | 90-120VAC, 260VA, 50/60Hz |
| **Ethernet** | 10/100 Base-T RJ45 Socket |
| **USB** | USB2.0, Type B Socket |
| **Fault/Alarm Relays** | Volt free, change-over<br>Max switching voltage: 24VDC<br>Max switching current: 6A (resistive) |
| **Pilot Relays** | Volt free, change-over<br>Max switching voltage: 250VAC<br>Max switching current: 6A (resistive) |
| **Display & Operator Control Options** | Traffic lights, LCD status display & navigation keypad |
| **Sensor, CFC, HCFC, HFC** | Styx infrared absorption sensor<br>24V DC plus serial coms<br>Resolution: 1ppm<br>Accuracy: better than 15% (species dependant) |
| **Sample Pumps** | 8 pumps<br>24V DC, 360mA |
| **Freeway** | 150m / 500ft length max (including all Spur Freeway)<br>1 spur kit/4 way split max per SAMM<br>All spur lengths to be 5m/16ft (coil excess Freeway) |
| **Max available 24V DC power supply capacity for Remote Beacon/Sounders** | 1.2A up-to 50°C enclosure temperature<br>(10 Parasense Beacon/sounders)<br>0.6A between 50-60°C enclosure temperature<br>(5 Parasense Beacon/sounders)<br>No spare capacity above 60°C enclosure temperature |
| **Parasense Beacon/sounder current consumption at 24VDC** | Wired C-NC = 110mA |
| **Operating Conditions** | Operating temperature: -9°C to 43°C (15°F to 110°F)<br>Storage temperature: -23°C to 65°C (-10°F to 150°F)<br>Relative Humidity: 0 to 95% RH (non-condensing) |
| **Approvals** | Vibration MIL-STD-167-1A<br>Shock Grade A MIL-S-901D<br>EMC MIL-STD-461F |
| **Enclosure Rating** | NEMA 12<br>IP54 |

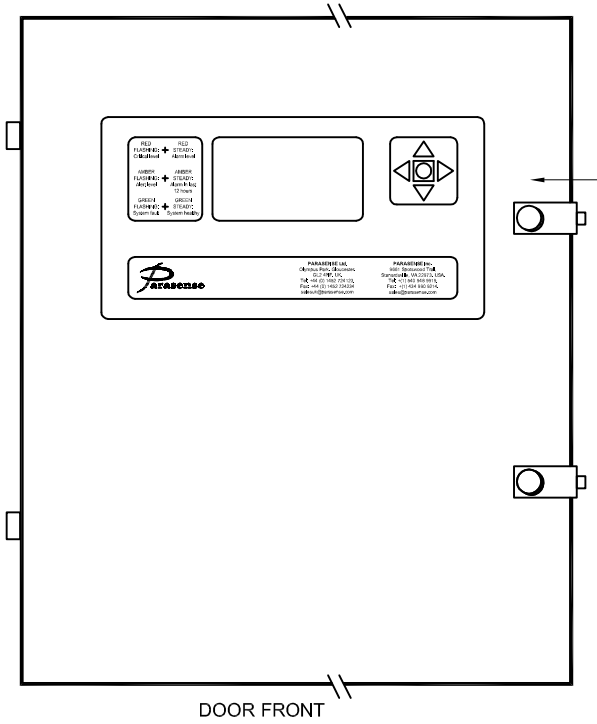
# 3300RM2 GENERAL ARRANGEMENT (PM1940)

NSN: 7H 6625-01-614-3112
Cage Code: 09WX1
Part no: 3300RM2

# 3300RM$_2$

## REFRIGERANT MONITOR, WITH 4# SHOCK MOUNTS (3300RM2 GRADE A)

NSWCCD-SSES Ltr 9514 Ser 921-020 dated 7 Oct 2013 - Parasense 3300RM2 Shock Approval Surface Ships and Ser 450TCR3/0227 01 Apr 14 Approval Submarines; Vibration Approval Ser 954/1475 dated 23 Apr 13; EMI Approved by D. Bozarth dated 27 Jun 13.
MIL-S-901D Grade A, Class II, Type A Shock; MIL-STD-461F EMC and MIL-STD-167-1-A, Type 1, Vibration.



DOOR FRONT

STYX MODULE
comprising:
1no.9005/3300RM2-2. Infrared Sensing Device on Mounting Plate

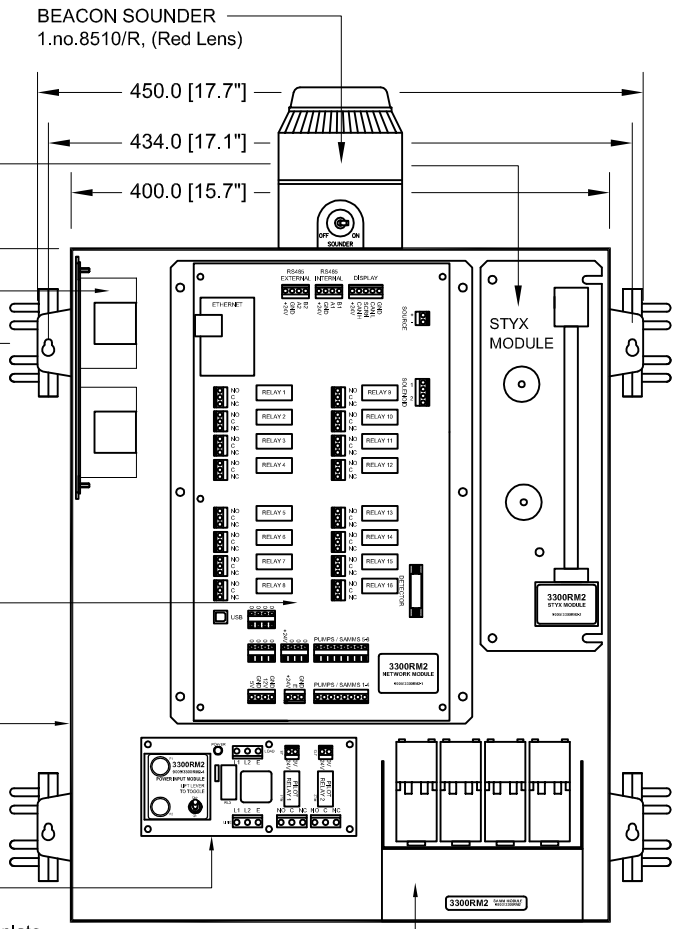
POWER SUPPLY MODULE
comprising:
1no. 9005/3300RM2-3. Power Supply Unit on Mounting plate

DOOR MODULE
comprising:
1no.9010/3300RM2. Enclosure Door with part lift-off hinge set, compression latches with anti-shock brackets, Operators membrane keypad and display , fixing studs for pcb. and earths.

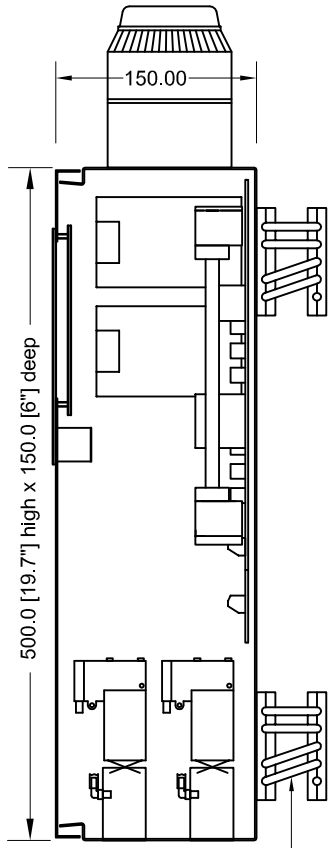
NETWORK MODULE
comprising:
1no.9005/3300RM2-1. Main PCB on Mounting plate

MONITOR ENCLOSURE
comprising:
1no.9090/3300RM2.'Industrial' Enclosure Body with part hinge set, holes for cable entries, fixing studs for Insert Plates and earths, welded on fixing lugs, 4no.

POWER INPUT MODULE
comprising:
1no.9005/3300RM2-4. pcb with mounting plate and 2.5A fuses.




ENCLOSURE
( Door removed)




SECTION

GRADE A SHOCK MOUNTS
4no.5073

SAMM MODULES
comprising:
2no.9003/3300RM2. Aluminium Manifold blocks, positioned in tandem, each with Freeway hose connectors, Air Filters and 4no. Pumps.

Note:
All external metal plate work finished in White polyester powder paint.

This is a representation of the internal modules. It is not to scale nor fully representative of the electronic layout. Please refer to module drawings for specific details.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Doc. Ref: H105-4 09/03/18

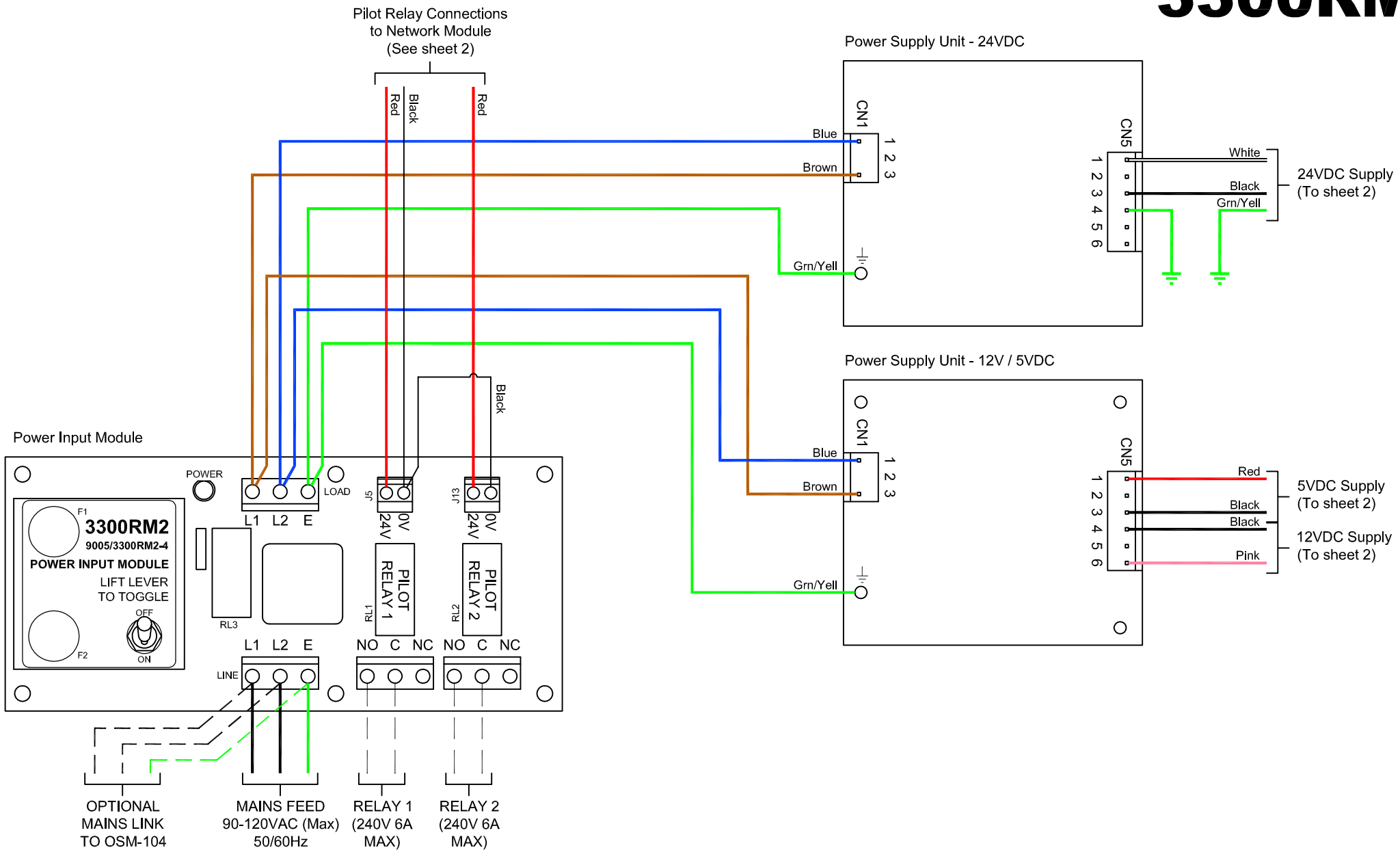
| title: | drawing number: | revision: | sheet: |
|---|---|---|---|
| 3300RM2 General Arrangement | PM1940 | 13 | 1 of 1 |

| drawn: | date: | part number: |
|---|---|---|
| James Wilkinson | 16th Jan 2012 | 3300RM2 |

| revision: | checked: |
|---|---|
| 12. Drawing border updated. JW 19th January 2017 | AK |
| 13. Drawing border updated. JW 21st March 2018 | JB |

# 3300RM2 WIRING SCHEMATIC (PS0716)

# 3300RM2





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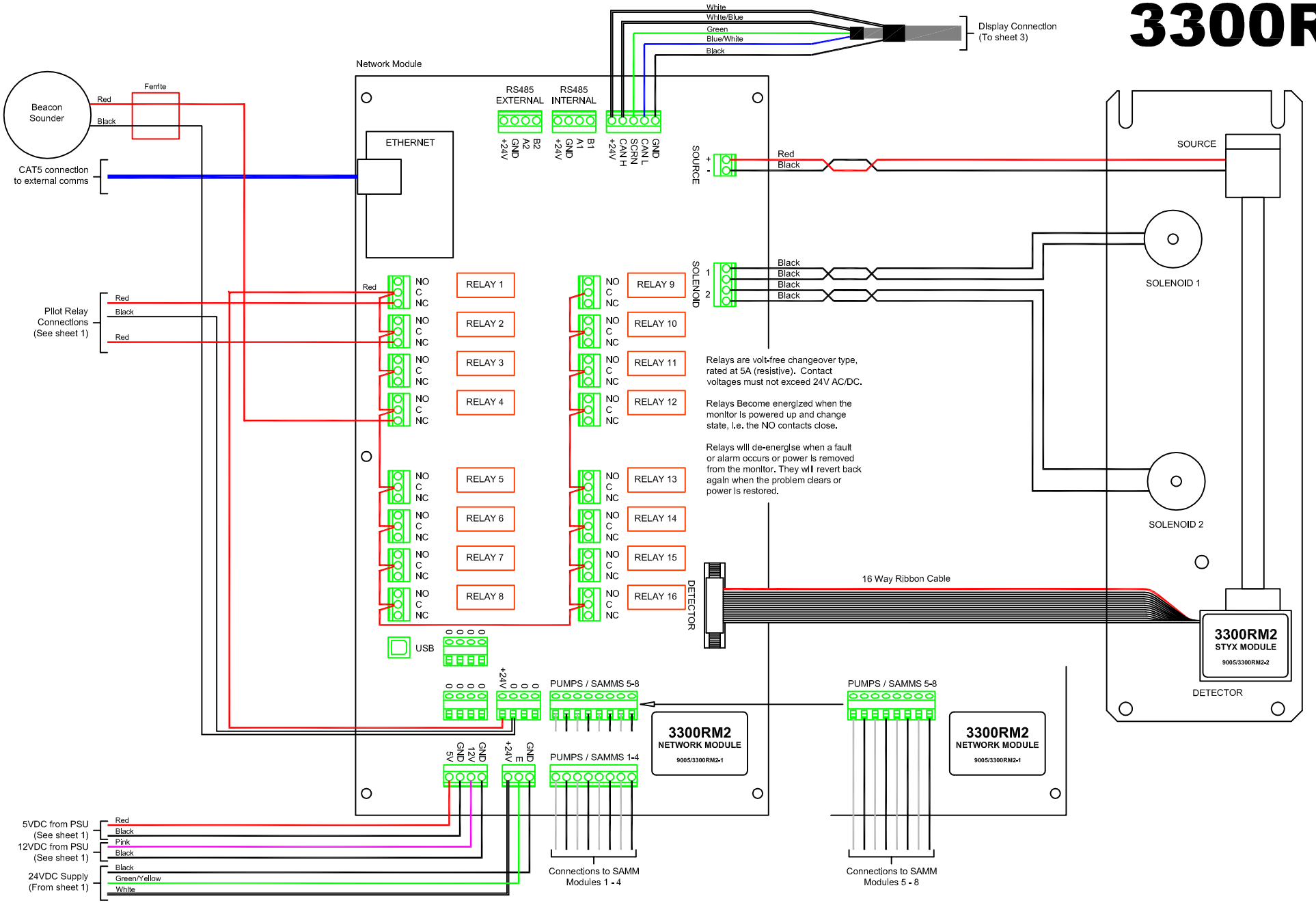
Doc. Ref: H105-4 09/03/18

| title: | drawing number: | |
|---|---|---|
| 3300RM2 WIRING SCHEMATICS | **PS0716** | |
| | revision: **12** | sheet: **1 of 3** |

| drawn: | date: | part number: |
|---|---|---|
| J. WILKINSON | 25th JAN 2012 | 3300RM2 |

| revision: | checked: |
|---|---|
| 10. 24DC supply earth wire colour corrected JW 9th Nov 2015 | AK |
| 11. Drawing border updated. JW 3rd February 2017 | AK |
| 12. Drawing border updated. JW 21st March 2018 | JB |

# 3300RM2





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Doc. Ref: H105-4 09/03/18

title: 3300RM2 WIRING SCHEMATICS

drawing number: **PS0716**

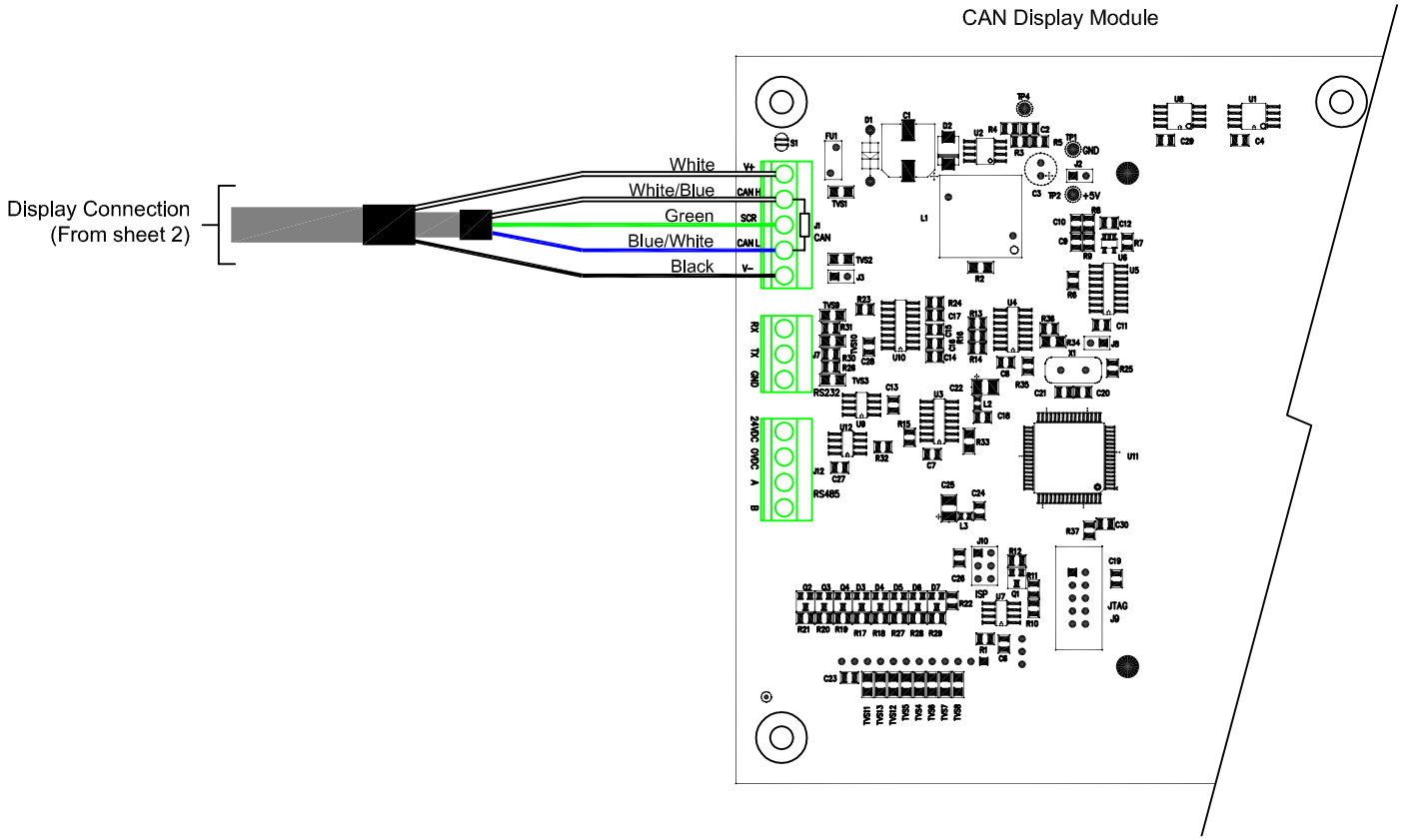
| drawn: | date: | part number: |
|---|---|---|
| J. WILKINSON | 25th JAN 2012 | 3300RM2 |

revision: **12**

sheet: **2 of 3**

| revision: | checked: |
|---|---|
| 10. 24DC supply earth wire colour corrected JW 9th Nov 2015 | AK |
| 11. Drawing border updated. JW 3rd February 2017 | AK |
| 12. Drawing border updated. JW 21st March 2018 | AK |

# 3300RM2





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Doc. Ref: H105-4 09/03/18

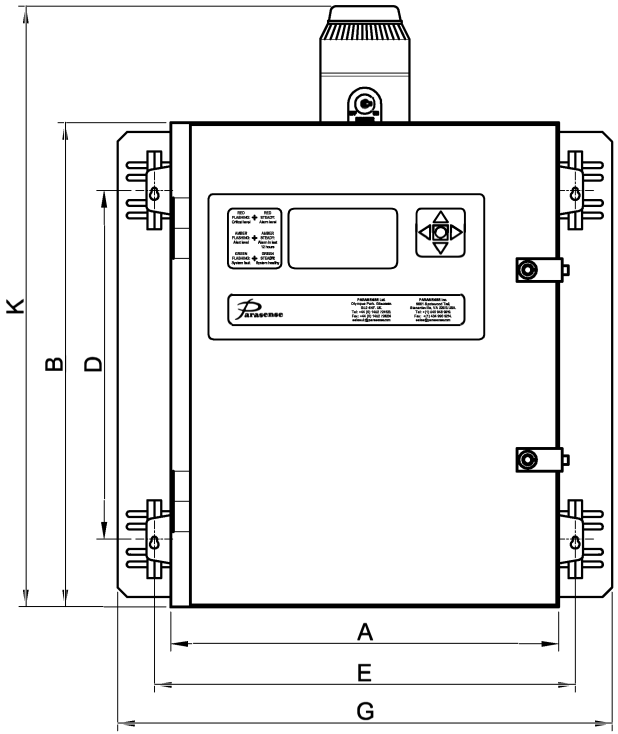
| | | | |
|---|---|---|---|
| title: 3300RM2 WIRING SCHEMATICS | | | drawing number: **PS0716** |
| drawn: J. WILKINSON | date: 25th JAN 2012 | part number: 3300RM2 | revision: **12** / sheet: **3 of 3** |

| revision: | checked: |
|---|---|
| 10. 24DC supply earth wire colour corrected JW 9th Nov 2015 | AK |
| 11. Drawing border updated. JW 3rd February 2017 | AK |
| 12. Drawing border updated. JW 21st March 2018 | JB |

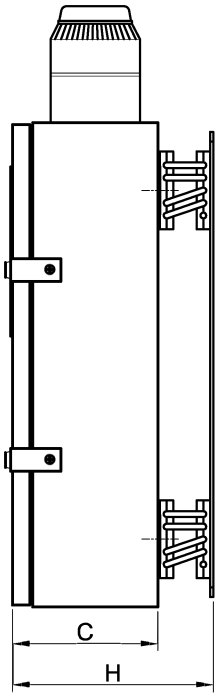
# 3300RM2 PANEL MOUNTING DETAILS (PM1951)

NSN: 7H 6625-01-614-3112
Cage Code: 09WX1
Part no: 3300RM2
REFRIGERANT MONITOR

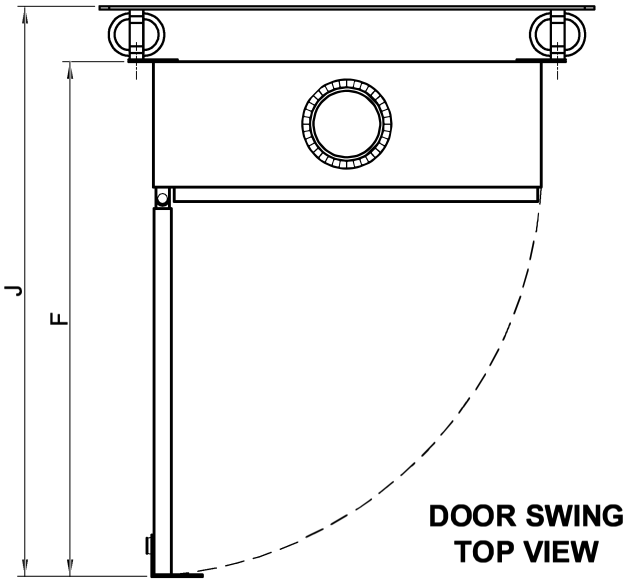
# 3300RM$_2$




FRONT VIEW




SIDE VIEW




DOOR SWING
TOP VIEW

## DIMENSIONS

| MODEL - 3300RM2 | A | B | C | D | E | F | G | H | J | K | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric (mm) | 400 | 500 | 150 | 360 | 434 | 550 | 510 | 208 | 758 | 620 | 16.2kg (exc. shock kit) |
| Imperial (inches) | 15.7 | 19.7 | 5.9 | 14.2 | 17.1 | 21.7 | 20.1 | 8.2 | 29.9 | 24.4 | 35.6lb (exc. shock kit) |

Shock kit finished weight: 6.3kg (14lb)

## MOUNTING INSTRUCTIONS

1. It must be mounted to a solid vertical surface or structure capable of supporting the stated weight. It must be positioned where the door can be fully opened, and in a location that facilitates easy service and maintenance.

2. The panel should be mounted using the fixed brackets as shown in the 'Front View' above.

3. Sufficient space must be allowed underneath the monitor for installation of the sampling pipes. For sampling pipe installation guidelines, please see separate drawing.

4. Ensure the panel is mounted where the environmental conditions are within; Temperature: -9°C/+15°F to +43°C/+110°F. Humidity: 0% to 95%, Non-condensing.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Doc. Ref: H105-4 09/03/18

| title: | drawing number: | revision: | sheet: |
|---|---|---|---|
| 3300RM2 Panel Mounting Details | PM1951 | 8 | 1 of 1 |

| drawn: | date: | part number: |
|---|---|---|
| James Wilkinson | 26th Jan 2012 | 3300RM2 |

| revision: | checked: |
|---|---|
| 6. Drawing border updated JW 10th May 16 | AK |
| 7. Display membrane and drawing border updated. JW 3rd February 2017 | AK |
| 8. Drawing border updated. JW 21st March 2018 | JB |


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