Abriox

Remote monitoring & control for pipelines

SUNBIRD

SP Test Post Monitor
Installation Instructions

V6

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Abriox

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2. SAFETY INFORMATION

Please ensure you are familiar with the Electrical Safety Regulations of your Company and observe them at all times.

2.1 General Safety Summary

This manual contains information and warnings that must be observed to keep the SUNBIRD SP Test Post Monitor in a safe condition and ensure safe operation. To use the SUNBIRD SP Test Post Monitor correctly and safely, read and follow all precautions given. Please ensure you fully understand all instructions throughout this manual that relate to specific measurement functions. In addition, please follow all generally accepted safety practices and procedures required when working with and around electricity.

2.2 Safety and Electrical Symbols

The table below lists safety and electrical symbols that appear within this document.

Symbol	Description
CAT IV	Installation Category (Overvoltage Category) IV
	Risk of danger. Important information.
	Hazardous voltage. Voltage > 30V AC (42.4V peak) or 60V DC might be present

2.3 Maximum Input Voltage for Channels 1 and 2

Channels 1 (Pipe 1 or Coupon / Ref Cell 1) and 2 (Pipe 2 or Coupon 2 or Native Coupon / Ref Cell 2) of the SUNBIRD SP Test Post Monitor have a maximum input voltage range of 35V AC (RMS) and 50V DC without damage.

2.4 Maximum Input Voltage for Channel 3

Channel 3 (Shunt + / Shunt -) of the SUNBIRD SP Test Post Monitor provides readings up to 100mV AC and ±100mV DC. The channel itself should not be exposed to voltages greater than ±1V peak. Greater voltages than this will cause the channel input protection to activate which can only protect the SUNBIRD SP Test Post Monitor for a limited period of time.

2.5 Danger of Electric Shock

If there are voltages greater than 30V AC (42.4V peak) or 60V DC present, care should be taken as there is a danger of electric shock.

2.6 Channel Input Protection

All of the input channels have CAT IV surge protection for their rated input voltage ranges.

2.7 Backup Power Replacement

The backup power pack is specific to the product and cannot be replaced.

2.8 Disclaimer

If this equipment is used in a manner not specified by Abriox, the protection provided by the equipment may be impaired. Please ensure you follow all guidance for safe and correct use of your equipment.

2.9 Compatibility

The SUNBIRD SP Test Post Monitor has been designed to fit most standard 3" riser posts including Pro-Mark PM TS3, Big Fink, Rhino and Tinker & Razor T-3.

Note

Any existing hardware needs to be stripped off the test post terminal cap in order to facilitate the fitting of the SUNBIRD Interface PCB.

3. COMPLIANCE

This product is CE marked which means that Abriox declares that the product or equipment complies with all applicable European Directives. A copy of the Certificate of Conformity can be obtained from Abriox.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

Do not make any changes or modifications to the equipment unless otherwise specified in the manual. If such changes or modifications should be made, you could be required to stop operation of the equipment.



This symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorised one-for-one basis when you buy a new similar product or to an authorised collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, approved WEEE scheme or your household waste disposal service.

4. SOFTWARE COMPATIBILITY

The SUNBIRD SP Test Post Monitor is only compatible with **iCPSM4**. Earlier versions of the software are not compatible and do not support the features offered by this model.

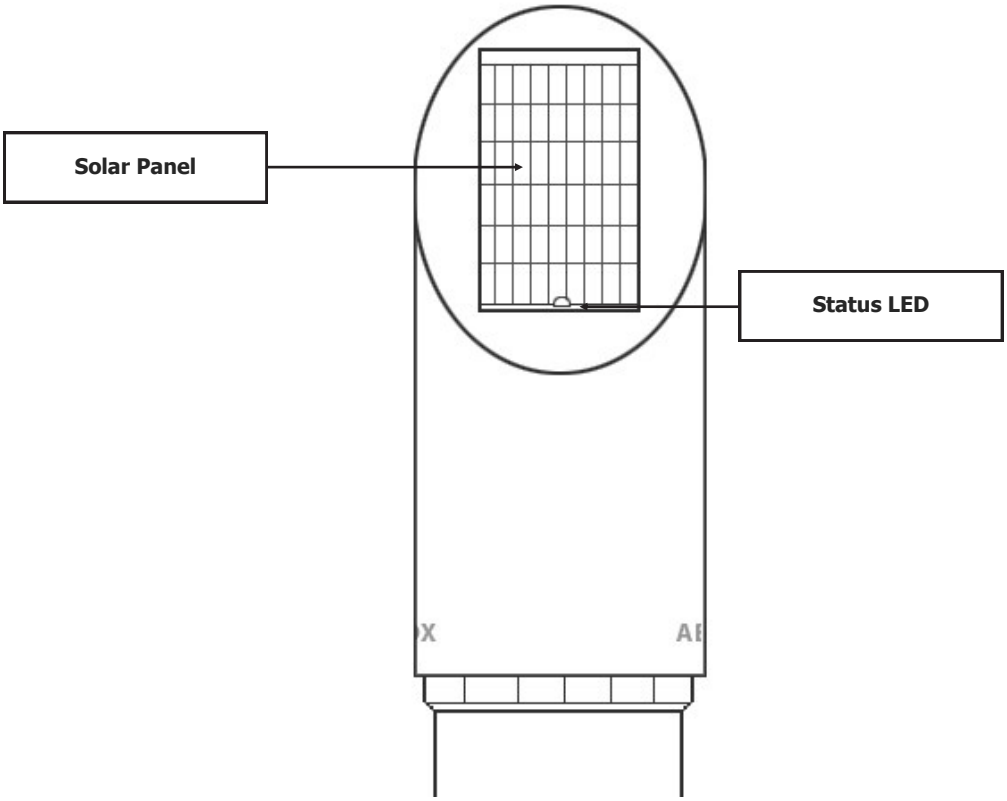
5. INTRODUCTION

The SUNBIRD SP Test Post Monitor is a compact Cathodic Protection Remote Monitoring Unit (RMU) designed to fit on a CP riser post. It harvests energy from the sun and incorporates the latest 5G IoT communication technology.

SUNBIRD SP Test Post Monitor checks the measurements against specified alert criteria and reports immediately if an alarm threshold is exceeded. The SUNBIRD SP Test Post Monitor can be deployed anywhere on the pipeline network where it is important to record ON/OFF pipe-to-soil potentials, native coupon potentials and measurements of bonding or interfering currents. Alternatively it may simply be that certain measurement points on the pipeline create risks to CP technicians, such as at busy road or rail crossings, or are difficult to access, such as on private land.

All data is automatically transmitted in a management report to the system HQ where it is accessed online using Abriox's iCPSM4 software.

5.1 Front View of the SUNBIRD SP TEST POST MONITOR



6. BEFORE GOING TO SITE

6.1 Check iCPSM4 is Running

Please ensure you have a running iCSPM4 system and you can log in (as detailed on your iCPSM Licence Certificate).

Note

It is vital the iCPSM4 system is running prior to going to site otherwise the installation will fail.

6.2 Check the Test Point is Suitably Prepared

Check that the test point (riser post) to be monitored has a permanent reference cell and a coupon (if required).

Note

Any existing hardware needs to be removed from the test post terminal cap in order to facilitate the fitting of the SUNBIRD Interface PCB.

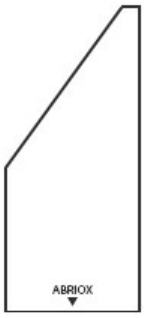
6.3 Equipment Check

Make sure you have the following equipment prior to going to site.

Item	Description
Magnet	A strong magnet to activate the unit on site
Permanent reference cell	
Coupon	
Shunt	An appropriate current shunt for the coupon current (if this is to be monitored), 20A 200mV is recommended for 1cm coupons or 200mA 200mV is recommended for 25cm coupons. However, the choice of shunt will be dependent on the current to be measured and taking some alternative value shunts is always recommended. SUNBIRD SP TEST POST MONITOR has an input range of 0 to 100mV AC and ±100mV DC on its current shunt input.
Consumables	For making the connections at the test post
Tool Kit	Tool kit for the installation on site
Documents	Installation instructions (this document), Quick Start Guide
Multimeter	Multimeter to check the voltage and current readings on site

6.4 SUNBIRD SP Installation Kit Contents

* SUNBIRD SP Test Post Monitor Unit
* Interface PCB
* Terminal Fixing Bolts x 8
* Half Nuts x 16
* Retention Clips x 2
* Rubber Spacers (specifically for Tinker & Rasor test stations) x 2



SUNBIRD
SP Test Post Monitor Unit



Interface PCB



Terminal Fixing Bolts x 8



Half Nuts x 16



Retention Clips x 2



Rubber Spacers x 2

7. ON SITE

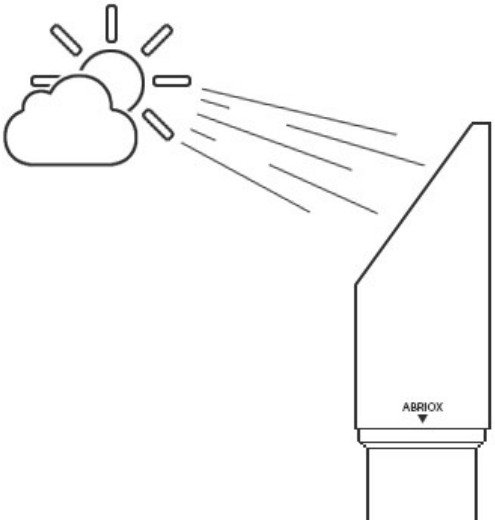
Please ensure you are familiar with the Electrical Safety Regulations of your company and observe them at all times.

7.1 SUNBIRD Positioning

The SUNBIRD SP requires direct view of the sun in order to work correctly. Install the SUNBIRD SP in full sunlight. Do not install the SUNBIRD SP in shade, under foliage or next to buildings as this will hinder power and communications.

Note

Panel Orientation - The solar panel must be turned towards the terrestrial equator (facing south in the northern hemisphere) so that during the day its orientation allows the panel to catch the greatest amount of solar radiation possible.





7.2 The Install Process

7.2.1 Remove the Existing Cap From the Post

7.2.2 Disconnect and Remove Existing Hardware

7.2.3 Disconnect Existing Wires

7.2.4 Install Interface PCB

7.2.5 Make Wired Connections

7.2.6 Install Retention Clips

7.2.7 Take a Reading (Optional)

7.2.8 Fit SUNBIRD SP Unit

7.2.9 Activation

7.2.10 Compare the Readings on iCPSM4

7.2.11 Finish on Site

7.2.1 Remove Existing Cap From the Post

Unscrew and remove the existing cap from the test post.

7.2.2 Disconnect and Remove Existing Hardware (if applicable)

Disconnect and remove any existing hardware from the test post terminal cap in order to facilitate the fitting of the SUNBIRD Interface PCB.

7.2.3 Disconnect Existing Wires

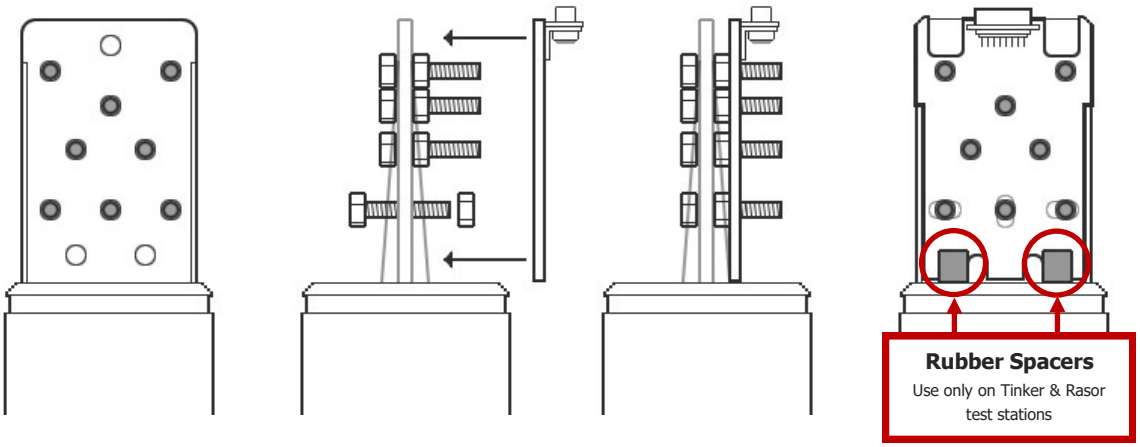
Disconnect all wires/connections from the test post terminal cap.

7.2.4 Install Interface PCB

Insert the **Terminal Fixing Bolts** (x8) and secure in place with the **Half Nuts** (x8) as shown. With the bolts installed, fit the **Interface PCB** in place over the Terminal Fixing Bolts.

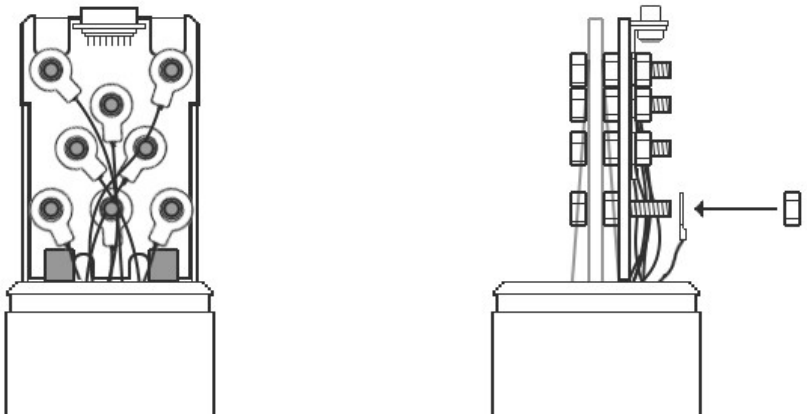
Note

If using a **Tinker & Rasor** test station you will need to attach the supplied **Rubber Spacers** on the **Interface PCB** as indicated prior to fitting the **Interface PCB** in place. The Rubber Spacers are only applicable for Tinker & Rasor test stations.



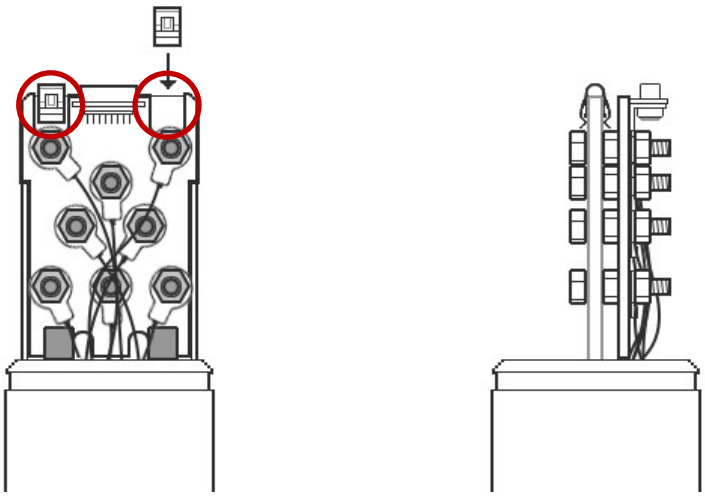
7.2.5 Make Wired Connections

Using the markings on the PCB, connect the test post wires to the **Interface PCB** where required and hold in place with the supplied **Half Nuts** (x8). Please refer to the Installation Examples page (page 12) for further information on wiring diagrams.



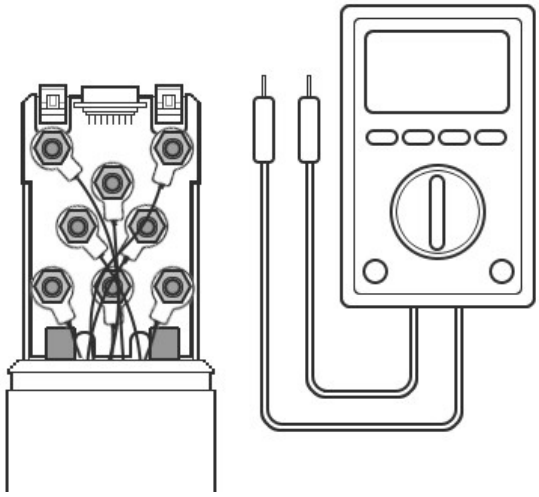
7.2.6 Install Retention Clips

Push supplied **Retention Clips** (x2) onto the test post between the Interface PCB voids as shown.



7.2.7 Take a Reading (Optional)

Take a reading on the terminals using a multimeter to compare the measurements against the readings given by the SUNBIRD SP Test Post Monitor given in iCPSM4 (refer to step 7.2.10 Compare the Readings on iCPSM4).

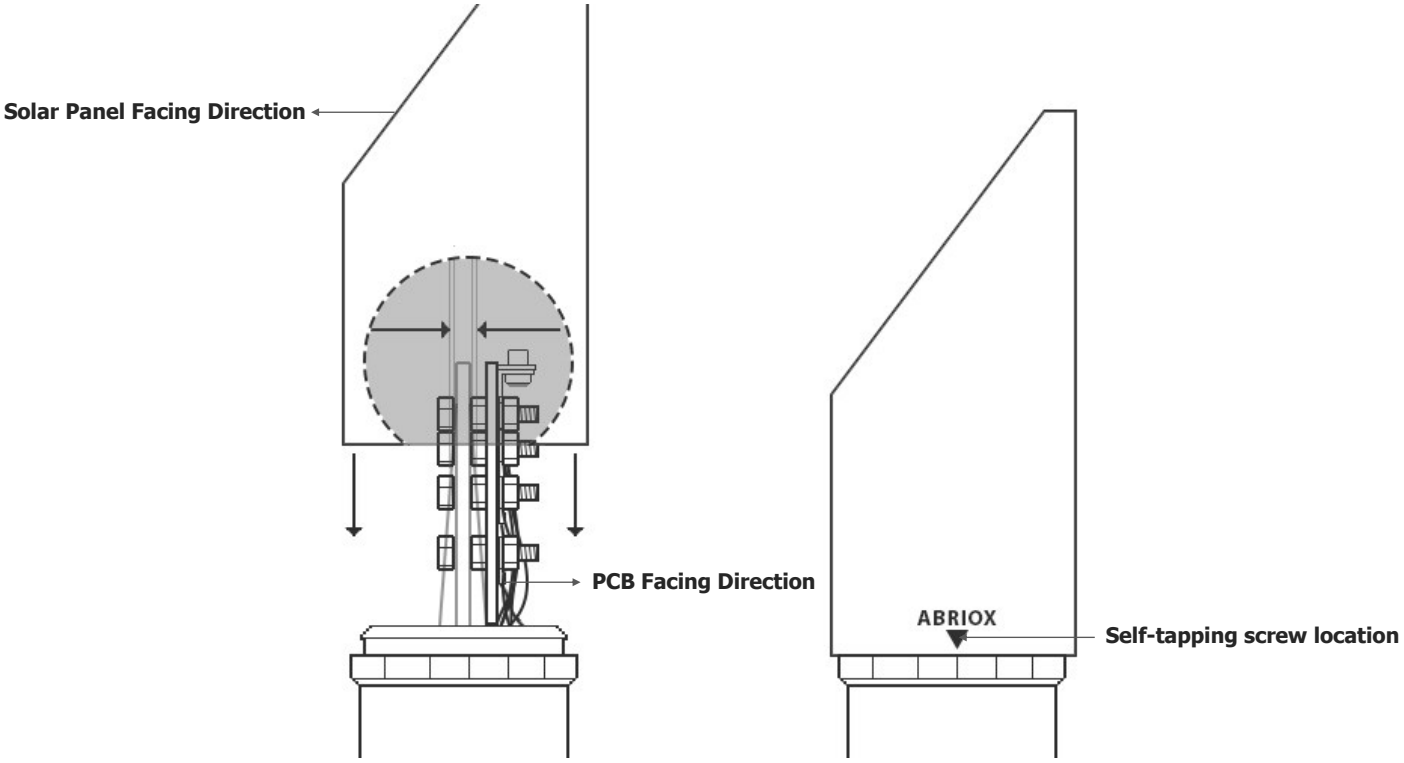


7.2.8 Fit SUNBIRD SP Unit

Make a note of the serial number (located on the inside of the unit) then dock the **SUNBIRD SP Test Post Monitor Unit** on top of the test post ensuring orientation is correct (PCB and solar panels should face opposite directions). The **aligning arrow** on the side of the unit will aid correct fitting. Push the SUNBIRD SP in place until it is securely held by the retention clips.

Note

To aid security, you may use self-tapping screws (No.6 x 5/8 self-drilling screw) where indicated.



7.2.9 Activation

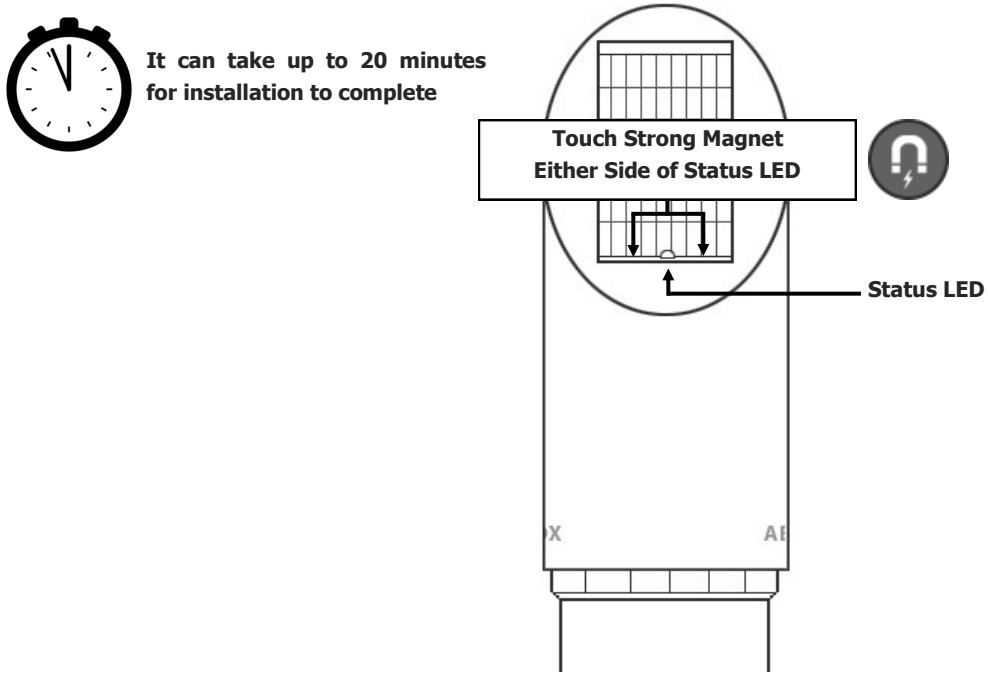
Activate the SUNBIRD SP by touching a strong magnet next to the Status LED as indicated. Once the LED has illuminated, remove the magnet to start the installation process

The **Status LED** on the SUNBIRD SP (located below the solar panel) will flash to indicate the installation status.

An ORANGE flash indicates initialisation (communications/GPS). A GREEN flash indicates communication activity with the iCPSM4 server.

Once the unit is flashing green (1 green flash every 2 seconds), communications have been established and installation has bæn completed.

The Status LED can indicate various statuses, please refer to the LED descriptions page (page 11) for further information.



7.2.10 Compare the Readings on iCPSM4

To check the measurements taken by the SUNBIRD SP, open iCPSM4 via a browser on your phone/tablet/laptop etc.

Once you are logged in, click on "New Installations" from the menu on the left and locate your unit by serial number. Check the reading values match those given by the multimeter.

If any other readings are inconsistent with the multimeter check the wiring.

7.2.11 Finish on Site

Installation of the SUNBIRD SP has been completed.

8. POST SITE CONFIGURATION AND INSTALLATION

Once the physical installation is complete you need to set up the **Channel Configuration** (see table in Installation Examples for your installation type) in **iCPSM4**.

Here you can also enter shunt value (and coupon surface area, if used) in the **iCPSM4** software. You will also need to specify the alert thresholds, measurement time and time zone.

Note

Further configuration and operational features can be carried out directly via the software.

9. LED DESCRIPTIONS

The Status LEDs on the SUNBIRD SP TEST POST MONITOR describe the current status and can indicate any problems.


Red LED


Amber LED


Green LED

During Installation

LED Colour	Sequence	Description
	All LEDs Illuminated	Magnet is present on Reset Switch
	Amber/Green Alternating	Connecting to the network and installing

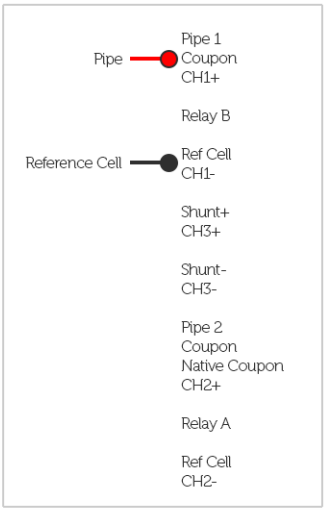
During Normal Operation

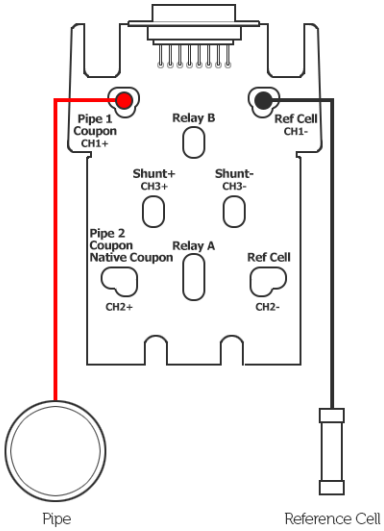
	1 flash every 2 seconds	Everything is OK
	2 flashes every 2 seconds	Temporary loss of cellular communications
	3 flashes every 2 seconds	Temporary loss of GPS communications
	1 flash every 2 seconds	Low battery or battery not connected
	2 flashes every 2 seconds	Low battery and temporary loss of cellular communications
	3 flashes every 2 seconds	Low battery and temporary loss of GPS communications
	4 flashes every 2 seconds	No SIM/SIM error
	5 flashes every 2 seconds	Installation failure (continuous AMBER LED flashing)
	1 flash every 2 seconds	Invalid configuration (serial number, apn, server, etc.). Contact Abriox
	2 flashes every 2 seconds	Other fault (e.g. no modem comms, no GPS comms). Contact Abriox

10. INSTALLATION EXAMPLES

The following examples are shown only as a guide.

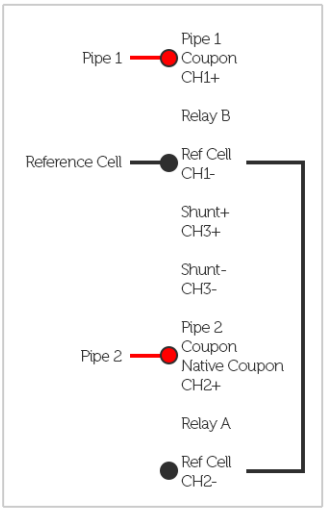
10.1 One Pipe and One Reference Cell

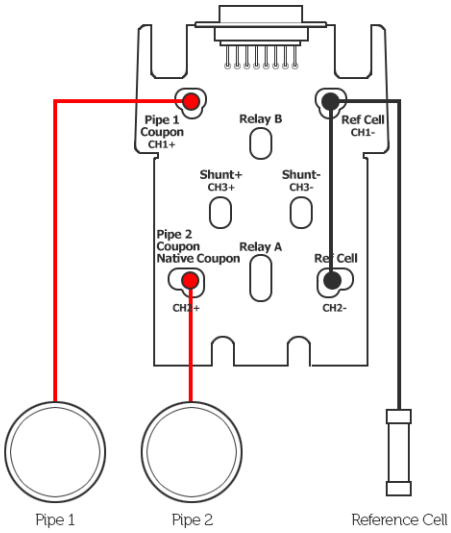




iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Unused
Input 2 AC	Unused
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

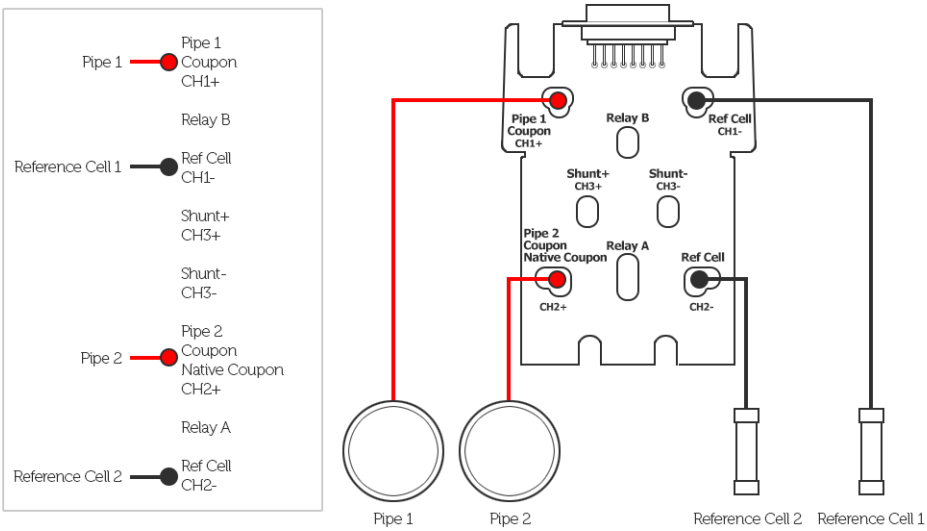
10.2 Two Pipes and One Reference Cell





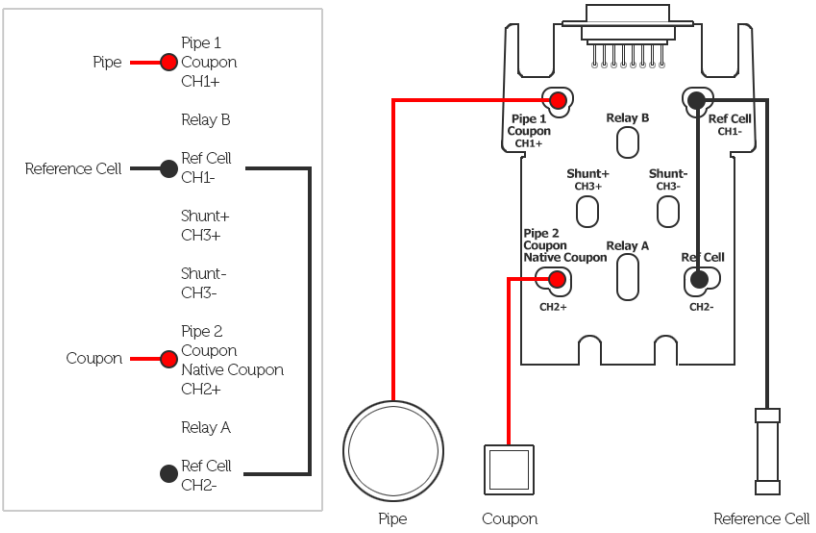
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Pipe 2 ON DC
Input 2 AC	Pipe 2 ON AC
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

10.3 Two Pipes and Two Reference Cells



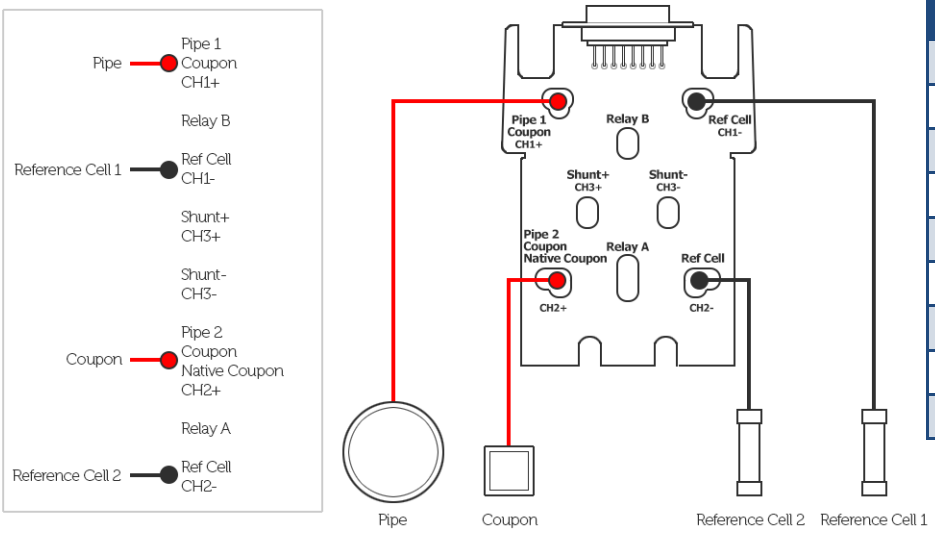
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Pipe 2 ON DC
Input 2 AC	Pipe 2 ON AC
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

10.4 One Pipe, Coupon and One Reference Cell



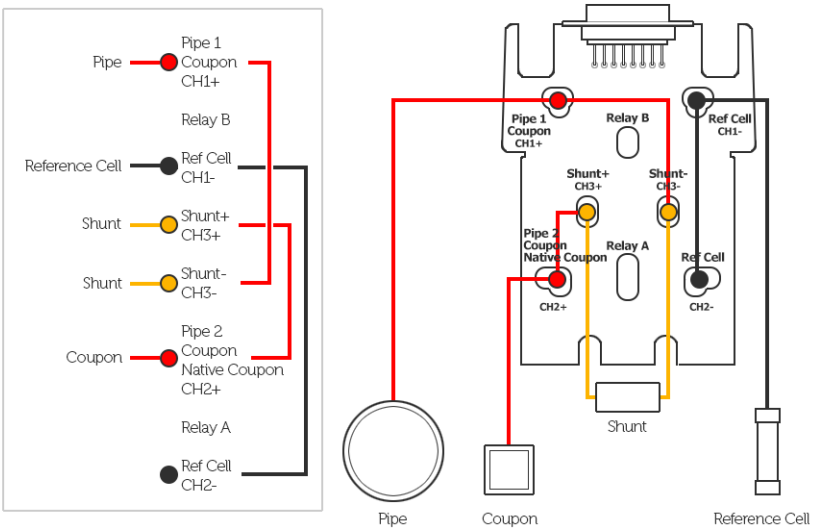
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Coupon ON DC
Input 2 AC	Coupon ON AC
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

10.5 One Pipe, Coupon and Two Reference Cells



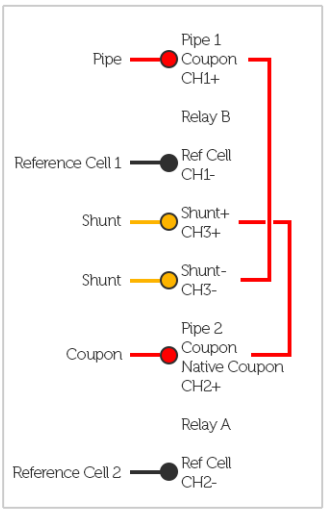
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Coupon ON DC
Input 2 AC	Coupon ON AC
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

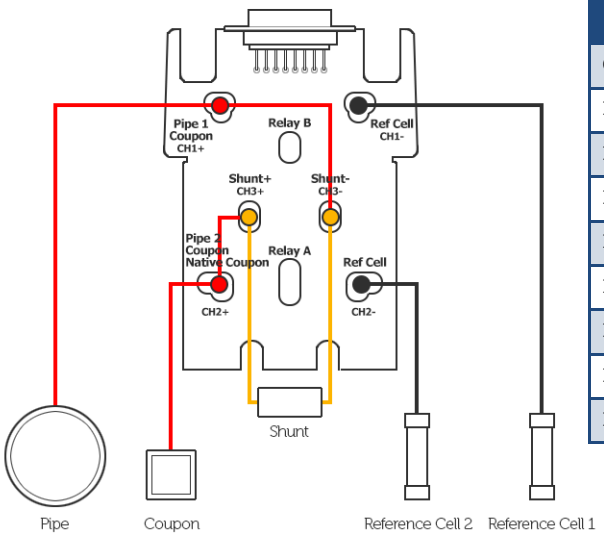
10.6 One Pipe, Coupon, Shunt and One Reference Cell



iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Coupon ON DC
Input 2 AC	Coupon ON AC
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

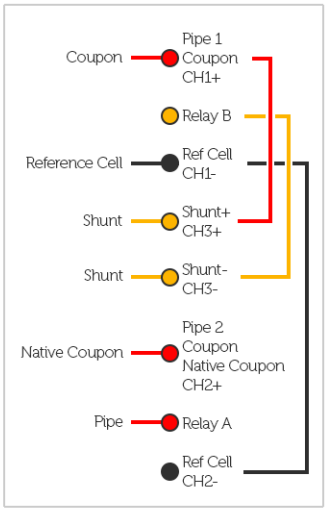
10.7 One Pipe, Coupon, Shunt and Two Reference Cells

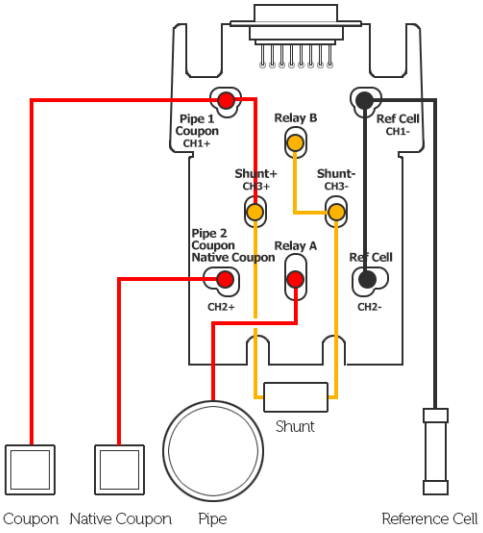




iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Pipe 1 ON DC
Input 1 ON AC	Pipe 1 ON AC
Input 1 OFF DC	Unused
Input 1 OFF AC	Unused
Input 2 DC	Coupon ON DC
Input 2 AC	Coupon ON AC
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current On AC

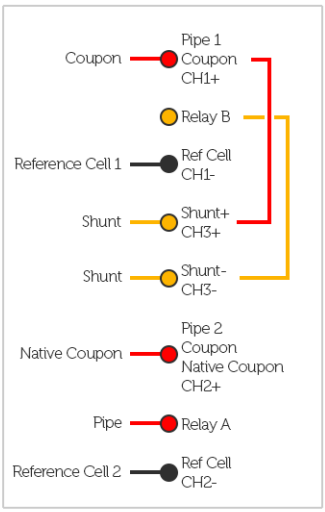
10.8 Coupon ON & OFF with Shunt, Native Coupon and One Reference Cell

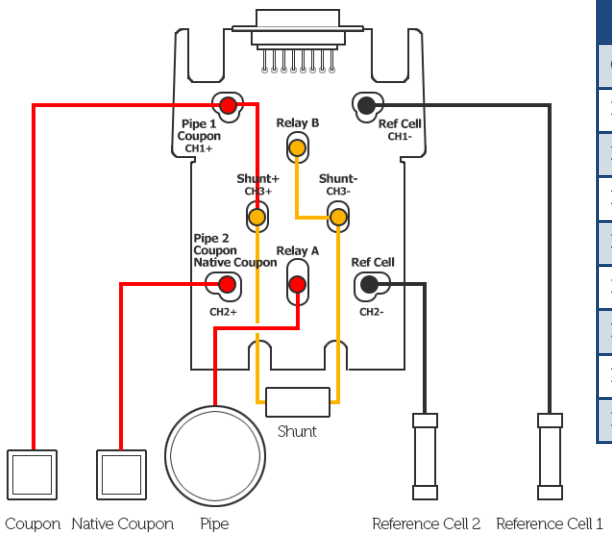




iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Native Coupon DC
Input 2 AC	Unused
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

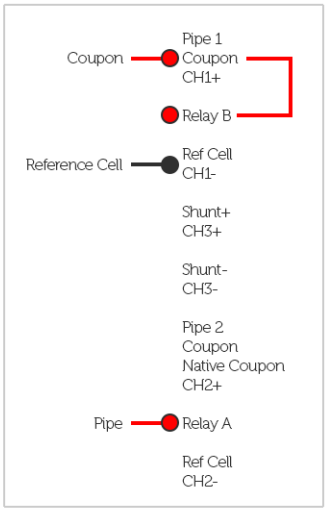
10.9 Coupon ON & OFF with Shunt, Native Coupon and Two Reference Cells

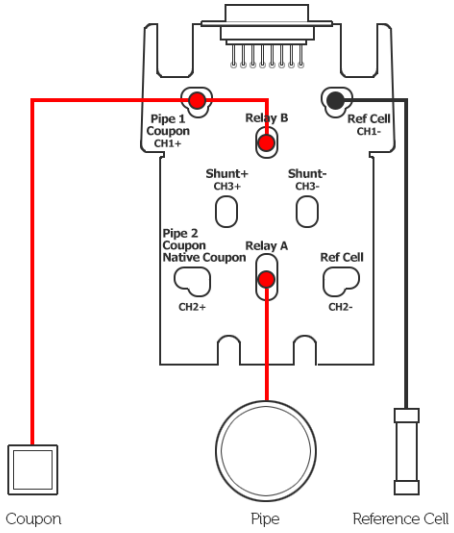




iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Native Coupon DC
Input 2 AC	Unused
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

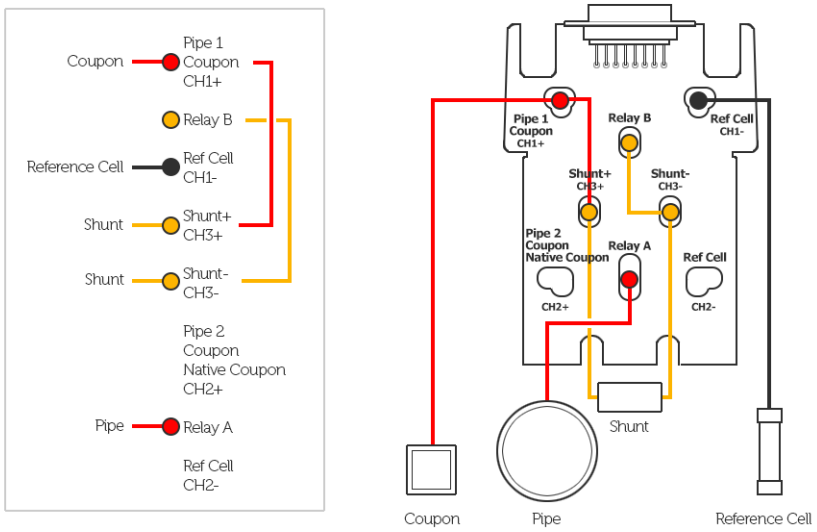
10.10 Coupon ON and OFF with One Reference Cell





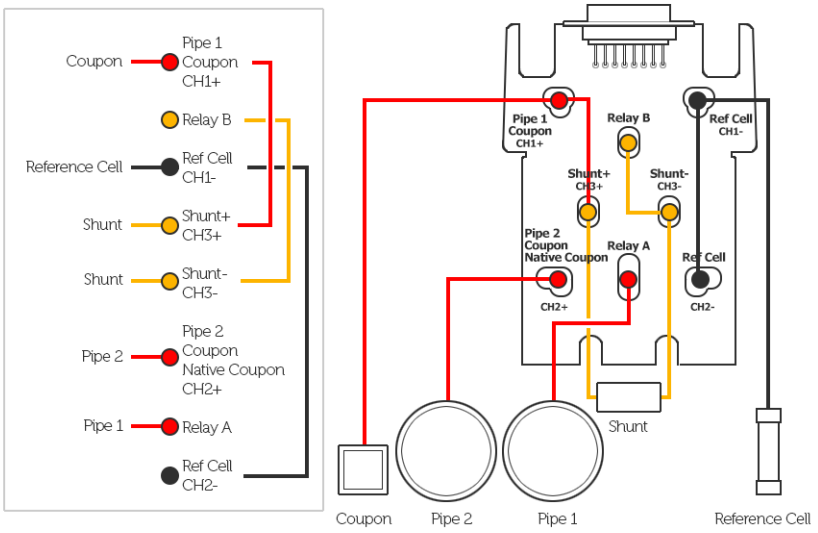
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Unused
Input 2 AC	Unused
Input 3 (Current) DC	Unused
Input 3 (Current) AC	Unused

10.11 Coupon ON & OFF with Shunt and One Reference Cell



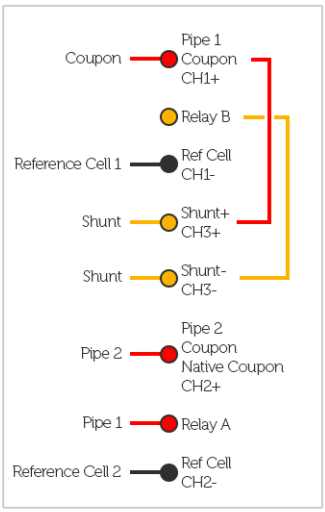
iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Unused
Input 2 AC	Unused
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

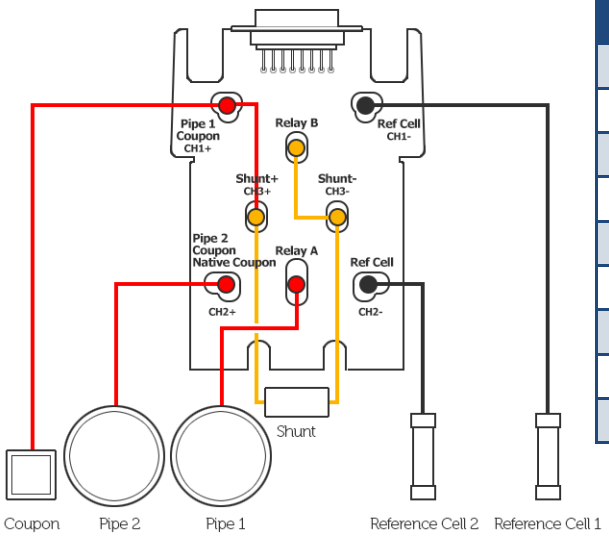
10.12 Coupon ON & OFF with Shunt, Pipe 2 and One Reference Cell



iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Pipe 2 ON DC
Input 2 AC	Unused
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

10.13 Coupon ON & OFF with Shunt, Pipe 2 and Two Reference Cells





iCPSM4 Channel Configuration	
Channel Name	**Channel Label**
Input 1 ON DC	Coupon ON DC
Input 1 ON AC	Coupon ON AC
Input 1 OFF DC	Coupon OFF DC
Input 1 OFF AC	Coupon OFF AC
Input 2 DC	Pipe 2 ON DC
Input 2 AC	Unused
Input 3 (Current) DC	Coupon Current ON DC
Input 3 (Current) AC	Coupon Current ON AC

11. NOTES

Use this space to write your own notes, tips and cheats to aid future installations.

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