HANWELL


# SR2

## Instruction Manual

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# SR2

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## Document History

| Issue No. | Issue Date | Changes | By |
|---|---|---|---|
| 1 | 27 Sept 2012 | First release | LH |
| 2 | 19 Oct 2012 | Sections 4.3 and 5.1 revised | LH |
| 3 | 15 Dec 2006 | Sections 5.1 and 5.3 revised | LH |
| 4 | 15 Jan 2007 | Section 2 revised (adding a new section 3.2 and revising others to suit) | LH |
| 5 | 25 Jan 2007 | Copy of GD4116 added as new section 2 and other section numbering revised.<br>Section 5.3 modified.<br>Section 6.3 added | LH |
| 6 | 27 Nov 2007 | Fall back behaviour changed (Sec. 4.1, SR2Comms > V1.6) | MSH |
| 7 | 18 Dec 2009 | Revised format | LC |
| 8 | 5 Sept 2012 | Format change | MM |

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# Introduction

This document details how to install the Hanwell Smart Receiver 2 (SR2) unit. The SR2 is a network enabled Receiver, designed for collecting environmental monitoring data from multiple points within a site. In addition, it can be upgraded to a Transceiver which both receivers and retransmits data. It uses standard TCP/IP communications protocol for speedy data handling.

# General Notes

## Pre-requisites

Before installing and configuring the SR-2, you should have read Hanwell document GD4116 that details the pre-requisites. A copy of this is supplied overleaf.

If a radio survey has not been completed and there is not permanently mounted to the wall until the radio reception has been tested.

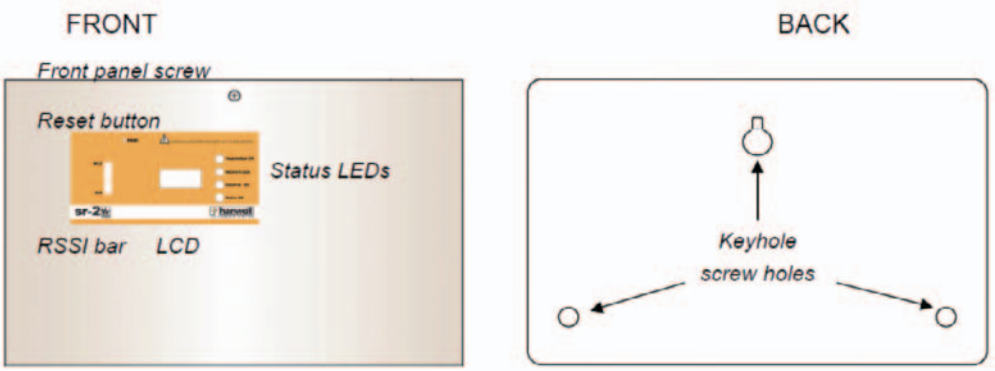
## Inventory

Your SR2 should contain the following as standard:

- 1 x SR2
- 1 x 1m straight-through CAT5 cable
- 1 x UPS battery (unless an external one is to be used)
- 1 x external Receiver Unit (boxed separately)
- IM4083 (this document)
- Wall-mounting drilling template

If you are missing any of these parts, please contact Hanwell Instruments. You will also need the Radiolog 8 software (CD code W400 or W500).

## Drawings



# GD4116

Hanwell document GD4116 should have been supplied when the Smart Receiver was ordered so that the pre-requisites could be completed in advance. The contents of it are reproduced here in case the original has been lost.

This section lists pre-requisites – physical and virtual – needed to configure and install Hanwell Smart Receivers for operation network. This information can in most cases be obtained from your IT department.
The network information must be available prior to the commissioning of the system.

## Physical Pre-requisites

The following pre-requisites assume that a final location for the **Smart Receiver**(s) has been defined after a radio survey. If this is not the case, then the following should be factored in to deciding the final location.
There should be:

- A 24 hour mains power outlet within 1.5m of the planned location.
- An enabled 10/100 BaseT LAN socket at the planned location.
- If this is greater than 1m from the planned location then a suitable straight through CAT5 lead is required. This can in most cases be supplied by the IT department.
- A suitable wall structure on which the Smart Receiver can be mounted so that the antenna is vertical.
  The planned location should NOT:
- Be in an area subjected to high temperature or humidity levels.
- Have any metallic objects within 0.3m of the antenna in any direction.
  This includes any structures hidden within walls, pillars etc.

## Virtual Pre-requisites

Each Smart Receiver requires a unique static IP address, which should be assigned by the IT department. This IP address should be accessible from the PC on which the software will run.

| | |
|---|---|
| *IP Address*<br>For example, 192.168.1.100 | ___ • ___ • ___ • ___ |
| *Subnet*<br>For example, 255.255.255.0 | ___ • ___ • ___ • ___ |
| *Gateway*<br>For example, 192.168.1.1 | ___ • ___ • ___ • ___ |

If the IT department requires a MAC address in order to assign an IP address, contact Hanwell Instruments to request it. The MAC address is also listed on a label on the ‘daughter’ PCB inside the Smart Receiver, in the format xx:xx:xx:xx:xx:xx.

# Install the SR2

There are four steps to installing an **SR2**:

1. Wall-mounting the **SR2**. See section 3.1
2. Connecting the Receiver Unit. See section 3.2
3. Connecting the Power and Network connections to the **SR2**. See section 3.3. Note: do NOT power up the **SR2** until these steps are complete!
4. Configuring the **SR2** in the Radiolog software. See Hanwell document **IM3751**. In addition, you can also change the default hardware settings of the **SR2** (see section 4), or connect local sensors (see section 4.2).

## Wall-mounting the SR2

The SR2 has a key hole and two screw holes in is plate. These should be used for wall-mounting the unit. A drilling template is supplied.

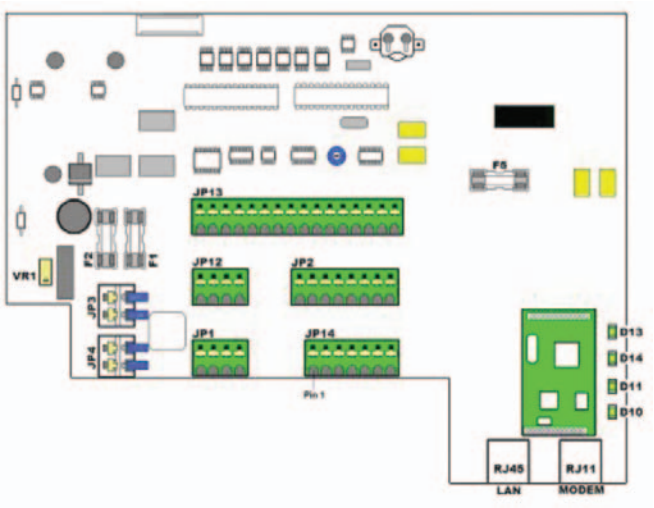
**Note: We recommend the radio reception at the chosen location is thoroughly tested before final wall-mounting!**

1. Use the drilling guide to position the screws.
2. Mount the SR2 to the wall and screw into place.

## Connecting the Receiver Unit

The Receiver Unit will come supplied with 3m of cable pre-wired to it. This should be wired to JP14 on the **SR2**.

1. Open the **SR2**
2. Feed the Receiver Unit cable through one of the glands in the base of the **SR2**
3. Connect the cable to **JP14** as below:
   *Pin 1: unused*
   *Pin 2: unused*
   **Pin 3: Yellow (RX data)**
   **Pin 4: Red (RX power)**
   **Pin 5: Blue (Signal Strength)**
   *Pin 6: unused*
   **Pin 7: Green (GND)**
   INCORRECT WIRING CAN SERIOUSLY DAMAGE THE SR2: ALWAYS DOUBLE-CHECK THE WIRING BEFORE CONNECTING POWER!
4. Close the **SR2**
5. Screw the aerial onto the Receiver Unit.



## Connecting the Power and Network

1. Unscrew the front panel (top screw) and lower the front.
2. Check that fuses F1, F2 and F5 are fitted.
3. Check that the coin cell is fitted (with the positive side topmost).
4. Connect the UPS battery to the leads: double-check the polarity!
5. Close the front panel and screw in place
6. Connect the mains power and switch on
7. Confirm that the **Mains** LED comes on
8. Confirm that the **Receiver** LED comes on
9. Connect the LAN cable from the LAN socket on the **SR2** to the enabled Ethernet socket
10. Confirm that the **Network Link** LED comes on

## Configuring the SR2 Network Settings

See Hanwell document **IM3751**. This is available in the docs folder on the **Radiolog** CD.
Double-check that you configure the unit with the **SR2** settings, as below.

| | |
|---|---|
| **Speed:** | **115200** |
| **Databits:** | **8** |
| **Parity:** | **None** |
| **Stopbits:** | **1** |
| **Flow:** | **CTS/RTS** |

The unit is now ready to use.
Section 4 and 5 document contain optional additional settings and connections.

# Advanced Configuring of the Hardware

The **SR2** is sent out set to its default hardware configuration. These settings can be changed via a set of 8 DIP switches on the back of the display PCB. Switches 5-8 inclusive are not used and should be set to OFF.

## Fall Back Operation

The **SR2** behavior in the event of network or mains power failure. Set on DIP switch 1.

| | |
|---|---|
| ON (Default) | In the event of mains power failure, the SR2 will switch to Power-Fail mode. The Receiver will only be powered up for 5 minutes in every 10 to prolong the life of the on-board battery. In the event of no network Comms for 75 minutes, the SR2 will switch to Comms – Fail mode. In either case the SR2 will log the first signal received from each sensor in a 10 minute period. This will greatly increased the time before which wraparound starts to overwrite older data. |
| OFF | In the event of a Comms or mains power failure, the SR2 continues to log all data received while power is available. If Comms is not restored when the memory becomes full, older data will start to be overwritten. |

## On-Board Sensors

The **SR2** has 8 inputs for local probes, the equivalent of 4 x RL2000 Sensors with pre-defined ID numbers. Set on DIP switch 2.

| | |
|---|---|
| ON | The inputs are read. |
| OFF | (Default) The inputs are not read. |

See section 5.3 for the On-Board Sensor connections.

## Alarm Relay Operation

The SR2 has an on-board 12V relay which can be connected to a buzzer or beacon. The relay is normally held closed. It opens in the event of any alarm on the assigned Grids. DIP switch 3 sets which alarms the relay open on.

| | |
|---|---|
| ON | **Network Fail Alarm:** the relays will go off in the event of all alarms on the assigned Grids in the software or a network communications failure (no network comms for 60 minutes). When the network comms are restored, the relays will be reset. |
| OFF (default) | Normal operation the alarm relays respond to all alarms on the assigned Grids in the software only. |

### Assigning Grids

To assign a Grid in the software, so that its alarms are indicated on the **SR2** alarm relay, you should set the **Grid's SR ID for Alarm** to the same number as the **SR2's** Rec number (found in the **PC configuration** dialog in the software).

See section 5.1 for the Alarm Relay connections.

## Transmitter Preamble

This setting only applies to the **SR2** Transceiver builds. Set on DIP switch 4.

| | |
|---|---|
| ON | Preamble set for FF/F1 transmission |
| OFF | Preamble set for SF transmission |

The setting for your type of module will be indicated on the inner panel of the unit.

# Additional Connections

The SR2 can be connected to other Hanwell or 3rd party devices. These are connected using the spring-loaded inputs.

## Alarm Relays

The SR2 has three on-board relay outputs that can be used to send alarm notification to a beacon or via an auto-dialer (or other 3rd party device).

These are connected via **JP2**, as follows:

| Pin | Connection | Description |
|---|---|---|
| 1 | Relay 1 N/O | This relay closes and a nominal 12V appears on Pin 1 in the event of any alarm on the assigned Grids. It is fused via F1. This suitable for driving alarm beacons. See section 4.3 for additional options. |
| 2 | Relay common | |
| 3 | Relay common | This is a changeover relay responding to alarms in the software. When no alarms exist, pins 3+5 are connected. When an alarm exists, pins 3+4 are connected. |
| 4 | Relay 2 NC | |
| 5 | Relay NO | |
| 6 | Relay 2 Common | This is a changeover relay indicating the mains power state of the SR2. When power is present pins 6+8 are connected. When power fails pins 6+7 are connected. |
| 7 | Relay NC | |
| 8 | Relay NO | |

## MS1000 Control Panel

The SR2 can be connected to a Hanwell MS1000 Control Interface. The connections are to JP12, as follows:

| Pin | Connection |
|---|---|
| 1 | 12V OUT |
| 2 | TX + |
| 3 | TX - |
| 4 | GND |

## On Board Sensors

The **SR2** has 8 inputs for local probes, the equivalent of 4 x RL2000 Sensors with pre-defined ID numbers. See section 4.2 for how to enable the on-board sensors.
The probes should be connected to JP13, as follows:

| Radio Sensor Type | Radiolog ID No. | Channel | Probe Connections |
|---|---|---|---|
| RL2000 Dual Thermistor | 200 | Thermistor A | Pin 1: positive<br>Pin 2: GND |
| | | Thermistor B | Pin 3: positive<br>Pin 4: GND |
| RL2000 RH/ Thermistor | 201 | RH | Pin 5: +5V<br>Pin 6: signal<br>Pin 8:GND |
| | | Thermistor | Pin 7: positive<br>Pin8: GND |
| RL2000 Linear | 202 | Linear 4...20mA | Pin 9: positive<br>Pin 10: negative |
| | | Linear 4...20mA | Pin 11: positive<br>Pin 12: negative |
| RL2000 | 203 | Digital | Pin 13: positive<br>Pin 14: negative |
| | | Digital | Pin 15: positive<br>Pin 16: negative |

**Note on Thermistor sensors:**
Ensure the 30k9 load resistance is selected on the Calibration section of the Sensor properties in the **Radiolog** software.

**Note on Accuracy:**
Due to the nature of the connections the on-board Thermistor channels have an accuracy of +/- 0.5°C and the Humidity has an accuracy of +/-3%. For greater accuracy, you should use the RL4000 or RL5000 radio sensors (+/- 0.2°C and +/-% s standard).

**Note on Stability:**
If the Thermistor or RH channels produce unstable results, fit a 10µF tantalum electrolytic capacitor across the relevant terminals. This is polarity sensitive, so the capacitor should be fitted as follows:

| Radio Sensor Type | Channel | Capacitor Connections |
|---|---|---|
| RL2000 Dual Thermistor | Thermistor A | Pin 1: positive<br>Pin 2: negative |
| | Thermistor B | Pin 3: positive<br>Pin 4: negative |
| RL2000 RH/Thermistor | RH | Pin 6: positive<br>Pin 8: negative |
| | Thermistor | Pin 7: positive<br>Pin 8: negative |

# Maintenance

## UPS Battery

The lead acid UPS Battery should be replaced every 2 years.

Hanwell recommends that the same make and model of battery should be used if possible. If this is not possible then the battery float voltage should be adjusted to meet the battery manufacturer's recommended voltage.

To adjust the battery float voltage:
Fit the new battery and allow to charge for several hours.
Measure the voltage across the battery terminals.
Adjust VR-1 until the measured voltage meets the manufacturers recommended voltage.

## Coin Cell Battery

The coin cell ensures uninterrupted power to the clock chip. It should be changed every 5 years.

## Fuse Specifications

| | |
|---|---|
| Mains | 1Amp anti-surge 6.3mm x 25mm |
| F1 | 1Amp anti-surge 20mm |
| F2 | 5Amp anti surge 20mm |
| F5 | 1 Amp anti-surge 20mm |

CONTACT

HANWELL


# Contact

**T: +44 (0)1462 688070**
**W: the-imcgroup.com**

The IMC Group Limited
Pendle House
Jubilee Road
Letchworth
Hertfordshire
SG6 1SP