Validation & Monitoring Solutions

IM5984
RL4512 Dual Channel CO_2 and Temperature Sensor Unit

User Guide

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Contents

1 Introduction

This Document details how to configure the **RL4512 CO_2 and Temperature Sensor Unit** from Ellab Monitoring Solutions Ltd for use in conjunction with the EMS application.

The RL4512 Unit is a Dual Channel Transmitter with channels for CO_2 and Temperature data inputs from their respective sensors/probes.

The RL4512 Unit also has an on-board Data Logging facility. This facility can provide a data backup capability in the event of a transmission or power failure or other interruption to the flow of data from the Unit to EMS.

- Data is transmitted/uploaded to EMS from the Unit at defined Transmission Intervals, either directly or via an SR2 Controller.

The current CO_2 and Temperature values, battery voltage and, optionally, the Alarm Status are also displayed on the Unit's LCD screen.

1.1 Pre-requisites

You will need the following to enable communication between EMS and the RL4512 Unit:

- **Y055** USB lead.
- **EMS** application installed on a PC/Server.
- **EMS Remote Management Tools**
  If the RL4512 Unit can be physically connected to the PC/Server with EMS installed or if EMS is installed on a Virtual Machine (VM) or a Remote Server.
- **Upgrade Disk**
  Installations running EMS Version 1.7.0 or lower must run this disk and follow the instructions in the **ReadMe.txt** file before adding the Sensor Unit to EMS.

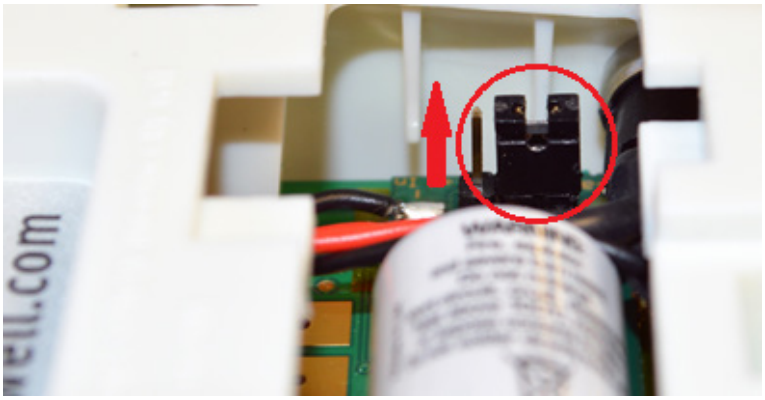
2 The RL4512 Sensor Unit

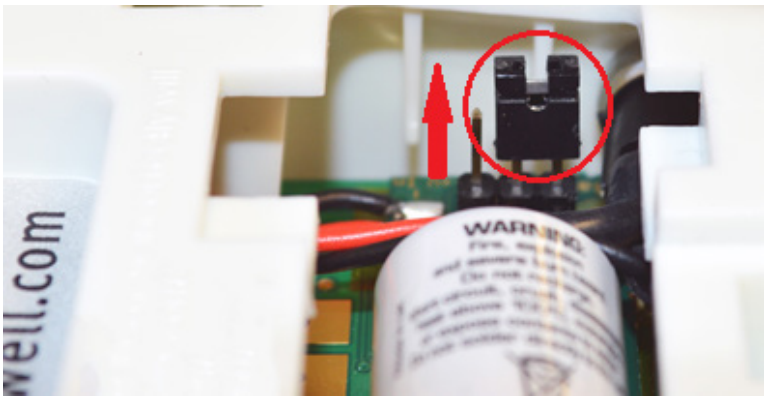
Figure 1
RL4512 Unit fitted with CO_2 and Temperature/Thermistor probes

2.1 Sensor Unit Battery

WARNING!

The RL4512 Series Sensor is powered by a 12V mains power supply which MUST remain connected during normal operation.
When the Unit is not in use, the Battery Link, located on the Unit's PCB, MUST be moved to the position shown in Figure 2 below to disconnect the battery and prevent it discharging.





Disconnected

Connected

Figure 2 - Battery Jumper Link

The Unit's internal battery is ONLY provided as a reserve backup power supply to prevent the RL4512 from losing logged data during the following operations, which may require the Unit to be disconnected from the mains supply:

- **Initial setup of the Unit.**
- **Downloading logged data following a transmission or power failure.**
- **Any change of the Unit's configuration.**

Note: The internal battery is soldered in and is not replaceable by the customer. If the battery becomes discharged, the Logging functionality will no longer work and the Unit will have to be sent back to Ellab Monitoring Solutions for battery replacement.

2.2 Mounting the Sensor

A wall-mounting bracket is available for the RL4512 Unit (Code: **Y119**). It comprises a metal strip which is fitted to the wall.

- To mount the RL4512 Unit on the bracket, line up the slots on the back of the Unit with the tabs on the bracket and click the Unit into place.
- To remove the RL4512 Unit from the bracket, gently press the tag at the bottom of the Unit's case towards the wall, using a small screwdriver or similar, and lift the Unit free.

2.3 Radio Testing Dongle

This is an optional plug-in device (Code: **Y058**).

When connected to the RL4512's USB socket, it overrides the Unit's configured Transmit Interval and forces the Unit to send a transmission every five seconds.

2.4 Compliance

The RL4512 Unit has been designed to comply with the RoHS and WEEE EU Directives and carries the CE mark.

3 Setting up the RL4512 Unit with EMS

For information on the addition of the RL4512's details to EMS, please refer to the EMS Online User Guide, in particular the section **System Configuration - Sensors**:

http://www.help.emsprocloud.com/index.html?system-configuration-sensors.html

- The RL4512 Unit should be added as a **CO2/Thermistor** sensor.

Note: Default Temperature Calibration values are already configured/entered into the Unit and will not need changing.

3.1 Entering a Sensor/Probe's Calibration Settings into EMS versions 1.0.9 and later.

Note: For details on entering **Calibration Settings** into EMS **prior to Version 1.0.9**, please refer to **Appendix A**.

1. Select **Edit Mode** from the main **View Data** menu. See Figure 3 below:

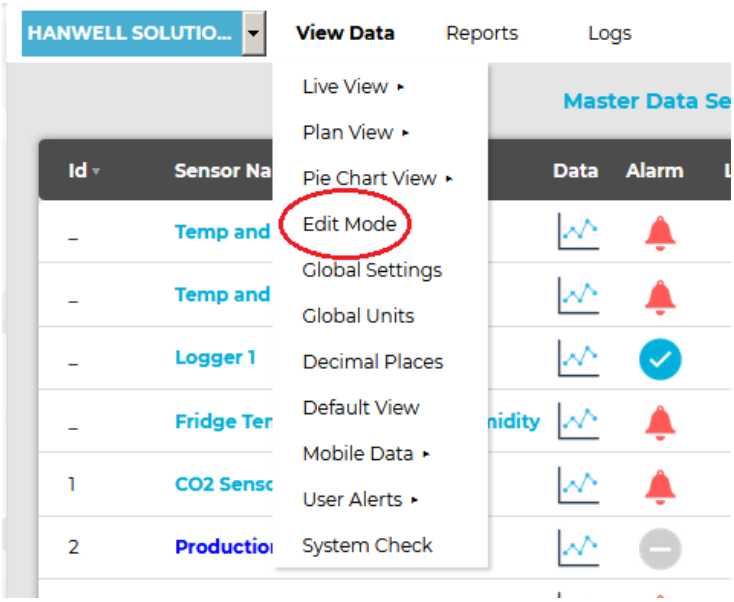


Figure 3

- The **Edit Mode** window is displayed. See Figure 4 overleaf:

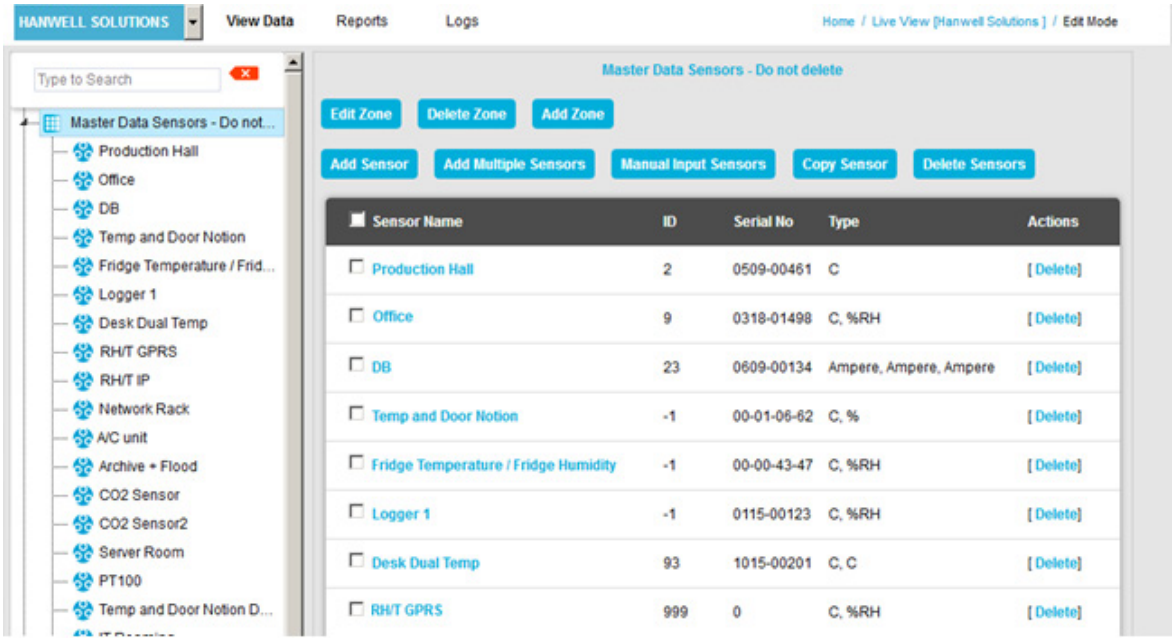


Figure 4

- By default, the **Edit Mode** window for the **Zone** at the top of the left-hand menu is displayed.
- To display another Zone's **Edit Mode** window, click on the entry for the required **Zone** in the left-hand menu. For an example, see Figure 5 below:

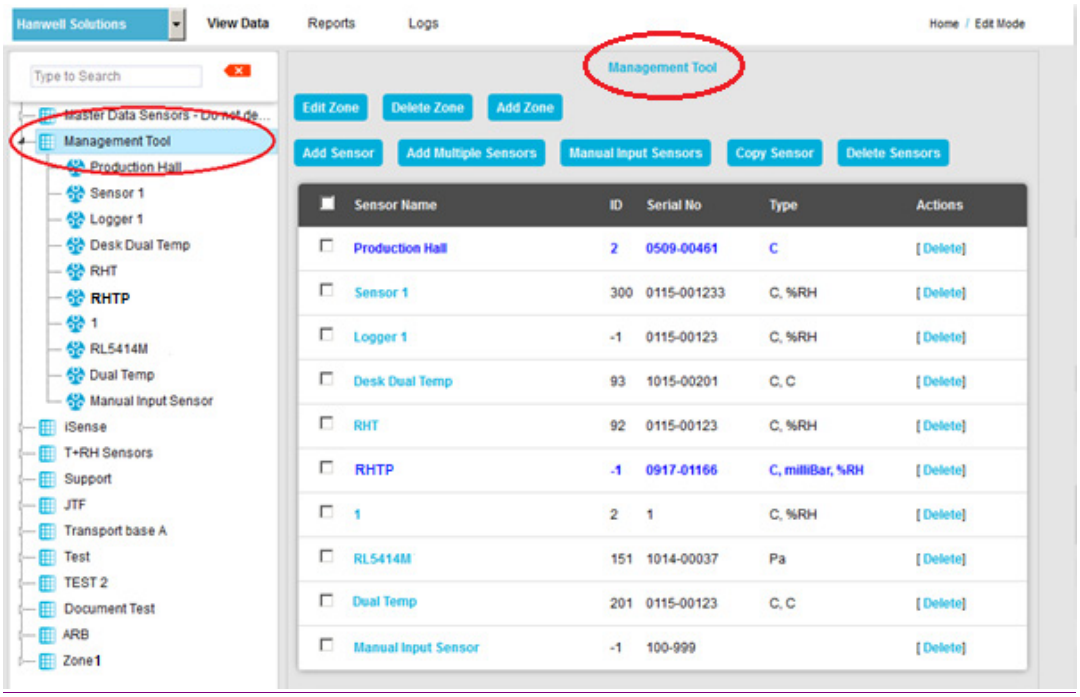


Figure 5

Note: **Edit Mode** is only available if you have the correct access **Permissions.**
If you do not have the correct access **Permissions** the following message window will be displayed. See Figure 6 below:

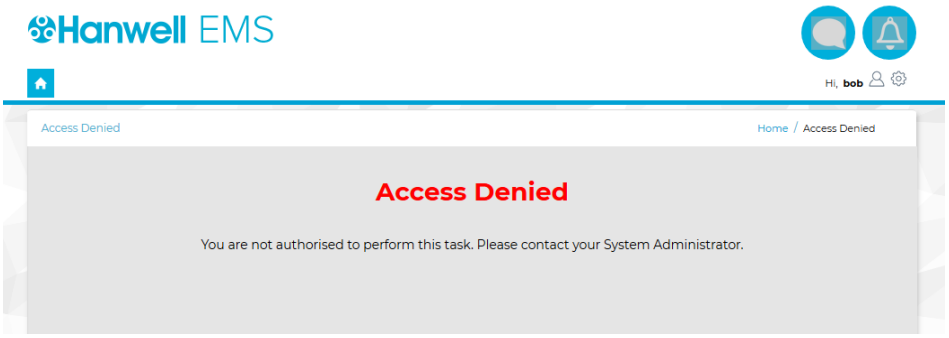


Figure 6

2. **Either**:

i. In the left-hand list of the Zone's **Edit Mode** window, click on the small 'arrow' symbol to display a list of the Sensor Units associated with the Zone. See Figure 7 below:

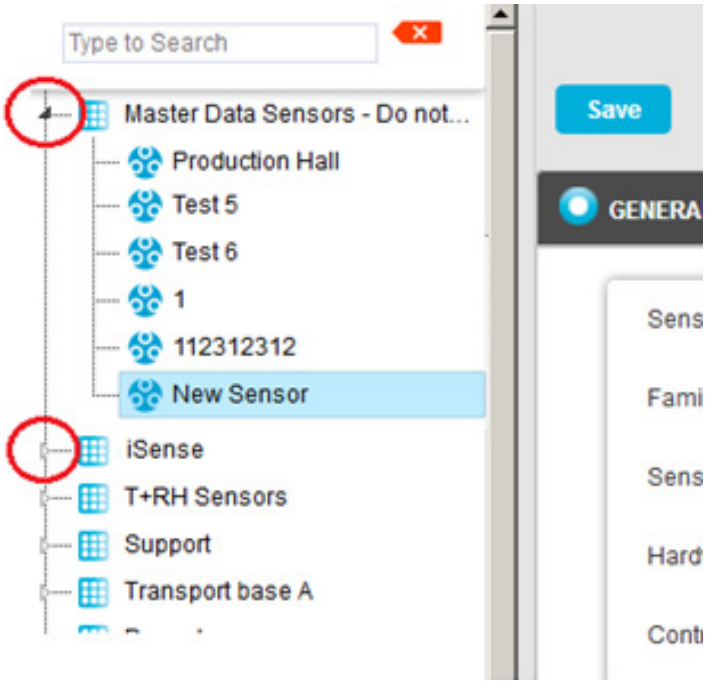


Figure 7

ii. In the left-hand list, click on the required R4512 Series Sensor Unit's icon: 

Or:

In the table in the Zone's **Edit Mode** window, click on the required R4512 Series Sensor Unit's name in the Sensor Name column. See Figure 8 overleaf:

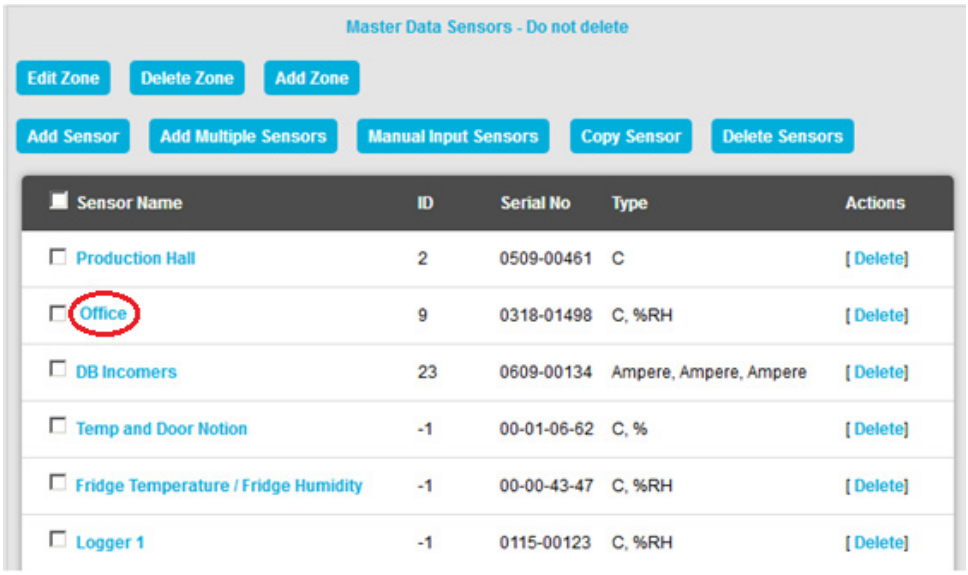


Figure 8

- The **Edit Mode** window for the selected R4512 Series Sensor Unit is displayed. See Figure 9 below:

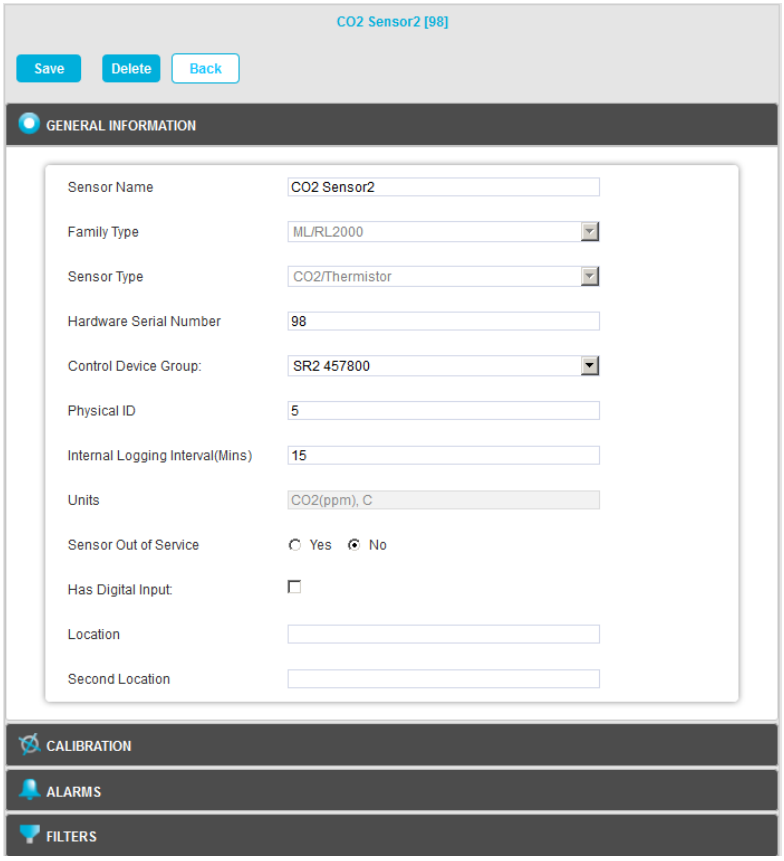


Figure 9

3. Click the on the **Calibration** field to expand the **Calibration** pane for the selected R4512 Series Sensor Unit.

   - The **Calibration** pane will display separate tabs for the Sensor Unit's Temperature and CO_2 channels.

   See Figure 10 below:

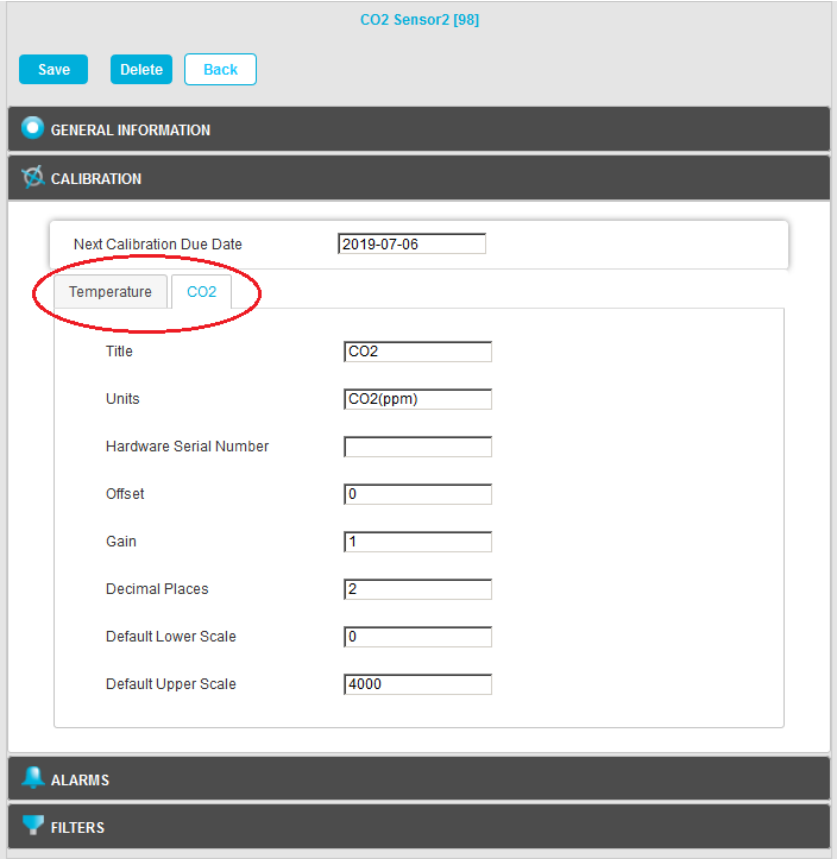


Figure 10

4. Click on the **CO_2** tab and:

   i. Enter the date that the next Calibration is due into the **Next Calibration Due Date** field, in the format:

   YYYY-MM-DD

   * If the Sensor Unit has just been added to the System, you will notice that the default date on the form will be one year from the date that the Sensor Unit was added.
   * The normal Calibration period is one year.
   * A good rule of thumb would be 12 months for environments that are either contaminated or have consistently high operating humidities.

Where the environments are uncontaminated and average humidities are mid-range, then every 24 months would be acceptable.

ii. Enter or edit any other CO_2 Calibration parameter values as required.

* The **Offset** and **Gain** values for the supplied Vaisala CO_2 sensor/probe are listed in the **CH 1** column of the table at the top of the Box Insert.
* For more detailed information on Sensor Unit calibration parameters, please refer to the Online Manual:

http://www.help.emsprocloud.com/index.html?calibration-general.html

5. When you are happy with the new date select **Save**.

- Click on the **Back** button to cancel any changes to the **Next Calibration Due Date**.

- If the Update has been successful, you will be returned to the Zone's **Edit Mode** window and the following message will be displayed. See example in Figure 11 below:

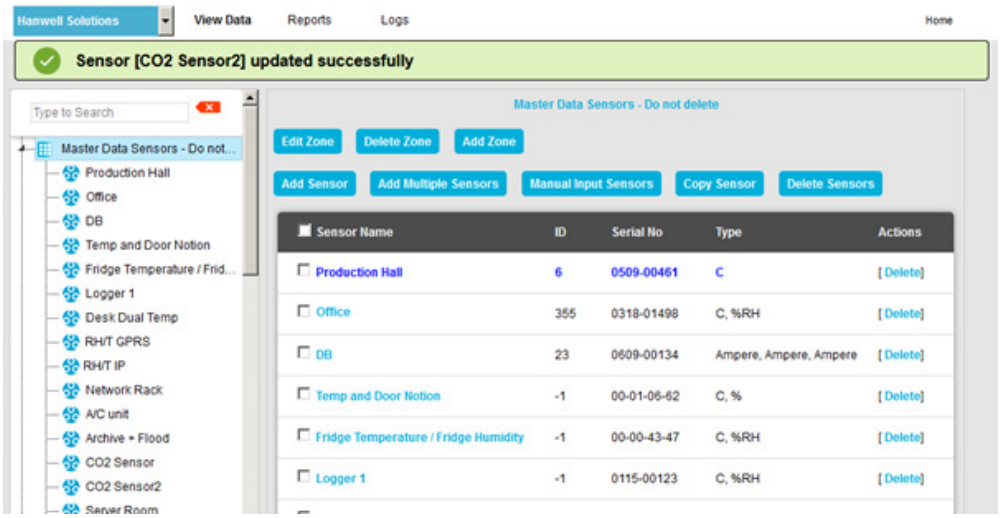


Figure 11

6. Repeat Steps 2 -5 for all required R4512 Series Sensor Units.

Note: Should you wish to carry out your own calibration of the CO_2 probe, please refer to both the EMS Online User Guide:

http://www.help.emsprocloud.com/index.html?calibration-management-tools.html

and the following links which are also listed on the Box Insert:

http://pd.hanwell.com/Cal-linear-sensor.xls

http://pd.hanwell.com/Cal-linear-sensor.zip

7. Repeat Steps 2 -7 for all required RL4512 Units.

3.1.1 Setting Alarms

To set Alarm Parameters and Levels, refer to the following section in the EMS Online User Guide:

http://www.help.emsprocloud.com/index.html?levels.html

3.2 Synchronising Sensors/Unit

The Synchronise process:

Sets the **Physical Transmit ID** of the device.

- If the Physical Transmit ID listed in the Unit does not match the ID of the Sensor that you are trying to synchronise with, then the ID listed in the Unit's memory will change to what is set on the Sensor you are synchronising with.

And

Takes the following Sensor Calibration settings for the selected RL4512 Unit and loads the Calibration and Alarm settings from the EMS Database into the Unit:

- The CO_2 setting calculated from the **Offset** and **Gain** values entered as outlined in Section 3.1 above.
    - The default Temperature values.

To Synchronise a Sensor:

1. Ensure that the RL4512 Unit is connected to the PC/Server running EMS via the supplied **Y055** USB lead.
2. Open the EMS Remote Management Tools application.
    - **EMS Remote Management Tools** provide an HTTP link to data in the EMS database, allowing you to synchronise an RL4512 Unit when using EMS installed on a Virtual Machine (VM) and also provide a physical link to the database when it is possible to connect the RL4512 Unit directly to the PC with EMS installed via the YO55 USB lead.

    Refer to the following sections in the EMS Online User Guide:

    http://www.help.emsprocloud.com/index.html?EMS-remote-management-tool.html
3. Select the CO_2 Sensor from the EMS Management Tool's/EMS Remote Management Tools' **EMS Management** window.
4. Right click on the selected Sensor and select **Sync Selected Sensor** from the displayed menu.
    - The **EMS Synchronise USB Sensor Vx.x** window is displayed. See Figure 12 overleaf:

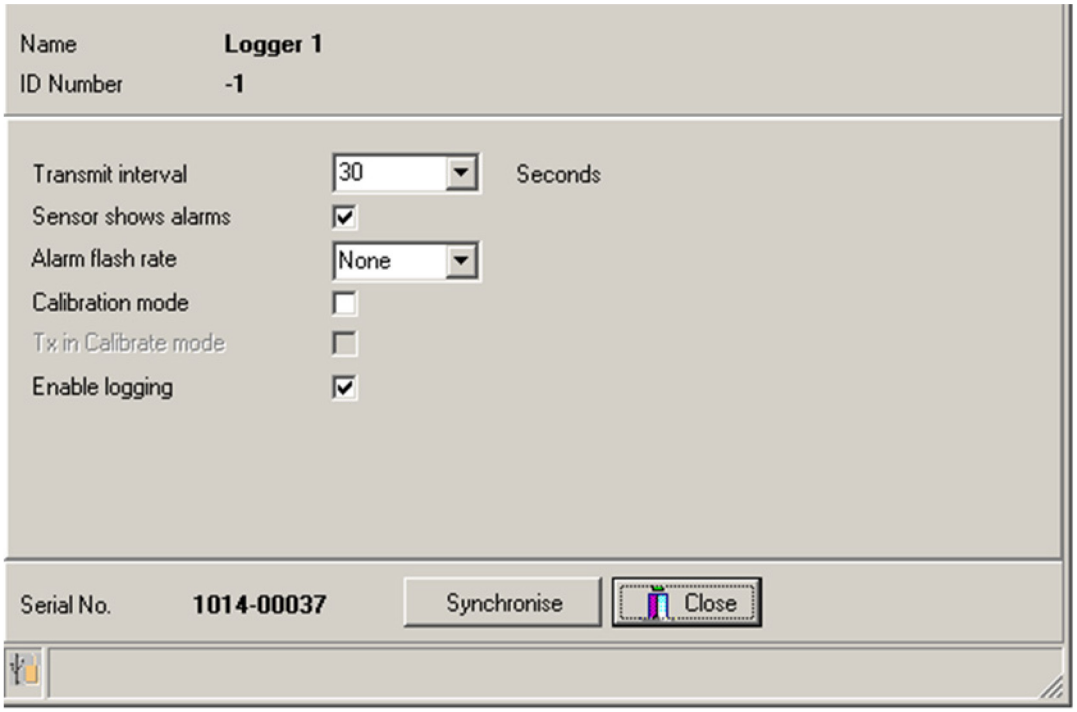


Figure 12

Note: The sensor selected must match the Physical Device or the program will not complete.

5. Select the required Transmit (TX) interval from the **Transmit interval** drop-down list (60 seconds is recommended for Calibration).

   - The **EMS Synchronise USB Sensor Vx.x** window completes loading and all of the window's fields are populated.

6. Click the **Synchronise** button and follow the instructions given until it reports that the Synchronisation is complete.

   - The Sensor's display should now show the same value as displayed in EMS.

7. Close the window to finish Synchronisation and update the EMS database.

8. Repeat Steps 1 - 7 for all RL4512 Units to be added.

- Refer to the following section in the Online EMS User Guide for information on **Viewing Sensor Data**:

  http://www.help.emsprocloud.com/index.html?viewing-data2.html

3.3 Merging Collected Data

The **EMS Remote Management Tools** can be used to merge data saved in the RL4512 Unit, via its on-board Data Logging function, with data received by EMS.
This will enable any missing data points in the EMS Database, as a result of power or transmission failure or any other break in the data transmitted from the Unit to EMS, to be uploaded to the EMS Database from the Unit's memory.

To Merge Collected Data:

1. In **EMS Remote Management Tools**, right click on the Sensor (CO_2 or Temperature) which is to have its collected data merged with the EMS database

   For additional information on the EMS Remote Management Tools, refer to the following sections in the EMS Online User Guide:

   http://www.help.emsprocloud.com/index.html?EMS-remote-management-tool.html

2. From the displayed drop-down menu, select **Merge Selected Sensor**. See Figure 13 below:

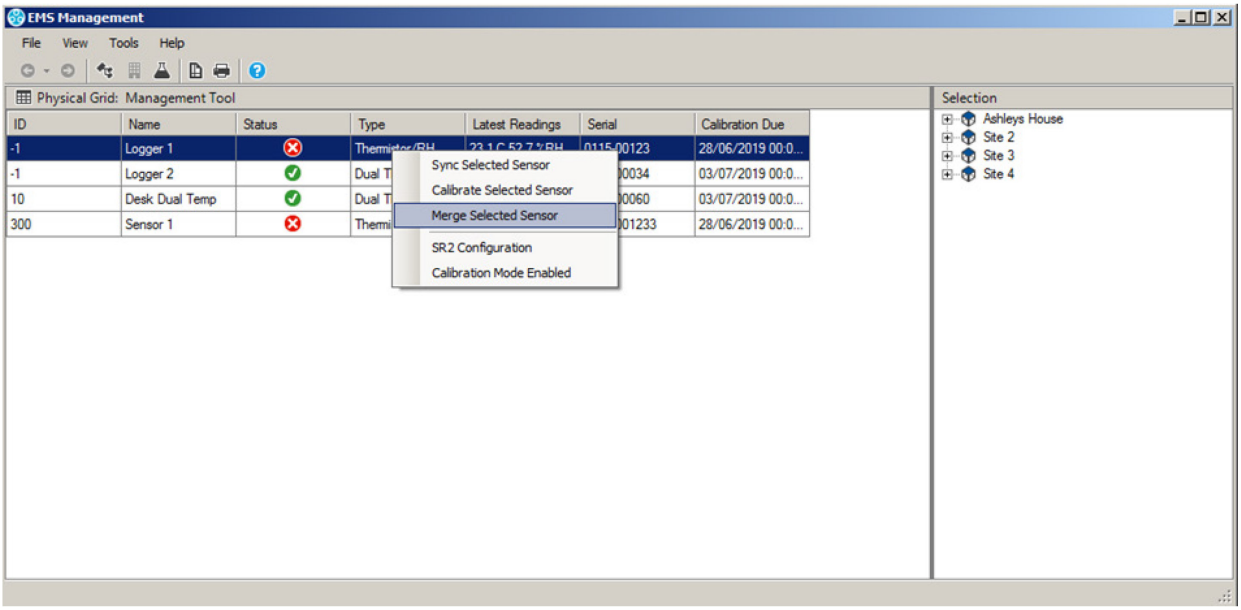


Figure 13

- The **Hanwell 4000 series logger download** window is displayed. See Figure 14 below:

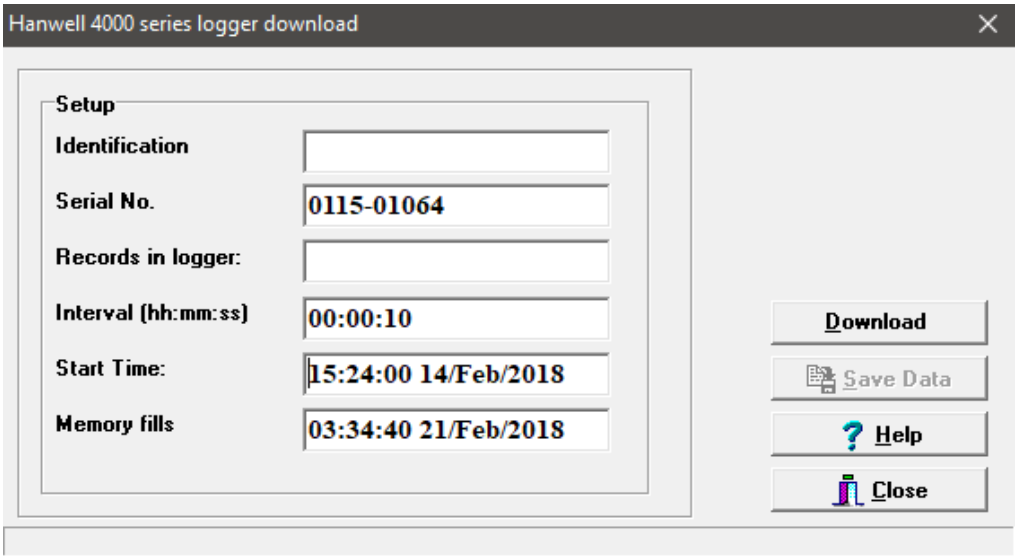


Figure 14

3. Click on the **Download** button.

   - The **Save Data** button becomes active and '**Download complete**' is displayed in the bottom left-hand corner of the window when the Download is complete. See Figure 15 below:

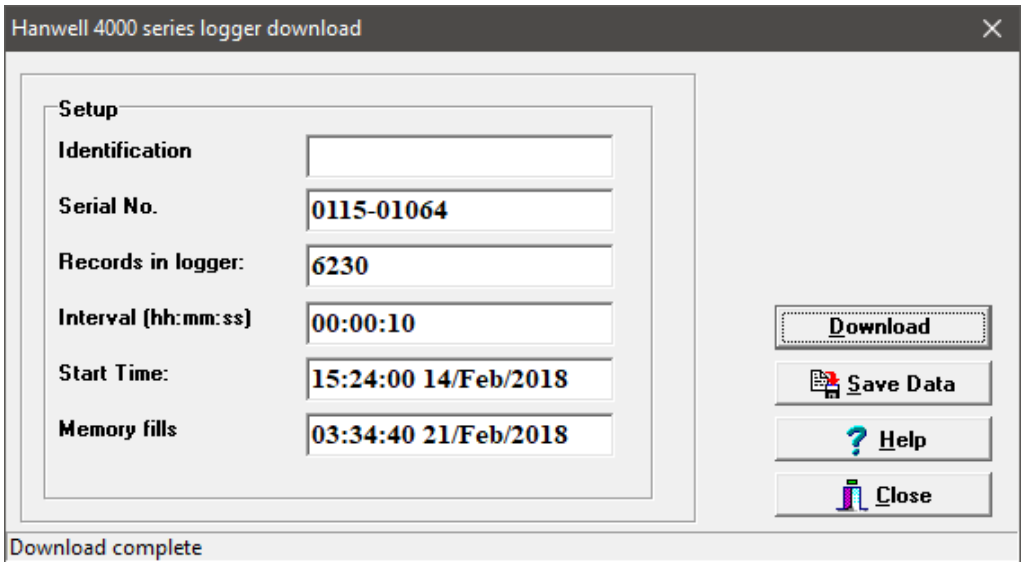


Figure 15

4. Click on the **Save Data** button.

5. The **Waiting for Task** window is displayed, with a bar illustrating the progress of the Merge operation. See Figure 16 overleaf:

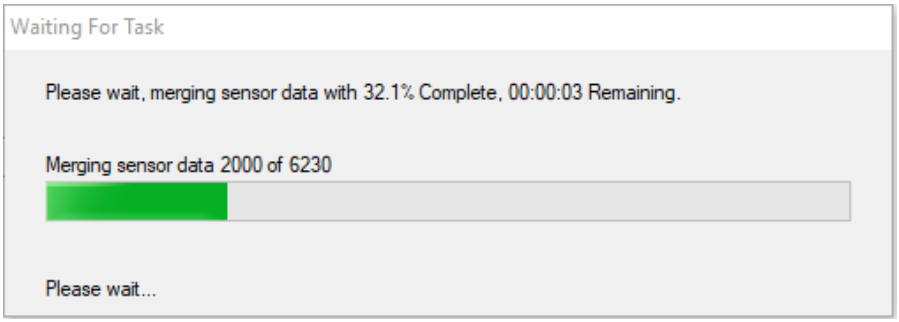


Figure 16

- When the Waiting for Task window disappears with no error messages displayed, the data from the Unit's memory has been successfully merged with the EMS Database.

The Merge Collected Data process is now complete and the **Data filing complete** Information window is displayed. See Figure 17 below:

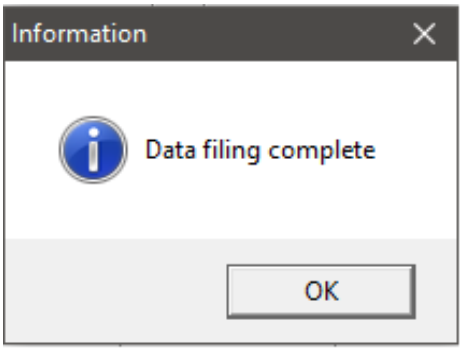


Figure 17

Appendix A
Entering a Sensor/Probe's Calibration Settings into EMS versions prior to 1.0.9

Note: For details on entering **Calibration Settings** into EMS **Version 1.0.9 and later**, please refer to Section 3.1.

1. In the left-hand menu of the **Editing and Configuration** (**View Data** > **Edit Mode**) window, navigate to the icon representing the RL4512 Unit, as outlined in the **Accessing Sensor Properties** section of the EMS Online User Guide:

   http://www.help.emsprocloud.com/index.html?accessing-sensor-properties.html

2. Click on the + sign next to the RL4512's icon to access the **Properties** icon.

3. Click on the + sign next to the **Properties** icon in the left-hand menu to display the **Calibration** icon.

4. Click on the + sign next to the **Calibration** icon to expand the Calibration property entries. See Figure 18 below:

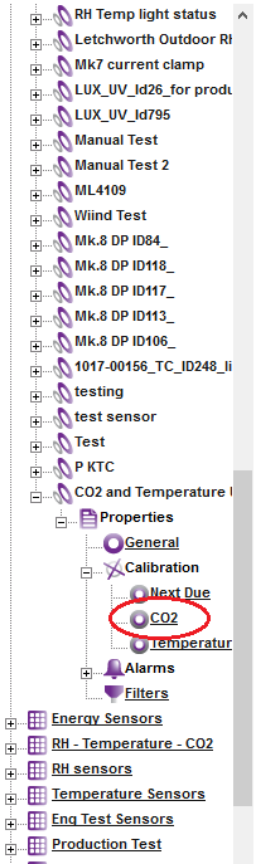


Figure 18

5. Click on the **CO2** icon (see Figure 18 above) to display the **CO2** window for the selected RL4512 Sensor/Transmitter. See Figure 19 below:

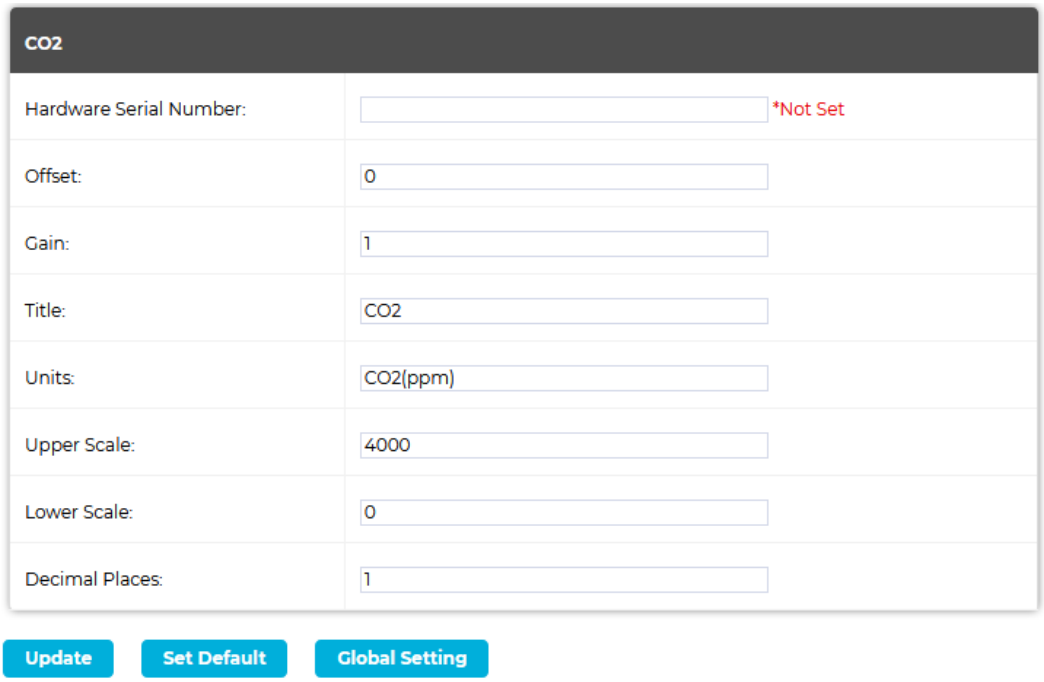


Figure 19

6. In the displayed **CO2** window, enter the **Offset** and **Gain** values for the supplied Vaisala CO_2 sensor/probe into their respective fields.

   - These values are listed in the **CH 1** column of the table at the top of the Box Insert.

   Note: Should you wish to carry out your own calibration of the Vaisala CO_2 sensor/probe, please refer to both the EMS Online User Guide: http://www.help.emsprocloud.com/index.html?calibration-management-tools.html and the following links which are also listed on the Box Insert:

   http://pd.hanwell.com/Cal-linear-sensor.xls

   http://pd.hanwell.com/Cal-linear-sensor.zip

7. Select **Update** to confirm the details and load the **Offset** and **Gain** values into EMS.

   - If the Update has been successful, the following message will be displayed. See Figure 20 below:

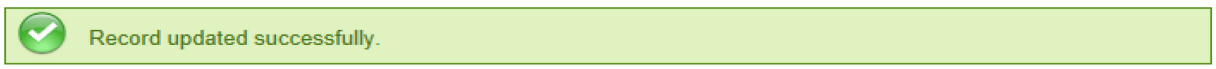


Figure 20

8. Repeat Steps 1 -7 for all required RL4512 Units.

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1	31 October 2018	First Issue	IR
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3	2nd November 2021	• Further amendments to Contact Details to reflect change to Ellab Monitoring Solutions. • Document History moved to end of document.	IR

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