



## Wi5D Data Concentrator User Manual



**Warning:** This manual contains important safety and operating information.  
Please read, understand and follow the instructions in the manual.

# TABLE OF CONTENTS

<b>1</b>	<b>DESCRIPTION</b>	<b>3</b>
1.1	Technical Specifications	3
1.2	Radio Receiver	4
1.3	Data Recording	4
1.4	Data Transfer	4
1.5	Monitoring Unit Status	5
1.6	Unit Configuration	6
1.7	Use of Cellular networks / SMS – Important Notes	6
<b>2</b>	<b>COMMISSIONING</b>	<b>7</b>
2.1	Step 1: Inspecting Package Content	7
2.2	Step 2: SIM Card installation (GPRS Version)	8
2.3	Step 3: Connecting the product	9
2.4	Step 4: Interpreting Front Panel LEDs	11
2.5	Step 5: Confirming Data Transfer	12
<b>3</b>	<b>CONFIGURATION</b>	<b>13</b>
3.1	USB Driver	13
3.2	Connecting the USB cable	13
3.3	Configuration using IDT	13
<b>4</b>	<b>INSTALLATION</b>	<b>14</b>
<b>5</b>	<b>TROUBLESHOOTING GUIDE</b>	<b>15</b>

# 1 Description

## 1.1 Technical Specifications

### Power supply

- 12V – 2A DC input provided by external PSU (supplied).
- Battery Backup – supply power to the unit in the event of mains power loss to maintain the real-time-clock.
- DC input requirements: 0.5A average current with short current transients of 2A (GPRS Modem); unit will stop operating below 9VDC.

### Radio Compatibility

- Compatible with AMR transmitters.
- Single-frequency Reception:
  - UHF (433.92 MHz or 868.950 MHz).
  - VHF (169.40625 MHz or 153.100 MHz).

### Real Time Clock

- On board real-time-clock synchronized every time communication with the remote server occurs.

### Data Recording

- Records data on MicroSD card (supports SD & SDHC).

### GPRS/SMS

- Uses Quad-band GSM engine.
- Configurable filters used to reduce amount of GPRS traffic.
- GPRS connections established only at transfer time.
- Uses HWM proprietary protocol to transfer data to Toran software.

### Ethernet

- Uses HTTP/HTTPS to transfer data.
- DHCP Enabled to get dynamic IP from LAN – Static IP configurable.
- Time automatically synchronised from HWM time server.

### Configuration

- Via Local USB Connection & IDT Software.

## Installation

- Wall mounting
- Front panel LEDs to assist in operation diagnostic

## Housing

- Dimensions – 225 mm x 203 x 47 mm.
- Weight: 500 grams without antennas.
- IP rating: Standard Housing IP20 (IP66 available with optional enclosure).

## 1.2 Radio Receiver

The Wi5D concentrator can work on only one receiving frequency as the radio receiver fitted on the PCB is different for each frequency. The part number of the product identifies which frequency is to be used.

The product is compatible with AMR transmitters.

As radio packets are coming in, these are time-stamped using the on-board real time clock. The clock is synchronized periodically using a UTC Time Server to guarantee accuracy. All time stamps will be UTC/GMT.

## 1.3 Data Recording

The Wi5D concentrator uses an on board microSD card to record the data before transmission. It will keep historical data which can be retrieved at any time using SD card reader and standard text editor by pressing the push-button on the concentrator PCB for 2 seconds. The microSD card can then be removed from the connector.



**The microSD card is required for product operation ensure you insert it and lock it back in the connector after data upload.**

## 1.4 Data Transfer

Data is transferred at a periodical interval via GPRS UDP or HTTP/HTTPS for Ethernet versions. If the data transfer is not successful (intermittent GPRS connection, LAN disconnection); the data will be stored and transferred on the next occasion. In the event that the Wi5D concentrator is offline for an extended period it will send stored data starting from the oldest record.

Filters can be used to reduce the amount of data sent to the server.

- Only allow particular transmitter IDs or packet types.
- Reject particular transmitters IDs or packet types.
- Reject a packet from a transmitter if it has already transmitted within the last x seconds.
- Only allow one packet per transmitter per transfer.



**Please Refer to Product configuration paragraph for the procedure to change the concentrator's configuration.**

## 1.5 Monitoring Unit Status

The concentrator will send at a specified rate a summary report to the server. This report contains information on the unit status such as:

- Mains Power status (GPRS Only)
- GSM signal strength (GPRS Only)
- Filter Settings
- Concentrator ID
- Firmware Revision
- Statistics on data transfer

This report can also be sent via email.

### **GPRS versions only:**

Please note that in this mode the unit will not record transmitted data packets, this is done to minimize power consumption and ensure the unit will function on battery for 24 hours.



**Please Refer to Product configuration paragraph for the procedure to change the concentrator's configuration.**

## 1.6 Unit Configuration

The unit operation can be configured via local USB connection using IDT Software to upgrade, configure and download.



**Please Refer to Product configuration paragraph for the procedure to change the concentrator configuration.**

## 1.7 Use of Cellular networks / SMS – Important Notes

### **Availability of SMS**

Models which include the GPRS cellular network modem have the ability to communicate to a server via use of the cellular data network. They also offer SMS (Short Message Service) messaging for some services. For SMS use, the logger uses the available **2G network**.

**Important:** 2G (GPRS) services, which carry the SMS messaging system, are slowly being turned off around the globe. Once 2G is switched off the SMS services available within the Wi5 will no longer be able to function. Therefore, check with your cellular network operator for their switch off date before setting the Wi5 to use any feature requiring SMS use.

## 2 Commissioning

This paragraph describes the required steps to ensure the product is fully functional following reception. Ensure one step is covered before going to the next.

### 2.1 Step 1: Inspecting Package Content

RT-Wi5 Data Concentrator



Mains Power Supply Unit – 12V DC output



Configuration Cable (USB A/B) – optional



Antennas (VHF/UHF BNC – GSM SMA)

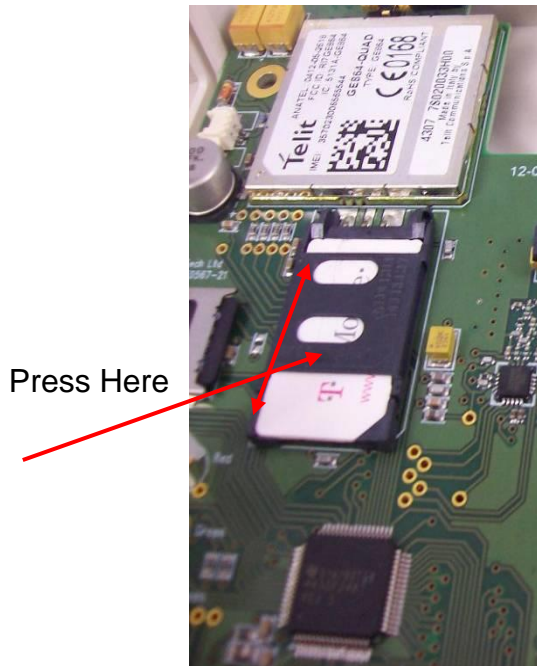


## 2.2 Step 2: SIM Card installation (GPRS Version)

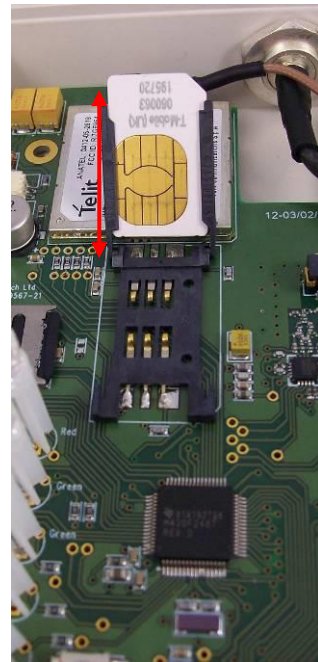
If not already equipped by HWM the SIM card can be installed using the following procedure:

- Remove the front cover.
- Install the SIM card into the SIM card connector as shown below:

**Locking/Unlocking the connector**



**Remove/insert the SIM Card**



**Please Refer to Product configuration paragraph for the procedure to change the concentrator's configuration.**



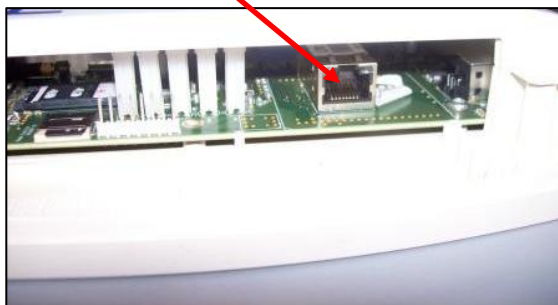
## 2.3 Step 3: Connecting the product

- In order to avoid GPRS transmission during shipping the backup battery is disconnected. Connect the battery connector as shown below (**not required for Ethernet versions**):



**Only use the battery supplied with the unit. Failure to do so could result in product damage.**

- Connect the Ethernet cable (if applicable).



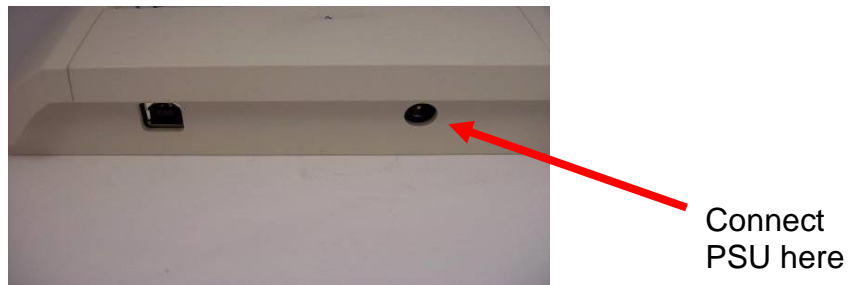
- Reinstall the top cover.

- Connect the external GSM (if applicable) and Radio antennas to the connectors as shown below.



**If using a heavy RF cable for GSM or Radio connection use a strain relief on the cable to avoid stressing the connector with excessive stress, this will increase the risk of the case cracking.**

- Connect the external Power Supply Unit DC connector into the location shown below:



- Connect the external Power Supply Unit to the mains socket.



wall



**Only use the Power Supply Unit supplied with the unit. Failure to do so could result in injury and product damage.**

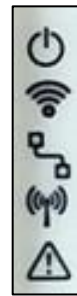


**There is no power switch on the unit, to power off the unit it is required to disconnect both the Power Supply Unit and the battery. Ensure the Power Supply Unit is accessible on site.**

## 2.4 Step 4: Interpreting Front Panel LEDs

LEDs are used to indicate the current status of the unit and indicate potential faults:

- **Mains Power (Red LED)**
  - Present: double flash every 2 seconds.
  - No Mains power: one flash every 5 seconds.
- **GSM/GPRS (Green LED)**
  - GSM ON: double flash every 2 seconds.
  - GPRS transfer in progress: ON Steady.
- **Ethernet/USB (Green LED) :**
  - Data Transfer (In/Out): LED Flashes.
- **RF Data Received (Orange LED):**
  - Data Coming In : LED flashes.
- **Status (Red LED):**
  - No Fault: OFF
  - SIM card not recognized / no registration on the GSM network / poor GSM signal (less than 2 bars): single flash every 2 seconds
  - SD Card not recognized: double flash every 2 seconds
  - Time Synchronization failed : three flash every 2 seconds



### Note:

- For the first 2 minutes following power-up the status LED will flash while the unit is initializing, wait for at least 2 minutes before interpreting the status LED.
- If a combination of faults exists the status LED flashing will alternate between error codes, for example:
  - Single Flash indicates GSM issue
  - 2 seconds wait
  - Triple Flash indicates the time synchronization did not take place
  - 2 seconds wait
  - Single Flash...

In order to confirm that the unit is fully operational ensure that the status of the LEDs is as follow:

- Mains Power (Red LED) is **double flashing every 2 seconds**.
- GSM/GPRS (Green LED) is **either double flashing or constant ON**.
- Ethernet/USB Status (Green LED) is **OFF**.
- RF Data Received – (Orange LED) is **flashing when a test transmitter is activated**.
- Status (Red LED) is OFF ; **this should turn itself off ~2 minutes after powering on the unit**.



**If the status of the LEDs do not match with the above, please refer to the Troubleshooting section.**

## 2.5 Step 5: Confirming Data Transfer

Check the server/destination address set in IDT setup.



**If the status of the LEDs do not match with the above, please refer to the Troubleshooting section.**

### 3 Configuration

Configuration is performed using IDT software and PC connected to the Wi5D USB port.

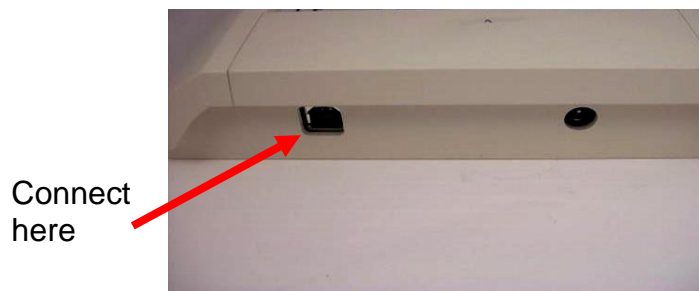
#### 3.1 USB Driver

It is unnecessary to download and install the latest Windows Driver D2XX from FTDI website. All the required drivers are included in the IDT build. Should this be required the following link can be used to manually update.

<http://www.ftdichip.com/Drivers/D2XX.htm>

#### 3.2 Connecting the USB cable

- A standard USB A/B connector is required. Ensure the unit has the Power Supply Unit connected and connect the USB cable as shown below:



**If using your own USB cable ensure the total length is less than 3 metres.**

#### 3.3 Configuration using IDT

The Wi5D can be configured using the IDT software which can be downloaded from the HWM website <http://www.hwmglobal.com> under the "Support" section.



Refer to IDT manual for details on how to configure the Wi5D (MAN-130-0001 IDT Configuration).

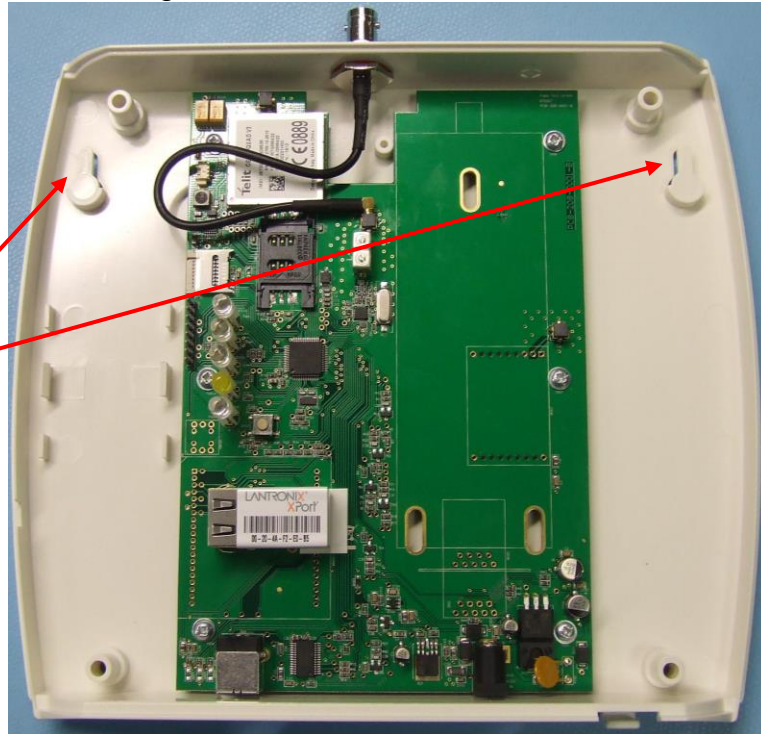
## 4 Installation



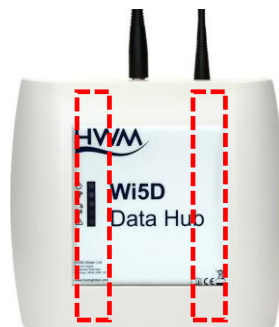
The concentrator is not waterproof and as a result suitable for indoor use only. If outdoor installation is required, optional IP66 enclosure must be used.

Wall mounting points to hang the Wi5D from.

Wall Mounting Locations.



Alternatively industrial Velcro can be used at the back (red boxes on the picture).



Also ensure that Mains Power is securely mounted to avoid falling out.



**For connections and tests, please refer to commissioning paragraph Steps 3 to 5.**

## 5 Troubleshooting Guide



### **Mains Power LED is single flashing.**

- Ensure that the PSU is plugged in the mains socket and the DC connector fully inserted in the GPRS concentrator.



### **No USB Connection.**

- The IDT software will auto-detect and setup the correct communication settings. If there is a requirement to use a terminal emulation program, use the following settings:  
8-bits, no parity, 1-bit stop, 4800 baud.



### **Data Received LED does not flash if test transmitter is activated.**

- Ensure the BNC antenna/cable is connected properly.
- Ensure the whitelist is set correctly. If the whitelist is used (ticked) in the IDT setup and there is no type or ID filters entered this will not receive any transmitters.



### **SIM Card not recognized / no registration on the network / poor GSM signal (it may take up to one minute for LED to come off after adjustments below have been made).**

- Ensure the SIM card is inserted properly.
- Ensure GSM Antenna is connected properly.
- Check that the area has sufficient coverage with the SIM card provider.



### **SD Card not recognized.**

- Open the lid, ensure that the microSD card is there and connector is locked into place.

#### **WARNING: - LITHIUM BATTERIES**

If batteries are exposed - do not short circuit, re-charge, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. **Risk of fire or explosion.** These batteries are sealed units which are not hazardous when used according to the recommendations of the manufacturer.

HWM-Water Ltd  
Ty Coch House  
Llantarnam Park Way  
Cwmbran  
NP44 3AW  
United Kingdom  
+44 (0)1633 489479  
[www.hwmglobal.com](http://www.hwmglobal.com)



©HWM-Water Limited. This document is the property of HWM-Water Ltd. and must not be copied or disclosed to a third party without the permission of the company. All images, text and designs are protected by international and UK copywrite law and remain the property of HWM-Water. It is against the law to copy or use any of the content from the HWM website or literature without the written consent of HWM-Water. HWM-Water Ltd reserve the right to vary the specification.

MAN-567-0008-C (Wi5D Data Concentrator User Manual)