Wi5D Data Concentrator
User Manual

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

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1 Description

1.1 Technical Specifications

Power supply

- 12V – 2A DC input provided by external PSU (supplied)
  PSU compatible with AC Input: 90-264 VAC 50-60 Hz

- Battery Backup – supply power to the unit for 24 hours in the event of mains power loss (***GPRS version only***)

- DC input requirements: 0.5 A average current with short spikes of 2A ; unit sill stop operating below 9VDC

Radio Compatibility

- Compatible with RTCOM transmitters
- Mono-frequency (version dependent) :
  - UHF (433.92 MHz or 868.950 MHz) – short antennas supplied
  - VHF (169.40625 MHz or 153.100 MHz) – antennas optional

Real Time Clock

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

Data Recording

- Records up to 3 months worth of data on 1GB/2GB MicroSD card (supplied)

GPRS/SMS

- Uses Quadband GSM engine
- Configurable filters used to reduce amount of GPRS traffic
- GPRS connections established only at transfer time
- HWM Proprietary Protocol To Toran Software

Ethernet

- Uses HTTP to transfer data
- DHCP Enabled to get dynamic IP from LAN – Static IP configurable
- Internet access required to synchronize unit on public time server

Configuration

- Via Local USB Connection

Installation

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

Housing

- Dimensions – 220 mm X 200 X 45 mm
- Weight : 500 grams without antennas and VHF receiver
- IP rating : IP66 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 majority of RTCOM 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 up to 3 months worth of historical data which can be retrieved at any time using SD card reader and standard text editor by pressing the pushbutton 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 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 (ftp or email):

- 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:

In the event of a mains power failure, a summary report will be sent immediately, the report will indicate that the unit is working on battery.

Alternatively an alert SMS can be sent to a specific phone when this event occurs.

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, or for GPRS versions via SMS.

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

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-Wi5D Data Concentrator

Mains Power Supply Unit – 12V DC output

Configuration Cable (USB A/B) – optional

Antennas (GSM SMA / UHF BNC – VHF is

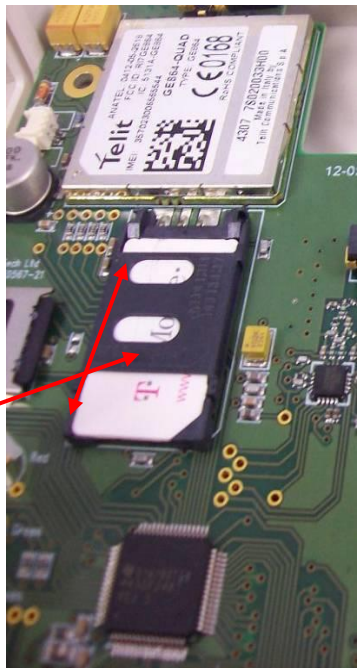
2.2 Step 2: SIM Card installation (GPRS Version)

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

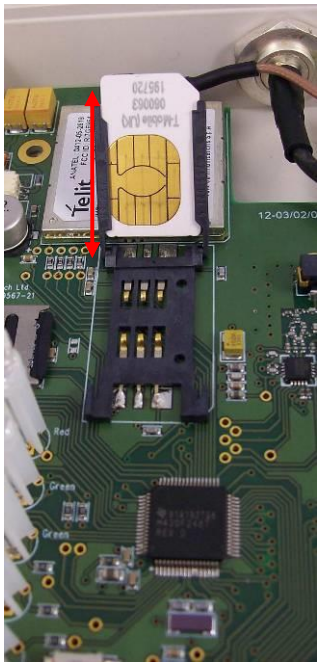
- Remove the front cover
- Install the SIM card into the SIM card connector as shown below:

Locking/Unlocking the connector

Press Here



Remove/insert the SIM Card



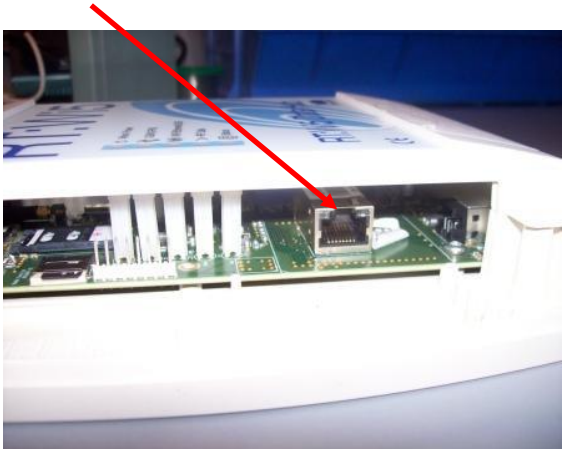
Please Refer to Product configuration paragraph for the procedure to change the concentrator's configuration.

2.3 Step 3: Connecting the product

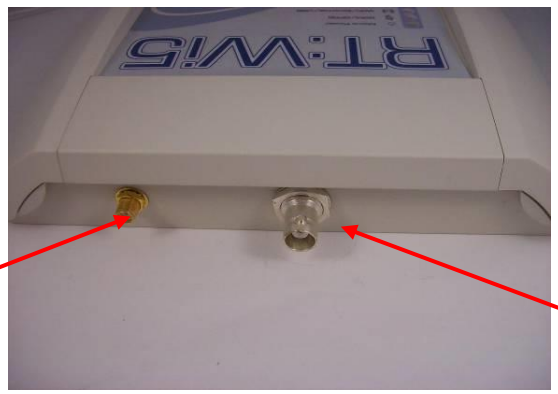
- In order to avoid GPRS transmission during shipping the backup battery is disconnected. Connect the battery connector as shown below (**not required for Ethernet versions):**

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 and Radio antennas to the connectors as shown below:



If using a heavy RF cable for GSM or Radio connection use a strain relied on the cable to avoid stressing the connector, with excessive stress there is risk of cracking the case

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

Connect PSU here

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

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. So ensure the Power Supply Unit is accessible on site.

2.4 Step 4: Interpreting Front Panel LEDs

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

- **Mains Power (RED Color)**
  - Present : double flash every 2 seconds
  - No Mains power : one flash every 5 seconds
- **GSM/GPRS (GREEN Color)**
  - GSM ON : double flash every 2 seconds
  - GPRS transfer in progress : ON Steady
- **Ethernet/USB (GREEN Color) :**

- Data Transfer (In/Out) : LED Flashes

- **RF Data– VHF or UHF version dependent (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*
    - *Triplet 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 Colour) is **double flashing every 2 seconds**

- GSM/GPRS (GREEN Colour) is **either double flashing or constant ON**

- Ethernet/USB Status (GREEN Colour) is **OFF**

- RF Data – VHF or UHF version dependent (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

Once the unit has been configured the system time should be checked. This can be done by typing “status” (without the quotes), the time and date will be displayed in the status response. To test the connection to the server:

- enter “dump reports” (without the quotes). If there are any active transmitters within range the Wi5D should display the packets ready to be sent.
- enter “upload reports” (without the quotes). The Wi5D should contact the specified server, send the data then confirm if the data transfer was successful.

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

3 Configuring

3.1 Configuration using USB port

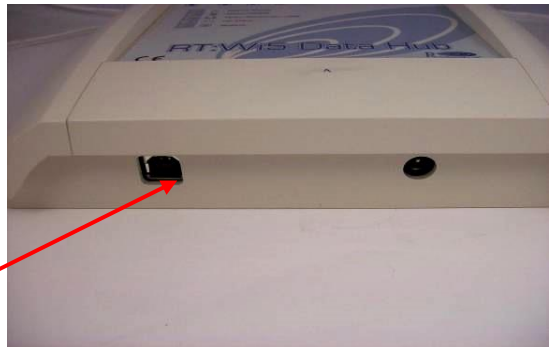
3.1.1 USB Driver

It is recommended to download and install the latest Windows Driver D2XX from FTDI website: http://www.ftdichip.com/Drivers/D2XX.htm before proceeding.

3.1.2 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:

Connect here



If using your own USB cable ensure the total length is less than 3 meters

3.1.3 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.

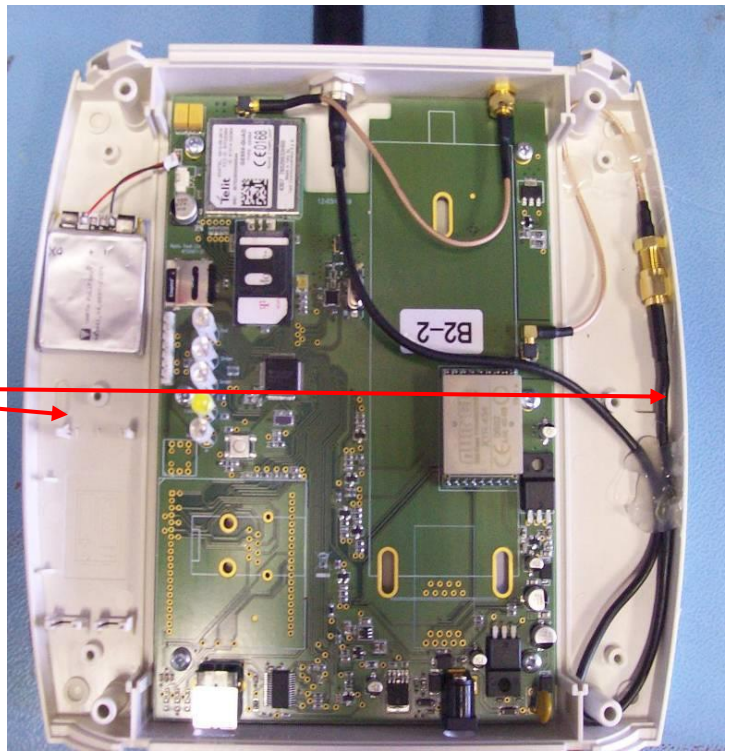
Refer to IDT manual for details on how to configure the Wi5D

4 Installation

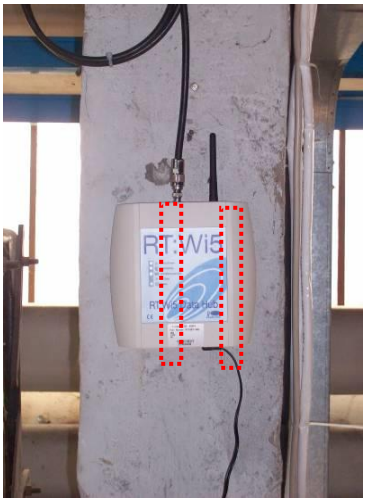
The concentrator is not waterproof and as a result suitable for indoor use only. If outdoor installation is required, optional IP66 enclosure must be used.

- Once the two side lids are removed, simply take off the front cover. The disassemble unit and wall mounting punch through holes are shown below:

Punch through holes 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
- Ensure that the PSU supplies 12VDC

No USB Connection

- Ensure the computer has the latest FTDI driver installed (see driver section in this manual)
- If GPRS LED is ON constantly, a FTP transfer is taking place, during this period of time incoming commands are not processed, wait until the GPRS LED double flashes
- Ensure the terminal software has the correct settings 8 bits, no parity, 1 bit de stop, 4800 bauds and the COM port selected is the one detected by Windows (see configuration paragraph)

Radio LED does not flash when test transmitter is activated

- Ensure the BNC antenna cable is connected properly
- Ensure the correct Radio freq. has been selected (see configuration)

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 sides lids and remote front cover, ensure that the microSD card is there and connector is locked in place

SIMPLIFIED DECLARATION OF CONFORMITY

This simplified EU declaration of conformity referred to in article 10(9) shall be provided as follows:

Hereby, HWM Ltd declares that the radio equipment type transceiver is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at www.hwmglobal.com

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