**Vaisala WXT/WMT**

**Multi-Parameter Sensor**

**Setup and Check**

**Issue 3.9**

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# Introduction

This document applies to the WMT and WXT series of multi-parameter sensors, and least the following hardware/software versions:

Vaisala Configuration Tool (WXTConf.exe) v2.41\_r.4

Vaisala Online Monitor (WXTMonitor.exe) v2.01\_r.4

WXT510 / WXT520 / WXT53x / WMT51 / WMT52 software v3.5

The sensor family has had a series of revisions. This table shows the history and the naming convention.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **1st generation** | **2nd generation** | **3rd generation** |
| Wind Only | WMT51 | WMT52 | WXT532 |
| Wind + Multi-Parameter. No analogue channels | WXT510 | WXT520 | - |
| Multi-Parameter. No wind or analogue channels | - | - | WXT534 |
| Wind + Multi-Parameter + Analogue channels | - | - | WXT536 |

Other versions of the WXT53x series exist but are not in use by MetService

The WMT is both physically and software wise a subset of the WXT. The same ultrasonic sensor head is used in the WMT as in the WXT.

In this document the term WXT/WMT is used to refer to both sensors collectively or separately i.e. the procedures and documentation can be performed on, and used for, both sensors.

The Sensor cable plugs into the Sensor connector on all models of the WXT and WMT.

The User port settings are those that apply to communications via the Sensor connector.

## Use with Non-IridiumLink Systems

The sensor will be set up for 1-min averaging and reporting via the serial interface with either 15 second reporting (when sending to MetService weather station ingest server) or 1-min reporting (for local on-site message sensing e.g. to iSTAR or mSTAR or other).

Fill out the parts of the **WXT Setup** record that are relevant for the sensor.

## Use with IridiumLink AWS

The IridiumLink uses the WMT as a wind sensor (10-min averaging and 1-min reporting set within WMT) via the SDI-12 addressed interface. Note the special Wind Message settings required for wind polling command to work.

Refer to the **IridiumLink AWS Setup** document for the relevant **AWS Status Table** (DO NOT use the AWS Status Table in this document).

Fill out the parts of the **WXT Setup** record that are relevant for the IridiumLink.

# Unique Sensor Address and Port Setup

## Sensor Port Setup

MetService uses ‘COM 2’ for RS232 or RS485 data communications.

## Sensor Address

WXT/WMT messages provide a one character Sensor Address as the first character in the message. The address character can be A...Z, a...z, 0...9 providing for 62 unique station addresses. MetService sets the address character to "A" for non-IridiumLink systems (RS-232 and RS485), and to “0” for IridiumLink systems (SDI-12).

## Identifying a Station (ICAO and WMO Identifiers)

The sensors include a programmable string that can be included immediately before the checksum at the end of the sensor message. This string must be programmed with the station ICAO identifier followed by a "**\***" (to clearly delimit the checksum).

MetService ingest software identifies the station that data messages came from using the ICAO identifier programmed into the string as described above.

For IridiumLink SDI-12 the ICAO identifier is not required in the WMT/WXT settings as it is handled in the IridiumLink settings (See the IridiumLink Setup document).

# MetService AWS Ingest Server Setup

For a WXT the station height and barometer height must be entered into the STATION.TABLE file so that MSL, QFE and QNH pressure can be calculated by the message ingest system.

You will need at least the following additional information to set up a new station:

* Station and barometer height

## Info: WXT Ground Temperature (Tr) Decoding to 1 Minute Data

The WXT536 can report one in-ground temperature (Tr).

This parameter is used ONLY FOR 2cm Road Temperature OR 10cm Soil Temperature.

The Kelburn ingest processing for WXT messages uses the Station.Table "Groups" switch, and the AWS\_STATUS.Table "E05cm" and "E10cm" switches, to identify where the WXT message Tr temperature value is decoded to. The configuration instructions for the two tables are included in the appropriate sections below.

For information the filing algorithm in psuedo code form is as follows...

For WXT ingest format messages (i.e. Station.Table item "WXT\_WMT" is not blank)...

If Station.Table row with Id=ICAO... "Groups" does contain "RD" Then

If AWS\_STATUS.Table "E05cm" = Y then

1 minute ingest Road\_T3\_01MnAvg = Tr

EndIf

Else (Station.Table row with Id=ICAO... "Groups" does NOT contain "RD") Then

If AWS\_STATUS.Table "E10cm" = Y then

1 minute ingest Earth10\_01MnAvg = Tr

EndIf

EndIf

In table form the filing algorithm is as follows...

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Station.Table  row Id=ICAO  Groups | AWS\_STATUS.Table  E05cm | AWS\_STATUS.Table  E10cm | 1 minute Output  Road\_T3\_01MnAvg | 1 minute Output  Earth10\_01MnAvg |
| RD | Y | - | Tr | x |
| RD | N (or blank) | - | x | x |
| No RD | - | Y | x | Tr |
| No RD | - | N (or blank) | x | x |

- means don't care i.e. can be Y, N or blank

x means none i.e. no data value

RD means the string "RD" is entered into the "Groups" field for Station.Table row with Id=ICAO.

No RD means the string "RD" is not entered into the "Groups" field for Station.Table row with Id=ICAO.

After turning a data parameter on/off it takes about two minutes for the 1 minute data parameter to appear/disappear.

After switching between output data parameters (Road\_T3\_01MnAvg <-> Earth10\_01MnAvg) it takes about one minute for the old data parameter to disappear then up to 15 minutes for the new data parameter to appear.

## Setup: AWS\_STATUS.TABLE

You can only perform this process using DoTable (AWS\_STATUS).

On a WinTel computer find and run the application **thunder\ops\_pc\DoTable\DoTable.exe**

|  |  |
| --- | --- |
| Connect to **MetJet**...  (MetJet or MetCat will both work) | ...and select the table **AWS\_STATUS** |

|  |
| --- |
| Find the station you want to modify and highlight it, or select **+** to create a new one. |

|  |  |
| --- | --- |
| Click the icon to modify the selected or new record.    Make the required changes/entries on the form that appears. Example shown on the right.  The parameters should be set as shown in the panel on the right, with the following items changed to reflect individual station settings:  • IIiii (WMO identifier)  • ICAO (ICAO identifier)  • NWnumber (Climate identifier)  • WXT/WMT Sensor address:port number (this item is no longer used but if the menu item is available enter the value "A:50004") |  |

If setting up a WXT536 model and a ground temperature sensor is being installed then

If the sensor is on a road and is at a depth of 2 cm then

In the table row for the sensor set E05cm = "Y" and E10cm = "N"

If the sensor is not on a road and is at a depth of 10 cm then

In the table row for the sensor set E05cm = "N" and E10cm = "Y"

|  |  |
| --- | --- |
| To finish up and save all modifications you must close the program and when prompted to Update the Changes, click the Yes button. |  |

## Setup: STATION.TABLE

You can only perform this process using DoTable (STATION.TABLE).

On a WinTel computer find and run the application **thunder\ops\_pc\DoTable\DoTable.exe**

|  |  |
| --- | --- |
| Connect to **MetJet**...  (MetJet or MetCat will both work) | ...and select the table **STATION**  Station File |

|  |
| --- |
| Find the station you want to modify and highlight it, or select **+** to create a new one.  Main |

|  |  |
| --- | --- |
| Click the icon to modify the selected or new record.    Make the required changes/entries on the form that appears. Example shown on the right.  For a WXT the station height and barometer height MUST be entered so that MSL, QFE and QNH pressure can be calculated by the message ingest system.  The parameters should be set as shown in the panel on the right, with the following items changed to reflect individual station settings:  • Id (WMO identifier)  • Name  • Lat and Long  • AltID (ICAO identifier)  • Cistern Level and Station Level  • Ingest | Station Record |

If setting up a WXT536 model and a ground temperature sensor is being installed then:

If the sensor is on a road (at a depth of 2 cm) then

In the table row with Id=ICAO (alphabetic characters)...

make sure the "Groups" field DOES contain "RD" (use comma separators if needed).

If the sensor is not on a road (at a depth of 10 cm) then

In the table row with Id=ICAO (alphabetic characters)...

make sure the "Groups" field DOES NOT contain the text "RD".

|  |  |
| --- | --- |
| To finish up and save all modifications you must close the program and when prompted to Update the Changes, click the Yes button. | Save |

## How to Confirm WXT/WMT Messages are Received at Kelburn

WXT/WMT 1 minute message communications and data can be viewed from <http://aws-proc/aws.html>

# WXT5xx and WMT5xx Modifications

## Replacement of Service Port Connector Cap

The existing connector cover is prone to letting water and chemicals in and is to be replaced.

### You Will Need

* One 5 mm diameter plastic tyre valve with internally fitted rubber seal (available from bicycle or automotive spare parts stores).

### Modify the WXT/WMT

|  |  |
| --- | --- |
| * Find the M8 connector (Service Port) on the base of the WXT/WMT. * Remove the existing connector cover. * Screw on the new plastic tyre valve (shown in the picture) so that it is firmly finger tight. |  |

# WXT/WMT Pre-install Setup and Test

## You Will Need

The WXT/WMT may be communicated with and set up using either the Sensor Cable only, or the Service Cable and Sensor cable. This document is written for the method using the Service Cable and Sensor Cable as this allows both the setup and message send monitoring to be performed at the same time.

You will need…

* WXT/WMT Service Cable.
* WXT/WMT Sensor Cable with... DB9 female to female null modem.
  + - * or WXT/WMT Sensor Cable with... RS485-to-RS232 converter and DB9 female to female null modem.
      * or WMT cable wired for SDI-12 IridiumLink use.
* If WXT536 external analogue sensors are implemented: cable and plug to Analogue Input socket
* Suitably rated power supply.
* Computer with a serial port, and running the programs:
  + - * Vaisala Configuration Tool
      * A terminal communications program e.g. HyperTerminal (or Vaisala Online Monitor)
      * Note: Both Vaisala programs are installed using WXT WMT Software... Installer. The MetService licence key is in the software installer folder. Refer to the latest CD PC Tools for the software package.
* A pre-configured WXT/WMT station preference file (WXTxxx\_NZxxx.wxc or WMTxxx\_NZxxx.wxc) or the default preference file (WXT\_WMT\_v2\_Default.wxc).

**Do NOT check actual values while the WXT/WMT Service Cable is connected**

**as some voltages are affected while it is connected.**

### WXT/WMT Service Cable

This is supplied by the manufacturer with the sensor.

One end: DB9 female and back entry 9 volt battery connector

Other end: Flat 4 pin rectangular female connector

### WXT/WMT Sensor Cable

This is supplied by the manufacturer with the sensor.

For RS232 a DB9 connector will need to be fitted to the cable flying leads either directly in the case of a bench test cable (see below), or through the Gas arrestor board when testing field installations (refer to the WXT/WMT Site Wire drawing V1).

Sensor end: Round female 8 pin M12 (screw shroud) connector

Other end: Power Supply: Brown: +12 vdc (5 to 30 vdc)

PSU Ground Options: Clear: Power Ground and Cable Shield

Or Red: Power Ground and Black: Cable Shield.

RS232 DB9 male: White to 2, Blue to 3, Green to 5, Loop 4 to 6

For RS485 use Blue(Data –), Slate (Data +), Green (Data Ground)

For SDI-12 use White(Rx) & Blue(Tx) joined

Heating Option: Yellow: +12 vdc (9.6 to 14.4 vdc), Pink: Ground.

Note: The RS232 DB9 male connector is wired to allow direct connection of the WXT/WMT Sensor Cable to a communications interface. A female-to-female null modem is required to connect the cable to a computer.

### WXT/Analogue Sensor Cable

If an external analogue sensor (tipping bucket, solar sensor etc.) will be connected to a WXT536 then refer to the WXT530 instruction manual and see 8-pin socket location in under Analogue Input Interface, and the table for input pin wiring under Analogue Input Signals.

|  |  |
| --- | --- |
| Aux Temperature (pt1000) | PTI+ Pin 1  PT+ Pin 2  PT- Pin 3 |
| External Tipping Bucket | AGND Pin 4  TIP IN Pin 5 |
| Solar - LiCor with UTA | SR+ Pin 6  SR- Pin 7 |

### Power Supply

**ONLY apply power to one of:** WXT/WMT Service Cable 9 volt battery connector OR WXT/WMT Sensor Cable power.

No heating: Use a nominal 12 vdc (5 to 30 vdc), ≥ 100 mA power supply.

With heating: Use a nominal 12 vdc (9.6 to 14.4 vdc), ≥ 1.2 A power supply.

## Set up the hardware

### Check the Marine Grounding Jumper (WXT520 only)

For ALL MetService installations the sensor Earth must NOT be connected to the sensor signal ground.

|  |  |
| --- | --- |
| Connect the appropriate WXT/WMT Sensor Cable (for RS232 or RS485 or SDI-12) to the Sensor connector.  Do NOT connect anything to the other end of the cable.  Use a multimeter and check that the circuit between the signal ground (sensor cable shield) and the sensor mounting bayonet is open circuit (this is the normal factory default).  If the circuit was not open circuit then:   * Loosen the three long screws at the bottom of WXT520. * Pull out the bottom part of the transmitter. * Move the grounding jumper to 2 - 3. See (1) in the picture. * Replace the bottom part and tighten the three screws. To make sure that the radiation shield stays straight, do not tighten the screws all the way in one go or over tighten. | WXT Jumper 1 |

Connect the WXT/WMT Sensor Cable brown and power supply ground wire (NOT the shield wire) to a 12 vdc power supply current limited to 200mA.

Connect the WXT/WMT Service Cable to the Service connector on the sensor base and the other end to a computer RS232 serial port. The battery connection will NOT be used.

Check that the WXT/WMT has been set up for serial RS232, SDI-12, and RS485 operation as follows:



## Program the WXT/WMT

### General

In the setup record the following terms are used:

\_ an underscore is used to represent ASCII space.

√ means "on" or a ticked check box.

- means don't care.

If you cannot communicate with the sensor refer to the User Guide for further ideas.

 The program menu item Show Timing Controls will not be used as part of the sensor setup, however it may be used as a hardware diagnostic tool providing more rapid data updates (averaging times and update intervals of 1 second are recommended).

 The program menu item Test Monitor will not be used as part of the sensor setup, however it may be used as a hardware diagnostic tool providing more rapid data updates than the normal 1 minute message output interval (15 seconds is recommended).

 The program menu item Display Composite Message will not be used as part of the sensor setup, however it may be used as a hardware diagnostic tool providing a display of the sensor real time elements.

The WXT/WMT will NOT send messages out the WXT/WMT Sensor Cable

port while the WXT/WMT Service Cable is connected.

### Messages Settings output and Configuration Tool control

Using the Configuration Tool, the Menu item Message Settings  controls the contents in the ASCII serial and SDI-12 message outputs. Follow carefully the Setup record fields.

It should be noted that within Message Settings:

* Each grey boxed group is a numbered message group and if any of the parameters are enabled, the Address and message number will appear out the data port on a new line as a separate message. For example the Composite Message is message 0. The number appears after the address, e.g. ‘Ar0’.
* The SDI-12 interface for IridiumLink will use the Wind message (top left) as this enables the message output for the 0R1! command.
* The Composite Message settings also affects the enabling of live values in the Configuration Tool display. Otherwise live data will be greyed out if the sensor is not ticked.
* IridiumLink will not be affected if both of the Wind Message and Composite Message wind settings are left on as data is polled via the 0R1! command type and delivered separately in the SDI-12 wire configuration.

### Perform the Setup Process

Work through the section Setup Record: WXT/WMT.

## Check the WXT/WMT Operation

### Service Port:

Disconnect the WXT/WMT Service Cable from the sensor and the computer.

### Data Port:

Connect the WXT/WMT Sensor Cable to the computer (the cable should already be connected to the sensor with power supplied to the sensor through it (see above).

If necessary change the port settings in HyperTerminal to the Com port and port settings (9600 or 1200, 8 data bits, no parity, 1 stop).

For sensor use with the IridiumLink: set the baud rate to 1200, 7 data bits, even parity, 1 stop bit.

Once every 15 or 60 seconds (depending on the communications configuration) a message like the following should appear (do NOT check actual values at this point as some voltages are affected by the connection of the WXT/WMT Service Cable).

Work through the document WXT/WMT Field Test Sheet.doc.

To increase the reliability of message throughput for Network communications (e.g. cellular, IPSTAR, Internet) messages are sent every 15 seconds. Local connections (e.g. RS232, radio link, short haul modem) have a message send rate of once per minute.

### Typical Message Examples:

Checksums are not correct in the following (all shown as ???).

WXT520...

|  |
| --- |
| Ar0,Dn=249D,Dm=274D,Dx=289D,Sn=2.4M,Sm=3.3M,Sx=4.1M,Ta=11.3C,Tp=11.2C,Ua=76.9P,Pa=893.8H,Rc=0.00M,Hc=0.0M,Th=11.7C,Vh=0.0N,Vs=14.1V,Vr=3.546V,Id=NZWOX\*???<cr><lf> |

WXT534...

|  |
| --- |
| Ar0,Ta=11.3C,Tp=11.2C,Ua=76.9P,Pa=893.8H,Rc=0.00M,Hc=0.0M,Th=11.7C,Vh=0.0N,Vs=14.1V,Vr=3.546V,Id=NZWOX\*???<cr><lf> |

WXT536 (values may be out of range when analogue sensors disconnected)

Ar0,Dn=095D,Dm=017D,Dx=180D,Sn=0.0M,Sm=0.1M,Sx=0.2M,Ta=23.0C,Tp=23.5C,Ua=35.6P,Pa=996.3H,Tr=51.9C,Ra=0.6M,Sl=0.001274V,Sr=0.011573V,Rt=27919.2R,Th=23.2C,Vh=0.0N,Vs=9.7V,Vr=3.616V,Id=XYZ\*???<cr><lf>

WMT52, WXT532 using RS232 or RS485 i.e. not SDI12...

|  |
| --- |
| Ar0,Dn=071D,Dm=100D,Dx=125D,Sn=3.0M,Sm=4.8M,Sx=6.5M,Th=16.8C,Vh=13.7N,Vs=13.8V,Vr=3.514V,Id=NZDBX\*???<cr><lf> |

WMT52, WXT532 SDI-12 for IridiumLink may be like…

0+345+039+149+0.8+1.3+1.8+20.4+0.0+12.7+3.500+NZFWW\*

## Finish off

Quit the program HyperTerminal.

Archive the configuration file to the main station archive server.

Put the record documents to the appropriate files.

## Test the WXT/WMT with a Target Communications Interface

Set up the communications interface (e.g. Cellular modem, D-Link router, IPSTAR User Terminal) as required for operation on the MetService target communications network.

For IridiumLink see the IridiumLink Setup documents for testing a WXT/WMT with SDI-12. The system polls the sensor for all its data parameters when required (e.g. SDI-12 command used: “0R1!” )

Change the modem serial port baud rate to the value configured in the WXT/WMT Device Settings/User port settings (probably 1200 or 9600).

Connect the WXT/WMT Sensor Cable to the target system.

Make sure the target system communications interface has the correct network destination IP address and port for operation with a WXT/WMT - refer to the document and drawing AWS and LDN IP Network.

Power reset the communications interface.

Check that the communications interface is indicating a successful connection.

Confirm WXT/WMT Messages are Received at Kelburn ingest server.

The sensor is now ready for installation.

# Installing a WXT/WMT System

NOTE: The WXT acoustic rainfall detector is susceptible to vibration. For this reason, the rainfall detector is not implemented in the MetService network.

Refer to the WXT/WMT System Generic Site Wiring Diagram as required.

Install the WXT/WMT Base Plate or WXT/WMT Cabinet (and the communications interface and appropriate power supply), and the solar panel or mains power connection.

Check that the power supply is functioning and the battery is charging.

Connect the communications interface to the power supply (plug in the interface power connector) and plug in its serial communications connector.

Check that the communications interface is indicating a successful connection.

Mount the WXT/WMT sensor onto the required structure. If possible the sensor should be to the prevailing wind side of any nearby masts or other structures that may affect the sensor measurements. Ensure that the sensor North marker is correctly aligned to True North.

Ensure that the sensor Earth is connected to site Earth: Either...

* By screwing the fixing screw (mounting bolt) into a mast or pole that is earthed OR...
* If the mounting mast or pole is not earthed then using a bushing and grounding kit and a suitable length of 16 mm2 (AWG 5) earthing wire, connect the sensor chassis to the site Earth.

Connect the sensor cable to the base of the sensor and apply appropriate water proofing.

If external sensors are implemented (WXT536 only) run the external sensor cable down the mast, into the cabinet and connect to the WXT/WMT base plate GFSA card connectors (use the lower GFSA).

Run the WXT/WMT Sensor Cable down the mast and into the cabinet.

Connect the WXT/WMT Sensor Cable serial data to the field computer using the appropriate null modems or converters.

Connect the WXT/WMT power supply leads to the target system.

Using HyperTerminal confirm that the WXT/WMT is sending messages once a minute, and use the WXT/WMT Field Test Sheet.doc to confirm that all data channels are functioning and the data is sensible.

Remove the WXT/WMT Sensor Cable serial data to the field computer connection and connect the WXT/WMT to the target system.

Confirm WXT/WMT Messages are received at Kelburn and that all required data fields are decoded.

Notify the appropriate operations staff and customers that the system is operational.

Photograph the installation, write an installation report and circulate it.

# Setup Record: WXT/WMT

|  |  |
| --- | --- |
| Done by / Date... | Serial Number… |
| Sensor Model... WXT\_\_\_\_\_\_\_ / WMT\_\_\_\_\_\_\_ | Software Version… |
| Grounding Jumper (WXT only)... Removed | Address… |

**WARNING: The Service port MUST be used when changing the Data port baud rate.**

**Do NOT try to change the Data port settings through the Data port.**

Connect the computer to the sensor **Service connector**.

Connect power to the sensor using the **Sensor connector**.

Run the program Vaisala Configuration Tool (WXTConf.exe).

Click the Connection Setup icon  and select...

* Connect Using Which ever computer Com port is connected to the sensor
* Service Port Settings 19k2,8,None,1
* Polling Interval 3 s

Establish communications...

* When the program is communicating with the sensor the message ‘Connected’ with a time duration will be displayed in the bottom left corner.
* If necessary check cables and change port settings to establish a link.

Using a pre-configured WXT/WMT station preference file (WXTxxx\_NZxxx.wxc or WMTxxx\_NZxxx.wxc) or the default preference file (WXT\_WMT\_v2\_Default.wxc).click the Profile Manager icon  and...

* Change Folder to the folder containing the default WXT/WMT sensor preferences file and highlight the appropriate Profile file.
* Click Write to device to send the file to the sensor. The button will only be enabled if you are connected to a sensor.
* After you get All values successfully updated, Close the window.

Work through and fill in the table on the next page.

Click the Profile Manager icon  and...

* Change Folder to the folder containing the saved WXT/WMT sensor preferences files.
* Click Read from device to Read the preferences from the sensor. The button will only be enabled if you are connected to a sensor.
* Click Save as then enter an appropriate file name e.g. WXT\_NZAABC or WMT\_NZAABC and save the file. The Save as button will only be enabled if you are connected to a sensor.

Quit the program Vaisala Configuration Tool.

Known Bug: After doing a Save, the Composite Message / Auto Report Interval may become blanked. Ignore this for the time being.

## WXT/WMT Settings

WARNING: Not all preferences are saved to the .wxc file. ALWAYS reconfirm ALL preferences.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Click the Device Settings icon | Non-IridiumLink | IridiumLink  (wind only) | Ok |
| Device | Model  Version: WXT510 ≥1.13, WXT520/WMT52 ≥ 2.13, WXT53X ≥ 3.5  Calibration date  Info (ICAO ID)  Serial number  PTU serial number  Order code  Address | \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  NZ\_\_\_\_\_\_\_\_\*  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  A | \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  NZ\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_  0 |  |
| Enhancements | Enable heating: Mains power = √ or off, solar power = off  Error messaging  Composite message auto transmission  Sending to MetService Weather Station ingest system  Supervision interval  Auto composite interval  Sending to local on-site system (e.g. iSTAR, mSTAR, other)  Supervision interval  Auto composite interval | √ or off  off  √  15 s  15 s  60 s  60 s | off  off  off  15 s  15 s |  |
| Communications Protocol | SDI-12  Continuous measurements  NMEA  ASCII auto  Polling only  Response with CRC | off  off  off  √  off  √ | **√**  **√**  -  -  -  - |  |
| User port settings | Port type  Port setup: Cellular modem or iSTAR or UDS1100  Port setup: Radio modem or Short Haul Modem  RS-485 line delay (mS)  IridiumLink SDI-12 Port: | RS-232 RS485  9600,8,None,1  1200,8,None,1  *disabled* | SDI-12  -  -  -  1200,7,E,1 |  |
|  | Click the Sensor Settings icon | MetService  Network Value | IridiumLink  (wind only) | Ok |
| Wind^^ | Gust Averaging  Speed unit  Sampling frequency  Direction correction  Averaging time  Update interval | 3 sec  m/s  4 Hz  0  1 min  1 min | 3 sec  m/s  4 Hz  0  10 min  1 min |  |
| PTU^^ | Temperature unit  Barometric pressure unit  Update interval | Celsius  hPa  1 min | -  -  - |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Click the Analogue Inputs icon | MetService  Network Value | IridiumLink  (wind only) | Ok |
| Precipitation^^ | Counter reset  Rain unit  Hail unit  Auto report based on  Rain Overflow Reset  Hail overflow reset  Auto report interval | Automatic  Metric  Metric  Time  *disabled*  *disabled*  1 min | -  -  -  -  -  -  - |  |
| Solar Radiation (LiCor 200SA)^^ | Solar radiation and aux level averaging time (s)  Solar radiation gain  Gain = Resistor (100 ohm) x 100,000 / Cal Const uA/kW/m2,  e.g. for R = 100 ohms and Cal Const = 70 uA/kW/m2,  Gain = 100 x 100,000 / 70 = 142857 | 1 minute  \_\_\_\_\_\_\_\_ | off  off |  |
| Auxiliary Level (snow)^^ | Auxiliary level range (0 = 2.5V, 1 = 5V, 2 = 10V) | - | off |  |
| Auxiliary Temperature (5cm Road or 10cm Soil)^^ | Aux temperature averaging time (sec) | 60 | off |  |
| Auxiliary Rain Sensor (tipping bucket)^^ | Aux rain counter reset (M=no reset, L=limit based, A=automatic)  Aux rain counter limit  Aux rain gain (mm/tip, ≥ 0.1) | L  4999.9  0.2 | off  off  off |  |
|  | Click the Message Settings icon | MetService  Network Value | IridiumLink  (wind only) | Ok |
| Wind message^^ | Wind Direction: minimum average maximum  Wind Speed: minimum average maximum | off off off  off off off | √ √ √  √ √ √ |  |
| PTU message | Barometric message Pressure ref temp  Air temperature Relative humidity | off off  off off | off off  off off |  |
| Precipitation message | Rain accumulation  Hail | off  off | off  off |  |
| Analog input message | Solar Radiation  Aux Temperature  Aux pt1000 resistance  Aux Level  Aux Rain | off  off  off  off  off | off  off  off  off  off |  |
| Self-diagnostic message | Heating Temp. Heating voltage Supply voltage  3.5V reference Info | off off off  off off | off off off  off off |  |
| Composite message^^ | Wind Direction: minimum average maximum  Wind Speed: minimum average maximum  Barometric Pressure Pressure Ref. Temp  Air Temperature Relative Humidity  Rain: accumulation duration intensity peak  Hail: accumulation duration intensity peak  Solar Radiation  Aux Temperature  Aux pt1000 resistance  Aux Level  Aux Rain  Heating Temp. Heating voltage Supply voltage  3.5V reference Info | √ √ √  √ √ √  √ √  √ √  off off off off  off off off off  √  √  √  off  √  √ √ √  √ √ | √ √ √  √ √ √  off off  off off  off off off off  off off off off  off  off  off  off  off  off off off  off off |  |
|  |  |  |  |  |

**#** If WXT510 version < v1.13 or

WXT520/WMT52 version < v2.13 or

WXT53X version < v3.5

then return the sensor to Vaisala Australia for software upgrading.

^^ Some menu items will be unavailable due to the hardware configuration of the purchased model. Ignore those menu items that are not available.

End