

How to integrate the Vaisala WXT510/520/530 and the Septentrio PolaRx5 (Web User Interface)

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Configuring the Vaisala WXT510/520/530 Weather Transmitter

There are two ways to configure the Vaisala WXT510/520 Weather Transmitter:

1. Use the Vaisala configuration software and service cable; load the UNAVCO configuration file located at:
[/questions/306/Vaisala+WTX-510%7B47%7D520+config+file+ .](#)

OR

1. Use hyper terminal (or any other terminal emulation program) to configure the Vaisala WXT510/520 manually.

To configure the Vaisala using a terminal emulation program:

1. Connect to the Vaisala using the following settings:
 - Baud: 19200
 - Parity: None
 - Flow Control: None
 - Edit the hyper terminal ASCII settings:
 - check box for "send line ends for line feed"
 - check box for "Echo typed characters locally"
 - check box for "Append line feed to incoming line ends"
2. With the terminal connection established, power up the Vaisala. You should get a "0X0, start" message.
3. Use the following commands to configure the WXT510/520:
 - 0XU,M=Q,C=2 (This should set the WXT510 to NMEA polled, RS232 communication)
 - 0TU,R=&11010000,I=180,P=B,T=C (This should set the pressure units to bar and temperature to Celsius)
 - 0RU,R=&10000000U=M,Z=A (This sets the precipitation units to mm/hr and counter reset)
 - 0WU,R=&01001000 (These next two commands sets wind averaging, units, and output values)
 - 0WU, I=180,A=180,U=M,F=1
 - 0SU,R=&00000000 (This removes the system status elements from the output values)
 - 0XU,M=P (to change the communication protocol back to ASCII)

1. Verify the Vaisala is enabled:

- Issue a "OR0" command.
- The met pack is set to output the following string:

```
OR0,Dm=076D,Sm=0.1M,Ta=24.4C,Ua=20.9P,Pa=0.8429B,Rc=0.00M,Hc=0.0M
```

where:

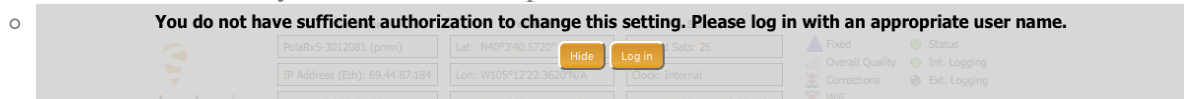
OR0 - the command that is sent
Dm - wind direction, degrees
Sm - wind speed, m/s
Ta - temperature, degree C
Ua - humidity, percent
Pa - barometric pressure, Bar
Rc - rainfall, mm/sampling period (reset at each measurement)
Hc - hail, hits/sampling period (reset at each measurement)

Configuring the Septentrio PolaRx5

Note: If using a WXT530, you must update the receiver firmware to 5.4.0

Configuring the PolaRx5 using a telnet connection

- Connect to the receivers Web User Interface with a browser (Firefox works best)
- Login to the receiver with your username and password



- Navigate to Communication -> Serial Port. Here we choose to configure the serial port COM2 to communicate with the met device.
- Select a baud rate of 19200, 8 bits, no parity, 1 stop bit, and no flow control. **Make sure to click OK when finished with your selection.**



Receiver	Position	Status
PolarX5-3012081 (pnnn)	Lat: N40°3'40.5720" N/A	Tracked Sats: 26
IP Address (Eth): 69.44.87.184	Lon: W105°12'22.3620"N/A	Clock: Internal
Uptime: 5d 22:07:39	Hgt: 1571.267m N/A	Temp: 44 °C — V: 12.23 volts

- Fixed
- Overall Quality
- Status
- Corrections
- Int. Logging
- Wifi
- Ext. Logging

- Overview
- GNSS
- Station
- Communication
- Corrections
- NMEA/SBF Out
- Logging
- Admin

Communication > Serial Port

COM Port Settings

	COM1	COM2	COM3	COM4
Baud Rate	115200 baud	19200 baud	115200 baud	115200 baud
Data Bits	8 bits	8 bits	8 bits	8 bits
Parity	No	No	No	No
Stop Bits	1 bit	1 bit	1 bit	1 bit
Flow Control	none	none	none	none

Default Ok

- Navigate to Corrections -> Input.

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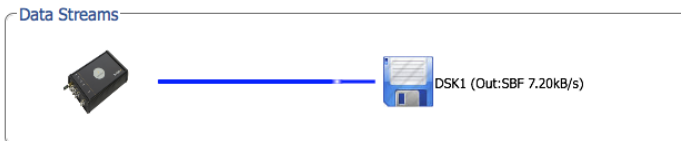
Receiver	Position	Status
PolarX5-3012081 (pnnn)	Lat: N40°3'40.5720" N/A	Tracked Sats: 25
IP Address (Eth): 69.44.87.184	Lon: W105°12'22.3620"N/A	Clock: Internal
Uptime: 5d 22:12:59	Hgt: 1571.267m N/A	Temp: 44 °C — V: 12.18 volts

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Corrections > Corrections Input

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Input Streams

Input

COM1	auto
COM2	ASCIIN
COM3	auto
COM4	auto
USB1	auto
USB2	auto
IP10	auto
IP11	auto
IP12	auto
IP13	auto
IP14	auto
IP15	auto
IP16	auto
IP17	auto
NTR1	auto
NTR2	auto
NTR3	auto
IPR1	auto
IPR2	auto
IPR3	auto

Advanced Settings

Default Ok

- o In the dropdown menu select ASCIIIN. This allows the COM2 serial port to accept ASCII strings as input. **Make sure to click OK when finished with your selection.**

- Navigate to Station -> External Sensor.

The screenshot shows the Septentrio web interface for station configuration. At the top, there are three main sections: Receiver, Position, and Status. The Receiver section shows 'PolarX5-3015983 (pton)', 'IP Address (Eth): [redacted]', and 'Uptime: 1497d 06:16:21'. The Position section shows 'Lat: N40°20'44.9220" N/A', 'Lon: W74°39'17.0530" N/A', and 'Hgt: 46.692m N/A'. The Status section shows 'Tracked Sats: 33', 'Time: 2021-03-11 05:12:18', and 'Temp: 49 °C — V: 12.75 volts'. Below these sections is a navigation bar with tabs for Overview, GNSS, Station, Communication, Corrections, Data Output, Logging, and Admin. The 'Station' tab is selected, and the page title is 'Station > External Sensor'. The main content area is titled 'ASCII Input' and contains a text area with the following text:

```
[COM2][05:11:00] OR0,Dm=114D,Sm=2.4M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:11:45] OR0,Dm=109D,Sm=0.9M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:11:50] OR0,Dm=148D,Sm=0.6M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:11:55] OR0,Dm=172D,Sm=0.3M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:12:00] OR0,Dm=060D,Sm=0.6M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:12:05] OR0,Dm=058D,Sm=0.9M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:12:10] OR0,Dm=044D,Sm=0.5M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
[COM2][05:12:15] OR0,Dm=084D,Sm=1.4M,Ta=9.0C,Ua=83.5P,Pa=1.0191B,Rc=0.00M,Hc=0.0M
```

Below the text area are 'Clear' and 'Freeze' buttons. Underneath is the 'Enable ASCII Input' section with radio buttons for COM1, COM2 (selected), COM3, and COM4. Below that is the 'Set Periodic Echo' section with a table for configuring the message and interval for each COM port. The table is as follows:

	COM1	COM2	COM3	COM4
Message	A:Unknown	A:OR0%%CR%%LF	A:Unknown	A:Unknown
Interval	off	sec5	off	off

At the bottom of the 'Set Periodic Echo' section are 'Default' and 'OK' buttons.

- Enable ASCII Input for the serial port where the met device will be connected (COM2 in the example).
- Add the ASCII message that will be sent to the receiver (A:OR0%%CR%%LF).
 - The 'A:' tells the receiver that you will be sending an ASCII string from COM2
 - The 'OR0' is the command that will tell the met device to make a measurement.
 - The '%%CR%%LF' correctly terminate the 'OR0' command.
- Select the desired interval for your measurement (usually something like 5min).
- **Make sure to click OK when finished to save your selection.**
- If the me device is connected and functioning, you should start seeing the response in the ASCII Input window.
- If you selected a 5min interval you may have to wait a little while to see the first response.

- Navigate to Logging -> Log Sessions.



Receiver	Position	Status
PolaRx5-3012081 (pnnn)	Lat: N40°3'40.5720" N/A	Tracked Sats: 23
IP Address (Eth): 69.44.87.184	Lon: W105°12'22.3620"N/A	Clock: Internal
Uptime: 5d 22:30:06	Hgt: 1571.267m N/A	Temp: 44 °C — V: 12.23 volts

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Logging > Log Sessions

Disk Usage

Internal Disk (15.1 GB)
used (29%, 4.4 GB)
free (71%, 10.7 GB)

External Disk
Disk not present

Logging SBF
Unmount Format 500 MB/day

Log Sessions

ID	Name	Data	Auto-Delete	Disk	FTP		
LOG1	A	SBF	After 1 year	Internal			
LOG2	B	SBF	After 30 days	Internal			
LOG3	C	SBF	After 7 days	Internal			
LOG4	M	SBF	After 7 days	Internal			
LOG5	Unused	Create					
LOG6	Unused	Create					
LOG7	Unused	Create					
LOG8	STATUS	SBF	After 30 days	Internal			

- o Click the edit button for the logging session that you would like to add met logging to.
- o Click SBF Logging
- o Click to edit the stream for that session.

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Receiver	Position	Status
PolarX5-3012081 (pnnn)	Lat: N40°3'40.5720" N/A	Tracked Sats: 23
IP Address (Eth): 69.44.87.184	Lon: W105°12'22.3620"N/A	Clock: Internal
Uptime: 5d 22:33:36	Hgt: 1571.267m N/A	Temp: 44 °C — V: 12.23 volts

- Fixed
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Overview GNSS Station Communication Corrections NMEA/SBF Out **Logging** Admin

Logging > Log Sessions

Disk Usage

Internal Disk (15.1 GB)
used (29%, 4.4 GB)
free (71%, 10.7 GB)
Logging SBF 500 MB/day

External Disk
Disk not present

Edit SBF Stream

Interval 15 sec

Clear

Rinex

Support

RawData

PostProcess

GUI

Measurements

RawNavBits

GPS

GLO

GAL

GEO

CMP

- o Scroll down and select ASCIIIN.

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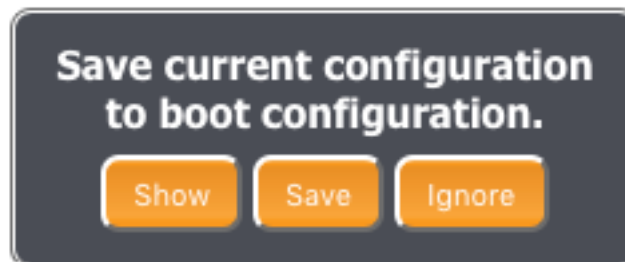
Edit SBF Stream

Interval 15 sec

<input type="checkbox"/> Event	<input type="checkbox"/>
<input type="checkbox"/> DiffCorr	<input type="checkbox"/>
<input type="checkbox"/> Status	<input type="checkbox"/>
<input type="checkbox"/> UserGroups	<input type="checkbox"/>
PosCart	<input type="checkbox"/>
ReceiverSetup	<input checked="" type="checkbox"/>
Commands	<input type="checkbox"/>
Comment	<input type="checkbox"/>
BBSamples	<input type="checkbox"/>
ASCIIn	<input checked="" type="checkbox"/>
RxComponents	<input type="checkbox"/>
PosProjected	<input type="checkbox"/>
RxMessage	<input type="checkbox"/>
DynDNSStatus	<input type="checkbox"/>

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- Select Apply
- Important Note: ASCIIn is a special record that ignores the logging interval. ASCIIn messages will log to the file when the receiver receives a response from the met device.
- **Now save your new settings to Boot!** (if you forget, your receiver will revert to it's previous state the next time it reboots)

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Using teqc to extract met records

Use the following command to create a met file:

```
teqc +met <filename>.met -M.obs pr+td+hr+ws+wd+ri+hi <filename>.sbf > <filename>.obs
```

where <filename>.sbf is the binary file that you pulled from the receiver,

and

<filename>.met is the ASCII file that contains the extracted met data,

and

<filename>.obs is the RINEX observation file extracted from the SBF file.

Online URL:

<https://kb.unavco.org/article/how-to-integrate-the-vaisala-wxt510-520-530-and-the-septentrio-polarx5-web-user-interface-847.html>