

Vaisala WXT510 Weather transmitter – SDI-12

Introduction

The Vaisala WXT510 is a weather transmitter for general purpose applications and is easily read by the *DT80* range of loggers.

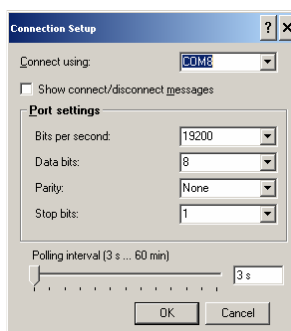
The *DT80* range loggers are designed to intelligently talk to the SDI-12 devices connected. This allows the user to simply select which measurement they want and the *DT80* will perform the measurement, wait and read data request transparently and present the requested data. The *DT80* range of loggers also enquire of the device as to what version of the SDI-12 standard the device has and configures itself to communicate in the best possible manner.

This makes the reading of SDI-12 devices simpler for the user who only needs to select the data item they require.

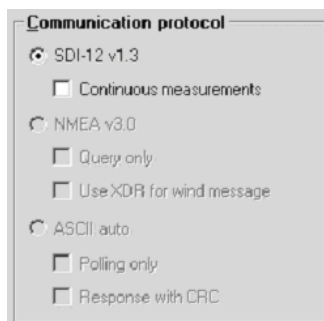
Requirements

WXT510 Configuration:

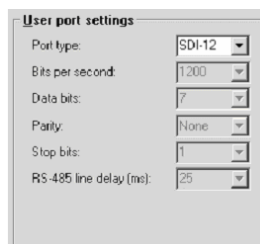
Connect service cable to WXT510 and connect to an RS232 port on your computer.
Run WXT510 configuration software.
Configure com port. File > connection set up and select com port



Settings > device > Check SDI-12



User port settings. Select SDI-12 click OK



Close software.
Disconnect Service cable.

Sensor Note

SDI-12

The *DT80* and *DT85* can communicate with four separate SDI-12 networks each connected to digital inputs 5, 6, 7 and 8. The *DT81* has one SDI-12 Network on digital input 4. Each SDI-12 network can have up to 10 SDI-12 devices each with a unique address in the range 0 to 9.

Wiring Configurations:

The wiring configuration to the *DT80* Series SDI-12 channels is as per table 1.

Wire Color	M12 Pin#	SDI-12	DT80 Series
Blue	7	Data in/out (Tx)	Digital 5, 6, 7 or 8 (1)
White	1	Data in/out (Rx)	Digital 5, 6, 7 or 8 (1)
Green	3	GND for data	D GND
Pink	6	GND for Vh+	External Power + (2)
Yellow	4	Vh+ (heating)	External Power – (2)
Red/Clear	8	GND for Vin+	D GND (3)
Brown	2	Vin+ (operating)	PWR OUT (3)

Table 1. Wiring configuration.

Notes:

1. Tx and Rx lines must be connected to the same digital input.
2. Must have a separate power supply if heating function is used.
3. There are three separate power options
 - External power to Brown to Power +, Red/Clear to Power -.
 - DT80 and DT85, 12V to Brown, D GND to Red/Clear.
 - DT85, PWR OUT to Brown, D GND to Red/Clear.

SDI-12 WXT510 Data

With SDI-12 each message, or register set, can have a number of items of data. For example the WXT510 message 2 (Register set 2) has three items of data Air Temperature, Relative Humidity and Air Pressure.

A summary of the WXT510 messages and data item is shown in table 2

Register	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8
Set 0	Composite message							
Set 1	Wind direction Min	Wind Direction Ave	Wind Direction Max	Wind Speed Min	Wind Speed Ave	Wind Speed Max		
Set 2	Air Temperature	Relative Humidity	Air Pressure					
Set 3	Rain Accumulation	Rain Duration	Rain Intensity	Hail Accumulation	Hail Duration	Hail Intensity	Rain Peak Intensity	Hail Peak Intensity
Set 4	Not Used							
Set 5	Heating Temperature	Heating Voltage	Supply Voltage	Reference Voltage				

Table 2. Summary of messages and data items.

Notes:

1. Register Set 0 - Composite message items will change depending on which items are selected. Refer to WXT510 manual for further details.
2. Register Set 4 is not used.

Resetting Counters

The WXT510 requires special commands to reset the rain accumulation and rain intensity counters.

1. nXZRUI Resets the rain accumulation counter.
2. nXZRRI Reset rain intensity counter.

Notes:

1. Resets both rain and hail counters.
2. n is the SDI-12 device number.

These commands can be sent using the *dataTaker* command SDI12SEND *m* "Command"
Where *m* is the digital channel of the SDI-12 network and *Command* is any valid SDI-12

command. The SDI-12 command must be enclosed in the double quotes. Refer to program below for example of usage.

Example Program:

This sample program

- Read all the standard messages from the WXT510 every one minute.
- Clear the counters every hour.
- Powers weather transmitter from the 12 VDC supply of the *dataTaker* data logger.
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BEGIN"WXT510"
1SSPWR=1 'Turn on power to WXT510

RA1M LOGONA GA 'Poll WXT510 every one minute
'Read all items from message 1
5SDI12(AD0,R101,"WindDirMin~Deg")           'Read Wind direction minimum
5SDI12(AD0,R102,"WindDirAve~Deg")           'Read Wind direction Average
5SDI12(AD0,R103,"WindDirMax~Deg")           'Read Wind direction Maximum
5SDI12(AD0,R104,"WindSpeedMin~m/s")         'Read Wind speed minimum
5SDI12(AD0,R105,"WindSpeedMin~m/s")         'Read Wind speed minimum
5SDI12(AD0,R106,"WindSpeedMin~m/s")         'Read Wind speed minimum

'Read all items from message 2
5SDI12(AD0,R201,"Air Temp~DegC")             'Read Air temperature
5SDI12(AD0,R202,"Humidity~%RH")             'Read Humidity
5SDI12(AD0,R203,"AirPressure~kPa")           'Read Air pressure

'Read all items from message 3
5SDI12(AD0,R301,"RainAcc~mm")                'Read Rain accumulation
5SDI12(AD0,R302,"RainDuration~Sec")          'Read Rain duration
5SDI12(AD0,R303,"RainIntensity~mm/hr")       'Read rain intensity
5SDI12(AD0,R304,"HailAcc~Hits/cm^2")         'Read Hail accumulation
5SDI12(AD0,R305,"HailDuration~Sec")          'Read Hail Duration
5SDI12(AD0,R306,"HailIntensity~Hits/cm^2h")  'Read Hail intensity

RB1H LOGOFFB GB 'Reset rain and rain intensity counters every 1 Hour
DO{SDI12SEND 5 "0XZRU!"}                     'Reset Rain counter
DO{SDI12SEND 5 "0XZRI!"}                     'Reset Rain Intensity counter

END
```

Note: When a register set is first read the message is loaded into a buffer and then each item of data can be read as required. As the WXT510 takes 15 seconds to read and return the data for each time a new register set is requested, it is best practice to read all the required data from each register set before requesting the next data set. Randomly accessing data from multiple register sets will greatly increase the sample time.