

ELT wM-Bus External Configuration Guide



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1. External Sensors

The ELT wM-Bus sensors can be connected to a wide array of external sensors, equipment, and modules. All connections to external gear are made available through the terminal block located on the top left of the circuit board inside the ELT wM-Bus. Available connections on the terminal block are power, ground, and either one or two multi-purpose input ports.

Slot	Designator	Explanation
1	B+	Power output
2	IN	Multi-purpose input 1
3	GND	Ground
4	IN2	Multi-purpose input 2

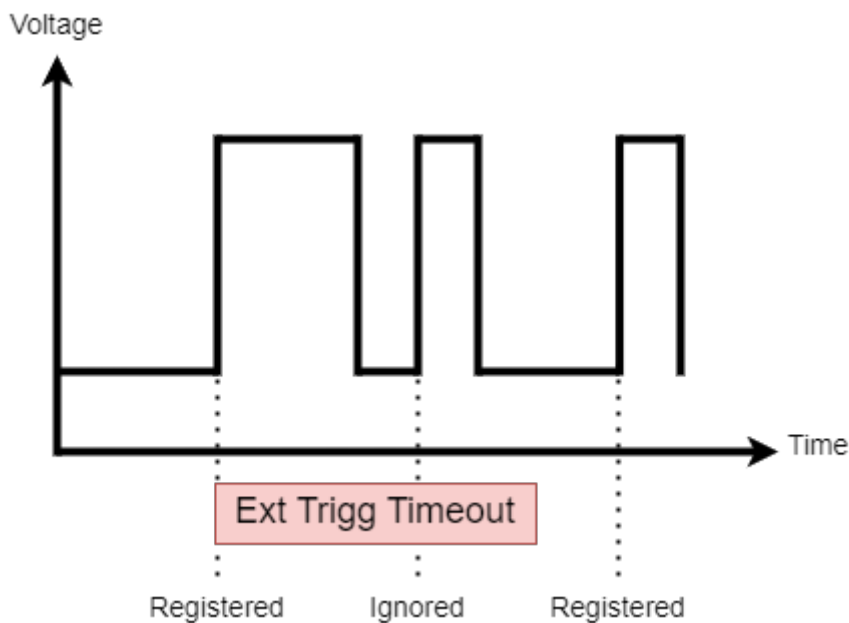
2. General External Sensor Parameters

All the following settings can be set using NFC and our app Sensor Settings.

External Configuration (ExtCfg): Sets the external sensor type.

Pulse VIF and VIFE (wPulseVif and wPulseVife): If Pulse input is selected in the Extern Configuration step, a custom VIF and VIFE can be selected, which will be sent in the telegram.

External Trigger Timeout (TriggTime): The amount of time in milliseconds from a trigger event to a new trigger being allowed. The External Trigger Timeout is used in the Pulse mode.



3. Power Output

The ELT wM-Bus sensor can power external sensors and modules using the B+ output on the terminal block. A default startup time is applied by the ELT wM-Bus, see section 5.2 for default startup times. The B+ output voltage is not regulated; it is directly tied to the + pole of the battery.

4. Module support

The ELT wM-Bus sensor has four ports on the terminal block and supports ELSYS modules which expand the functionality. Some modules are only operable with specific external configurations (see §5.1). Refer to module documentation for information and settings for module specific modes

Module	Description	ExtCfg Specific
EXT-module	Allows the ELT wM-Bus to be externally powered and to read higher voltage equipment (10-50 V).	No
ADC-module	Adds high precision ADC with 2- and 4-wire connectivity support.	Yes
PT100-module	ADC-module tuned for PT100 temperature probes.	Yes

5. External Configurations

The external configuration parameter (ExtCfg) sets the behavior of the multi-purpose input. The external configuration parameter can be set via NFC through the Sensor Settings app.

5.1 Supported External Configurations table

ExtCfg (decimal)	External Configuration	Required module
1	Analog Input (0-10 V)	
2	Pulse Input, pull-down	
3	Pulse Input, pull-up	
6	1-Wire temperature probe (DS18B20)	
12	Water leak	
16	Analog Input (0-3 V)	
17	PT1000	ADC-module
30	PT100	PT100-module
35	SHT4x	

5.2 Default Startup Times

Some external configurations apply default startup times that have been tuned for their specific application.

ExtCfg	External Configuration	Default Startup Time (ms)
6	1-Wire temperature probe (DS18B20)	1000
12	Water leak	0
26	PT1000	200
30	PT100	200
35	SHT4x	0

5.3 Analog Input

With the analog input modes set as external sensor type, the sensor will wake up on main time base and measure the voltage at the input.

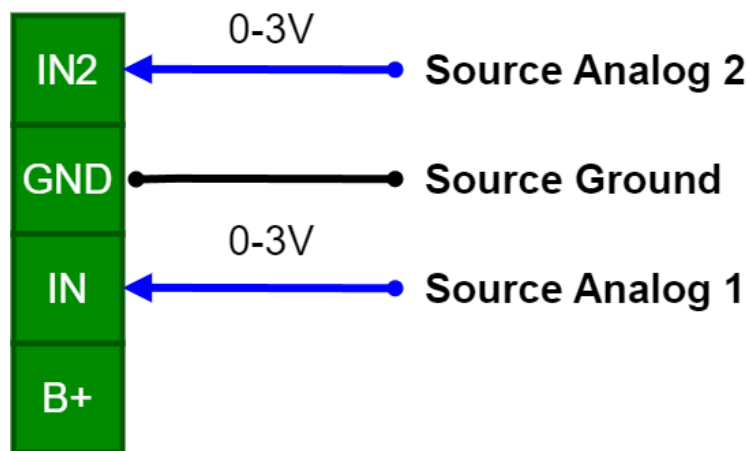
The sensor will sample both inputs.

The reported value will be the voltage in mV. It can be set to measure two voltage ranges, 0–3 V or 0–10V.

Note: Values for unconnected Analog inputs are undefined, meaning any number in the ADC may be reported for that channel. If a defined value is desired for unconnected inputs, connect a short jumper between the input and GND, which will result in the channel value being 0.

5.3.1 Analog Input 0-3 V

Connect positive lead to IN and negative lead to GND on the terminal of the ELT wM-Bus. A second source may be connected to the positive lead connected to input 2 and negative lead to GND. The input impedance is approximately 50 k Ω .

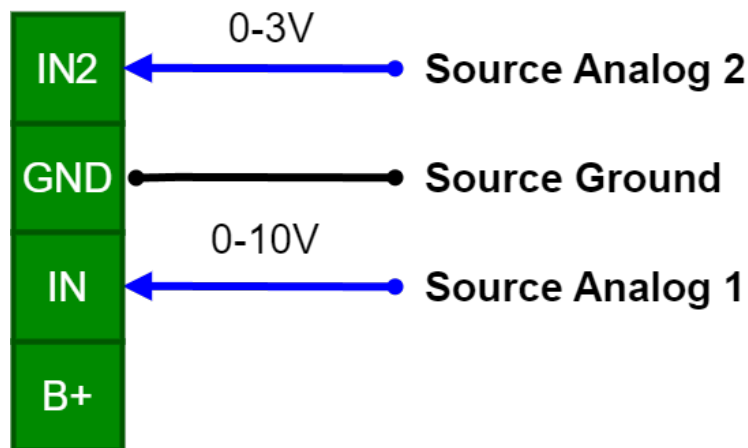


5.3.2 Analog Input 0-10 V

Connect positive lead to IN and negative lead to GND on the terminal of the ELT wM-Bus.

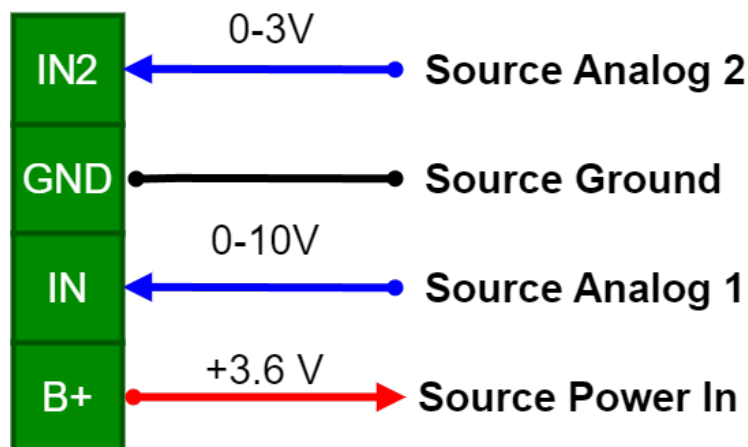
The input impedance is approximately 6.5k Ω on the IN terminal.

If the sensor has IN2, a second source may be connected to the positive lead connected to IN2 and negative lead to GND. IN2 is in 0-3 V range in this mode with an input impedance of approximately 50 k Ω .



5.3.3 Powered analog input 0-10 V

Connect positive lead to IN, negative lead to GND and the power to B+ on the terminal of the ELT wM-Bus. The time between power is applied to B+, and the ELT wM-Bus samples the input, can be set by the External startup time parameter.



5.4 Pulse Count

With any of the pulse counting modes set as external sensor type, the sensor will be continuously sampling the input. The external trigger timeout is used in all pulse modes (see §2 for details).

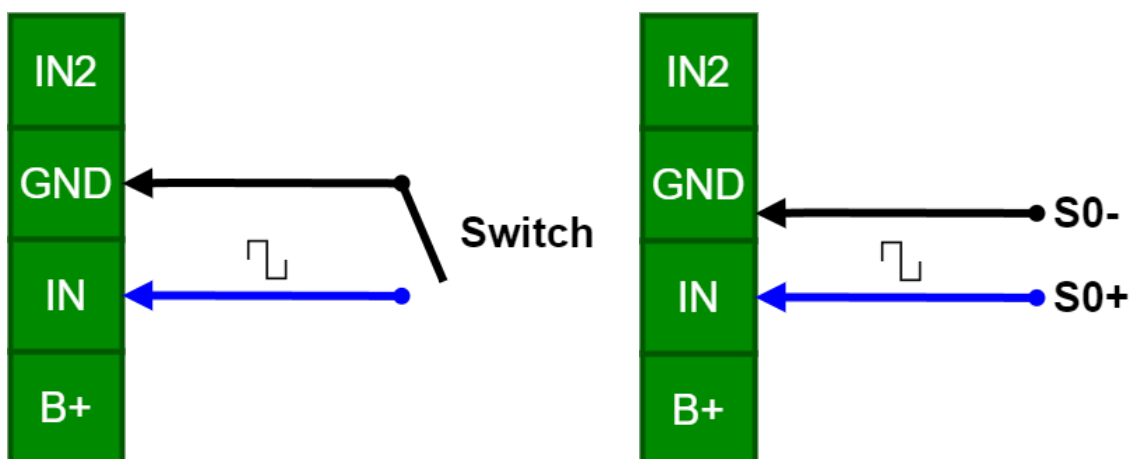
The voltage needs to be as close as possible to the internal sensor voltage to register as a pulse. The pulse input modes will work with both passive switches and active outputs.

There are two ways to count pulses. In normal counting, the sensor will report the number of pulses registered since the last uplink. In absolute count mode, the sensor will keep the number of pulses, so the reported value will be the number of pulses registered since the device was started. The pulses will keep their count in absolute count mode even if the sensor resets and can only be reset by changing the external configuration via NFC.

Both these modes can be combined with a debounced mode which will use the external trigger timeout to wait for the signal to stabilize.

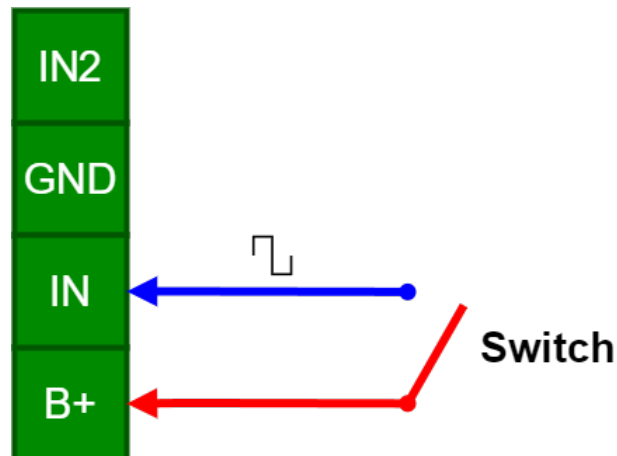
5.4.1 Pulse Input Pull-up

Connect positive lead to IN and negative lead to GND on the terminal of the ELT wM-Bus. If connected to an S0 output, connect the S0- lead to GND and S0+ lead to IN. The ELT wM-Bus will count all falling edges of the input signal. The ELT wM-Bus input is internally pulled up by approximately 50k Ω .



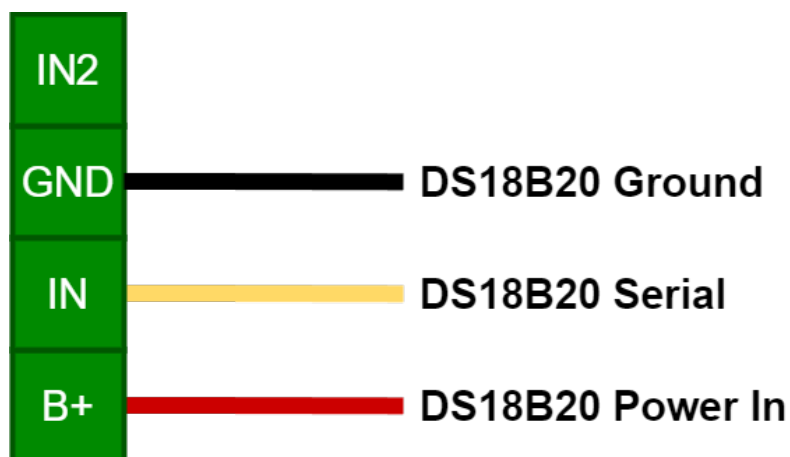
5.4.2 Pulse Input Pull-down

Connect positive lead to B+ and negative lead to IN on the terminal of the ELT wM-Bus. The ELT wM-Bus will count all rising edges of the input signal. The ELT wM-Bus input is internally pulled down by approximately 50kΩ.



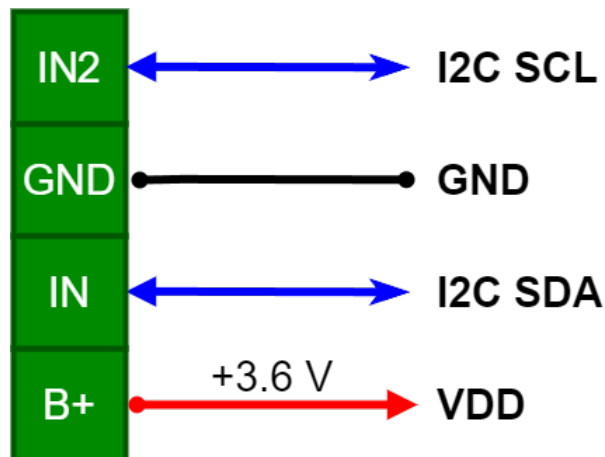
5.5 Temperature Probe DS18B20

The ELT wM-Bus is compatible with DS18B20 1-wire temperature probes. One DS18B20 is supported, and when connected to the ELT wM-Bus, the probes will be set to 12-bit-mode. Connect the black lead(s) to GND, the yellow lead(s) to IN and red lead(s) to B+.



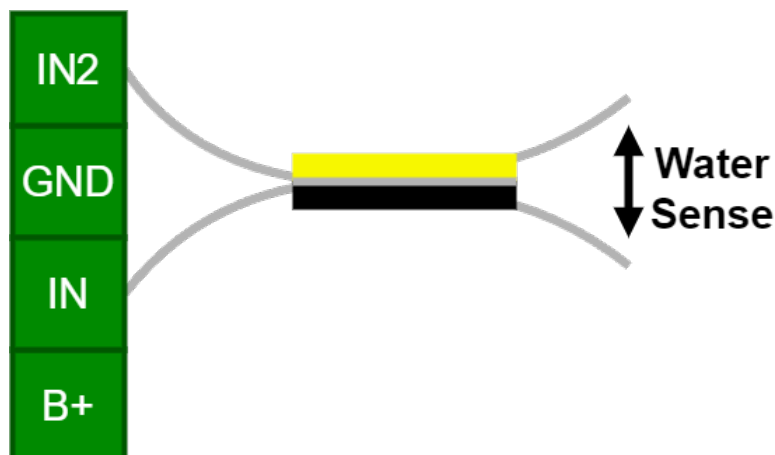
5.6 Sensirion SHT4x - External Temperature and Humidity Sensor

The Sensirion SHT4x series are high accuracy temperature and relative humidity sensors. The external SHT probe is sampled using single shot high repeatability measurements.



5.7 Water leak

The water leak mode measures conductivity between two wires which can be used to detect water and moisture. The reported values are 0-255 where higher values mean higher conductivity. Note that longer water leak cables have a higher base conductivity, this needs to be measured after the cables have been installed and an appropriate alarm level will need to be set in the backend system. Connect the unshielded wires to IN and IN2, make sure they are not touching each other as that will result in the sensor always measuring maximum conductance.



Note: The above picture is for illustrative purposes only. The water sense leads do not need to extend the black and yellow wires.

6. Document version history

Version	Comment
1.0	First version