Loadsensing LS-G6 Digital Node and Vaisala WXT536

Document Information

Version	Creation Date	Author	Description
1.0.0	08/03/2023	Customer Success	Draft version - LS-G6 Digital Node and Vaisala WXT536

Confidentiality Agreement

All information, products, services, licenses and, in general, whatever revealed by Worldsensing is considered as confidential unless otherwise expressly stated by it. In addition to this confidentiality, no information, product, service, or license can be disclosed, communicated, disseminated, distributed, stored, in whole or in part, or transformed. All information, as well as the products, services, and licenses, are and will be the property of Worldsensing, which is and will also be the propriety of all intellectual, industrial, patent, and trademark rights. The use of any Software of Worldsensing will be subject to the application of the EULA (End User License Agreement) document in force at any time, as well as the General T&C in force. Worldsensing reserves the right to revise and change this publication, the information, the products, and/or the services given by it when deemed necessary.

Any issues or queries arising should be addressed to *support@worldsensing.com*.

The content presented in this document will be binding only after the signature of a formal contract between the parties.

Vaisala WXT536

Vaisala sensor compatibility

The integration of the Vaisala WXT536 RS 485 with the LS-G6-DIG data logger is done through the RS 485 port. This integration requires a specific factory configuration of the Vaisala device, to enable the Modbus RTU ports, please consider this requirement when you order the device.

As an example, an order form of the Vaisala WXT536 sensor compatible with the LS-G6-DIG node is attached on the Annex 1. Please make sure that the specifications from the sensor match with the ones on the order form.

Gateway and node versions and compatibility

In July 2018, it was implemented a significant improvement in the internal architecture of Loadsensing gateways. It was packetized the firmware of the gateway achieving a new architecture ready for adding new features and enhancements in the future. This new architecture was implemented from gateway firmware version 2.0. Upwards. Worldsensing dispatches gateways with this new architecture implemented from July 2018. All the gateways with ID higher than 20001 correspond to these firmware versions. The integration with Vaisala WXT536 was officially included in version 2.5.

Gateways with ID higher than 20001 can be remotely updated to the latest version because they already have the architecture of firmware version 2.X. In addition, it is important to note that Worldsensing dismisses the possibility of a remote update from version 1.16 to 2.1 for technical reasons. Gateway with firmware version 1.1X can be reprogrammed by Worldsensing in our installations. Contact Customer Success (support@worldsensing.com) or Sales team (sales@worldsensing.com) for further details about the updating process.

Regarding the node, the compatibility requires the FW version 2.47, at minimum.

Power the Vaisala WXT536

LS-G6 Digital node is able to read the meteorological station WXT536 from Vaisala. Nevertheless, the station must be supplied externally because it must be always on. The node reads and transmits the parameters based on its configured sampling rate, using its own batteries. Wiring between the node and the WXT536 unit using an external power source that powers the Vaisala Weather Transmitter is done as follows:

Vaisala WXT536 Input connector	External power	LS-G6-DIG RS485 connector (*)
RS485-A (Grey)	-	A
RS485-B (Blue)	-	B
Supply Voltage (Brown)	Positive (+)	-
Ground (Green)	Negative (-) Bridge to GND in LS-G6-DIG RS485 connector	GND (common ground)

(*) Important notes:

- Duplex communication; node's 'Switch B' must be set to 'Half-duplex' position.
- Tested with 12VDC external power.

Digital node configuration for Vaisala WXT536

When configuring a digital node with a Vaisala WXT536 sensor, several specific steps must be followed during the configuration as described below. For the rest of the configuration steps, the user can refer to the corresponding sections of this document (index on page 1).

Step 3: Sensor wiring and set up

The wiring of the sensor

Protocol

Vaisala WWXT536: Select the specific manufacturer protocol from the list (fig. 45). When this option is selected, the only menu appearing is the address one.

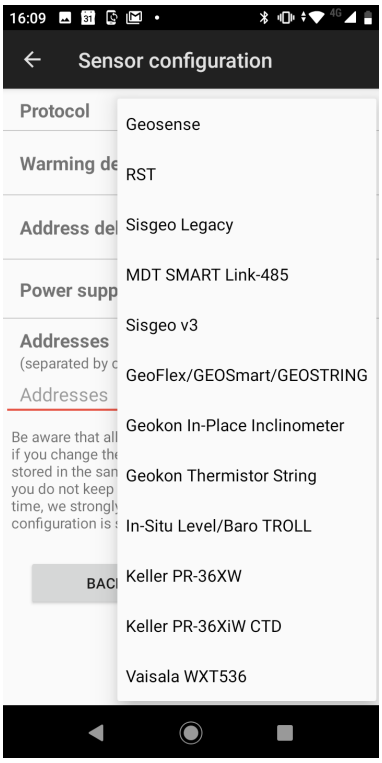


Figure 45, List of protocols compatible with LS-G6-DIG node

Addresses

In Addresses, the user has to enter the bus addresses of the sensor. By default, the value is 1 (figure 48).

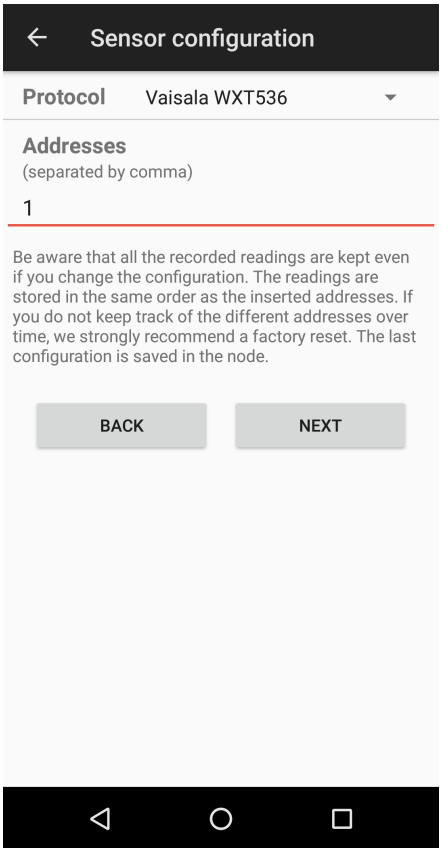


Figure 48, Bus address of the digital sensors

Step 4: Sensor's data and some considerations

If the node has been configured correctly, the sensor's data will be displayed. Another sample can be requested by pressing the reload button.

If the 'Out of range' message is displayed at some channel, it may be caused because the sensor has not yet updated the measurement values (usually occurs for a few seconds after powering the Vaisala WXT536).

For other averaging times, the Vaisala WXT536 can be reconfigured using its own Software and Configuration Tool, as it is described in the Vaisala WXT530-Users-Guide (figure 49).

Figure 49, Sensor's data displayed on the Dlog app

Step 5: Radio Configuration

The radio configuration can be done following the same steps on the LS-G6-DIG main documentation. Nevertheless, several considerations of the Vaisala WXT536 weather transmitter must be taken into account when selecting the sampling rate.

The WXT Weather Transmitter should be configured with an averaging time. An averaging period of 10 minutes is frequently used in meteorology so we recommend configuring it at 10 minutes.

By default, the averaging interval is 10 minutes in a WXT536 transmitter except for wind which is configured at 1 minute averaging interval by default. It is recommended to check the configuration of the weather transmitter according to the project monitoring needs.

Loadsensing digital nodes will have to be configured accordingly.

As an example, if the WXT536 is configured with the default averaging intervals, the sampling rate of the Loadsensing digital node should be 1 minute. In this scenario, new data coming from the weather transmitter will be available in Loadsensing data server according to the following table:

Parameter	Range & Units	Variant	Averaging interval (default)	Update interval of new data in LS system (@ 1 minute)
Relative air pressure	300.0 to 1200.0 hPa	Min	10 minutes	10 minutes
		Max		
		Avg		
Air temperature	-50.0 to 60.0 ºC	Min	10 minutes	10 minutes
		Max		
		Avg		
Relative humidity	0.0 to 100.0 % RH	Min	10 minutes	10 minutes
		Max		
		Avg		
Wind direction	0.0 to 359.9 Deg	Min	1 minute	1 minute
		Max		
		Avg		
Wind speed	0.0 to 75.0 m/s	Min	1 minute	1 minute
		Max		
		Avg		
Precipitation accumulation (absolute, continuous accumulated value)	0.00 to 655.30 mm	Instant	Instant - averaging doesn't apply	1 minute
Precipitation accumulation (differential, accumulated value between 2 consecutive requests)	0.00 to 100.00 mm	Instant	Instant - averaging doesn't apply	1 minute

Please, consider dependencies between the averaging interval configured in the Vaisala WXT536 and the sampling rate of the Loadsensing digital node. Some combinations could cause missing information. For instance, with the default averaging intervals, if the sampling rate of the digital node was 10 minutes, the wind direction and wind speed minutely averaged from the first 9 minutes would not be transmitted, it would only be transmitted wind direction and wind speed averaged for the last minute of the averaging interval.

The averaging interval of Vaisala WXT536 can be configured using a tool provided by Vaisala. The sampling rate of the Loadsensing digital node can also be configured using the Dlog app configuration tool or remotely setting the desired one on the web interface of the network.

FAQS

I am unable to read the Vaisala WXT536 with the LS-G6-DIG node. How can I ensure that the factory configuration of the sensor is correct?

When ordering the Vaisala WXT536 sensor, please make sure that the specifications match with the ones attached on the order form from Annex 1.

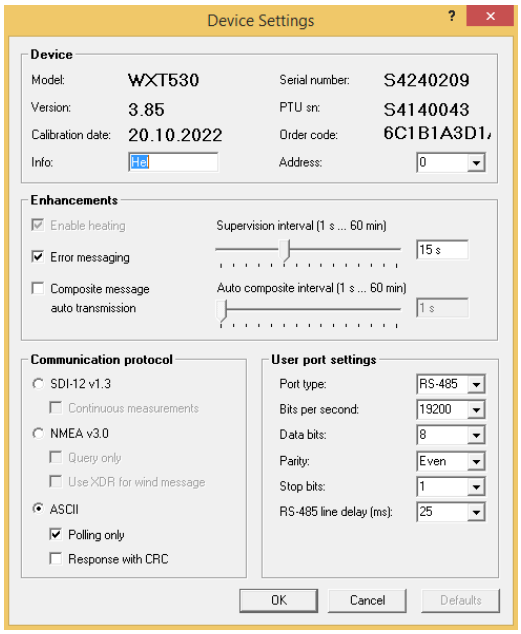
Some checkings regarding the Vaisala sensor settings can be done with the Configuration Tool that the manufacturer provides to ensure that they are configured to be compatible with our digital node.

Check that the serial port is configured as RS485 with the “Configuration tool” that Vaisala provides.

Follow the next steps for this:

1. Set the sensor in CLI mode (this is necessary for Vaisala tool to be able communicate with the sensor (see chapter 4.11 Chapter from Modbus Mode to CLI mode from the Vaisala user guide)

2. Once the sensor is on CLI mode and the configuration tool has recognized it and establishes communication, access to “Device Settings” and configure “User port settings” with the parameters of the image and save the configuration



3. Set the sensor in Modbus mode (see chapter 4.10 Changing from CLI mode to Modbus mode from the Vaisala user guide). It is important to ensure that the sensor has changed to Modbus mode. This can be checked by opening the Configuration Tool and testing that there is no communication with the sensor.

With these 3 steps, the Vaisala WXT536 sensor is updated to Modbus and configured with the necessary parameters to establish communication with our Digital data logger with the Modbus address 1, by default.

Environmental best practices

Installation and operation

Please install Worldsensing products in an energy-efficient manner by minimising power usage for computers, mobile phones or other devices needed for setup and configuration. Minimise the use of small components needed for installation, like mounting brackets and other connection materials. Avoid using toxic materials and/or hazardous substances.

- Set the sampling rate only in the nodes you need.

- When configuring the nodes, use "Set last configuration" whenever possible.

- Remove the batteries if you are not using the node.

- For nodes with switch, use the usb mode when not in operation.

Return Material Authorization (RMA)

In the event of requesting a Return Material Authorization (RMA) please make sure to use the most environmentally friendly mode of transportation possible.

Product End of Life and disposal

Please take the necessary measures to extend the life of the product and reuse it when possible.

Once the product reaches its end of life (EoL) recycling is crucial to divert material from waste streams into new applications.

Electrical and electronic devices, and batteries must be recycled according to the European Union WEEE Directive 2012/19/EU.

Please separate batteries from equipment.

This product and the batteries it may contain should not be discarded as unsorted waste. Please send them to separate collection facilities for recovery and recycling.

Product packaging

Worldsensing's product packaging is recyclable. Separate the different materials for a correct waste management.

Safety and emergency procedures

Please read the safety sheet that comes with our products before installing them. For safety information on batteries and other materials, as well as instructions in case of emergency please read the safety information available at: https://info.worldsensing.com/safety-information/

In the case of an emergency and after it has been managed, please evaluate the waste generated in order to dispose of it in accordance with current legislation and local regulation.

It is your responsibility to dispose of your waste equipment, batteries and packaging properly to help prevent potential negative consequences for the environment and human health.

The cost of environmental waste management is included in the battery's selling price.

By following these best practices you can help protect the environment. Thank you for your cooperation.

ANNEX 1: COMMUNICATION INTERFACE ON THE ORDER FORM FROM THE VAISALA WXT536 SENSOR

	WXT531	Parameters: R	1
2	Communication Interface		
		SDI-12 v 1.3, 1200 baud, 7, E, 1	**A**
		RS-232, Std. ASCII auto, 19200 baud, 8, N, 1	**B**
		RS-485, Std. ASCII polled, 19200 baud, 8, N, 1	**C**
		RS-485, Std. ASCII polled, 9600 baud, 8, N, 1	**D**
		RS-422, Std. ASCII auto, 19200 baud, 8, N, 1	**E**
		RS-422, NMEA 0183 v3.0, 4800 baud, 8, N, 1	**G**
		USB/RS-232, 1.4 m USB / M12 cable, ASCII auto, 19200,8,N,1	*H*
		USB/RS-485, 1.4 m USB / M12 cable, ASCII polled, 19200,8,N,1	*J*
		mA output 4-20 mA	**K**
		mA output 0-20 mA	**L**
		RS-485, NMEA 0183 v3.0, 4800 baud, 8, N, 1	**R**
		RS-485, Modbus RTU, client, 19200 baud, 8, E, 1	**U**
3	Analog Interfaces		