Application note Wireless data logger for vibrating wires

Reference : LGV41

Table of contents

1 PRODUCT DESCRIPTION

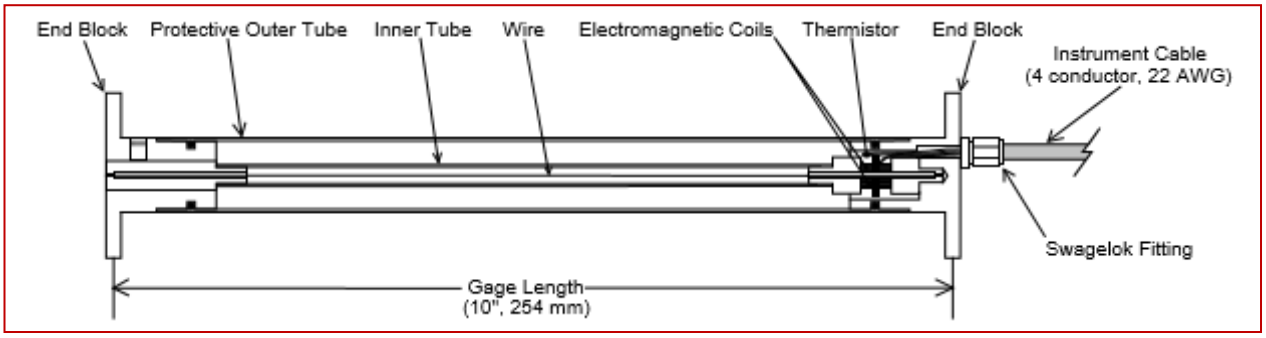
LGV41 allows you to connect up to 4 vibrating wires.

This data logger:

- records measurements or monitors in real time
- sends the data to a smart phone, a tablet or a PC

2 OPERATION PRINCIPLE OF THE VIBRATING-WIRE GAUGE

- The principle relies on the measurement of the natural frequency of a wire under tension; any change of tension causes a corresponding change of frequency.



3 FEATURES

- Frequency range : 300 Hz to 3500 Hz
- Measurement period :
    - o 300 Hz to 1200 Hz : 40 s / input
    - o 1201 Hz to 3500 Hz : 90 s / input

With 4 vibrating-wire gauge, at 2000Hz, the measurement period is 6 minutes. To set the LGV41 the measurement period minimum is 6 minutes.

4 CALIBRATION

Each new product is calibrated before sending.

The drift is about 30ppm / year (non significant).

5 BATTERIES REPLACEMENT

If you need to replace the batteries, use the Newsteo battery reference.

Newsteo supplies battery if you need.

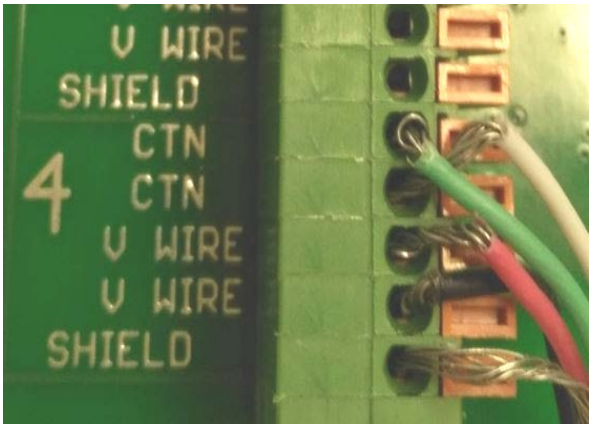
3.6 V Primary lithium-thionyl chloride (Li-SOCl2) - High power - C-size spiral cell with connector.

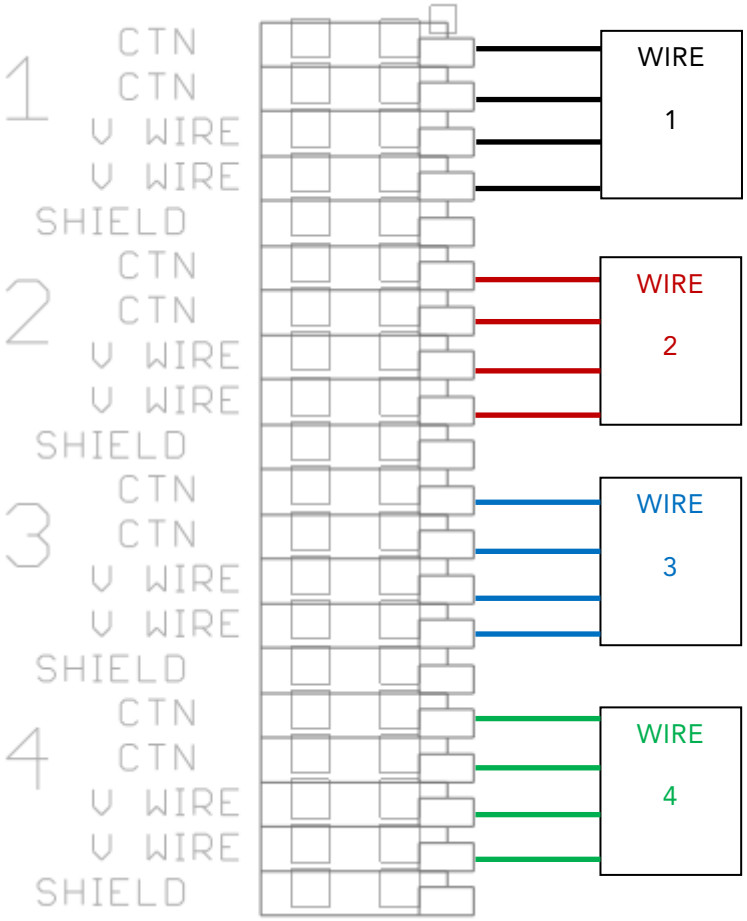
6 SOFTWARE: RFMONITOR – APPS: WEBMONITOR

LGV41 is a Newsteo product. LGV41 works with the Newsteo software (RF Monitor) and apps (Newsteo Webmonitor). To go further, please, follow Manual guides RFmonitor and Webmonitor.

7 LGV41: WIRING PLAN

LGV41 supplies a maximum output voltage of 13.6 V and a maximum output current of 100 mA. With 5 sensors, maximum current is 20 mA per sensor.





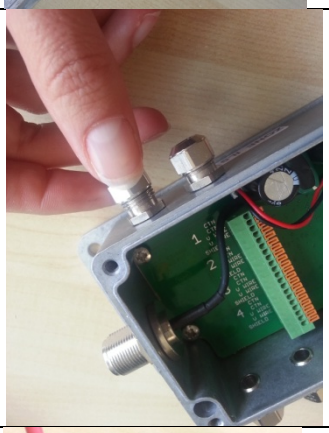
8 VIBRATING-WIRE GAUGE CONNECTION

Mounting:

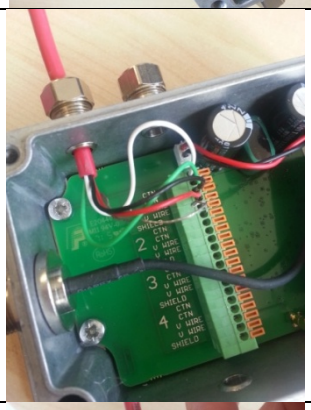
- Screw manually the antenna. Don't use tools to tight
- At first screw manually the gland, finish to tight gently with a key
- Wire diameter : 3.5 mm to 6.5 mm
- Gland not used must be sealed

1. Unscrew the cap

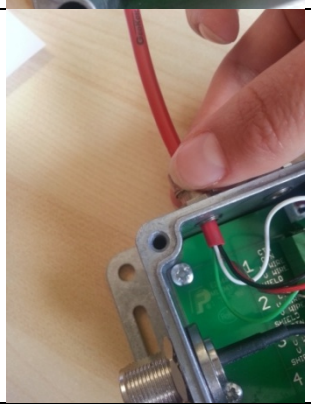
2. Unscrew the glance not used



3. Connect the vibrating-wire gauge



4. Screw the gland



5. Connect the other wire and seal the cap

9 LGV41 STARTING

- Starting (or after batteries replacement):
  Place the magnet 15 seconds *on zone ILS* -> LED blinks

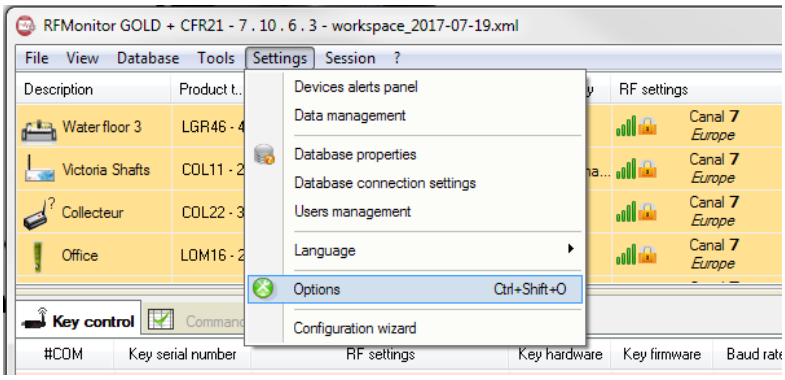
10SETTINGS

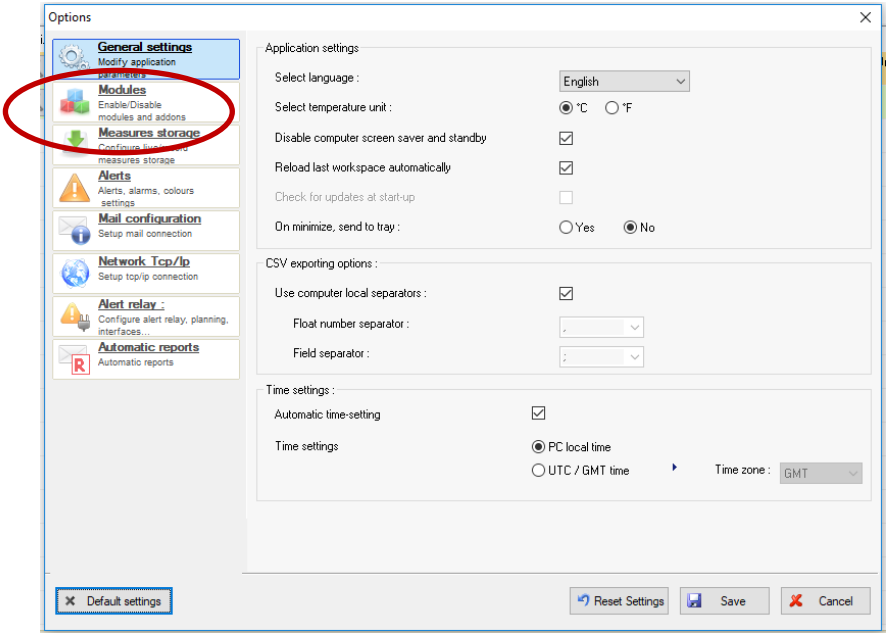
- To set the data logger, launch RFmonitor, insert the USB radio key (see RFmonitor manual guide)
- Set formulas

10.1 Launch RFM, enable devices formulas

- Start RFMonitor
- Insert USB radio key
- Swipe the magnet at the magnet area

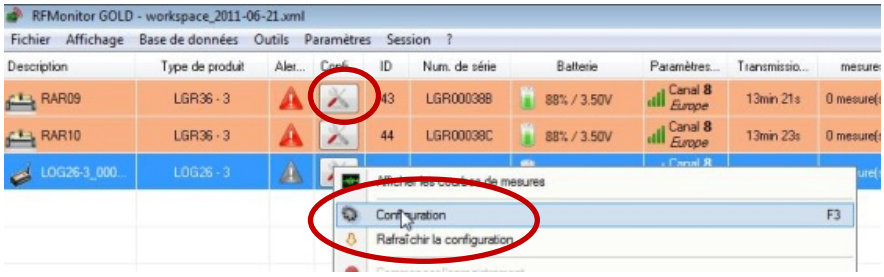
- Enable devices formulas edition :
  - Click on Settings/Options/Modules
  - Select Enable devices formulas edition
  - Click on Save





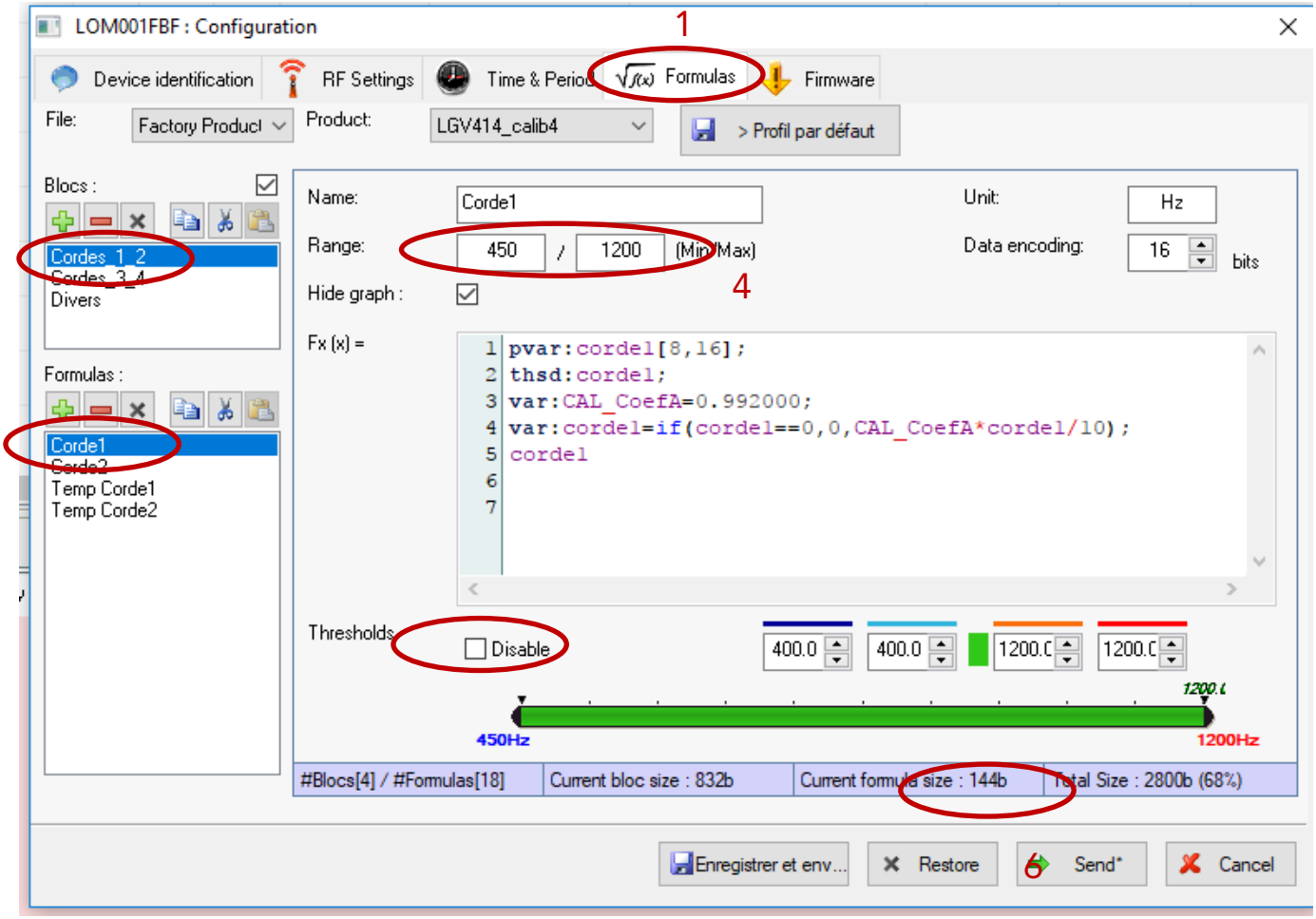
10.2 Formulas setting access

- Click on tools symbol
- Click on Configuration



10.3 Formulas setting

10.3.1 TO ACTIVATE INPUTS: Example with vibrating-wire gauge (450 Hz to 1200 Hz)



1. Click on Formulas
2. Click on blocs : Cordes_1_2
3. Click on : corde1
4. Set the range min and max : 450 and 1200 Hz
5. Disable « Disable »
6. Click on send

10.3.2 THERMISTANCE SETTING: Example with a vibrating-wire gauge: GEOKON4200

FEATURES: GEOKON4200

APPENDIX C - THERMISTOR TEMPERATURE DERIVATION

Thermistor Type: YSI 44005, Dale #1C3001-B3, Alpha #13A3001-B3

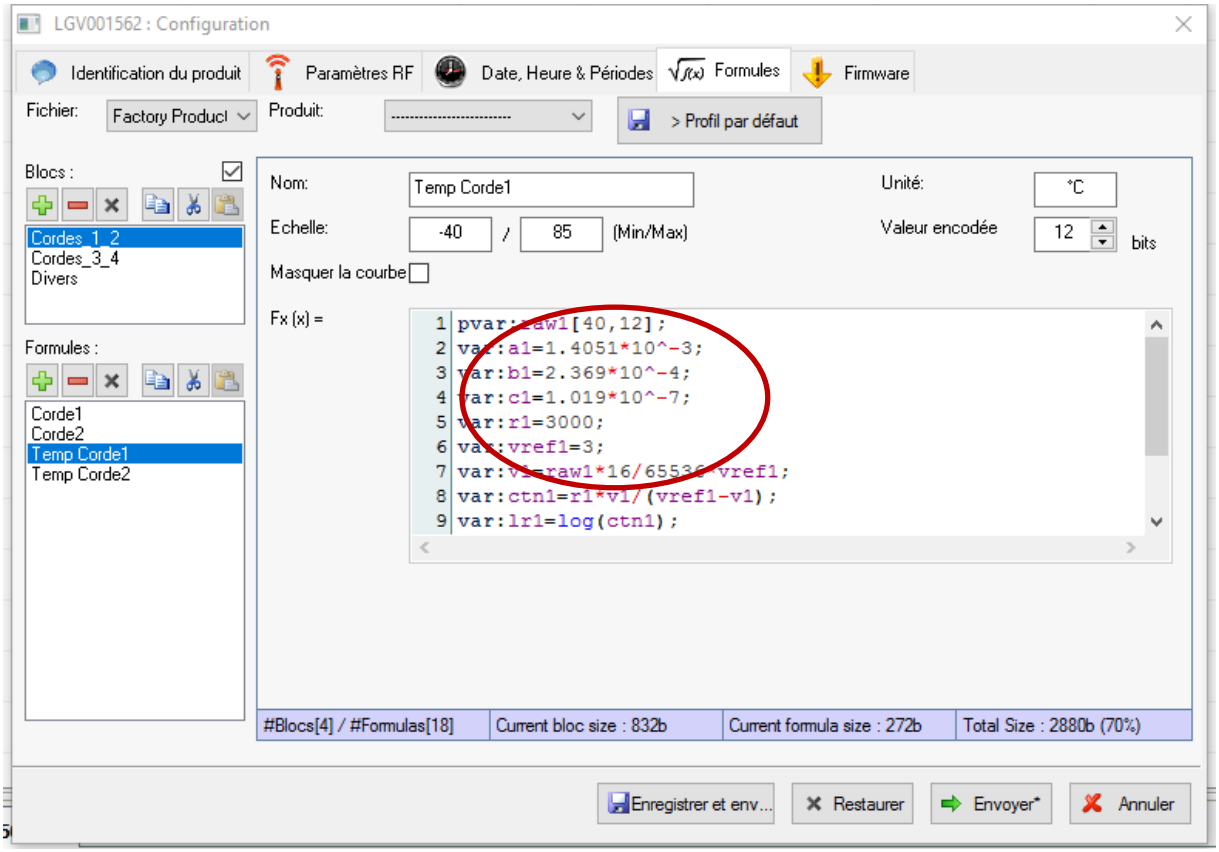
Resistance to Temperature Equation:

$$T = \frac{1}{A + B(LnR) + C(LnR)^3} - 273.2$$

Equation C-1 Convert Thermistor Resistance to Temperature

Where: T = Temperature in °C.
LnR = Natural Log of Thermistor Resistance
A = 1.4051×10^{-3} (coefficients calculated over the –50 to +150° C. span)
B = 2.369×10^{-4}
C = 1.019×10^{-7}

Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp
201.1K	-50	16.60K	-10	2417	+30	525.4	+70	153.2	+110
187.3K	-49	15.72K	-9	2317	31	507.8	71	149.0	111
174.5K	-48	14.90K	-8	2221	32	490.9	72	145.0	112
162.7K	-47	14.12K	-7	2130	33	474.7	73	141.1	113
23.16K	-16	3135	24	647.1	64	181.5	104	64.0	144
21.89K	-15	**3000**	**25**	624.7	65	176.4	105	62.5	145
20.70K	-14	2872	26	603.3	66	171.4	106	61.1	146



11 LGV41 INSTALLATION

Antenna must be vertical positioned

12 SUPPORT

http://support.newsteo.com/

- For a remote support we use AMMYY software

To download AMMYY, you have to use Internet Explorer, you need to be administrator of your PC

Download :

http://support.newsteo.com/customer/en/portal/articles/1155444-prise-en-main-%C3%A0-distance-par-le-support-technique

13 NEWSTEO ADDRESS

NEWSTEO S.A.S. - 93 avenue des Sorbiers – ZE Athelia 4- 13600 La Ciotat – France