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ELARA

Specification

ELARA-technical-spec

ABSTRACT
Technical specification - ELARA device.

CONTENTS

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1. VERSION CONTROL

Version	Date	By	Description
1.01	01/2020	Itamar	First Version
1.02	12/2020	Itamar	Indication LEDs description. working voltage Weight update Physical dimensions

2. Features highlights

- Wide working voltage range (12-65v)
- Small Size (2 DIN Rail Modules)
- Easy installation
- Support 4G/3G/2.5G cellular communication
- SIM on chip (option)
- Full OTA configuration process
- OTA firmware upgrade
- Easy LED Status Display
- On-Board Ethernet port
- On-Board RS485 port (2 ports)
- Analog Inputs
- Digital Output (Open collector)
- BLE Support
- External GSM Antenna
- ON-Board GPS (Internal Antenna)

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3. Hardware specifications

3.1. General specifications

Feature			
Power Supply	12-65 v		
Power Consumption	Full power mode	0.75W	
	Low Power mode	0.5W	
	Stand-by mode	0.25W	
Backup battery	Type	Li-Ion (950mAH)	
	Working Time	TBD	
GSM/GPRS	Antenna type	Internal	
	LTE, UMTS/HSPA(+) and GSM/GPRS/EDGE coverage		
GNSS	Antenna type	Internal	
	GNSS Systems	99 acquisition channels	
		33 tracking channels	
		GPS Support	
		GLONASS Support	
	Sensitivity	-167 dBm	
Main Serial Communication	Type	RS485	
	Surge Protection	IEC 61000-4-5 Class 4	
Secondary Serial Communication	Type	RS485 / RS232 / CAN (Hardware dependent)	
	Surge Protection	IEC 61000-4-5 Class 4	
Analog Inputs	Count	5	
	Voltage Range	0-15v	
	Type	Voltage / Temperature	
Outputs	Count	1	
	Type	Open Collector	
Ethernet Port	Ports	1	

	Interface Standard	8 pin RJ45
	Network interface protection	2KV electromagnetism isolation shell insulation blocking
Bluetooth	Protocols	Bluetooth v4.2 BR/EDR and BLE specification
Memory logger	Type	Micro-SD card
	Size (Messages)	TBD
Movement detection	Type	MEMs
	Axes	3
Storage Temperature	-40 - 85 Celsius	
Working Temperature	-20 - 70 Celsius	
Max. Relative humidity	90%	
Weight	154gr (No Battery) 176gr (Battery included)	
Size	85.5x86mm Height: 63mm	

4. Physical Dimensions

Parameter	
Length	86mm
Width	85.5mm
Height	63mm

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5. Hardware Specifications

5.1. Analog Inputs specifications

Parameter	
Reading Voltage range	0-15V
Reading Resolution	10mV
Reading Accuracy (max error)	2%
Max input voltage	18V

5.2. Analog Output specifications

Parameter	
Output Type	Open Collector
Max. Continuous working current	150 mA
Over Current protection	200 mA (Aprox.)
Maximum working voltage	18 V

5.3. External Voltage Measurement

Parameter	
Max voltage	75V
Resolution	0.03v
Accuracy	0.1v

5.4. Temperature Measurement

Parameter	
Active temperature range	[-20,70] [C]
Reading Accuracy	1 [C]
Reading Resolution	0.1 [C]

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6. GNSS Specifications

Parameter	
Antenna	On-Board
GNSS Features	GPS L1 Band Receiver (1575.42MHz)
	GLONASS L1 Band Receiver (1601.71MHz): Channel: 33 (Tracking)/ 99 (Acquisition)
Horizontal Position Accuracy	Autonomous: <2.5m CEP
Reacquisition Time	<1 SEC
TTFF @-130dBm	Cold Start: <15s Warm Start: <5s Hot Start: <1s
Sensitivity	Acquisition:: -149dBm Tracking: -167dBm Reqaquisition: -161dBm
Dynamic Performance	Maximum Altitude: Max. 18000m Maximum Velocity: Max. 515m/s Maximum Acceleration: 4G

7. Modem Specifications

Parameter	
Antenna	External
Frequency Bands	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/ B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
Data	LTE / UMTS / GSM
Approvals – Carriers	Deutsche Telekom* (Europe) Verizon*/AT&T*/T-Mobile* /Sprint* (North America)
Approvals – Regulatory	GCF (Global) CE (Europe) FCC/PTCRB* (North America) IC (Canada) Anatel (Brazil) IFETEL (Mexico) KC* (South Korea) NCC (Taiwan, China) JATE/TELEC (Japan) RCM (Australia) ICASA* (South Africa)

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8. Status LEDs

8.1.1. System Status1 LED

General Device Status

State	Pattern	Color
Working condition	One short blink every ~1 second (50mS On, 1000mS Off)	Green
"Direct Comm" mode (Remote commands)	Fast blinks (100mS On, 100mS Off)	Green

1.1.1. System Status2 LED

SD Status

State	Pattern	Color
SD Aactivity	Short Blink (100mS)	Green
No SD Card detected	Fast blink (100mS On, 100mS Off)	Red
Missing / Corrupted Configuration file	Slow blink (100mS On, 750mS Off)	Red

1.1.2. Modem State LED

Connection State	Color
No Connection to host	Red
Host Connected	Green

Network State	Pattern
Network Searching	Slow Blink (1800mS On, 200mS Off)
Idle	Slow Blink (200mS On, 1800mS Off)
Data	Fast Blink (125mS On, 125mS Off)

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9. Assembly information
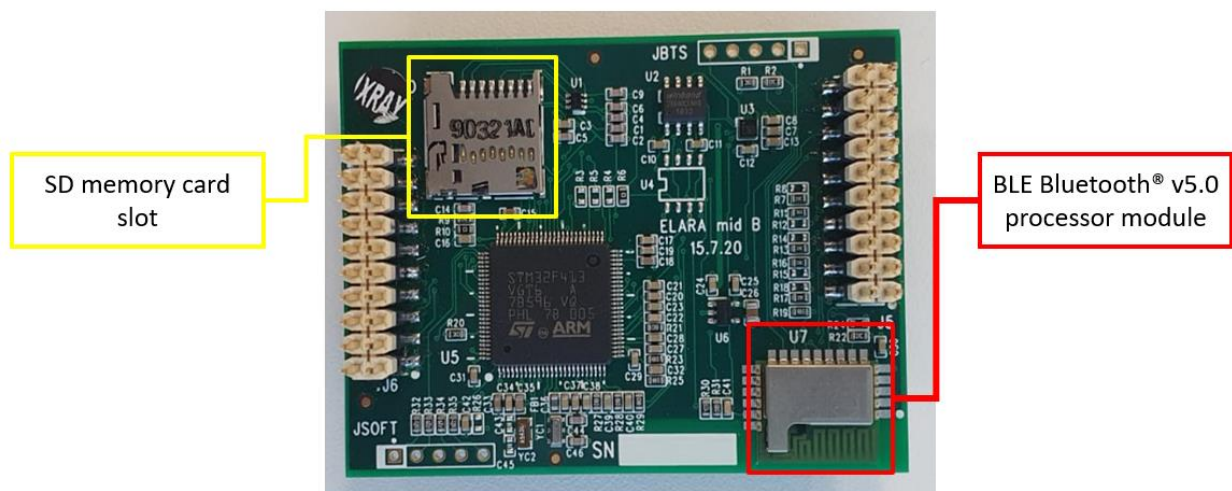
9.1. List of components:

Base PCB board – features:

- Power supply ports (V+ & GND)
- Two RS-485 serial communication ports
- Grounding protection port
- x5 Analog input ports
- x1 digital output port
- x1 Ethernet connection port for SNMP communication
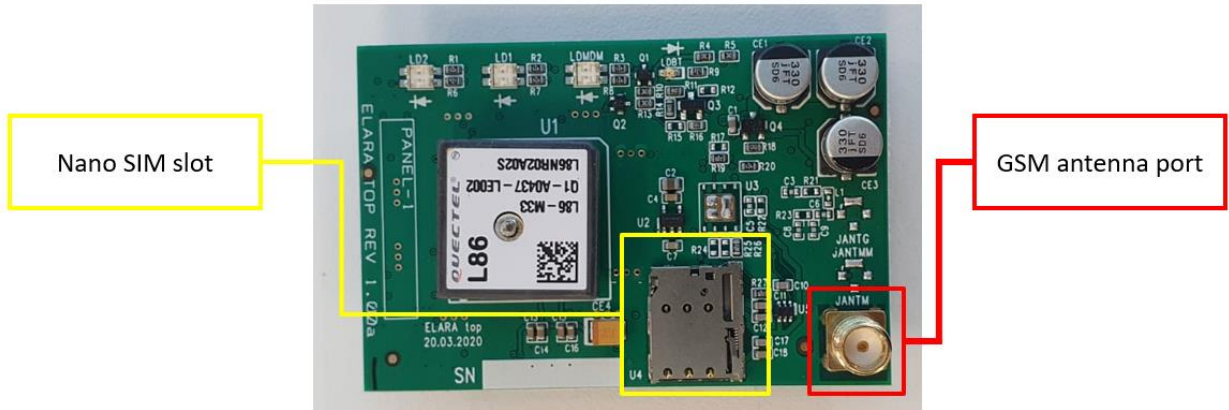

Middle PCB board - features:

- SD card slot – for configuration file operation
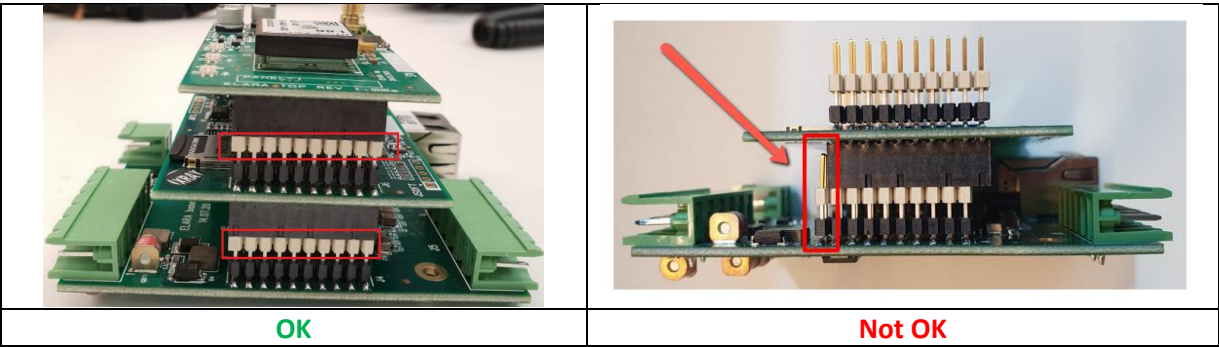- BLE Bluetooth® v5.0 processor module

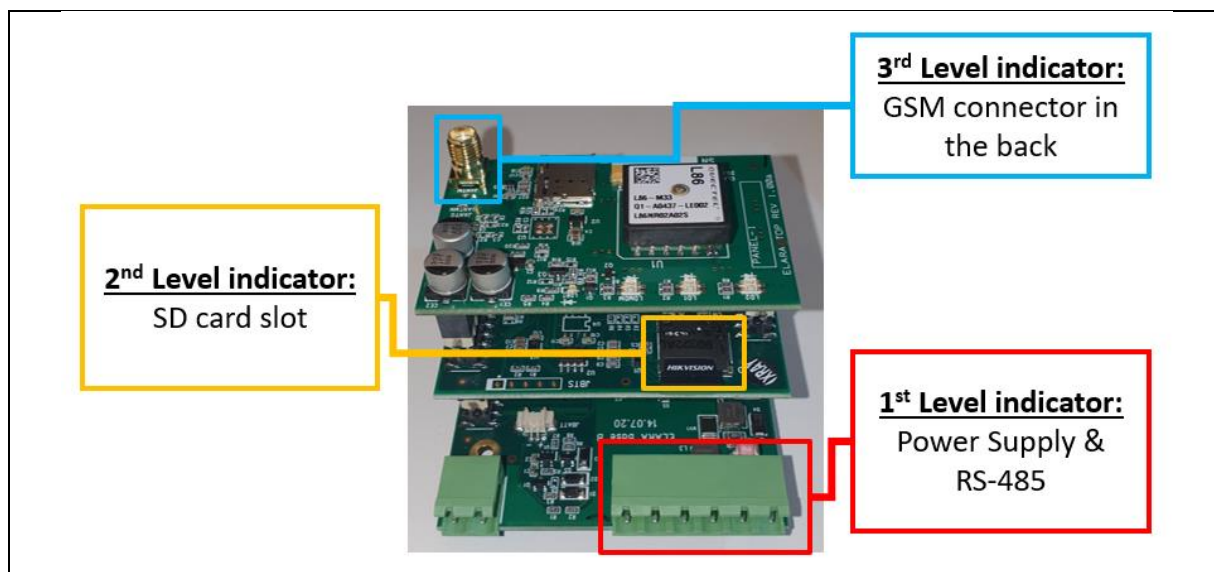galooli

Top PCB board - features:
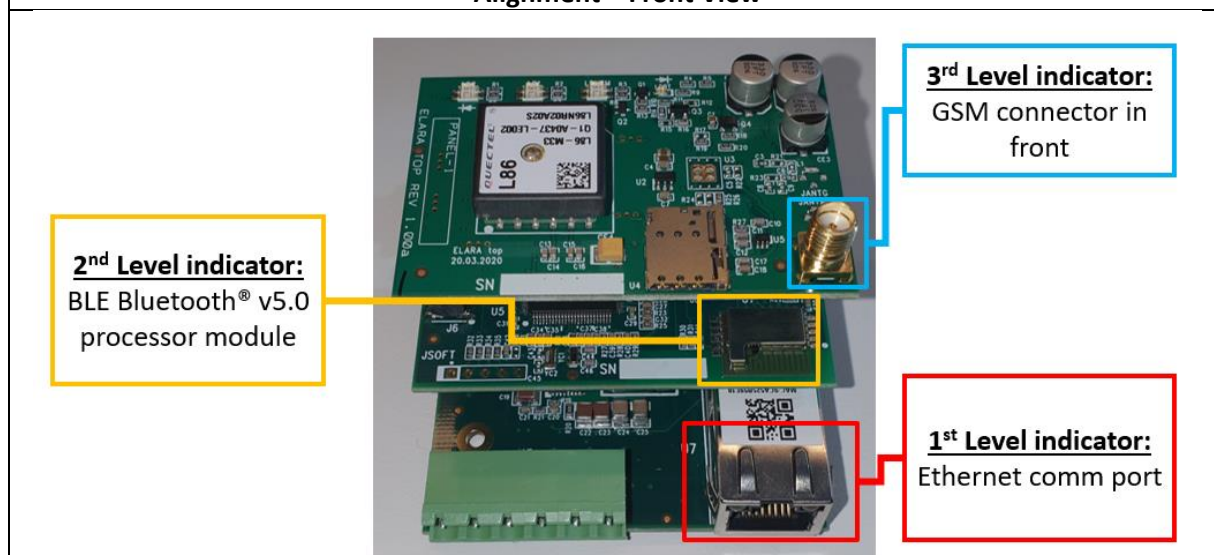
- GSM antenna port

- Nano SIM slot

Important Notes:

Upon connecting all the PCB boards, make sure to align the pinheads with no gaps and according to the text printed on the PCB boards
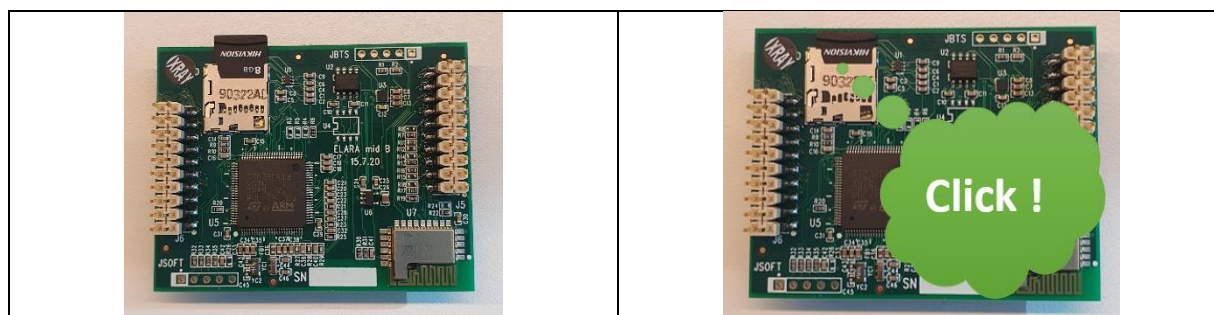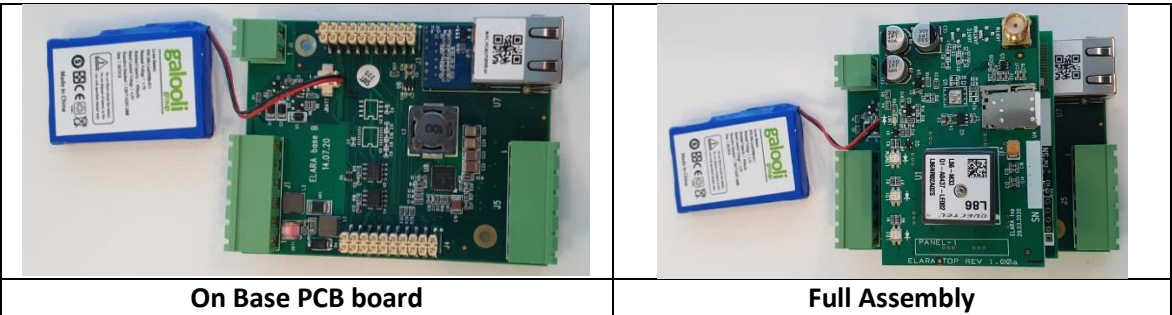

OK	Not OK

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3rd Level indicator: GSM connector in the back

2nd Level indicator: SD card slot

1st Level indicator: Power Supply & RS-485

Alignment – Front View

3rd Level indicator: GSM connector in front

2nd Level indicator: BLE Bluetooth® v5.0 processor module

1st Level indicator: Ethernet comm port

Alignment – Back View

Upon inserting the SD card into its slot, verify that you hear a silent click sound

Click !

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- The battery connection port is placed in the main Base PCB board

On Base PCB board	Full Assembly

10. Basic configuration

Like many Galooli devices, the Elara comes with two types of configuration setups – FW installation & a configuration file.
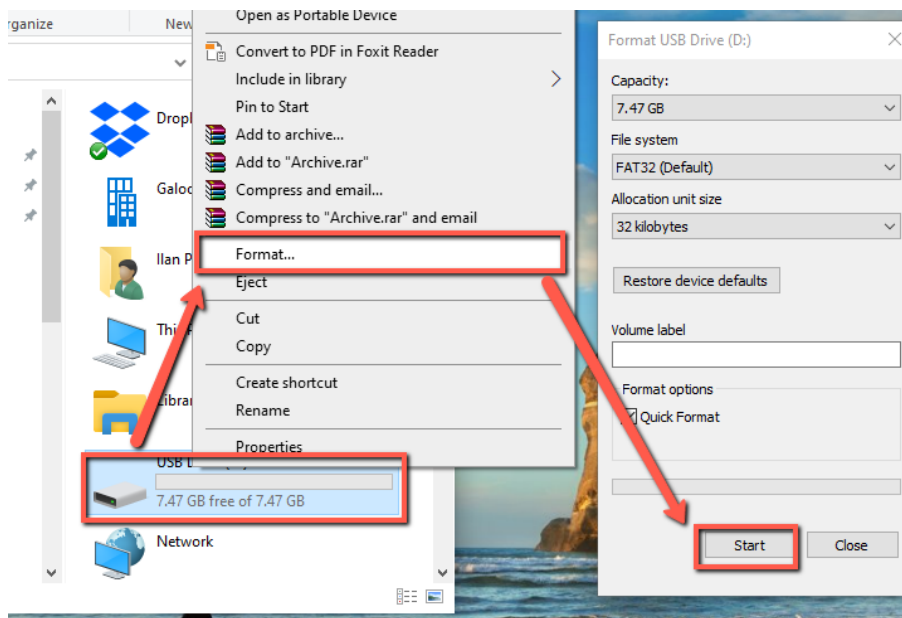
- The FW file is a **.bin** format file, and is installed using the proprietary PowerCenter program

- The configuration file is **.GIB** format (Text), and can be configured via the proprietary PowerCenter program or via any standard editor program

Connecting SD & SD card reader:

- We recommend using a micro SD card, class 10 with at least 8 GB storage memory

- Use a standard micro SD card reader – at least USB 2.0 protocol

After connecting the Micro SD card to the computer, make sure to format the SD card to remove any potential computing errors.
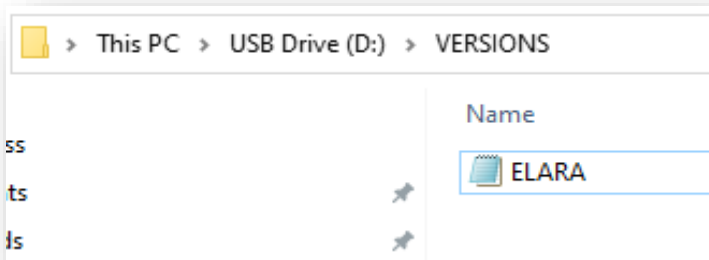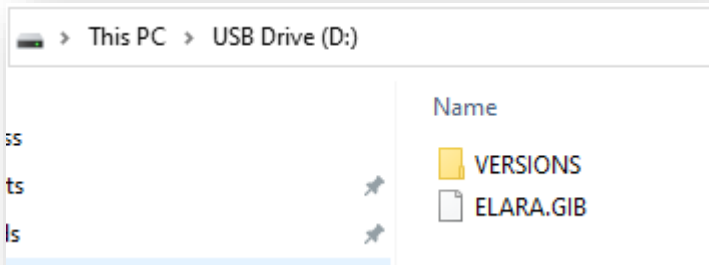
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Open the SD card and create two entities for the Elara to process the information properly.

- A folder named "VERSIONS" (with capital letters)

- In the VERSIONS folder, place the FW file that you wish to burn on the Elara

- A configuration file, named "ELARA.GIB" text file

Note:

The FW file inside the VERSIONS folder has to be named "ELARA" with capital letters, the Elara will only read from this file during the burning process and will disregard any other files named differently in that directory

Once the SD card is set up correctly, connect it to Elara in the second level in the SD card slot

Connect the Elara to a power source +12[V] and to one of the RS-485 ports

Open the PowerCenter program and set the [Active Device] = ELARA & [Connect Via] = relevant serial com port

Now your Elara device is connected and can be configured or provide live information over the serial connection.
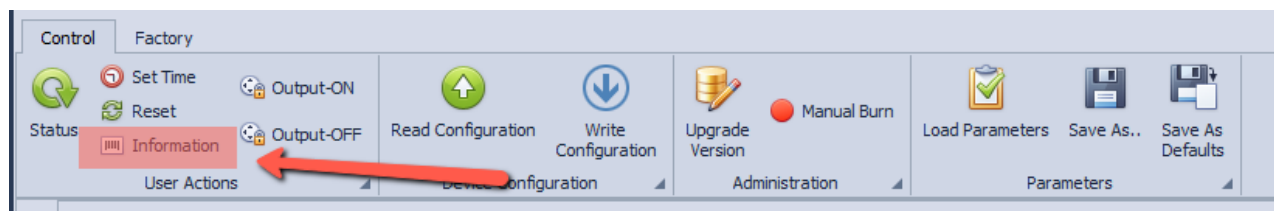
11. Power Center

11.1.1.   Status Tab

Group:_ELARA	ID of unit – serial number count starts from 8000000
	Time stamp of the device – full date format
	Connection of modem – statuses
	Signal strength of modem - percentage
	SD card status – Missing/Inserted and configuration file status Configuration OK
	Version of FW –
	IMEI, SIM – integers
	Accelerometer XYZ – Cartesian vectors
Group:_ELARA IOs	External Voltage – voltage reading XX.YY
	Backup Voltage – voltage reading X.Y
	Input Analog 1→6 – voltage reading XX.YY
	Output Digital – On or OFF status
	Vibration – No or Active status

Note – some of the information will be initially hidden, in order to expose it click on the information tab in the upper tool bar

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11.1.2.   Configuration Tab

The configuration includes several configuration groups that govern different aspects of the Elara device. The main group is called Global Configuration which includes:

Global Configuration	Acc. Sensitivity – three settings Low, Medium, High Network settings – Server, APN, User & Password RS-485 port 1 & 2 – 4 Modes: Binary – communication with computer Power Center Host – Communication with Other sensor over RS-485 Gateway – Terminal – Routing info such as Modem/GPS/Eth/BLE via port 1/2 6 Route modes: None, Port1, Port2, Modem, GPS, Eth, BLT

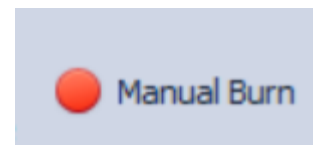Properties, these are the basic configuration settings

There are seven buttons available on the configuration tab:

Edit	Allows to edit the group's properties
Add Item	Adds a property in a specific group
Remove	Removes the whole group
Add Trap	?
Add Port-1 Device	Adds a sensor through the first RS-485 port
Add Port-2 Device	Adds a sensor through the second RS-485 port
Add ETH Device	Adds a sensor through the Ethernet port

How to upgrade the FW version of a unit:

- Insert wanted FW version in SD card → VERSIONS
- Connect Elara the PowerCenter
- Click on the [Manual Burn]
- Wait for the [Elara IAP burn] message following a reset

Note that his process will finish after a ~10 [sec] delay following a [reset]

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FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different
   from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.