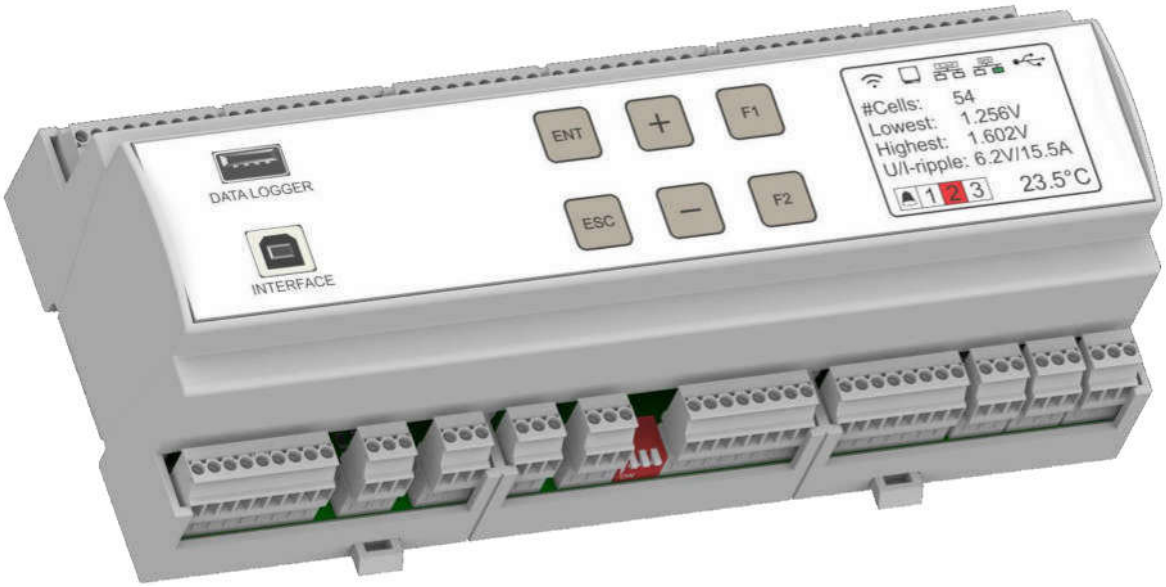
Watford Control

eBMS-1 Battery Monitoring System



- ✔ For lead acid and NiCd batteries
- ✔ High resolution TFT Display
- ✔ 60 Cells per module, extendable
- ✔ Continuous monitoring of each cell
- ✔ Charge-Discharge current monitoring
- ✔ U/I ripple monitoring
- ✔ PT100 Temperature monitoring
- ✔ Real Time cell readings (by USB)
- ✔ Megger Torkel 930, 950 and Software compatible
- ✔ Impedance AC measurement of each cell
- ✔ Flexible 4-20mA input (Gas or Electrolyte Level)
- ✔ USB Logger for measurement, alarms (5y++)
- ✔ RS485 Modbus RTU for PLC, PC's
- ✔ 3 programmable alarm relays
- ✔ Simple installation DIN Rail
- ✔ Further features on request

Technical description

The battery monitoring system is used to permanently monitor fixed installed batteries. The instrument monitors the attached battery while it records constantly the battery's parameters to the plugged USB-stick. When needed, the stick can be removed any time to evaluate the current and past battery state.

All cell voltages as well as the current, the ripple current and the ripple voltage of the whole battery are available on the USB-stick if wanted. Furthermore also the battery room temperature and its hydrogen concentration as well as many parameters more are written to the USB-stick.

On the high resolution display all measured parameters can directly be displayed without the use of a PC or a tablet. Additionally the instrument can be directly connected via USB to a PC or the Megger Torkel 930/950 device. A qualified report after the test can be generated.

Since the instrument is equipped with a standard MODBUS RTU interface, the data can easily be made available on your local PLC or PC without a large software overhead. Like this, the battery is remotely monitored and you have the datas available at all times. (E.g. by Scada systems)

In case, you need to monitor more than 60 cells, the instrument can directly be cascaded with its second RS485 interface in order to allow more cells.

Furthermore, the instrument has 3 potential free relay contacts. Multiple parameters can be programmed to these relays. The relay(s) can be connected to a general UPS common alarm or PLC. Present alarm(s) can be shown by pressing F2 on the device directly. (Alarm Log)

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Specifications

Supply voltage:	24-160VDC
Power consumption:	Max. 5W
Power supply:	Universal power supply 24 – 160VDC, for higher voltages connect the middle of the battery
Working temperature range:	-5ºC to +45ºC
Max. humidity:	95%, non-condensing
Mounting:	DIN-rail 35mm
Max. number of Inputs:	60
Max. voltage per cell:	0 – 160VDC, up to max. 300VDC on request
Cell input impedance :	1.04MΩ
Min. resolution of cell voltage:	3mV
Accuracy:	+/- 3mV @ 25ºC (160V) / +/- 6mV @ 25ºC (300V)
Long term stability(3 month period):	+/- 0.1%
Limit contacts: - Status - Contact hysteresis: - Max. contact load: - Life span of contacts:	3 potential free change over contacts Trigger criteria's programmable in the instruments menu Symbol on the internal display Adjustable, factory setting is +/- 5 counts 1A resistive / 230VAC 100'000 cycles at max. load 10'000'000 cycles at no load
Measurement input ripple voltage:	No need to connect this signal. The signal is directly measured from the instruments power supply connection.
Accuracy ripple current:	+/- 0.3%
Measurement input current:	Depending on the requested maximum current, a current sense module is supplied.
Accuracy current measurement:	+/- 0.1% gain error, Offset +/- 0.1%
Accuracy ripple current measurement:	+/- 0.25% gain error, Offset+/- 0.1%
Temperature measurement:	-30 … +70 ºC, with external 3-wire Pt-100 temperature sensor
Accuracy:	+/- 0.1 ºC
Pt-100 sensor cable length:	1000m, automatic cable length compensation
Hydrogen concentration input:	4 … 20mA, measurement with an external hydrogen sensor
USB data logger:	Accepts FAT32 formatted USB-sticks
USB Anschluss:	Galvanically separated USB Type B connector for the connection between the Torkel or PC
Data connection to PLC / PC:	RS485, termination resistors selectable by DIP switches - Galvanically separated - Protocol: MODBUS RTU - Terminals for the cable shield and the connection to the next instrument on the same bus connection
Dimensions:	L x W x H = 213mm x 91mm x 62mm
Weight:	425g
CE-conformity:	fulfilled

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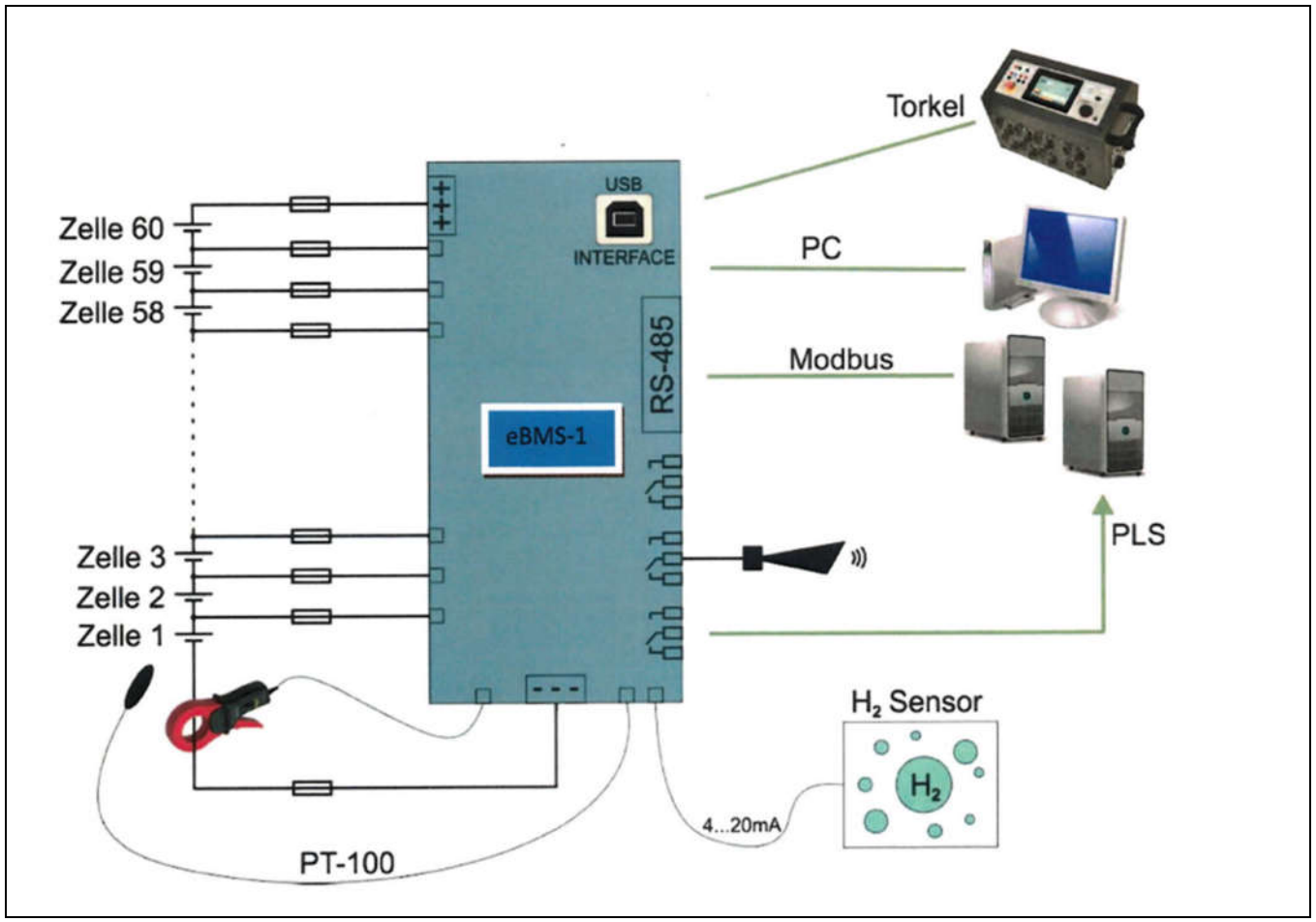
Basic diagram



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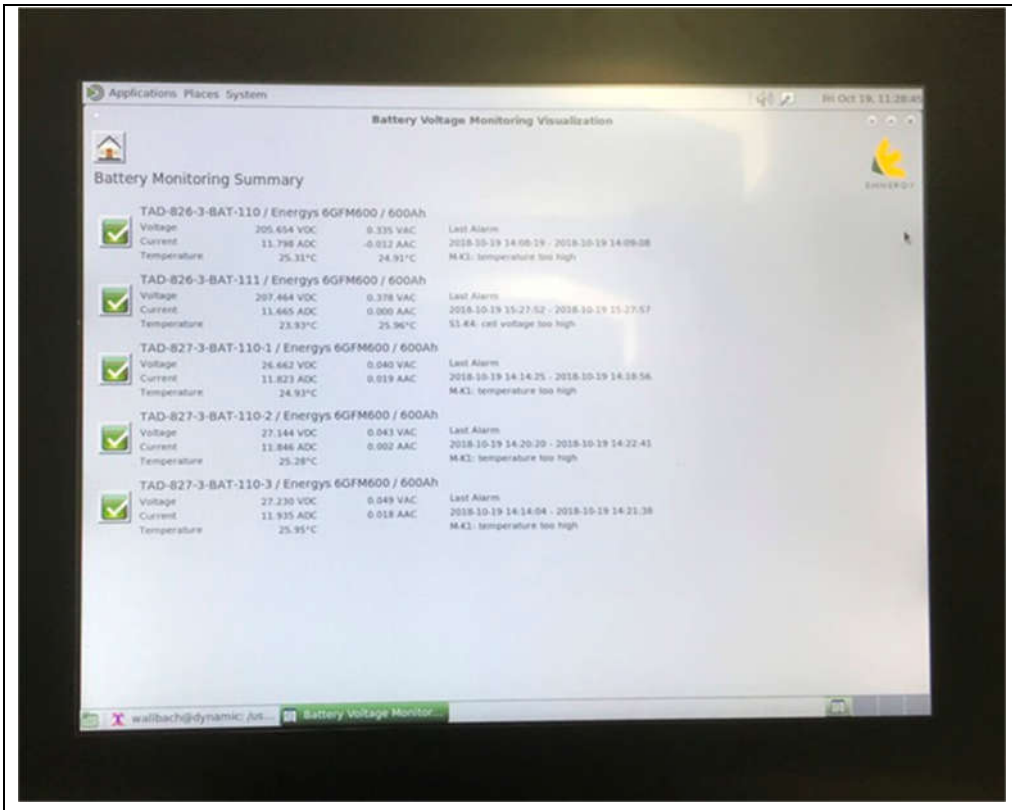
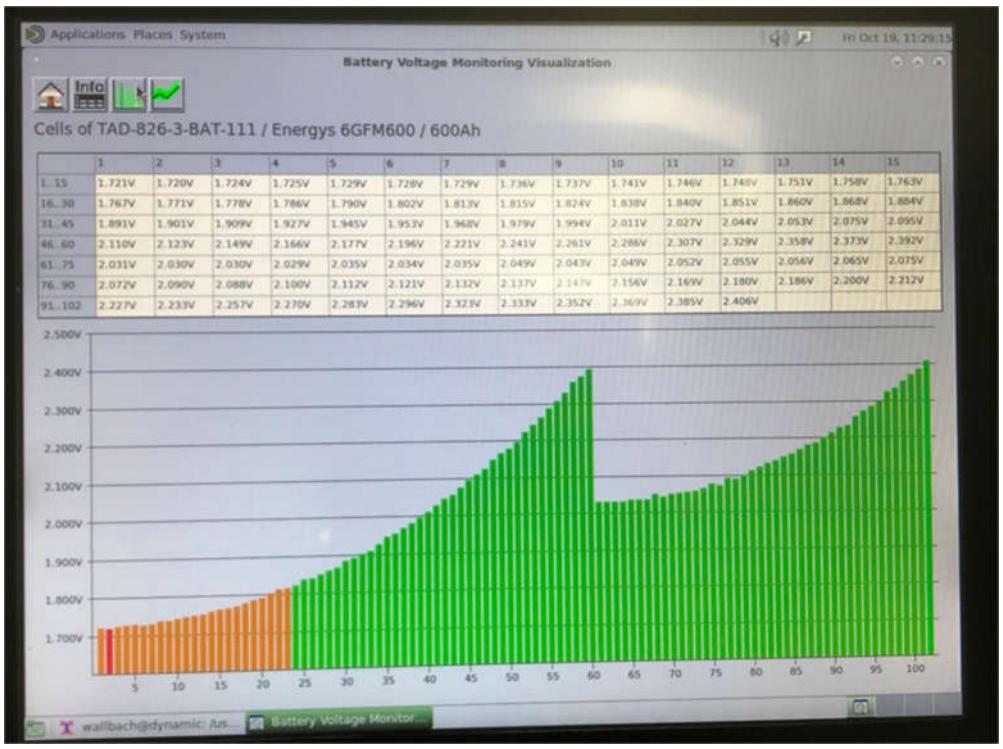
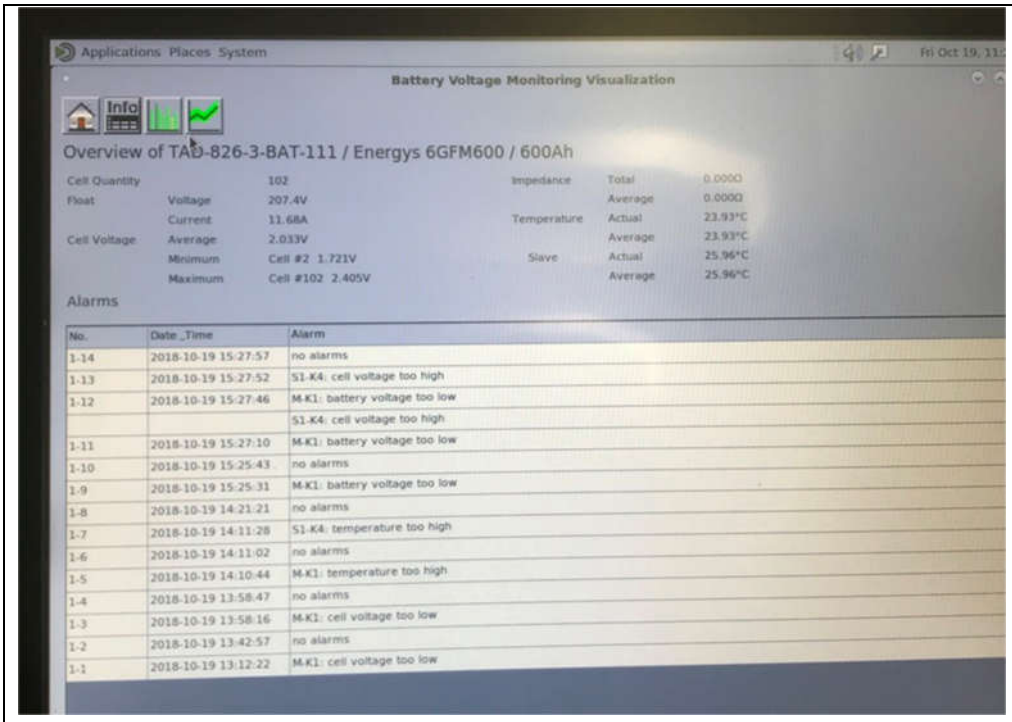
24/7 Analyze Software

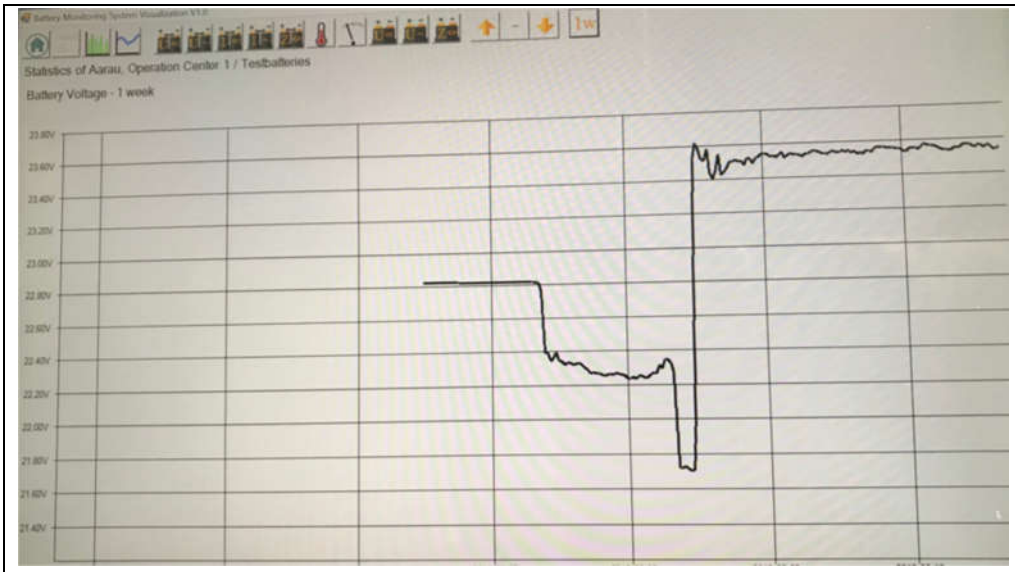




Cell Voltages from the simulator

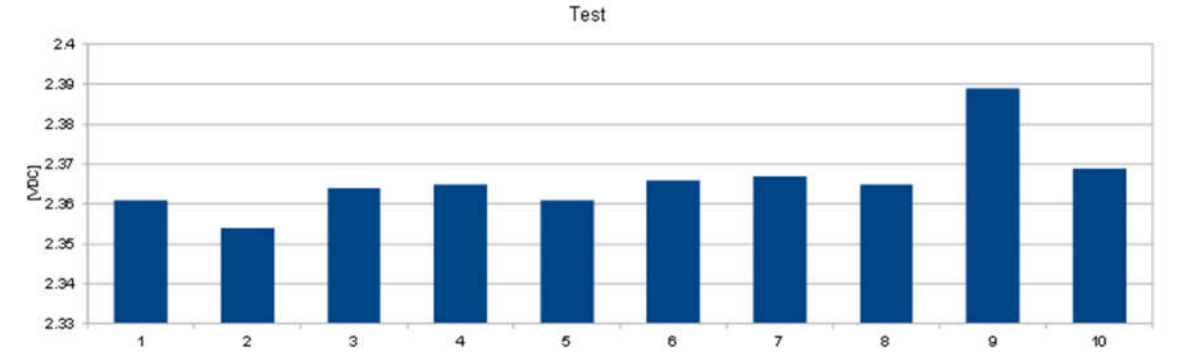


Alarm Log with RTC



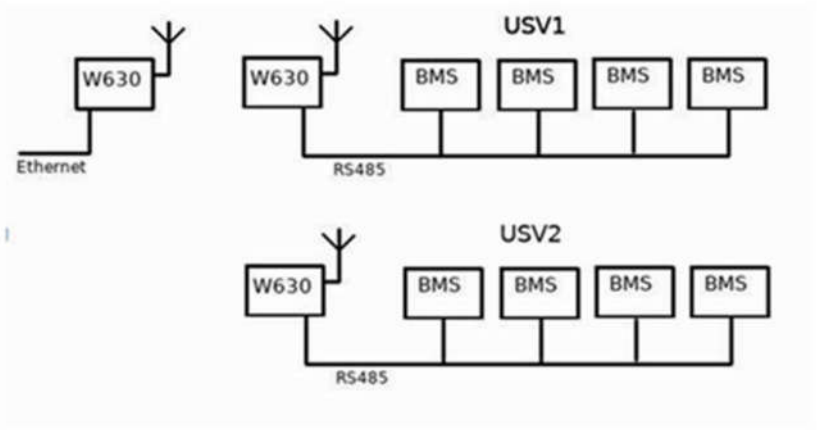
Trend measuring: Float charge / discharge / recharge condition over 1 week

Object	Monthy Battery Reports	Voltage	[VDC]	23.66	Current	[ADC]	10.64	Temp.	17.8
		Cells	[VDC]	Min. 2: 2.354		Max. 9: 2.389		Average	2.366
		Remarks		All is fine.					
Type	2SLA 400	[ ] IO [X] NIO							



Block	[VDC]	Block	[VDC]	Block	[VDC]	Block	[VDC]	Block	[VDC]	Block	[VDC]	Block	[VDC]	Block	[VDC]
1	2.361	2	2.354	3	2.364	4	2.365	5	2.361	6	2.366	7	2.367	8	2.365
9	2.389	10	2.369												

Date Signature



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