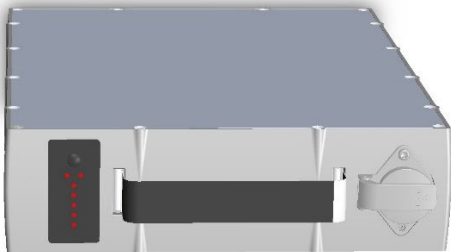
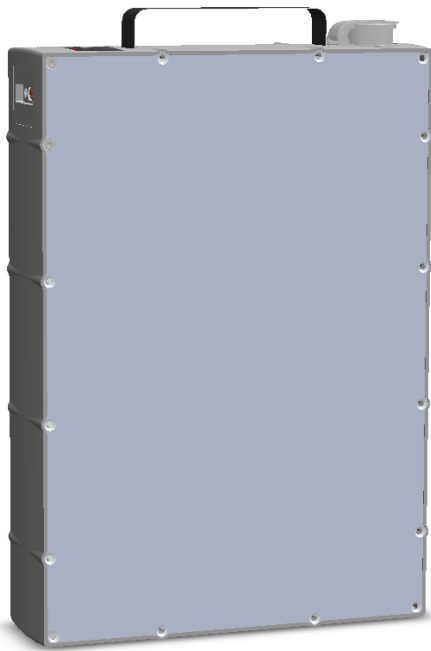


Emerge Battery Pack – WP / eScooter

Battery-Pack for demanding applications



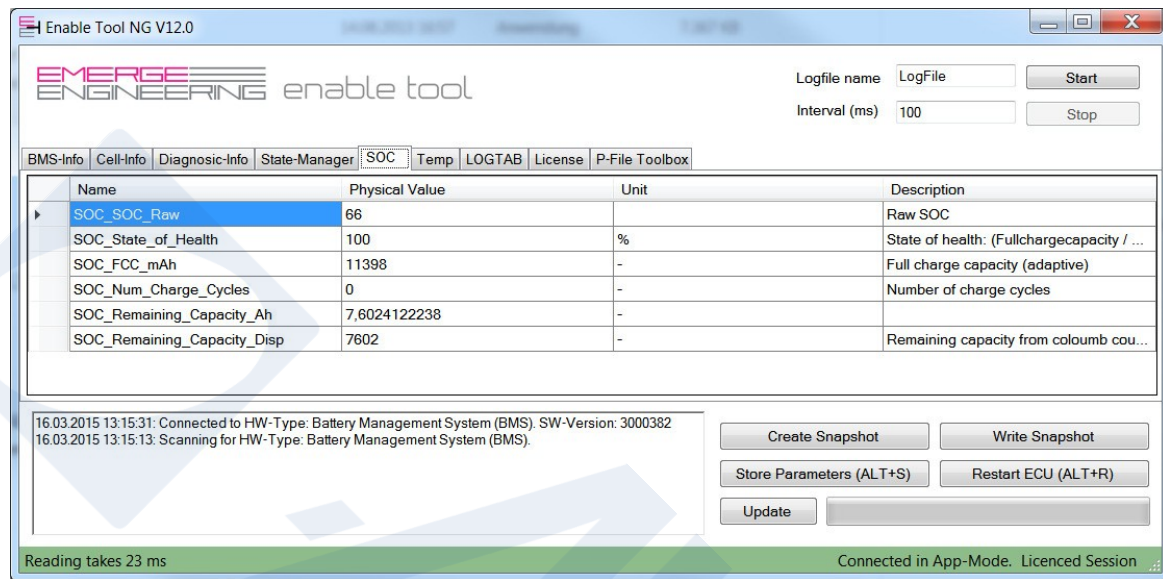
- ☐ Electrical Specification
 - ☐ 14S/12P Lithium Corepack
 - INR18650-35E Cells
 - Other Cells on request
 - ☐ 2026Wh
 - ☐ Voltage-Range: 58,8V
 - ☐ Up to 120A DC peak discharge current
 - ☐ 50A continuous current (connector limit)
 - ☐ 20A charge current
 - ☐ UN-Tested
 - ☐ Grid-ability: Build a grid of up to 12 CAN-bus connected batteries to form one large logical battery
- ☐ Mechanical Specification
 - ☐ Size (L x W x H):
 - ☐ 268mm x 76mm x 378mm
 - ☐ Weight: ~10kg
- ☐ Size Connectivity
 - ☐ CAN: Automotive CAN-Bus
 - ☐ USB: Enable-Tool Interface
 - ☐ Enable/Activation Input (e.g. from key lock)
- ☐ Features:
 - ☐ Grid-ability
 - ☐ SOC-Indication
 - ☐ Multi-redundant safety features
 - See EmERGE BMS spec. for details
 - ☐ SOC-calculation
 - ☐ Charge-/Discharge recommendation/control interface via CAN-Bus to prevent cut-off from overload

Emerge Battery Pack – WP / eScooter

Performance data		
Peak Power	W	3000W
Continuous Power (full discharge cycle)	W	1500W (limited by a 30°C cell temperature increase)
Max. current (depending on BMS)	A	55A (BMS only) 120A (BMS with extended powerstage)

Emerge Battery Pack – WP / eScooter

USB Interface



Use cases

The enable-tool USB-interface is made to support the different stages of a product development

- Development: Allowing the motor-controller to be analyzed, measured and calibrated in real-time.
- Production: with reduced complexity, just allowing to write the production dataset and calibrate the system
- Aftersales: The look and feel of Enable-Tool can be customized and reduced to a "minimum level of complexity" to allow a quick and easy support.
- Dealer and Retailers: Setup your dealers and retailers to service your vehicles.

Enable-Tool provides functions that you would expect from professional automotive measurement and calibration tools, like encryption of datasets to share with the production and dealerships, or encrypted and signed flash-datasets and encrypted-hex-files.

Supported OS

Windows 7 / Windows 8

Emerge Battery Pack – WP / eScooter

CAN Bus Interface

The CAN-Bus interface can be used with automotive standard tools. Baudrate can be setup from 125kbit/s to 1000kbit/s

The CAN-matrix as dbc-File is available on request.

Messages

Name	ID	ID-Format	DLC	Sendert	Zykluszeit	Sender	Kommentar	Nm.	Gen.	NmMessage	GenMsgLs.	Gen.	Gen.	Gen.	GenMsgSen.
BCM_Bms_0x160	CAN Stand...	8	Cyclic	100	EE_BCM			1*	0*	no*	Yes*	0*	100	0*	Cyclic
BMS_Info_0x171	CAN Stand...	8	Cyclic	10	EE_BMS			1*	0*	no*	Yes*	0*	10	0*	Cyclic
BMS_Info_0x172	CAN Stand...	8	Cyclic	1000	EE_BMS			1*	0*	no*	Yes*	0*	1000	0*	Cyclic
BMS_Info_0x173	CAN Stand...	8	Cyclic	100	EE_BMS			1*	0*	no*	Yes*	0*	100	0*	Cyclic
BMS_Info_0x174	CAN Stand...	8	Cyclic	100	EE_BMS			1*	0*	no*	Yes*	0*	100	0*	Cyclic
BMS_Info_0x175	CAN Stand...	3	Cyclic	100	EE_BMS			1*	0*	no*	Yes*	0*	100	0*	Cyclic
BMS_Info_0x176	CAN Stand...	8	Cyclic	1000	EE_BMS			1*	0*	no*	Yes*	0*	1000	0*	Cyclic

Signals

Name	Lan.	Bytes	Werttyp	Ini.	Fakt.	Offs.	Mini.	Maxi.	Ein.	Wertet.	Kommentar	NWM-Wa.
~BCM_Bms_State_Req	8	Intel	Unsigned	0	1	0	0	6	-	-	Requested battery state (0 = inaktiv, 1 = discharge, 2 = charge, 5=12V-mode, 6 = deep sleep)	<R.B.3>
~BMS_Balancing_Dev1	8	Intel	Unsigned	0	1	0	0	255	-	-	Shows in bit-coded style which cell of the referring device is being balanced	<R.B.3>
~BMS_Balancing_Dev2	8	Intel	Unsigned	0	1	0	0	255	-	-	Shows in bit-coded style which cell of the referring device is being balanced	<R.B.3>
~BMS_Balancing_Dev3	8	Intel	Unsigned	0	1	0	0	255	-	-	Shows in bit-coded style which cell of the referring device is being balanced	<R.B.3>
~BMS_Cellvoltage_01	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_02	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_03	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_04	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_05	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_06	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_07	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_08	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_09	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_10	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_11	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_12	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_13	8	Intel	Unsigned	0	0.03	0	0	7.96	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Cellvoltage_14	8	Intel	Unsigned	0	0.03	0	0	5	V	-	actual cell-voltage, cell might not be installed depending on pack configuration	<R.B.3>
~BMS_Charge_Plug_Detection	2	Intel	Signed	0	1	0	0	3	-	-	1=Plug detected	<R.B.3>
~BMS_ERR_Analog_Overcurrent	1	Intel	Unsigned	0	1	0	0	1	-	-	Overcurrent detected (analog)	<R.B.3>
~BMS_ERR_Analog_Overvoltage	1	Intel	Unsigned	0	1	0	0	1	-	-	Overvoltage detected (analog)	<R.B.3>
~BMS_ERR_CAN_Timeout	1	Intel	Unsigned	0	1	0	0	1	-	-	CAN Timeout detected	<R.B.3>
~BMS_ERR_Charge_Current	1	Intel	Unsigned	0	1	0	0	1	-	-	Charge current above limits	<R.B.3>
~BMS_ERR_CM_Alert	1	Intel	Unsigned	0	1	0	0	1	-	-	Alert from cell monitoring	<R.B.3>
~BMS_ERR_CM_Cell_Overvoltage	1	Intel	Unsigned	0	1	0	0	1	-	-	Overvoltage on one or more cells detected by cell monitoring	<R.B.3>
~BMS_ERR_CM_Cell_Undervoltage	1	Intel	Unsigned	0	1	0	0	1	-	-	Undervoltage on one or more cells detected by cell monitoring	<R.B.3>
~BMS_ERR_CM_CRC	1	Intel	Unsigned	0	1	0	0	1	-	-	CRC-error in cell-monitoring communication to host controller	<R.B.3>
~BMS_ERR_CM_Fault	1	Intel	Unsigned	0	1	0	0	1	-	-	Fault from cell monitoring	<R.B.3>
~BMS_ERR_Curr_Flow_Passive_State	1	Intel	Unsigned	0	1	0	0	1	-	-	Current flow detected when no current should flow	<R.B.3>
~BMS_ERR_Curr_Sensor_Offset	1	Intel	Unsigned	0	1	0	0	1	-	-	Offset of current measurement out of range	<R.B.3>
~BMS_ERR_Discharge_Current	1	Intel	Unsigned	0	1	0	0	1	-	-	Discharge current above limits	<R.B.3>
~BMS_ERR_Discharge_Voltage	1	Intel	Unsigned	0	1	0	0	1	-	-	Lowest cell voltage below minimum discharge limit	<R.B.3>
~BMS_ERR_EEPROM	1	Intel	Unsigned	0	1	0	0	1	-	-	Error in EEPROM	<R.B.3>
~BMS_ERR_External_Enable	1	Intel	Unsigned	0	1	0	0	1	-	-	External enable input inhibits output activation	<R.B.3>
~BMS_ERR_Output_Voltage_High	1	Intel	Unsigned	0	1	0	0	1	-	-	Voltage at charge/discharge terminal above limits	<R.B.3>
~BMS_ERR_Overtemp_Charge	1	Intel	Unsigned	0	1	0	0	1	-	-	Temperature while charging above limits	<R.B.3>
~BMS_ERR_Overtemp_Discharge	1	Intel	Unsigned	0	1	0	0	1	-	-	Temperature while discharging above limits	<R.B.3>
~BMS_LoK_Voltage_Max	1	Intel	Unsigned	0	1	0	0	1	-	-	Sum of cell voltages (pack voltage) above max	<R.B.3>
~BMS_LoK_Voltage_Min	1	Intel	Unsigned	0	1	0	0	1	-	-	Sum of cell voltages (pack voltage) below min	<R.B.3>
~BMS_LoK_Powerstage	1	Intel	Unsigned	0	1	0	0	1	-	-	Fault signal from powerstage driver	<R.B.3>
~BMS_LoK_PwCharge	1	Intel	Unsigned	0	1	0	0	1	-	-	Error during PwCharge. Reduce load	<R.B.3>
~BMS_LoK_Temp_Powerstage_1	1	Intel	Unsigned	0	1	0	0	1	-	-	Temperature at powerstage sensor 1 above limits	<R.B.3>
~BMS_LoK_Temp_Powerstage_2	1	Intel	Unsigned	0	1	0	0	1	-	-	Temperature at powerstage sensor 2 above limits	<R.B.3>

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Package / Delivery Format



Emerge Battery Pack – WP / eScooter

Revision / History		
Version	Date	Change
V3.0	20180325	Performance data added
V2.0	20170524	CAN-bus info added
V1.0	20170227	Initial document