

## Standard BMS Function Box - Rail



- *Real-Time commands sequencer and controller with a LAN and USB interface.*
- *Offers CAN, LIN, Analog inputs, Digital inputs and outputs channels for BMS signals*
- *Comes with a user-friendly graphical software, C# API and LabVIEW VIs to create sequence plans and view results.*

### Overview:

- The Standard BMS Loadbox from ART logics is a common loadbox, simulation for BMS/BMU.
- It's designed for BMS testing and simple to use without complex and difficult wiring setup.
- It can drive BMS running as real working situation in vehicle.
- It covers most default testing scenario for BMS tests.

**Detailed Specifications:**

The Standard BMS Loadbox can drive BMS run as test cases.

It simulates the specific signals for BMS.

There are sufficient resources to monitor and measure specific BMS signals.

There are CAN and LIN to communicate with BMS to diagnostic as specific test cases. It can support CAN FD as well.

The Standard BMS Loadbox controlled by LAN

**Function Overview**

Default Function		Detail information	Signal Name(BMS)	Remark
LV Power Supply Control	KL30	<ul style="list-style-type: none"> <li>● Power on BMS as vehicle switch.</li> <li>It's programmable as DUT behavior.</li> </ul>	KL30	Low Voltage PSU
	KL31		KL31	
	KL30C		KL30C	
Communication	Charge CAN	<ul style="list-style-type: none"> <li>● 3*CAN</li> <li>● Support High Speed CAN or CAN FD</li> </ul>	Charge CAN H Charge CAN L Charge CAN S	CAN Communication channels
	Internal CAN		Internal CAN H Internal CAN L Internal CAN S	
	Vehicle CAN		Vehicle CAN H Vehicle CAN L Vehicle CAN S	
	CAN2(Spare)	<ul style="list-style-type: none"> <li>● Not use</li> </ul>		
	CAN3(Spare)	<ul style="list-style-type: none"> <li>● Not use</li> </ul>		
	CSCCAN1		NA	Output for external control Can control ART Cell Simulation Box
	CS-ANALOG			Output for external control
	LIN1	<ul style="list-style-type: none"> <li>● 2*LIN</li> <li>Compliant with Local Interconnect Network (LIN)</li> <li>● Bus Specifications 1.3, 2.0, 2.1</li> <li>Compliant to SAE J2602.</li> </ul>	LIN1	LIN Channels
LIN2	LIN2			

Default Function		Detail information	Signal Name(BMS)	Remark
Analog Sensor Inputs (ADC Input)		<ul style="list-style-type: none"> <li>-20V to +20V</li> <li>Channel: 8</li> </ul>		Voltage Output Channels
HVIL	High Voltage Interlock	<ul style="list-style-type: none"> <li>Relays DPDT, 15 channels</li> <li>Relays SPDT, 15 channels</li> </ul>	HVIL_IN/OUT	
DC Signal Input (Sensors and Commands)	External Wake			ETTERNAL_WAKE+
	Ignition+		IGNITION+	Logic Input (Relays)
	Crash Input PWM	<ul style="list-style-type: none"> <li>Frequency Outputs</li> <li>8 channels</li> <li>0.9Hz to 50 KHz</li> <li>0.5 Hz tp 99.5KHz</li> </ul>	CRASH_INPUT	PWM Output Channels
	Leakage Sensor	<ul style="list-style-type: none"> <li>NA</li> </ul>	LEAKAGE_SENSOR	Load (Default)
Frequencyal Outputs	Low side fan relay?	<ul style="list-style-type: none"> <li>Frequency Inputs, 4 channels</li> <li>Frequency range 0.1 - 100K Hz</li> <li>Duty Cycle Range 0.5% to 99.5%</li> </ul>	LSF_01	can monitor frequency and duty cycle
	Low side fan relay?		LSF_02	can monitor frequency and duty cycle
Charging Protocols	CC	<ul style="list-style-type: none"> <li>Charging State Simulation</li> </ul>	CC	Multiple Signal (Ref. GB/T 18487.1-2015)
	CC2		CC2	
	CP		CP	
NTC Simulation	Temperature Sensor	<ul style="list-style-type: none"> <li>12 Channel Switchable Values (Up to 8 Values available)</li> </ul>	NTC	NTC Resistor Channels
Voltage Shunt Simulation	Small Voltage Signal	<ul style="list-style-type: none"> <li>Function Module on custom PCB</li> </ul>	U_SHUNT1 (3-02 3-03)	Shunt Voltage Output channels

BMS负载箱资源列表 Resource list					
板卡 Board	DUT Signal	通道名称 Channel Name	通道总数 量Chanel Qty	预计使 用数量 Used	剩余数量 Remain
TCU100	Logic Input *4ch	Relay	30	16	14
	Analog Input	Voltage output	8	0	8
	Measurement	Voltage input	15	8	7
	Frequency output *3ch Crash Input PWM Leakage Sensor	AWG	8	3	5
	LIN *2ch	CAN LIN	2 2	0 2	2 0
	Load		12	12	0
CCU20	CAN *3ch	CAN FD	6	3	3
Shunt board	Shunt Simulator	Voltage output	2	2	0
Wiring-board	/	Wiring	all	all	all
NTC board	NTC	NTC	12	12	0

***Resources***

Resource	Channels	Specifications
CAN / CAN FD	6	Configurable terminal resistance (None or 120Ω). Configurable Baud rate up to 1 Mbit/s.
Relay	3	Used for 1. External Wake 2. Ignition+ 3. HVIL Relays DPDT, 15 channels Relays SPDT, 15 channels
FOUT PWM Generator Channel	1	Used for Crash Input PWM Frequency Outputs, 8 channels 0.9Hz to 50 KHz 0.5 Hz tp 99.5KHz 7 for spare
Analog Output	8	-20V to +20V
Digital Inputs	5	Logic low is between 0v and 1.23v Logic high is between 3.3v and 5v
Digital Outputs	5	Push-pull Logic low is 0v Logic high is configurable.
Analog Inputs	2	Differential range between -5v and 5v.
Frequency Input	4	Used for frequency measurements Frequency Inputs, 4 channels Frequency range 0.1 - 100K Hz Duty Cycle Range 0.5% to 99.5%
CC/CC2/CP	3	Charging Protocols Multiple Signal (Ref. GB/T 18487.1-2015)
NTC Simulation	12	RM-10: 12 Channel Switchable Resistors (Up to 8 Values available)
Shunt Simulator	2	Voltage output

### Pin Definition

Standard BMS Loadbox Pin Definition			
PIN No [Function in loadbox]	BMS Function	Size	Color
LB75[VIN1+]	SENSOR_SUPPLY	0.35	ORANGE
LB76[VIN1-]	CURR_SENSOR_SUP_GND	0.35	ORANGE
LB49[CN4-S-03]	INFLOW_TEMP_SENSOR_IN	0.35	ORANGE
LB50[CN4-S-15]	INFLOW_TEMP_SENSOR_GND	0.35	ORANGE
LB51[CN4-S-04]	OUTFLOW_TEMP_SENSOR_IN	0.35	ORANGE
LB52[CN4-S-16]	OUTFLOW_TEMP_SENSOR_GND	0.35	ORANGE
LB09[VOUT01+]	HALL_CURR_MEAS_1	0.35	ORANGE
LB11[VOUT02+]	HALL_CURR_MEAS_2	0.35	ORANGE
LB10[VOUT01-]	GND	0.35	BLACK
LB12[VOUT02-]	GND	0.35	BLACK
LB14[VOUT03-]	GND	0.35	BLACK
LB16[VOUT04-]	GND	0.35	BLACK
LB18[VOUT05-]	GND	0.35	BLACK
LB20[VOUT06-]	GND	0.35	BLACK
LB22[VOUT07-]	GND	0.35	BLACK
LB24[VOUT08-]	GND	0.35	BLACK
LB41[CN4-S-11]	CAN_TERM_RES_1	0.35	ORANGE
LB42[CN4-S-23]	CAN_TERM_RES_2	0.35	ORANGE
LB43[CN3-V-01]	HVIL+	0.35	ORANGE
LB44[CN3-V-13]	HVIL-	0.35	ORANGE
LB190[FAN_REL]	FAN_REL_LSD	0.5	ORANGE
LB166[TCU_AWG1+]	CRASH_SIGNAL/AWG1	0.35	ORANGE
LB167[TCU_AWG2+]	FAN_SPEED_IN/AWG2	0.35	ORANGE
LB191[HSD_INPUT]	HSD_INPUT	0.5	ORANGE
LB192[HSD_INPUT]	HSD_INPUT	0.5	ORANGE
LB193[HSD_OUTPUT]	HSD_OUTPUT	0.35	ORANGE
LB194[HSD_OUTPUT]	HSD_OUTPUT	0.35	ORANGE
LB207[TCU_R27_COM]	AUX_POWER_DETECT	0.35	ORANGE
LB208[TCU_R26_COM]	CAN_FAILURE	0.35	ORANGE
LB06[IGNITION]	IGNITION_KEY	0.5	RED
LB01[VBAT]	VBAT	0.75	RED
LB02[VBAT]	VBAT	0.75	RED
LB03[PGND]	PGND	0.75	BLACK
LB04[PGND]	PGND	0.75	BLACK

LB73[CN3-V-03]	CC	0.35	ORANGE
LB109[BMS_CP]	CP	0.35	ORANGE
LB110[BMS_CC2]	CC2	0.35	ORANGE
LB53[CN1-C-08]	NTC2-	0.35	ORANGE
LB54[CN1-C-09]	NTC1-	0.35	ORANGE
LB55[CN1-C-12]	NTC1+	0.35	ORANGE
LB56[CN1-C-13]	NTC2+	0.35	ORANGE
LB57[CN3-C-08]	NTC2-	0.35	ORANGE
LB58[CN3-C-09]	NTC1-	0.35	ORANGE
LB59[CN3-C-12]	NTC1+	0.35	ORANGE
LB60[CN3-C-13]	NTC2+	0.35	ORANGE
LB195[CAN1H]	CANH	0.35	-
LB196[CAN1L]	CANL	0.35	-
LB199[CAN3H]	DCCHARGE_CANH	0.35	-
LB200[CAN3L]	DCCHARGE_CANL	0.35	-
LB201[CAN4H]	EV_CANH	0.35	-
LB202[CAN4L]	EV_CANL	0.35	-

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### **Power Requirement**

#### **DC power supply:**

24VDC

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### **Physical:**

#### **Dimension:**

**L\*W\*H = 454mm\*310mm\*365.6mm(8U)**

#### **Operating temperature:**

**-20 °C ~ +60 °C**

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