

# BMS Interface

## Installation, Commissioning & User Instructions

LV311273 | June 2022





## **IMPORTANT INFORMATION**

These instructions must be read and understood before installing, commissioning, operating or maintaining the equipment.

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**Read this manual  
carefully**

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**Warning**

Read this manual carefully before starting the BMS Interface. Failure to read the manual and to follow the printed instructions may lead to personal injury and damage to the BSM Interface, water heater or any other equipment.

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Although considerable care has been taken to ensure a correct and suitably comprehensive description of all relevant components, the manual may nonetheless contain errors and inaccuracies.

Should you detect any errors or inaccuracies in the manual, we would be grateful if you would inform us. This helps us to further improve our documentation.

**More information**

If you have any comments or queries concerning specific aspects related to the BMS Interface, then please do not hesitate to contact the supplier of the BMS Interface.

In the event of problems with your electricity or water supply connections, please contact the supplier/installation engineer of your installation.

# Content

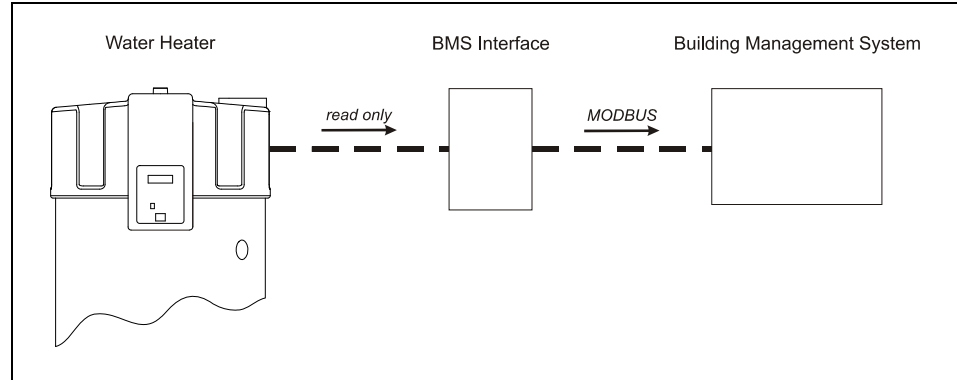
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# 1 Lay-out

## 1.1 Introduction

The BMS Interface is an interface that is used to connect a building management system (BMS) to the control of a EcoCharger. The communication, between the BMS and the EcoCharger, will be handled via a Modbus communication protocol and is meant for reading the data of the connected water heater. The BMS Interface does not have its own display or push buttons.

Schematic sketch BMS Interface



IMD-1155 R0.0

## 1.2 Lay-out

The BMS Interface will be supplied as in the pictured below, with a black plastic housing.



# 2 Mounting and Installing

## 2.1 Introduction

This chapter covers the following topics:

- Mounting the BSM Interface;
- Connecting the BMS Interface between the water heater and BMS.

## 2.2 Mounting

The BMS Interface is supplied with the following components:

- power supply cable;
- communication cable to connect the BMS Interface to the control of the water heater;
- communication cable to connect the BMS Interface to the building management system (Modbus).

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### Note

Mount the BMS Interface near the water heater.

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The BMS Interface should be mounted in the following way:

1. Remove the cover of the BMS Interface
2. Mount the rear side of the BMS Interface to the wall with fitting plugs.

## 2.3 Connecting

The BMS Interface should be connected to the BMS and water heater in the following way:

1. Connect the power supply cable to the connector on the upper right side of the BMS Interface.

Connect the other side of the cable to the mains power supply by using a double-pole isolator.

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### Note

Fit cable in the strain relief.

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### Attention

Do not power up the system until all the electrical connections have been made.

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2. Connect the communication cable to the water heater, via the pull relief, to the two way connector on the lower right side of the BMS Interface.

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### Note

Fit cable in the strain relief.

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3. Connect the communication cable to the BUS link connections (X5 and X6) on the far right side of the electrical connection box on top of the water heater.

**Note**

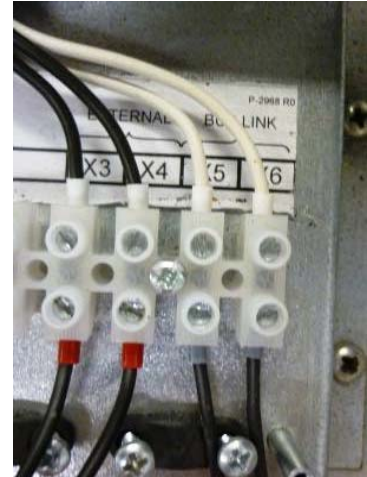
Fit cable in the strain relief.

**Max. length communication cable**

It is possible to select another, longer communication cable for the communication between the BMS Interface and the water heater.

The maximum length of the cable depends on the cable diameter, see the table.

Cable diameter [mm <sup>2</sup> ]	Max. cable length [m]
0,25	100
0,50	200
0,75	300
1,00	400
1,50	600



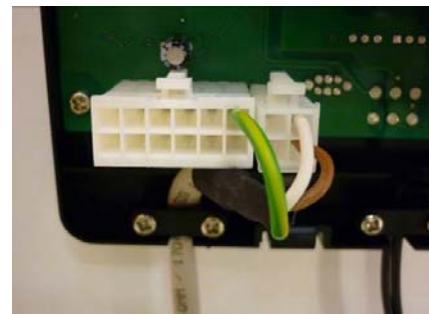
4. Connect the communication cable, for Modbus connection to the two connectors on the lower side of the BMS Interface.

**Note**

Fit cable in the strain relief.

**Attention**

First connect the twelve way connector containing the ground wire, next the four way connector can be connected.



5. Connect the Modbus communication cable to the BMS in the required way. For this purpose use the connectors which are supplied together with the BMS Interface.

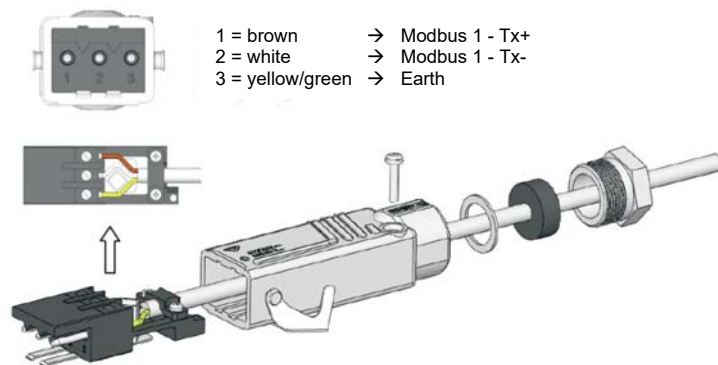
**Note**

Fit cable in the strain relief.





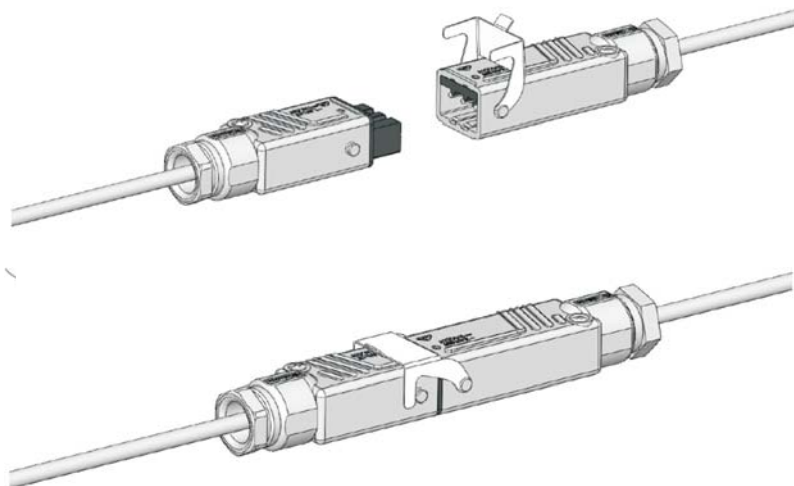
6. Connect the cable from the BMS to the supplied contra connector. First lead the cable through the strain relief. This three wire cable (2 wires + PE) is not supplied with the BMS Interface. Make sure that the wires are connected in the right sequence.



#### Attention

For optimal communication between the BMS Interface and the BMS, the cable must be shielded twisted pair with a maximum length of 1200 meters.

7. Finally, place the supplied clip over the connector and use this to lock both connector parts. All the wiring has now been connected properly.





## 3 Settings

To approach the BMS Interface, from the BMS, some settings need to be made in order to make the communication possible.

Setting	Value
Type	Modbus RTU
Baud rate	9600
Initial address	247
Data bits	8
Parity	None
Stop bits	1

# 4 Data readout

## 4.1 Introduction

The BMS Interface supplies data, in a Modbus format, to the BMS. The user will receive this data and needs to process this. The attached parameter list can be used.

Pay special attention to some of the data that has to be converted into the wright format before receiving the expected values. The required conversions are also a part of the table given on the next page.

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**ATTENTION:**

The parameters mentioned in the table are all of the type “*read only*”. The only exception is parameter 0, which is “*read/write*”.

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#### 4.2 Parameter list

Parameter	Register type	Value	Type	Unit	Description	Conversion y = first byte x = second byte	Setting
0	03	16 bits direct	Address	-	Actual Modbus address BMS Interface	-	Yes
1	03	16 bits direct	Temperature	°C	Temperature in the top of the water heater	x/100	Yes
2	03	16 bits direct	Temperature	°C	Temperature in the bottom of the water heater	x/100	Yes
3	03	16 bits direct	Temperature	°C	Flue gas sensor (dummy)	x/100	n.a.
4	03	16 bits direct	Temperature	°C	Set point water heater	x/100	Yes
5	03	16 bits direct	Delta T	K	Hysteresis up gas burner	x/256	Yes
6	03	16 bits direct	Delta T	K	Hysteresis down gas burner	x/256	Yes
7	03	16 bits direct	State	-	Unit state	-	Yes
8	03	16 bits direct	Relay	-	Relay: Potable water pump	1=Closed, 0=Open	Yes
9	03	16 bits direct	Burning hours	Hours	Burning hours water heater	-	Yes
10...14	03	16 bits direct	Error	-	Last 5 lock outs (internal codes)	-	Yes
15...19	03	16 bits direct	Error	-	Last 5 blocking errors (internal codes)	-	Yes
20	03	16 bits direct	Error	-	Actual error code (internal code)	-	Yes
21	03	16 bits direct	Relay	ON/OFF	Relay: External ON / OFF	1=Closed, 0=Open	Yes
22	03	16 bits direct	Solar State	-	State solar control	-	n.a.
23...27	03	16 bits direct	Error	-	Last 5 solar errors (internal codes)	-	n.a.
28	03	16 bits direct	Temperature	°C	Temperature solar collector (S1)	x/100	n.a.
29	03	16 bits direct	Temperature	°C	Solar temperature in the bottom of the tank (S2)	x/100	n.a.
30	03	16 bits direct	Temperature	°C	Solar temperature in the top of the storage tank (S3)	x/100	n.a.

Parameter	Register type	Value	Type	Unit	Description	Conversion y = first byte x = second byte	Setting
31	03	16 bits direct	Temperature	°C	Solar return temperature of the Q/T sensor (S4)	x/100	n.a.
32	03	16 bits direct	Temperature	°C	Temperature limit for solar heating	x/100	n.a.
33	03	16 bits direct	Contribution	Watt	Solar contribution; actual	-	n.a.
34	03	16 bits direct	Contribution	MJ	Solar contribution; last 24h	-	n.a.
35	03	16 bits direct	Contribution	GJ	Solar contribution; total	-	n.a.
36	03	16 bits direct	Flow	l/min	Actual flow through the Q/T sensor	x/10	n.a.
37	03	16 bits direct	Solar pump	%	Modulation percentage of the solar pump	x/2.55 (0...100% = 0...255)	n.a.
38	03	16 bits direct	Warning	ON/OFF	Warning Service required ON	1=On, 0=Off	Yes
39	03	16 bits direct	Day		Anti legionella purge; day	Sun (=0) ... Sat (=6) Legionella off = 7	Yes
40	03	16 bits BCD	Time	hh:mm	Anti legionella purge; start time	y=hh, x=mm	Yes
41	03	16 bits BCD	Time	hh:mm	Anti legionella purge; end time	y=hh, x=mm	Yes
42	03	16 bits direct	Temperature	°C	Anti legionella purge; set point	x/100	Yes
43	03	16 bits direct	Error	-	Actual error solar system (internal code)	-	n.a.
44	03	16 bits direct	Warning	ON/OFF	Warning Anode ON	1=On, 0=Off	Yes
45	03	16 bits direct	Heat input	%	Actual heat input in % of the maximum load	-	Yes
46	03	16 bits direct	Relay	-	Relay: Error activated	1=Closed, 0=Open	Yes
47	03	16 bits direct	Temperature	°C	CV setpoint	x/100	Yes
48	03	16 bits direct	Temperature	°C	CV temperature	x/100	Yes
49	03	16 bits direct	Relay	-	Relay: Heat demand roomthermostat	1=Closed, 0=Open	Yes
50							

# 5 Errors

## 5.1 Introduction

Through the BMS Interface, internal error codes can be viewed. On parameter 20, the actual error code for lock outs and blocking errors are displayed. Parameters 10 ... 14, 15 ... 19 and 23 ... 27 show the five most recent errors of respectively the lock outs, blocking errors and solar errors.

## 5.2 Lock-out codes

These internal codes are not the same code as the texted error that is visible on the display of the water heater and in the user manual of the water heater. The table below shows the explanation of these internal codes of the lock-out errors:

Internal code	Display error code	Description
0	C02	Internal error control
1	F04	Ignition error (3 attempts)
3	C22	Watchdog error
4	C02	Internal error control
5	C02	Internal error control
6	C02	Internal error control
7	F02	Fan error
8	C02	Internal error control
9	C02	Internal error control
10	F09	Maximum temperature error
11	C02	Internal error control
16	E03	Temperature difference top tank
17	C02	Internal error control
18	F07	Flame error
19	F08	Flame error
22	F05	Flame error
23	F03	APS not closed
24	F03	APS not open
25	F15	Flue gas temperature error
28	E05	Blocking error for 20 hours
255	-	No error

**5.3 Blocking codes**

The table below shows the explanation of the internal codes related to the blocking errors:

Internal code	Display error code	Description
36	C02	Internal error control
37	C02	Internal error control
38	C02	Internal error control
39	C02	Internal error control
40	F11	Flame error
41	E01	Maximum temperature error
42	F01	Reversed phase error
43	C02	Internal error control
44	F06	Ionisation error
45	C02	Internal error control
47	S01	Bottom tank sensor open
50	S04	Flue gas sensor 1 open
52	S05	Flue gas sensor 2 open
53	S02	Top tank sensor 1 open
54	S03	Top tank sensor 2 open
63	S11	Bottom tank sensor shorted
66	S14	Flue gas sensor 1 shorted
68	S15	Flue gas sensor 2 shorted
69	S12	Top tank sensor 1 shorted
70	S13	Top tank sensor 2 shorted
79	C03	Reset error
80	C04	Selection error
82	F19	Supply voltage error
255	-	No error

# 6 Status

## 6.1 Introduction

Via the BMS Interface, the state of the water heater and the solar control can be read out separately. The actual state of the control of the water heater can be found on parameter 7.

## 6.2 Status water heater

The numbers that will be read out refer to certain states of the control(s). Some states shall appear and disappear so quickly that they won't be visible. This is no problem.

In the table beneath, the reference to the numbers is specified:

Code	Description
0	Resetting the control
1	Resetting the control
2	Standby, no active burner cycle
3	Pre purge of the fan / unit
4	Pre purge of the fan / unit
5	Pre purge of the fan / unit
6	Check safety devices
7	Check safety devices
8	Ignition of the gas mixture
9	Ignition of the gas mixture
10	Burning is started, unit is heating up
11	Stop signal for burner cycle
12	Stop signal for burner cycle
13	Post purge of the fan / unit
14	Post purge of the fan / unit
15	Error present
16	Error present
17	Internal check of the control
18	Internal check of the control
19	Internal check of the control
20	Internal check of the control
21	Waiting time between states



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