

## **Project Documentation | JBOX - Junction Box**

---

**Project Number:**

**SMS Project Number:**

**Project Title:**

Junction Box for UMRR Traffic Management Sensor

**Keyword(s):**

JBOX Junction Box

**Date:**

May 24, 2016

**Document:**

JBOX Junction Box.docx

**PROPRIETARY**

**The information contained in this document may be subject to change without notice.**

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 1 Data Sheet

The Smartmicro **Junction Box** offers a universal and easy to use field installable way of connecting and surge protecting a UMRR-0A or UMRR-0C or UMRR-0F radar to the home run cable.

### 1.1 Features

- Provides an **easy-to-use** universal electrical interface through a terminal block.
- **Field installable:** A simple screwdriver is sufficient to install the Junction Box.
- **Surge Protection:** The Junction Box features protection for power, CAN and RS485 communication wires.
- **Robust:** The Junction Box is watertight and almost unbreakable.
- Rev01 Junction boxes feature
  - Captive screws
  - Signal names printed on PCB
  - Jumpers to determine RS485 full or half duplex operation<sup>1</sup>
- Versions for **all UMRR-0A and UMRR-0F models** available.
- Versions for **UMRR-0C** require HOUSING-070707 or compatible.
- Integrates into smartmicro's BRACKETs.

---

<sup>1</sup> UMRR hardware has to offer both options, check UMRR datasheet.

**PROPRIETARY**

**The information contained in this document may be subject to change without notice.**

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 2 Junction Box for UMRR-0A sensors



Figure 1: Junction Box JBOX-000000 with attached Lapp cable

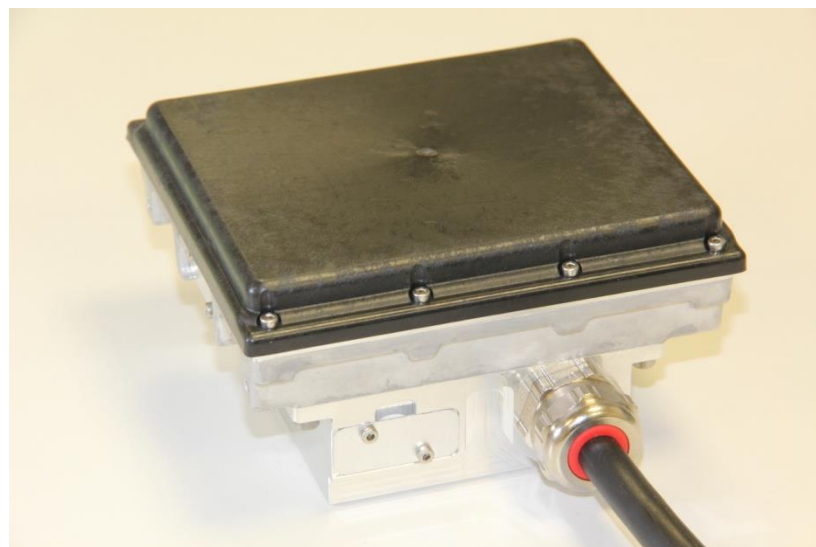


Figure 2: Junction Box JBOX-000000 with attached Sensor

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 2.1 Specifications

<b>Model No.</b>	<b>JBOX-000000 / JBOX-000100</b>
<b>Mechanical</b>	
Weight	183 g, excluding cable.
Height	79.8 mm excluding cable outlet ca. 116 mm including cable outlet
Width	84 mm
Depth	29 mm
<b>Supported Cables</b>	
Supported cable diameter	9 mm – 13 mm (smaller diameter available on request)
Supported conductor cross section range	0.13 mm <sup>2</sup> – 2.5 mm <sup>2</sup>
Recommended cable	Lapp cable UNITRONIC BUS IBS Yv COMBI type 2170217 or MEDI no. 9DB280431
<b>Surge Protection</b>	
Surge protection of power lines	Compliant to IEC 61000-4-2 (ESD) and IEC 61000-4-4 (fast transients)
Surge protection of data lines	Compliant to IEC 61000-4-2 (ESD) and IEC 61000-4-4 (fast transients)

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 2.2 Pinout

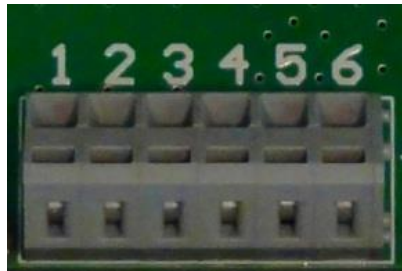


Figure 3: Terminal block with "pin" numbers

Pin No.	Function	Wire Color (Lapp type 2170217)	Wire Color (MEDI type #9DB280431)
1	CAN H	green	green
2	CAN L	yellow	yellow
3	Sensor RS485 TX/RX High	gray	gray
4	Sensor RS485 TX/RX Low	pink	pink
5	Sensor_VCC	red	red
6	Sensor_GND	blue	blue

Table 1: pinout of terminal block connector

## 2.3 Variants

See Table 2 for a list of Junction Box variants and the sensor types they support.

Junction Box variant	Supported UMRR-0A
<b>JBOX-000000</b>	Type 29 Type 31
<b>JBOX-000100</b>	Type 30 Type 32 (with Housing-070602)

Table 2: Junction Box variants

## 2.4 Recommended Cable

Lapp cable UNITRONIC BUS IBS Yv COMBI type 2170217.

### PROPRIETARY

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

### 3 Junction Box for UMRR-0C and UMRR-0F sensors



Figure 4: Junction Box JBOX-010001 inner view



Figure 5: Junction Box JBOX-010001 outer view

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

### 3.1 Specifications

<b>Model No.</b>	<b>JBOX-010001 / JBOX-010101</b>
<b>Mechanical</b>	
Weight	180 g, excluding cable.
Height	79.8 mm excluding cable outlet ca. 116 mm including cable outlet
Width	84 mm
Depth	29 mm
<b>Supported Cables</b>	
Supported cable diameter	9 mm – 13 mm (smaller diameter available on request)
Supported conductor cross section range	0.08 mm <sup>2</sup> – 0.5 mm <sup>2</sup>
Recommended cable	MEDI #KU110C12J002
<b>Surge Protection</b>	
Surge protection of power lines	Compliant to IEC 61000-4-2 (ESD) and IEC 61000-4-4 (fast transients)
Surge protection of data lines	Compliant to IEC 61000-4-2 (ESD) and IEC 61000-4-4 (fast transients)

### 3.2 Jumpers J3 and J4

J3 and J4 are bridges between pins 3 and 5 / pins 4 and 6 of the terminal block. Those bridges must be **open for full duplex RS485** operation, and must be **closed for half-duplex RS485**.

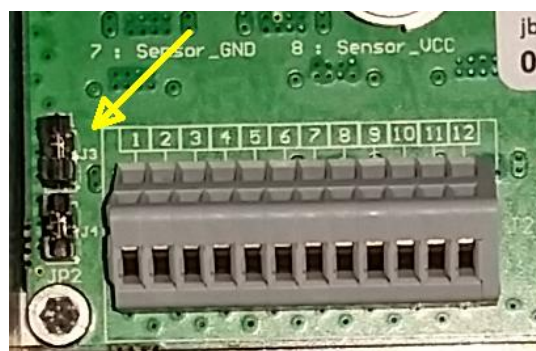


Figure 6: J3 and J4 determine RS485 full/half duplex operation

Please note **J3 and J4 are closed as delivered**. Remove the jumpers for full duplex RS485 operation.

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

### 3.3 Pinout

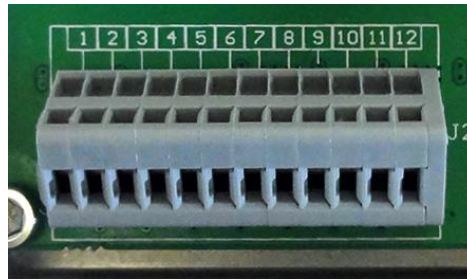


Figure 7: Terminal block with "pin" numbers

Pin No.	Function	Wire Color (MEDI type #KU110C12J001)
1	Sensor Ethernet TX H	gray / red
2	Sensor Ethernet TX L	red / blue
3	Sensor RS485 TX/RX L	pink
4	Sensor RS485 TX/RX H	gray
5	connect to pin 3 <sup>2</sup>	brown
6	connect to pin 4 <sup>3</sup>	white
7	Sensor_GND	blue
8	Sensor_VCC	red
9	Sensor Ethernet RX L	black
10	Sensor Ethernet RX H	purple
11	CAN H	green
12	CAN L	yellow

Table 3: pinout of terminal block connector (half-duplex/2-wire RS485, UMRR-0F products)

Pin No.	Function	Wire Color (MEDI type #KU110C12J001)
1	Sensor Ethernet TX H	gray / red
2	Sensor Ethernet TX L	red / blue
3	Sensor RS485 RX L	pink
4	Sensor RS485 RX H	gray
5	Sensor RS485 TX L	brown
6	Sensor RS485 TX H	white
7	Sensor_GND	blue
8	Sensor_VCC	red
9	Sensor Ethernet RX L	black
10	Sensor Ethernet RX H	purple
11	CAN H	green
12	CAN L	yellow

Table 4: Table 4: pinout of terminal block connector (full-duplex/4-wire RS485, UMRR-0C products)

<sup>2</sup> In half-duplex mode the pins 3 and 5 has to be hard-wired connected, use J3 and J4

<sup>3</sup> In half-duplex mode the pins 4 and 6 has to be hard-wired connected, use J3 and J4

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.



### 3.4 Variants

See Table 5 for a list of Junction Box variants and the sensor types they support.

Junction Box variant	Supported UMRR-0C	Supported UMRR-0F
<b>JBOX-010001</b>	none	Type 29 Type 31
<b>JBOX-010101</b>	Type 39 Type 40 Type 42	Type 30 Type 32 (with Housing-070602)

**Table 5: Junction Box variants**

**PROPRIETARY**

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## **4 General Information**

### **4.1 JBOX Grounding Requirements**

Neither the housing of the UMRR sensor nor the JBOX is electrically floated but connected to the negative supply voltage instead. To assure correct operation of the sensor, please refer to the grounding requirements described in [UMRR\\_Traffic\\_Sensor\\_Grounding\\_Requirements.pdf](#).

### **4.2 Fixation**

The JBOX will be attached to the UMRR sensor using the threaded holes on the back of the sensor. Please consider this in case that you design your own bracket or integrate the sensor in another housing. The threaded holes on the sides of the sensor are meant for the fixation of the sensor instead.

#### **PROPRIETARY**

**The information contained in this document may be subject to change without notice.**

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 5 Important Legal Disclaimer Notice

All Product, Product specifications and data in this project documentation are subject to change without notice to improve reliability, function, design or otherwise.

The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Smartmicro disclaims any and all liability for any errors, inaccuracies or incompleteness contained in this datasheet or in any other disclosure relating to the Product.

To the extent permitted by applicable law, Smartmicro disclaims (i) any and all liability arising out of the application or use of the Product or the data contained herein, (ii) any and all liability of damages exceeding direct damages, including - without limitation – indirect, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of suitability of the Product for a particular purpose.

Statements regarding the suitability of Products for certain types of applications are based on Smartmicro' knowledge of typical requirements that are often placed on Smartmicro' Products in generic/general applications. Such statements are, however, not binding statements about the suitability of Products for a particular/specific application. It is the customer/user's own responsibility to validate that the Product with the specifications described herein is suitable for use in its particular/specific application. Parameters and performance of the Products may due to particular/specific applications and due to particular/specific surroundings deviate from the statements made herein. Therefore, it is important that customer/user has thoroughly tested the Products and has understood the performance and the limitations of the Products before installing the Products for the final applications or before commercialization. Although Products are well optimized to be used for the intended applications stated herein, it must also be understood by the customer/user that the detection probability may not be 100 % and the false alarm rate may not be zero.

The information provided herein, relates only to the specific Product designated and may not be applicable when such Product is used in combination with other materials or in any process not defined herein. All operating parameters, including typical parameters, must be validated for each customer application by the customer/user's technical experts. Customers using or selling Smartmicro products not expressly indicated for use in such applications do so at their own risk.

This Product specification or data sheet does not expand or otherwise modify Smartmicro terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing by Smartmicro, the Products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Product could result in personal injury or death.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Smartmicro Product names and markings noted herein may be trademarks of their respective owners.

Please note that the application of the Product may be subject to standards or other regulations that may vary from country to country. Smartmicro does not guarantee that the use of Products in the applications described herein will comply with such regulations in any country. It is the customer/user's responsibility to ensure that the use and incorporation of Products complies with the regulatory requirements of their markets.

If any provision of this Disclaimer is, or is found to be, void or unenforceable under applicable law, that will not affect the validity or enforceability of the other provisions of this Disclaimer.

### **PROPRIETARY**

**The information contained in this document may be subject to change without notice.**

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.

## 6 Contact

### Address:

smart microwave sensors GmbH  
In den Waashainen 1  
38108 Braunschweig  
Germany

### Phone / Fax numbers:

Phone: +49-531-39023-0  
Fax: +49-531-39023-599

### Web / Email address:

Web: [www.smartmicro.de](http://www.smartmicro.de)  
Email: [info@smartmicro.de](mailto:info@smartmicro.de)

#### PROPRIETARY

The information contained in this document may be subject to change without notice.

The information contained in this document shall remain the sole exclusive property of s.m.s smart microwave sensors GmbH.