






# Expansion port **MBUSD**

**USERS' GUIDE**

## Used symbols

-  Danger – important notice, which may have an influence on the user’s safety or the function of the device.
-  Attention – notice on possible problems, which can arise in specific cases.
-  Information, notice – information, which contains useful advice or special interest.

## GPL licence

Source codes under GPL licence are available free of charge by sending an email to [info@conel.cz](mailto:info@conel.cz).



**Declared quality system  
ISO 9001**

Conel s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic  
Issue in CZ, 12/15/2011



## Contents

1. Safety instructions .....	1
2. Product disposal instructions.....	2
3. Expansion port description .....	3
4. Connection of MBUS connector .....	3
5. Overload detection .....	4
6. State indication of MBUS port .....	4
7. Delivery Identification .....	5
8. Technical specification .....	5
9. Recommended literature .....	5
10. Customers support .....	6

## Image list

Fig. 1: MBUS connector .....	3
Fig. 2: Circuit equipment with a router with data cable length less than 10 m .....	3
Fig. 3: Circuit equipment with a router with data cable length more than 10 m.....	4
Fig. 4: Port MBUS label.....	5



## Table list

Table 1: Connection of MBUS connector .....	3
Table 2: State indication .....	4
Table 3: Delivery identification .....	5
Table 4: Technical specification .....	5



## 1. Safety instructions

*Please observe the following safety instructions:*

- The expansion port must be used in compliance with all applicable international and national laws and in compliance with any special restrictions regulating the utilization of the communication module in prescribed applications and environments.
- Use only the original Conel company accessories. Thus you will prevent possible health risks and damage to the devices and ensure compliance with all relevant provisions. Unauthorised adjustments or use of unapproved accessories may result in damage to the expansion port and breach of applicable laws. Use of unapproved adjustments or accessories may lead to cancellation of guarantee, which has no effects on your legal rights.
- Do not expose the expansion port to extreme conditions. Protect it from dust, moisture and heat.



## 2. Product disposal instructions

The WEEE (Waste Electrical and Electronic Equipment: 2002/96/EC) directive has been introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques to minimize the impact on the environment. This product contains high quality materials and components which can be recycled. At the end of its life this product **MUST NOT** be mixed with other commercial waste for disposal. Check with the terms and conditions of your supplier for disposal information.

## 3. Expansion port description

The expansion port MBUSD is created as expansion port which enables to use of the next hardware interface of Conel routers for next signal processing. The expansion port MBUS is equipment of a MASTER type. This interface is physically connected on RJ45 connector on appropriate router. The expansion port MBUSD is internal supplies from appropriate router. The expansion port MBUSD is protected against inputs overload.



Expansion port MBUS is possible fitted into PORT1 and PORT2.

## 4. Connection of MBUS connector

Panel socket RJ45.

Pin number	Signal mark	Description	Data flow direction
1	GND	Signal and supply ground	
2	GND	Signal and supply ground	
3	TxRx-	M-BUS B (-)	Input/Output
4	TxRx+	M-BUS A (+)	Input/Output
5	TxRx-	M-BUS B (-)	Input/Output
6	TxRx+	M-BUS A (+)	Input/Output
7	+12 V EXT	External power supply	
8	+12 V EXT	External power supply	

Table 1: Connection of MBUS connector

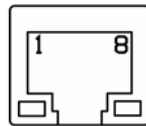


Fig. 1: MBUS connector



- **ATTENTION! External supply is for converter M-BUS!**
- Because of galvanic separation, the converter have to has external power supply.
- The signals 3-5 a 4-6 are linked inside of the modem.



Circuit example of the equipment with a router with data cable length less than 10 m:

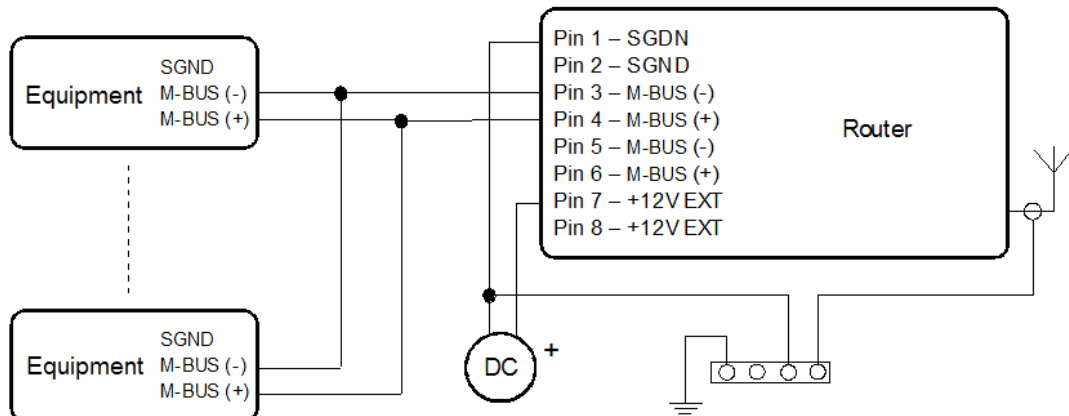


Fig. 2: Circuit equipment with a router with data cable length less than 10 m





Circuit example of the equipment with a router with data cable length more than 10 m:

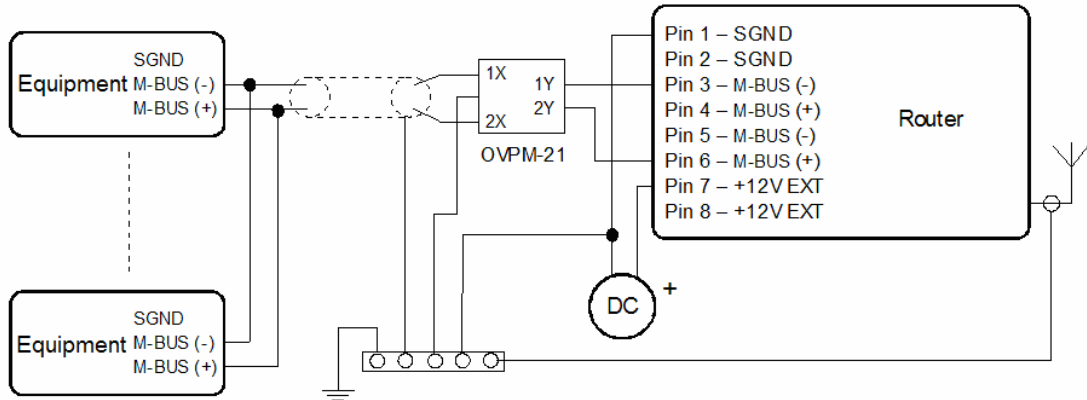


Fig. 3: Circuit equipment with a router with data cable length more than 10 m



With a M-BUS data cable more than 10m it is necessary to use overvoltage protection on the router side!

## 5. Overload detection

When the short-circuit is detected on M-BUS, power of the bus is disconnected. Then the bus is probed every 4 seconds by connection of power supply and measuring of current consumption. If the bus is still shorted, then power is disconnected again. Bus is operable again, approximately 8 seconds after short-circuit subsides. Short-circuit protection can be invoked also by connection more meters to the bus. They can trigger overcurrent detection, by their own power consumption. Overcurrent protection can be triggered also by connecting a critical number of meters, when power consumption can rise above limit during communication.

## 6. State indication of MBUS port

### LED port indicator

Green LED	Indicates Receive data
Yellow LED	Indicates Transmit data
Both LED lights	Indicates short circuit on the MBUS

Table 2: State indication



Status indication is supported from 3rd revision of boards.

## 7. Delivery Identification

Trade name	Type name	Power supply
XC-MBUS	XC-MBUS	External supply

Table 3: Delivery identification

Example of expansion port MBUSD label:

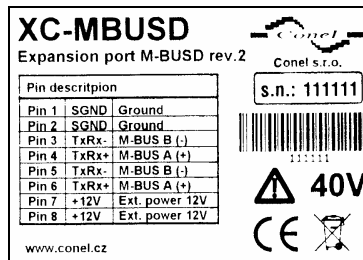


Fig. 4: Port MBUSD label

## 8. Technical specification

Expansion port M-BUS		
External power supply	Voltage	+10 .. +30 V
	Supply power	Max. 4 W
Environment	Operating temperature	-30 .. +60 °C
	Storage temperature	-30 .. +85 °C
Standards	Emission	EN 55022/B
	Immunity	ETS 300 342
	Safety	EN 60950
M-BUS specifications (EN 1434)	Max. devices (each 1,5 mA)	30
	Max. operating bus current	60 mA
	Overload detection	100 mA
	Short circuit strength	Permanent
	Bus voltage mark	36 .. 43 V
	Bus voltage space	24 .. 31 V
	Max. total cable length (300Bd, 200nF/km)	1000 m

Table 4: Technical specification

## 9. Recommended literature

[1] Conel: **Application guide – Expansion port mounting.**

## 10. Customers support

Up to date information about the product is on website:


<http://www.conel.cz/>

### **Upkeep-advice:**

During cleaning of the router do not use aggressive chemicals, solvents and abrasive cleaners!

Conel Company hereby declares that the router narrated in this user's guide fits all basic demands of directive 1999/5/EC (R&TTE).

Router fits values of coefficient SAR defined by association ICNIRP and values of "About protection of health before non-ionized radiation".

 Declaration about consistency was issued and is possible get it in accompanying CD or at producer.