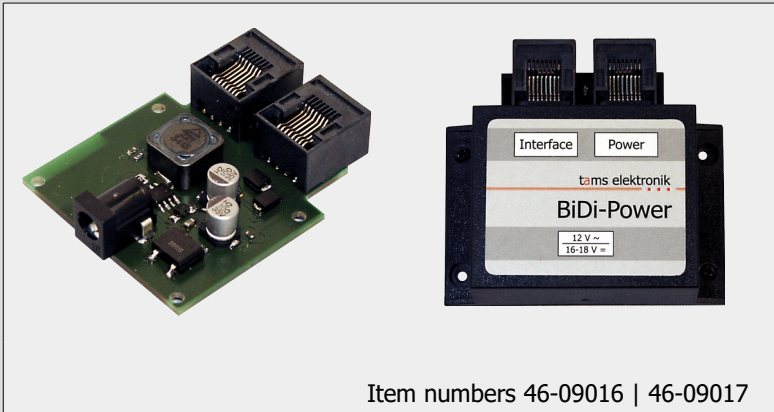


# BiDi-Power

Power Supply for BiDiB-Devices



## Manual



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### Printing the manual

The formatting is optimised for double-sided printing. The standard page size is DIN A5. If you prefer a larger display, printing on DIN A4 is recommended.

## 0. Notes on BiDiB®

The BiDiB devices described in this manual comply with the standards of the BiDiB specification (status V0.7). The BiDiB specification has been published on: [www.bidib.org](http://www.bidib.org).

BiDiB® is a registered trademark. Copyrights and trademarks to BiDiB are held by Wolfgang Kufer, OpenDCC.de.

In order to increase the readability of this text, we have refrained from referring to it whenever the term BiDiB is used.

## 1. Getting started

The instructions will help you step by step with the safe and proper installation and use of your BiDi-Power. Before you start to put the BiDi-Power into operation, read this manual completely, especially the safety instructions and the section on possible errors and their elimination. You will then know what you have to pay attention to and thus avoid errors that sometimes can only be rectified with a lot of effort.

Keep the instructions in a safe place so that you can restore functionality later in the event of any malfunctions. If you pass the BiDi-Power on to another person, also give the instructions with it.

### 1.1. Contents of the package

- 1 ready-built and tested circuit board BiDi-Power (item no. 46-09016-01) or  
1 BiDi-Power in housing (item no. 46-09017-01)
- 1 Ethernet patch cable (RJ-45)

### 1.2. Required materials

As a power supply you need a power pack (e.g. a.c. power pack item no. 70-09110-01):

|                             |  |
|-----------------------------|--|
| Voltage                     | 12 V a.c. voltage or<br>16 – 18 V d.c. voltage   |
| Current                     | min. 600 mA  |
| Connection to<br>BiDi-Power | Coaxial power connector (DC power connector)<br>outer / inner diameter of the plug: 5.5 / 2.1 mm |

### 1.3. Intended use

The BiDi-Power is intended for use in model construction, especially in model railway layouts, according to the specifications in the manual. Any other use is not in accordance with the intended use and will result in the loss of the warranty claim. Intended use also includes reading, understanding and following all parts of the instructions. The BiDi-Power is not intended to be used by children under the age of 14.

## 1.4. Safety instructions

Improper use and non-observance of the instructions can lead to incalculable hazards. Prevent these dangers by carrying out the following measures:

- Only use the BiDi-Power in closed, clean and dry rooms. Avoid moisture and splash water in the environment. After condensation has formed, wait two hours for acclimatisation before use.
- Disconnect the BiDi-Power from the power supply before carrying out wiring work.
- Supply the BiDi-Power only with extra-low voltage as specified in the technical data. Use only tested and approved transformers / power supply units.
- Only plug the mains plugs of transformers / power supply units into properly installed and fused earthed sockets.
- When making electrical connections, ensure that the cable cross-section is sufficient.
- Heating of the BiDi-Power during operation is normal and harmless.
- Do not expose the BiDi-Power to high ambient temperatures or direct sunlight. Observe the information on the maximum operating temperature in the technical data.
- Regularly check the operational safety of the BiDi-Power, e.g. for damage to the connection cables.
- If you notice damage or if malfunctions occur, disconnect the connection to the power supply immediately. Send the BiDi-Power in for inspection.

## 2. Operation overview

According to the BiDiB-specification devices (so-called "nodes") without need for additional current for their basic functions get the current they need via the bus line.

As a power supplier you can use:

- BiDiB-devices connected directly to a power supply (e.g. digital central unit), which are designed to feed current into the bus line
- specific BiDiB-power supplies

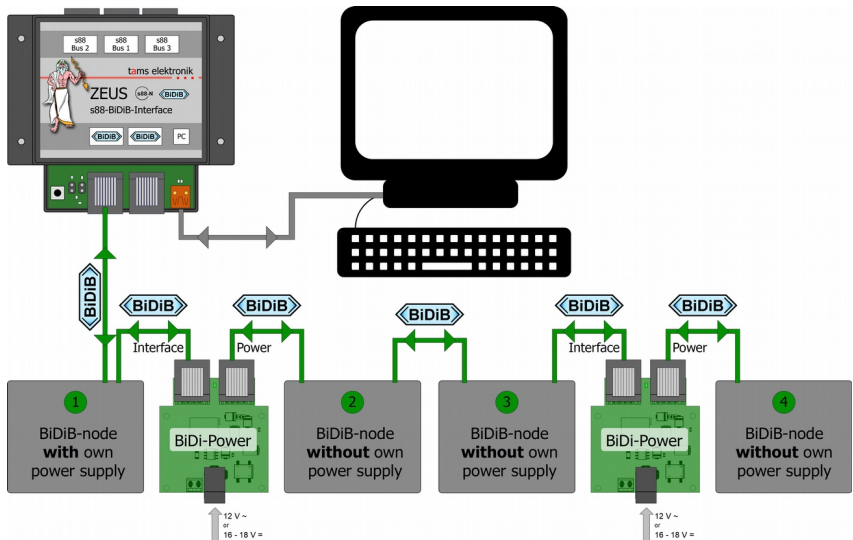
The BiDi-Power module is designed as a power supply for BiDiB-nodes and can provide up to 500 mA current. For the connection of the PCB to the BiDiBus Ethernet patch cable with RJ-45 connectors are used – as usual with BiDiB-devices.

### 3. Connections

#### 3.1. Arrangement in the bus line

The BiDi-Power module can only supply BiDiB components that are subsequently connected to the bus line (viewed from the direction of the interface). In order to be able to make optimal use of the current provided by the BiDi-Power, you must install the BiDi-Power **directly** in front of the BiDiB component(s) to be supplied in the bus line (viewed from the interface).

If one BiDi-Power is not sufficient to supply all BiDiB components on one bus line, you can connect further BiDi-Power modules. Insert these **directly** in front of the node or nodes to be supplied in the bus line.



In the example, a BiDi-Power module supplies nodes 2 and 3 and another BiDi-Power node 4. Before the first BiDi-Power module, a node with its own power supply is connected to the BiDiBus.

### 3.2. Connection to the BiDiBus

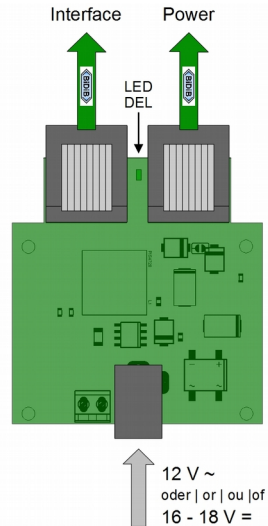
In order to connect the module BiDi-Power to the BiDiBus you use Ethernet patch cables with RJ-45 connectors. Connect the two Ethernet-cables according to the connection diagram to the RJ 45 connection sockets.

- Interface (→ Interface / digital control unit)
- Power (→ s88 modules to be supplied)

Observe the correct assignment of the cables to the two sockets.

#### **! Attention:**

An interchanged connection of the two Ethernet-cables to the sockets "Interface" and "Power" possibly causes serious damage to BiDi-Power and other current suppliers connected to the bus line. In case you discover a wrong connection, disconnect the power supply for the BiDi-Power module **immediately!**



### 3.3. Connection to the voltage supply

As a voltage source you can use a power pack with

- 12 V a.c. voltage ( $\sim$ ) or
- 16 – 18 V d.c. voltage ( $-$ )

in each case with a current of at least 600 mA.

The connection of the power pack to s88-Power is made via a coaxial (DC) power connector 5.5 / 2.1 mm (outer / inner diameter).

#### **! Attention:**

Do not use a power pack with a higher nominal voltage than specified. The resulting surplus power has to be dissipated as heat by s88-Power. There is a **risk of fire** if the nominal voltage of the power pack is too high!

### 3.4. Displaying operational readiness

As soon as the LED between the two RJ 45 connection sockets lights, BiDi-Power is connected to the voltage supply and ready for use.

#### 4. Checklist for troubleshooting and error correction

**Warning:**

If you notice a strong heat development, immediately disconnect the connection to the supply voltage. **Fire hazard!**

Possible causes:

- The two connections "Interface" and "Power" are interchanged on the BiDiBus. Thus the current flows into the wrong direction. → Check the connections. Possibly the module BiDiPower and/or other current suppliers connected to the BiDiBus line have been damaged.
- The power pack provides a too high voltage. → Check the technical data of the power supply unit. Possibly the module BiDiPower and/or other current suppliers connected to the BiDiBus line have been damaged.
- The BiDi-Power is defective. → Send in the BiDi-Power for inspection/repair.

**No voltage at the BiDiB nodes:**

There is no voltage applied to the BiDiB-nodes intended to be supplied by BiDi-Power.

- The two connections "Interface" and "Power" are interchanged on the BiDiBus. → Disconnect the power supply for the BiDi-Power **immediately!** Otherwise, the module BiDiPower and/or other current suppliers connected to the BiDiBus line possibly are damaged.
- The connection to the power supply has been interrupted. → Check the connections.
- The current of all connected BiDiB-nodes exceeds 500 mA. → Check the current of the nodes and connect additional modules BiDi-Power, if required.

## 4.1. Technical Hotline

If you have any questions about the use of the BiDi-Power, our technical hotline will help you (telephone number and e-mail address on the last page).

## 4.2. Repairs

You can send us a defective BiDi-Power for inspection / repair (address on the last page). Please do not send us your return freight collect. In the event of a warranty or guarantee claim, we will reimburse you for the regular shipping costs.

### **Please enclose the following with your shipment**

- proof of purchase as evidence of any warranty or guarantee claim
- a brief description of the defect
- the address to which we should return the product(s)
- your email address and/or a telephone number where we can reach you in case of queries

### **Costs**

The inspection of returned products is free of charge for you. In the event of a warranty or guarantee claim, the repair and return are also free of charge for you.

If there is no warranty or guarantee case, we will charge you the costs of the repair and the costs of the return. We charge a maximum of 50% of the new price for the repair according to our valid price list.

### **Carrying out the repair(s)**

By sending in the product(s), you give us the order to inspect and repair it. We reserve the right to refuse the repair if it is technically impossible or uneconomical. In the event of a warranty or guarantee claim, you will then receive a replacement free of charge.

### **Cost estimates**

Repairs for which we charge less than € 25.00 per item plus shipping costs will be carried out without further consultation with you. If the repair costs are higher, we will contact you and carry out the repair only after you have confirmed the repair order.



## 5. Technical data

### Connections

|                |   |
|----------------|---|
| Supply voltage | Socket for coaxial power connector (DC power connector)<br>outer / inner diameter: 5.5 / 2.1 mm |
| BiDiBus        | 2 RJ 45 connection sockets  |


### Electrical properties

|                        |  |
|------------------------|--|
| Voltage supply         | 12 V a.c. voltage or<br>16 – 18 V d.c. voltage |
| Maximum output current | 500 mA   |

### Protection

|                  |  |
|------------------|--|
| Protection class | Ready-made module (without housing): IP 00<br>Meaning: No protection against foreign bodies, contact and water.<br>Ready device (in housing): IP 20<br>Meaning: Protected against solid foreign bodies with diameter $\geq 12.5$ mm and access with a finger. No protection against water. |
|------------------|--|

### Environment

|   |                           |
|---|---------------------------|
|  | For use in closed rooms   |
| Ambient temperature during operation  | 0 ~ + 30 °C               |
| Permissible relative humidity during operation                                    | 10 ~ 85% (non-condensing) |
| Ambient temperature during storage  | - 10 ~ + 40 °C            |
| Permissible relative humidity during storage                                      | 10 ~ 85% (non-condensing) |

### Other features

|            |   |
|------------|---|
| Dimensions | PCB: approx. 48 x 52 mm<br>including housing: approx. 70 x 60 x 25 mm |
| Weight     | assembled board: approx. 20 g<br>including housing : approx. 37 g     |

## 6. Warranty, EU conformity & WEEE

### 6.1. Guarantee bond

For this product we issue voluntarily a guarantee of 2 years from the date of purchase by the first customer, but in maximum 3 years after the end of series production. The first customer is the consumer first purchasing the product from us, a dealer or another natural or juristic person reselling or mounting the product on the basis of self-employment. The guarantee exists supplementary to the legal warranty of merchantability due to the consumer by the seller.


The warranty includes the free correction of faults which can be proved to be due to material failure or factory flaw. With kits we guarantee the completeness and quality of the components as well as the function of the parts according to the parameters in not mounted state. We guarantee the adherence to the technical specifications when the kit has been assembled and the ready-built circuit connected according to the manual and when start and mode of operation follow the instructions.

We retain the right to repair, make improvements, to deliver spares or to return the purchase price. Other claims are excluded. Claims for secondary damages or product liability consist only according to legal requirements.

Condition for this guarantee to be valid, is the adherence to the manual. In addition, the guarantee claim is excluded in the following cases:

- if arbitrary changes in the circuit are made,
- if repair attempts have failed with a ready-made module or device,
- if damaged by other persons,
- if damaged by faulty operation or by careless use or abuse.

## 6.2. EU Declaration of Conformity

 This product fulfils the requirements of the following EU directives and therefore bears the CE marking.

2001/95/EU Product Safety Directive

2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

2014/30/EU on electromagnetic compatibility (EMC Directive). Underlying standards:

DIN-EN 55014-1 and 55014-2: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar electrical appliances. Part 1: Emitted interference, Part 2: Immunity to interference

To maintain electromagnetic compatibility during operation, observe the following measures:  
Only connect the supply transformer to a professionally installed and fused earthed socket.  
Do not make any changes to the original components and follow the instructions, connection and assembly diagrams in this manual exactly.  
Only use original spare parts for repair work.

## 6.3. Declarations on the WEEE Directive

This product is subject to the requirements of the EU Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE), i.e. the manufacturer, distributor or seller of the product must contribute to the proper disposal and treatment of waste equipment in accordance with EU and national law. This obligation includes

- registration with the registering authorities ("registers") in the country where WEEE is distributed or sold
- the regular reporting of the amount of EEE sold
- the organisation or financing of collection, treatment, recycling and recovery of the products
- for distributors, the establishment of a take-back service where customers can return WEEE free of charge
- for producers, compliance with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive.



The "crossed-out wheeled bin" symbol means that you are legally obliged to recycle the marked equipment at the end of its life. The appliances must not be disposed of with (unsorted) household waste or packaging waste. Dispose of the appliances at special collection and return points, e.g. at recycling centres or at dealers who offer a corresponding take-back service.

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Further Information and Tips:  
<http://www.tams-online.de>

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