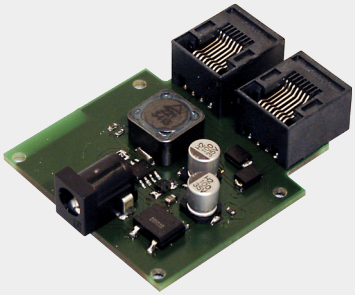
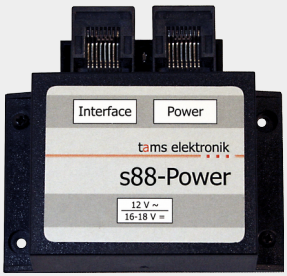
s88-Power

Power Supply for the s88 bus

s88-N

Manual





Item numbers 44-09016 | 44-09017

tams elektronik

Contents

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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.

1. Getting started

The instructions will help you step by step with the safe and proper installation and use of your s88-Power. Before you start to put the s88-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 s88-Power on to another person, also give the instructions with it.

1.1. Contents of the package

- 1 ready-built and tested circuit board s88-Power (item no. 44-09016-01) or
  1 s88-Power in housing (item no. 44-09017-01)
- 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 12 – 18 V d.c. voltage
Current	minimum 800 mA
Connection to s88-Power	Coaxial power connector (DC power connector) outer / inner diameter of the plug: 5.5 / 2.1 mm

1.3. Intended use

The s88-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 s88-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 s88-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 s88-Power from the power supply before carrying out wiring work.
- Supply the s88-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 s88-Power during operation is normal and harmless.
- Do not expose the s88-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 s88-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 s88-Power in for inspection.

2. Operation overview

Background information

s88 modules draw the power they need for their operation via the bus line. The current is usually provided by the digital control unit (with s88 interface) or the PC interface. It is neither defined how high the current is that the control unit or interface should provide for the s88 bus, nor how high the current consumption of the s88 modules may be.

Standard s88 modules have a very low current consumption (usually less than 10 mA). s88 modules with special functions can have a significantly higher current consumption (up to approx. 50 mA). This is due to the fact that additional components are required for the special functions (e.g. processors) and in some cases components are used that require comparatively high current.

Problem

If the current consumption of the s88 modules on an s88 bus exceeds the current that can be provided by the digital control unit or the interface, the following problems can occur:

- voltage drop in the s88 bus and therefore incorrect transmission of feedback signals
- tripping of the short-circuit fuse of the control unit / interface
- in the worst case: Damage to the interfaces or the control unit

Power supply for the s88 bus

The s88-Power module is designed as an external power supply for the s88 bus and can provide up to 700 mA of current.

s88-N

The s88-Power has RJ-45 connections in accordance with the s88-N standard, which regulates the assignment of commercially available patch cables for use in s88 feedback systems. It cannot be used together with modules with RJ 45 connections that do not comply with the s88-N standard.

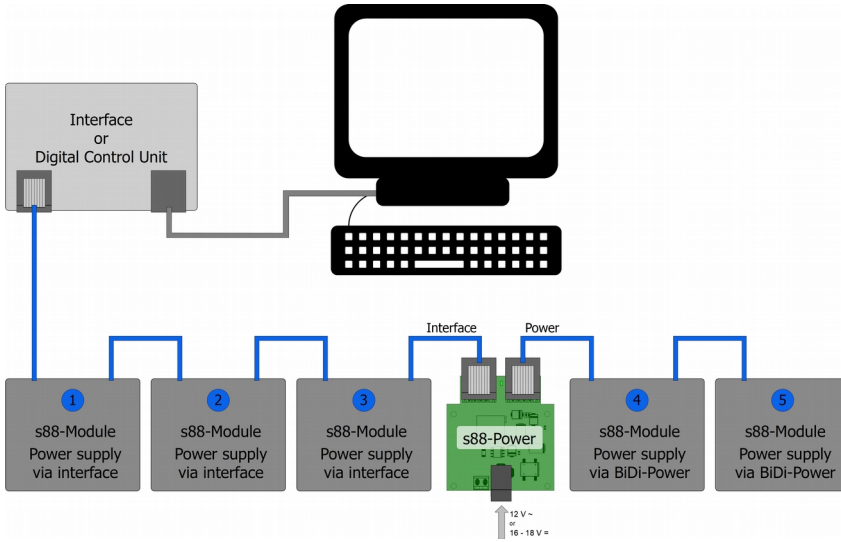
The s88-Power is inserted into the bus line behind the last s88 module that is still supplied by the control unit or the interface (viewed from the direction of the control unit or the interface).

3. Connections

3.1. Arrangement in the bus line

The s88-Power module is integrated into the s88 bus line. In order to make optimum use of the current provided by the s88-Power, you must install the s88-Power in the bus line directly in front of the s88 component(s) to be supplied (viewed from the interface).

If one s88-Power is not sufficient to supply all s88 components on a bus line, you can connect additional s88-Powers. Insert them into the bus line directly in front of the module(s) to be supplied.



In the example, s88 modules 1 to 3 are supplied via the bus line from the digital control unit / interface. The current that the control unit / interface can provide for the s88 bus is not sufficient to supply further s88 modules. A s88-Power is therefore inserted into the bus line. This supplies 700 mA current for the supply of further s88 modules (here s88 modules 4 and 5).

3.2. Connection to the s88 bus

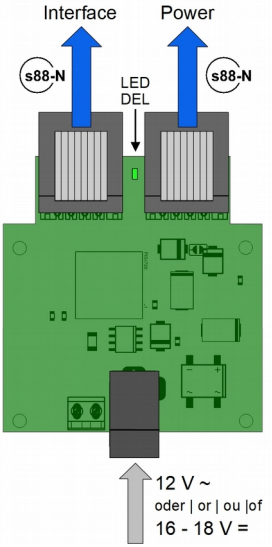
In order to connect the module s88-Power to the s88 bus you use Ethernet patch cables with RJ-45 connectors.

> **Please note:**
> Do not use the s88-Power together with s88 modules with RJ 45 connections that do not comply with the s88-N standard! The s88-Power and s88 modules connected to the bus can be damaged.

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.



> **Please note:**
> An interchanged connection of the two Ethernet-cables to the sockets "Interface" and "Power" possibly causes serious damage to s88-Power and other current suppliers connected to the bus line. In case you discover a wrong connection, disconnect the power supply for the s88-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 (~) or
- 12 – 18 V d.c. voltage (–)

in each case with a current of at least 800 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 sockets lights up brightly, voltage is present and the s88-Power is ready for operation. If the LED is only dimly lit, the power supply to the s88-Power is interrupted (e.g. the power supply unit is de-energised).

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 s88 bus. Thus the current flows into the wrong direction. → Check the connections. Possibly the module s88-Power and/or other current suppliers connected to the s88 bus line have been damaged.
- The power pack provides a too high voltage. → Check the technical data of the power supply unit. Possibly the module s88-Power and/or other current suppliers connected to the s88 bus line have been damaged.
- The s88-Power is defective. → Send in the s88-Power for inspection/repair.

No or faulty feedback

- The two connections "Interface" and "Power" are interchanged on the s88 bus. → Disconnect the power supply for the s88-Power **immediately**! Otherwise, the module s88-Power and/or other current suppliers connected to the s88 bus line possibly are damaged.
- The connection to the power supply is interrupted, the LED lights up dimly or not at all. → Check the connections.
- The current of all connected s88-modules exceeds 700 mA. → Check the current of the modules and connect additional moduldes s88-Power, if required.
- There are s88 modules with RJ 45 connections connected to the bus line that do not comply with the s88-N standard.

4.1. Technical Hotline

If you have any questions about the use of the s88-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 s88-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) outer / inner diameter: 5.5 / 2.1 mm
s88 bus	2 RJ 45 connection sockets, assignment according to S88-N

Electrical properties

Voltage supply	12 V a.c. voltage or 12 – 18 V d.c. voltage
Maximum output current	700 mA

Protection

Protection class	Ready-made module (without housing): IP 00 Meaning: No protection against foreign bodies, contact and water. Ready device (in housing): IP 20 Meaning: Protected against solid foreign bodies with diameter ≥ 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 including housing: approx. 70 x 60 x 25 mm
Weight	assembled board: approx. 20 g 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

CE 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.

Further Information and Tips:

http://www.tams-online.de

Warranty and Service:

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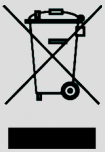

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