DF49 / DF53

smar

USER'S MANUAL

POWER SUPPLY IMPEDANCE FOR FIELDBUS

MAY / 12

DF49 / DF53

DF49-53ME

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Specifications and information are subject to change without notice.
Up-to-date address information is available on our website.

web: www.smar.com/contactus.asp

AVOIDING ELECTROSTATIC DISCHARGES

ATTENTION

Electrostatic discharges may damage semiconductor electronic components in the printed circuit boards. They usually occur when touching components or connector pins from modules and racks without wearing the appropriate equipment to prevent discharges.
It is recommended to take the following precautions:

- ✓ Before handling modules and racks, remove the electrostatic charge from your body by wearing a proper wristband or touching grounded devices;
- ✓ Avoid touching electronic components or connector pins from racks and modules.

DF49 / DF53 – POWER SUPPLY IMPEDANCE FOR FIELDBUS

Description

These modules were specially designed to provide appropriate impedance for fieldbus networks. The only difference between them is the number of fieldbus ports:

DF49 (2 ports) – PSI302P-2
DF53 (4 ports) – PSI302P-4
DF53-FC (4 ports)

The purpose of this impedance is to implement an output circuit where the impedance is greater than 3 KΩ, and when assembling in parallel with two 100 Ω ±2% terminators, it results in a 50 Ω line impedance approximately. This impedance can be implemented in a passive mode (50 Ω resistance in series with a 100 mH inductance) or in an active mode, through an impedance control circuit.

The fieldbus power supply impedance is a non-isolated, active impedance control device, in compliance with IEC 61158-2 standard. This device provides an output impedance which, in parallel with the two bus terminators (a 100 Ω resistor in series with a 1 µF capacitor) required by the standard, results in a pure resistive line impedance for a broad frequency range. The **DF49/DF53** cannot be used in intrinsic safety areas.

The figure shows the device block diagram. The **DF49/DF53** can be used in redundancy, connecting its output (+ and -) in parallel. In this case, use an external bus terminator (**BT302**) to allow maintenances or replacing the **DF49/DF53** in case of failure without interrupting the fieldbus communication.

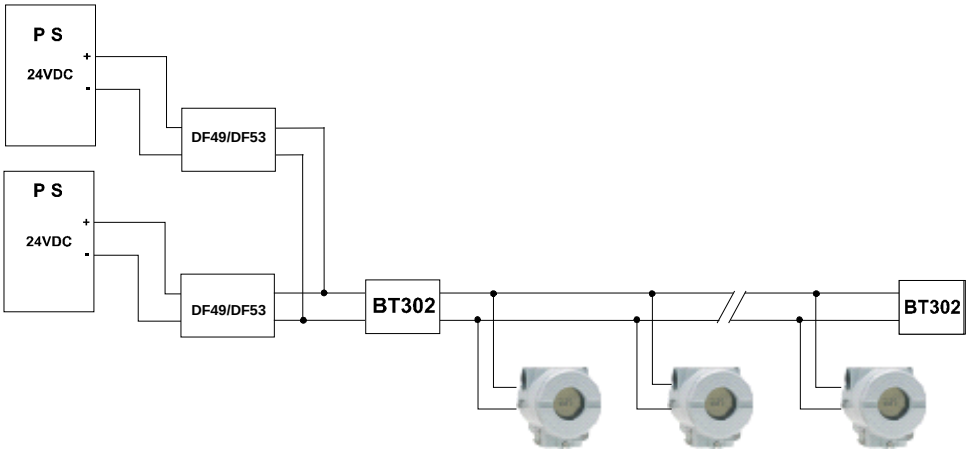


Figure 1 - System using the impedance DF49/DF53

The **DF49/DF53** modules have LEDs to indicate power supply and overcurrent. The input terminal block has two terminals (1A and 2A) that are connected to the external 24 Vdc. The power supply indication LED is green and it is energized while there is an external 24 Vdc power supply.

The overcurrent indication LED is red and it is energized only in case of an overcurrent caused by a short-circuit in the plant or by an excessive number of devices connected. The following figure shows a **DF49/DF53** layout.

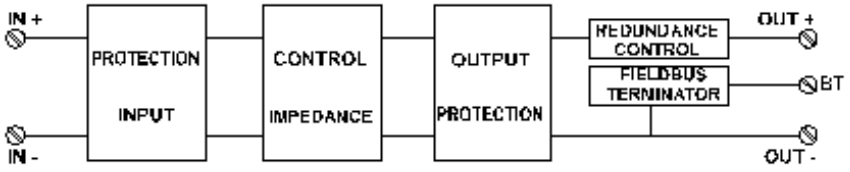


Figure 2 - System using the impedance DF49/DF53

DF49 (PSI302P-2): Four terminals (3A to 6A) implementing two independent Fieldbus ports, two DIP switches for activating the bus termination, one green LED for power status, and two red LEDs indicating overcurrent.

DF53 (PSI302P-4): Eight terminals (3A to 10A) implementing four independent Fieldbus ports, four DIP switches for activating the bus termination, one green LED for power status, and four red LEDs indicating overcurrent.

DF53-FC (PSI302P-4): It has the same characteristics of DF53 and meets the requirements for hardware tests of OIML R117-1 (Flow Measurement System of Liquids).

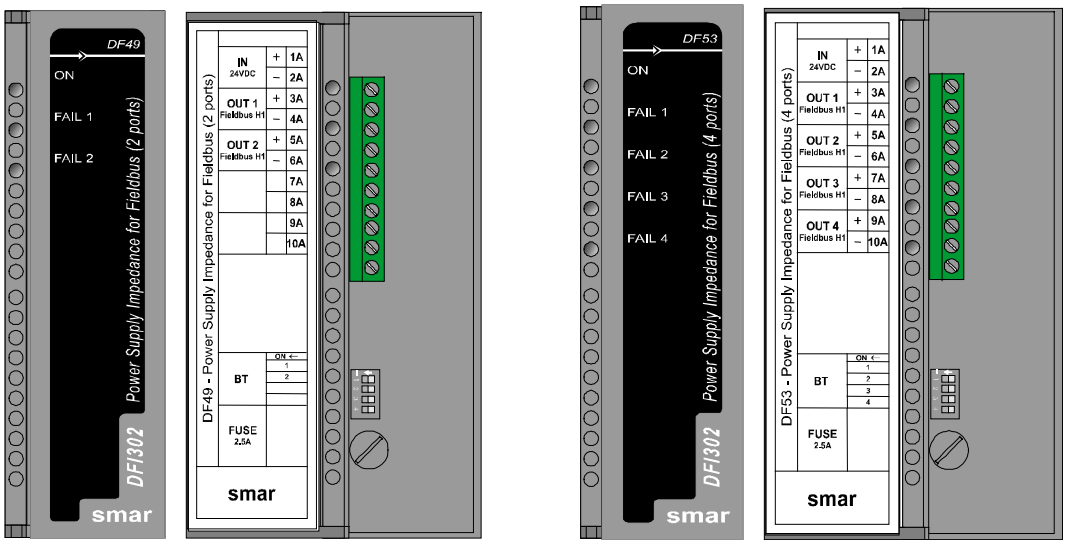


Figure 3 - Power supply impedance for fieldbus: DF49/DF53

Technical specifications

INPUT	
DC	24 to 32 Vdc ± 10%

OUTPUT	
Current	340 mA per channel

INPUT FILTER	
Attenuation	10dB in the input power ripple @ 60 Hz.

DIMENSIONS AND WEIGHT	
Dimensions (WxHxD)	39.9x137.0x141.5 mm (1.57x 5.39 x 5.57 in)
Weight (without package)	DF49 = 220 g DF53 = 260 g

TEMPERATURE	
Operation	0 ºC to 60 ºC
Storage	-30 ºC to 70 ºC

SAFETY	
Output Overcurrent	450 mA
Input Fuse	2.5 A
Atmospheric Discharges	Input and output protected by transient suppressors
Intrinsic Safety	It cannot be applied directly

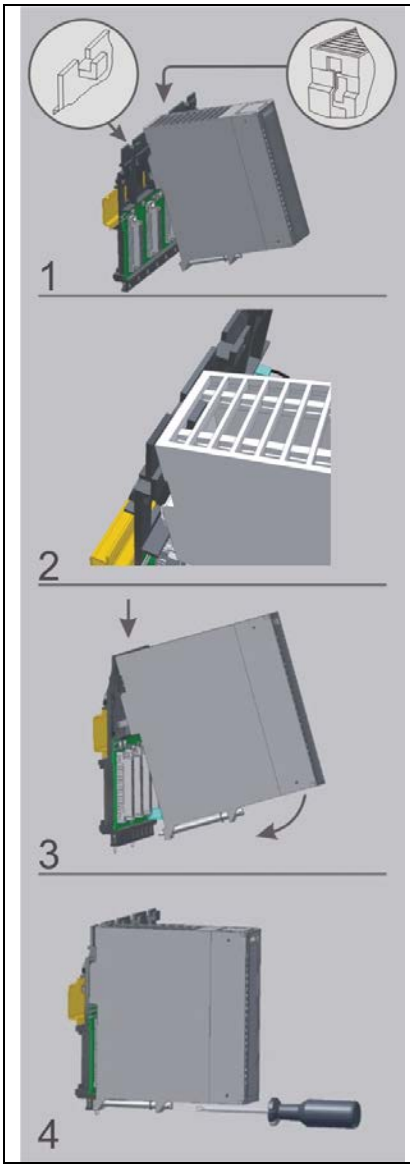
MAXIMUM LENGTH OF FIELDBUS WIRING		
DF49/DF53	No redundancy	1.900 m
	Redundant	1.900 m
DF53-FC	No redundancy	1.900 m
	Redundant	1.000 m

Installation

The **DF49/53** is a device specially designed for panel installation and it cannot be installed in unsheltered locations, as it cannot be exposed directly to the weather. The module can be connected to the panel directly on the DIN rail or using the auxiliary support provided with the module, fixed with screws.

Installing the module in the rack

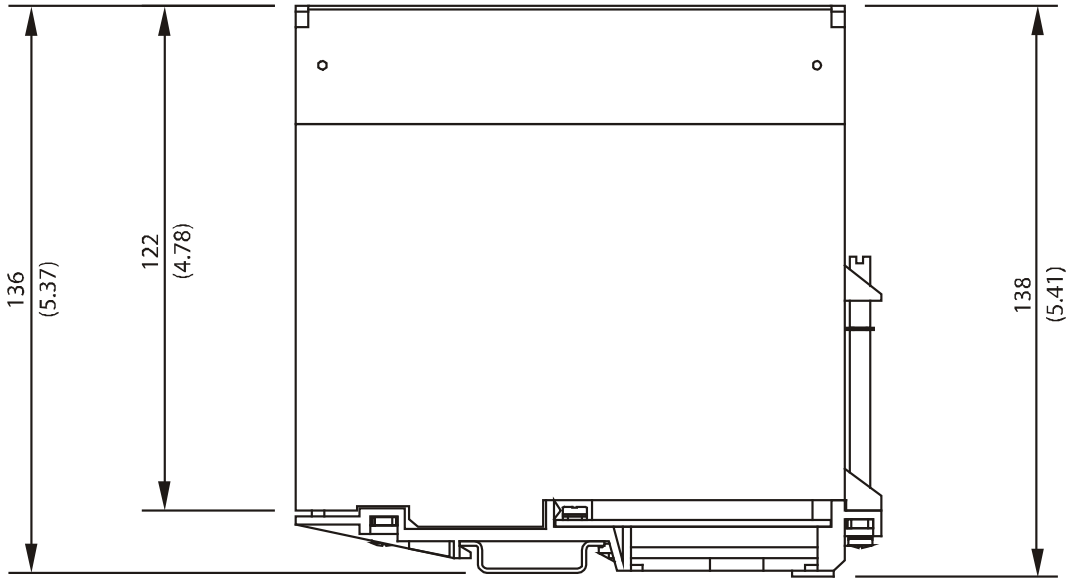
Follow the steps below to install the module in the rack.

	Attach the top of the module with a 45° inclination to the module support located on the upper part of the rack.
	Mounting detail.
	Push the module fixing it to the connector.
	Next, fix the module to the rack using a screwdriver, and fasten the fixation screw at the bottom of the module.

Installing the module using the auxiliary support

Fix the supplied support directly on the panel with screws. Attach the **DF49/53** in the auxiliary support.

Dimensional drawing



Maintenance and troubleshooting

The **DF49/53** is a robust device which basically requires no preventive maintenance. It is simply recommended to protect it from excessive dust accumulation and humid environments which might affect its output impedance.

The two models have LEDs which inform their operation status – one green LED which informs that the module is properly powered, and one red LED for each channel, that will be lit if any abnormal condition occurs in the field wiring.

These LEDs detect most of the problems which may occur in a Fieldbus installation. However, they might not detect other problems, such as:

- Excessive noise caused by the external power supply;
- Impedance lower than 20Ω in the communication line (note that such impedance may not be pure resistive and, therefore not detectable by the overcurrent circuit).

Such abnormal conditions may be easily detected by measurement instruments.

Because the **DF49/53** is a simple and compact device, it is recommended to replace faulty modules instead of electronic components during repair services.

Appendix A

smar	SRF – SERVICE REQUEST FORM	
	DFI302 – Fieldbus Universal Bridge	**Proposal Nº:**

COMPANY INFORMATION

Company: _____
Unit: _____
Invoice: _____

COMMERCIAL CONTACT

Full Name: _____
Phone: _____ _____ _____ _____ **Fax:** _____
E-mail: _____

TECHNICAL CONTACT

Full Name: _____
Phone: _____ _____ _____ _____ **Extension:** _____
E-mail: _____

EQUIPMENT DATA

Model: _____
Serial Number: _____

PROCESS DATA

Process Type (Ex. boiler control)**:** _____
Operation Time: _____
Failure Date: _____

FAILURE DESCRIPTON

(Please, describe the failure. Can the error be reproduced? Is it repetitive?)

_____
_____
_____
_____

OBSERVATIONS

_____
_____
_____
_____

USER INFORMATION

Company: _____
Contact: _____
Section: _____
Title: _____ **Signature:** _____
Phone: _____ _____ _____ _____ **Extension:** _____
E-mail: _____ **Date:** _____/ _____/ _____

For warranty or non-warranty repair, please contact your representative.
Further information about address and contacts can be found on **www.smar.com/contactus.asp**

SMAR WARRANTY CERTIFICATE

1. SMAR guarantees its products for a period of 24 (twenty four) months, starting on the day of issuance of the invoice. The guarantee is valid regardless of the day that the product was installed.

2. SMAR products are guaranteed against any defect originating from manufacturing, mounting, whether of a material or manpower nature, provided that the technical analysis reveals the existence of a quality failure liable to be classified under the meaning of the word, duly verified by the technical team within the warranty terms.

3. Exceptions are proven cases of inappropriate use, wrong handling or lack of basic maintenance compliant to the equipment manual provisions. SMAR does not guarantee any defect or damage caused by an uncontrolled situation, including but not limited to negligence, user imprudence or negligence, natural forces, wars or civil unrest, accidents, inadequate transportation or packaging due to the user's responsibility, defects caused by fire, theft or stray shipment, improper electric voltage or power source connection, electric surges, violations, modifications not described on the instructions manual, and/or if the serial number was altered or removed, substitution of parts, adjustments or repairs carried out by non-authorized personnel; inappropriate product use and/or application that cause corrosion, risks or deformation on the product, damages on parts or components, inadequate cleaning with incompatible chemical products, solvent and abrasive products incompatible with construction materials, chemical or electrolytic influences, parts and components susceptible to decay from regular use, use of equipment beyond operational limits (temperature, humidity, etc.) according to the instructions manual. In addition, this Warranty Certificate excludes expenses with transportation, freight, insurance, all of which are the customer's responsibility.

4. For warranty or non-warranty repair, please contact your representative.

   Further information about address and contacts can be found on www.smar.com/contactus.asp

5. In cases needing technical assistance at the customer's facilities during the warranty period, the hours effectively worked will not be billed, although SMAR shall be reimbursed from the service technician's transportation, meals and lodging expenses, as well dismounting/mounting costs, if any.

6. The repair and/or substitution of defective parts do not extend, under any circumstance, the original warranty term, unless this extension is granted and communicated in writing by SMAR.

7. No Collaborator, Representative or any third party has the right, on SMAR's behalf, to grant warranty or assume some responsibility for SMAR products. If any warranty would be granted or assumed without SMAR's written consent, it will be declared void beforehand.

8. Cases of Extended Warranty acquisition must be negotiated with and documented by SMAR.

9. If necessary to return the equipment or product for repair or analysis, contact us.
   See item 4.

10. In cases of repair or analysis, the customer must fill out the Revision Requisition Form (FSR) included in the instructions manual, which contains details on the failure observed on the field, the circumstances it occurred, in addition to information on the installation site and process conditions. Equipments and products excluded from the warranty clauses must be approved by the client prior to the service execution.

11. In cases of repairs, the client shall be responsible for the proper product packaging and SMAR will not cover any damage occurred in shipment.

12. In cases of repairs under warranty, recall or outside warranty, the client is responsible for the correct packaging and packing and SMAR shall not cover any damage caused during transportation. Service expenses or any costs related to installing and uninstalling the product are the client´s sole responsibility and SMAR does not assume any accountability before the buyer.

13. It is the customer's responsibility to clean and decontaminate products and accessories prior to shipping them for repair, and SMAR and its dealer reserve themselves the right to refuse the service in cases not compliant to those conditions. It is the customer's responsibility to tell SMAR and its dealer when the product was utilized in applications that contaminate the equipment with harmful products during its handling and repair. Any other damages, consequences, indemnity claims, expenses and other costs caused by the lack of decontamination will be attributed to the client. Kindly, fill out the Declaration of Decontamination prior to shipping products to SMAR or its dealers, which can be accessed at www.smar.com/doc/declarationofcontamination.pdf and include in the packaging.

14. This warranty certificate is valid only when accompanying the purchase invoice.