smar - DF53 / DF98

USER'S MANUAL

POWER SUPPLY IMPEDANCE FOR FIELDBUS

JAN / 13

DF53 / DF98

DF53-98ME

smar

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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.

DF53 / DF98 – POWER SUPPLY IMPEDANCE FOR FIELDBUS

Description

These modules were specially designed to provide appropriate impedance for fieldbus networks.

DF53 (4 ports)
DF53-FC (4 ports)
DF98 (2 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 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 **DF53** and **DF98** cannot be used in intrinsic safety areas.

The figure shows the device block diagram. The **DF53/DF98** 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 **DF53/DF98** in case of failure without interrupting the fieldbus communication.

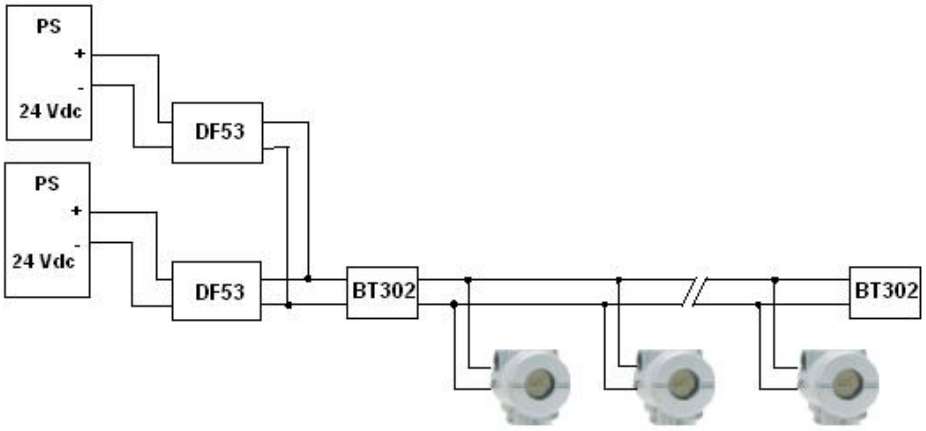


Figure 1 - System using the impedance DF53

The **DF53/DF98** 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 **DF53/DF98** layout.

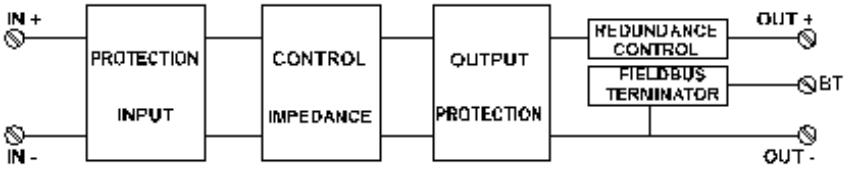


Figure 2 - DF53/DF98 block diagram

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

DF98: Four terminals (3A/4A and 9A/10A) 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.

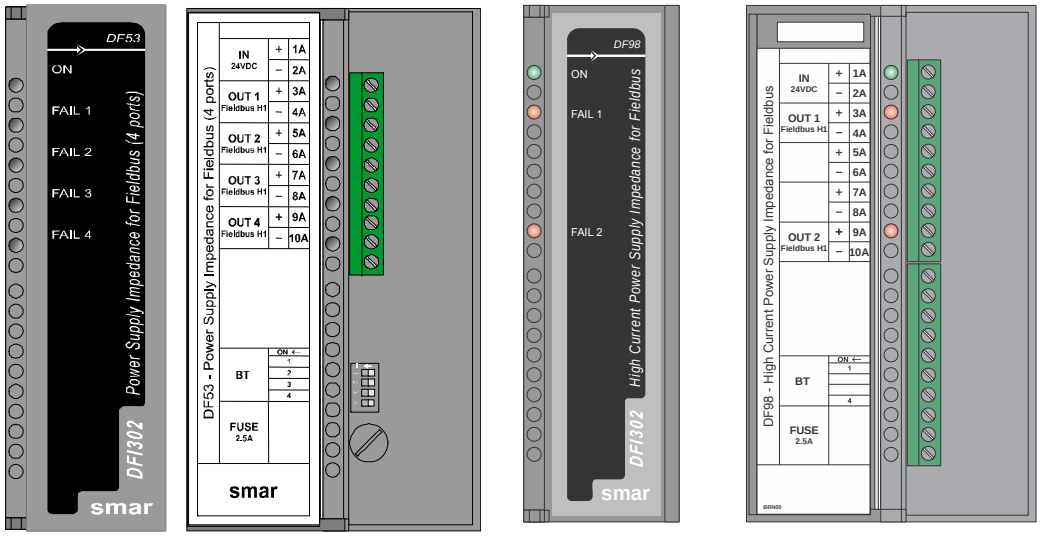


Figure 3 - Power supply impedance for fieldbus: DF53/DF98

NOTE
The DF49 model was discontinued. The replacement by DF53 or DF98 models should be evaluated according to the current limits. The DF53 supports up to 340 mA per channel and DF98 supports 500 mA per channel.

Technical specifications

INPUT	
DC	24 to 32 Vdc ± 10%

OUTPUT	
Current	DF53: 340 mA per channel DF98: 500 mA per channel

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

CONSUMPTION	
Maximum power dissipated	DF53: 2.26 W per channel DF98: 3.43 W per channel

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

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

SAFETY	
Output Overcurrent	DF53: 450 mA DF98: 600 mA
Input Fuse	2.5 A
Atmospheric Discharges	Input and output protected by transient suppressors
Intrinsic Safety	It cannot be applied directly

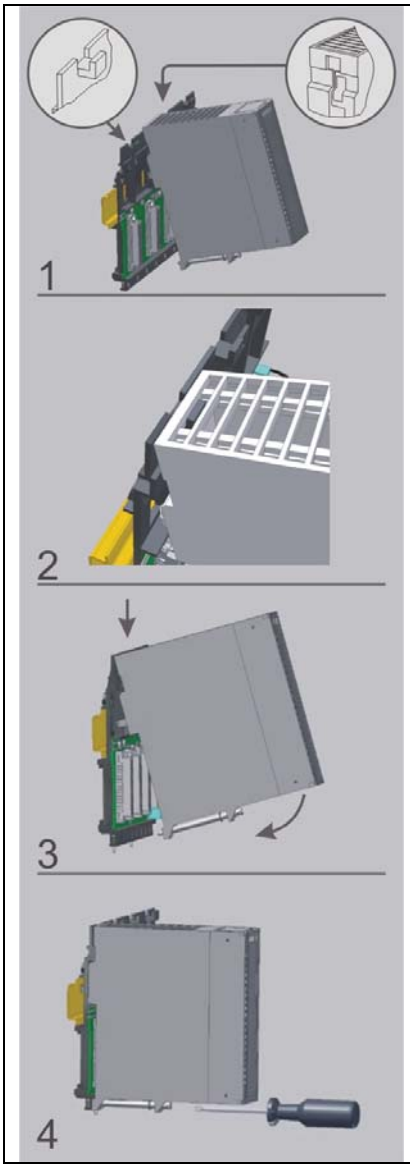
MAXIMUM LENGTH OF FIELDBUS WIRING		
DF53/DF98	No redundancy	1.900 m
	Redundant	1.900 m
DF53-FC	No redundancy	1.900 m
	Redundant	1.000 m

Installation

The **DF53/DF98** 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

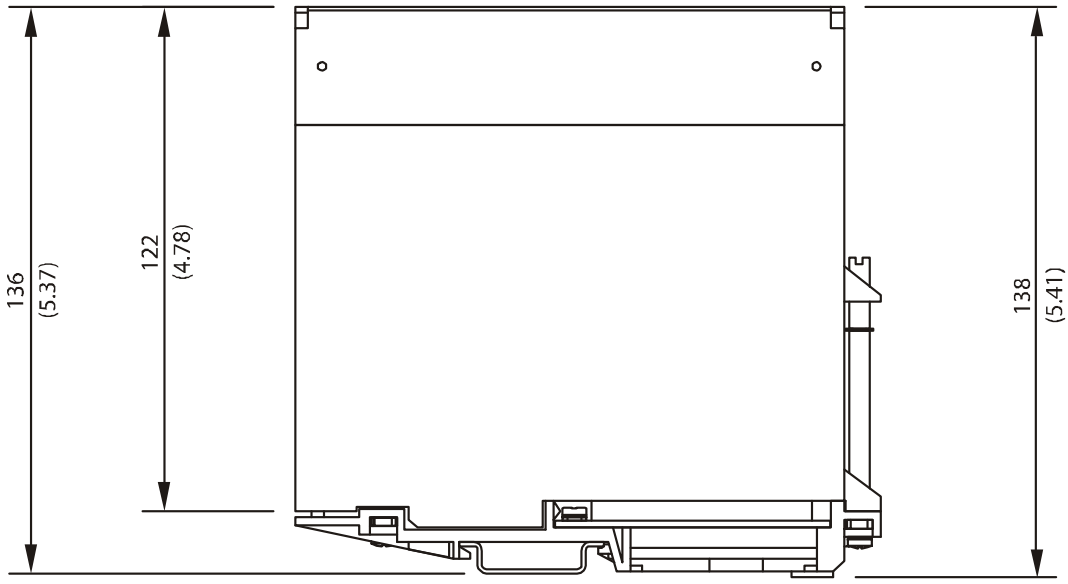
Follow the steps below to install the module in the rack.

	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 **DF53/DF98** in the auxiliary support.

Dimensional drawing



Maintenance and troubleshooting

The **DF53/DF98** 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 modules 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 **DF53/DF98** is a simple and compact device, it is recommended to replace faulty modules instead of electronic components during repair services.

Appendix

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