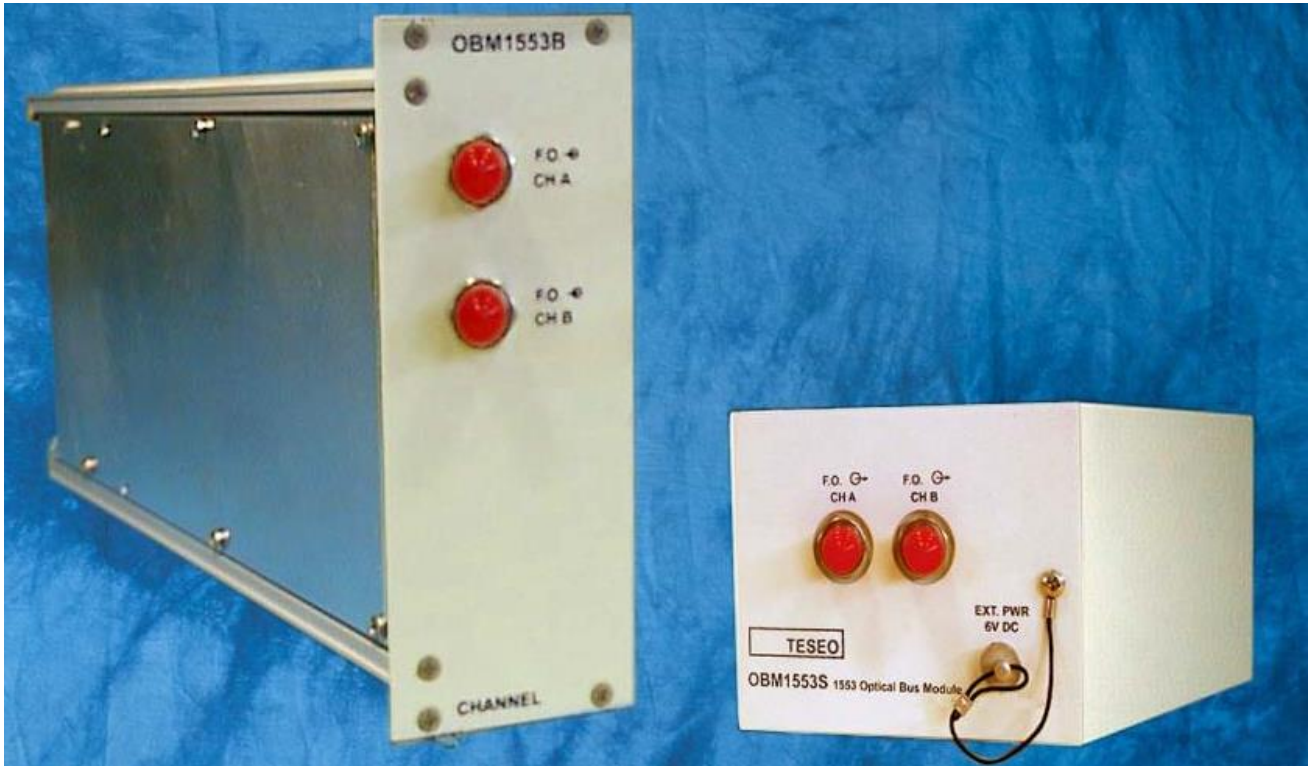


# Optical bus monitor

## OBM1553



The OBM1553 system is used to connect a MIL-STD-1553B bus to a remote analyzer for monitoring purposes.

A typical application is an EMC immunity test on an avionic LRU appended on the MIL-STD-1553B: the EUT is exposed to a high EM field level in the chamber while the bus analyzer, unable to withstand the same field level, is to be placed outside in a remote position with respect to the bus.

The portion of the system in the chamber must of course be shielded while the portion in the control room does not present any specific shielding requirement.

The OBM1553 optical link basically consists of dualchannel transmitters and receivers interconnected by means of bi-fiber optical cables providing the necessary isolation for the exchange of signals that have to cross the shielded room walls.

The dual channel capability and the associated dualfiber connection is required by the MIL-STD requirement for redundancy of the bus.

### SYSTEM COMPONENTS

*The system components are:*

- the dual channel shielded transmitter OBM1553S
- the dual channel transmitter battery charger CB1
- the dual channel unshielded receiver OBM1553B
- the receiver container selectable either OMM-1 or OMM
- the bifiber cable type FB

## COMPONENT DESCRIPTION

OBM1553S is a self-powered shielded unit. The shielding is designed for fields as high as 200 V/m. The internal 6 V lead type battery is able to operate for more than 8 hours before recharging. A battery charger is then required to recharge the battery at the end of the test.

The unit is fitted with a power ON/OFF switch and two LEDs showing POWER-ON and battery status.

The transmitter converts bus A and bus B from electrical into optical form. The bus levels compatible with the unit are from 0.86 to 14 V peak-to-peak, line-to-line.

CB1 is a 6 V battery charger powered from 230VAC 50 Hz European Mains. The CB1/US is the equivalent US version for 115 VAC 60 Hz American Mains.

OBM1553B looks like a plug-in type module for insertion in a 3 U high chassis. The receiver performs the reciprocal function as the transmitter as it reconverts the two signals from optical into electrical form. The output level is 4 V, peak-to-peak, line-to-line. The module is not stand alone and requires necessarily a cabinet.

The cabinet hosting the OBM1553B is a 19", 3 U high, 6 slots chassis OMM or 3 slot chassis OMM-1. The OMM-1 width is half the width of a 19" standard chassis and can be rack mounted only via a special adaptation kit.

Both OMM and OMM-1 distribute power to the module(s). They are powered from the European mains, but the American versions are available with codes OMM/US or OMM-1/US.

The bifiber optical cable, named FBmmm, with mmm the length expressed in meters, is a 200/240 um multimode fiber with ST connectors. The max recommended length is to be limited to 100 meter due to the direct modulation technique employed.

Special cables with FSMA connectors may be made available.

## CONFIGURATION

The minimum configuration for a dual bus is formed of n. 1 OBM1553S, n. 1 CB1, n. 1 OBM1553B, n. 1 OMM-1, n. 1 FBxxx. In

this configuration only one of the three slots available in the OMM-1 chassis is occupied.

Configurations for more busses are obtained by multiplying the components by the number of the couples of busses except for the chassis as a single OMM-1 has capacity for 3 OBM1553B (6 busses in total), while OMM has a capacity for 6 OBM1553B (12 busses in total).

It is recommended to buy as many chargers as transmitters to guarantee the recharge at the same time which can then guarantee the availability of all purchased channels when they are needed for testing. For complex configurations call the factory for advice.

## TECHNICAL SPECIFICATIONS

For all the specified parameters and their meanings, reference shall be made to document MIL-STD-1553B.

### Transmitter Module OBM1553S

<b>Voltage input level</b>	0.86 – 14.0 V, Peak-to-peak, line-to-line
<b>Input impedance</b>	>1000 Ohm, 75kHz – 1MHz, with sinusoidal signal 1 Vrms
<b>Common Mode Rejection</b>	+/-10V, Peak, line-gnd, DC-2MHz
<b>Shielding</b>	200Vm up to 18 GHz
<b>Battery operating time</b>	continuous > 8 h
<b>Battery recharge time</b>	2 hours
<b>Battery charger connector</b>	LEMO 5 poles circular
<b>Connector 1553</b>	Tri-axial (trompeter)
<b>Optical connector</b>	ST
<b>Power supply</b>	6V Internal battery
<b>Physical dimensions</b>	108 x 89 x 67 (D x W x H)
<b>Operating temperature</b>	0° + +50°C

### Receiver Module OBM1553B

<b>Output Voltage Level</b>	4 V, Peak-to-peak, line-to-line
<b>Rise/Fall time</b>	100-300 ns, 10% to 90%
<b>Connector 1553</b>	Tri-axial (trompeter)
<b>Optical connector</b>	ST
<b>Physical Dimension</b>	Standard OMM Plug-in

**General**

<b>OMM</b>	Standard 19" 3U chassis – 6 slots
<b>OMM-1</b>	Standard 9.5" 3U chassis – 3 slot
<b>Fiber Optic type</b>	200/240um multimode
<b>Fiber Optic max length</b>	100 mt

## SYSTEM PARTS

### Minimum-Redundancy System Configuration:

- **OMM-1** : three-slot base unit, fitted with power supply module
- **OBM1553B** : Dual-channel receiver, opto-electronic interface, Bus Analyzer side
- **OBM1553S** : Dual-channel transmitter, opto-electronic interface, MIL Bus side
- **CB1** : 6V-Battery charger
- **FBmmm** : Bi-fibre optical cable (mmm is the cable length in metres, 100m nominal)

**NOTE:** for multiple bus configurations replace OMM-1 with OMM when its three slot capacity becomes insufficient.