

Serial optical power meter

SOPM

**3 CHANNELS 10 kHz - 1 GHz -
RS232 OPTICAL LINK**



The **SOPM** is the first of a new family of virtual type instruments equipped with fiber optic links that TESEO is developing for inclusion in EMC test benches.

The SOPM is a virtual instrument in that it exploits the cheap computing capability of a PC avoiding the use of an on-board microprocessor and dedicated firmware. To be operative it needs to be connected to a PC but, on the other hand, it can be offered at a very competitive price. Furthermore EMC benches tend to become all automatic with a PC at the center of the system and in the rare cases in which a PC is not permanently available, a portable PC can be utilized for the duration of the test.

The adoption of the optic cable encourages the placement of the power meter in an electromagnetically hostile environment, like the inside of an anechoic chamber. The SOPM01 is the only power meter that can be located close to the antenna in the radiated immunity test set-up.

The connection to the RS 232 port of the PC is convenient because of the associated low cost and, technically, because it allows the daisy chaining of up to 8 instruments of the family. A configuration with several instruments, not necessarily identical, can be regarded as the modern version of the more expensive SLOTBUS configuration of different instruments TESEO presented successfully a few years ago within the AFOM system.

SYSTEM SPECIFICATIONS

SOPM01S is a small shielded box, battery powered, able to withstand high electromagnetic fields.

It connects to the three measurement points via coaxial cables. It converts the measurements from analog to digital and transfers the data to the PC through a fiber optic cable..

The SOPM01S can be used for ten hours before battery recharge. The status of the battery can be read from the PC together with the three measurements.

The SOPM01S houses a manual ON/OFF switch.

The SOPM01S is shielded up to 200 V/m. A special attention is to paid to the coaxial connections because any EM noise picked up by a cables act to the power measurements. As a precaution the unit is delivered with double shielded cables.



MAIN FEATURES

The main characteristics of the system are:

- three measurement channels
- CW power or voltage or current measurements from 10 kHz to 1 GHz
- 53dB min dynamic range (power from -40 to +13dBm)
- small size, battery powered sensor unit
- standard 50 Ohm input impedance
- shielding to more than 200 V/m from 10 kHz to 1 GHz
- RS232 optical interface with PC
- computer based, low cost
- number of SOPM01S satellite unit cascadable in daisy chain: 8 max
- protocol information: SOL (see user's manual)

SYSTEM DESCRIPTIONS

The SOPM is formed of:

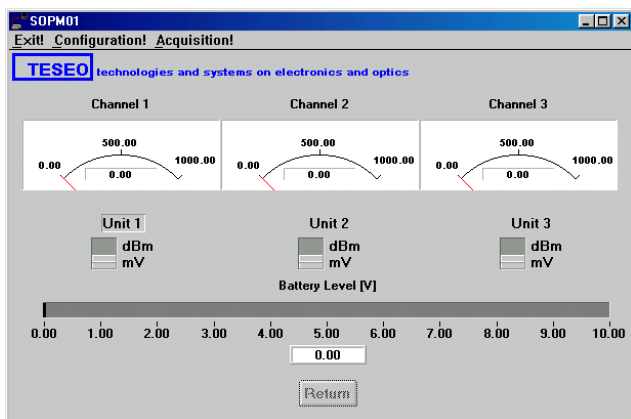
n° 1 SOPM01S	satellite unit
n° 1 SOI	serial optic interface with 25 to 9 pole adapter type D
n° 1 FB008	standard 8 meter bifibre cable, ST connectors
n° 1 CB1	battery charger (power supply 110/220V - 50/60Hz)
n° 1 SOPM01W	Software for Windows™ (3" ½ diskette)
n° 3 CAVO223BSM-02	double shield cable with SMA and BNC connectors

SOPM01W

The floppy disk is used to install the software. At the PC terminal the test engineer can read the three channels (voltages or powers) and the status of the battery. Each channel can be acquired at a rate of 10 readings per second; the measuring unit (mV or dBm) can be selected.

The application software is developed for Windows™ environment and is very easy to work with. No specific training is needed.

For customers willing to write their own software, interface commands and reading formats are provided in the technical manual.



SOI

The **SOI** is a self powered optical transducer that plugs into a 25 D type RS 232 port of the PC. An adapter for a 9 pin D type connector is provided. A single SOI can control up to 8 satellites, even of different type, connected in a daisy chain configuration. Each instrument is recognized by the position in the chain.

The transducer operates in both directions in half duplex mode.



APPLICATIONS

The SOPM is intended to be used for the measurement of RF CW signals. In particular in the presence of high electromagnetic fields.

Typical applications are:

- monitoring of the forward and reverse power in radiated immunity tests like IEC 1000-4-3
- monitoring (and calibration) of the voltage in conducted immunity tests like IEC 1000-4-6
- monitoring of injected currents in Bulk Current Injection tests. In this latter case the three channels are used all at once to measure direct and reverse power plus injected current.

TESEO has inserted the SOPM in the automated test benches driven by TESEO software.

The SOPM01 software driver written for this purpose is available for customers willing to upgrade existing systems.

TECHNICAL CHARACTERISTICS

Electrical

channels	3
measure	CW voltage / power
frequency range	10 kHz to 1 GHz
input impedance	50 Ohm
sensitivity	2 mVrms (-40 dBm)
full scale input	1 Vrms (+13 dBm)
max safe input	100 mW (+ 20 dBm)
measuring units	mV / dBm
resolution	0.1 mV
amplitude accuracy (@ 1MHz)	from 2 mV to 800 mVrms $\pm 10\%$ ± 1 mV
flatness (@ 0dBm)	from 100kHz to 1GHz ± 1 dB

OPTIONS

FOBC ST	ST fiber optic cable feedthrough
FBmmm	Bifibre optical cable (mmm = length in meters, up to 500m)
FCmmm	Monofiber optical cable (mmm = length in meters)
ATT20-2	20 dB coaxial attenuator (2 W)

Certificate of calibration SIT or ISO9000

SYSTEM PARTS

SOPM:

SOPM01S satellite unit + **SOI** serial optic Interface with 25 to 9 pole adapter type D + **B008** 8 meter bifibre cable + **CB1** battery charger + **SOPM01W** software + 3 double shield cable

Mechanical and environmental

Satellite unit

battery operating time	continuous > 10 h (switch-off > 1000 h)
battery recharge time	2 hours
electrical input connectors	SMA
fiber optic connector	ST
dimensions	170 x 110 x 55 mm
operating temperature	0 \div +50 $^{\circ}$ C
storage temperature	-20 \div +70 $^{\circ}$ C

Serial optical interface

baud rate	9600
computer connector	D-25P or D-9P
fiber optic connectors	ST
dimensions	60 x 50 x 20 mm
operating temperature	0 $^{\circ}$ \div +50 $^{\circ}$ C
storage temperature	-20 $^{\circ}$ \div +70 $^{\circ}$ C