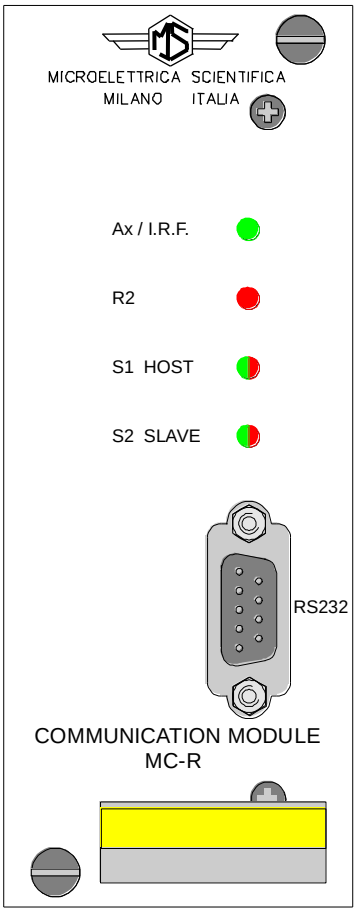
MULTIFUNCTION DATA RECORDING
&
COMMUNICATION MODULE
TYPE
MC-R
OPERATION MANUAL



CE

REV.	DESCRIPTION	DATE	PREP.	CONTR.	APPR.
1	Mod. N°557	10-02-99	P. Brasca	D. Ciminaghi	
0	*EMISSION*	*30-06-98*	*P. Brasca*	*D. Ciminaghi*	

1 INDEX

1 GENERAL UTILIZATION AND COMMISSIONING DIRECTIONS

Always make reference to the specific description of the product and to the Manufacturer's instruction.
Carefully observe the following warnings.

1.1 STORAGE AND TRANSPORTATION

must comply with the environmental conditions stated on the product's instruction or by the applicable IEC standards.

1.2 INSTALLATION,

must be properly made and in compliance with the operational ambient conditions stated by the Manufacturer.

1.3 ELECTRICAL CONNECTION,

must be made strictly according to the wiring diagram supplied with the Product, to its electrical characteristics and in compliance with the applicable standards particularly with reference to human safety.

1.4 MEASURING INPUTS AND POWER SUPPLY,

carefully check that the value of input quantities and power supply voltage are proper and within the permissible variation limits.

1.5 OUTPUTS LOADING,

must be compatible with their declared performance.

1.6 PROTECTION EARTHING

When earthing is required, carefully check its efficiency.

1.7 SETTING AND CALIBRATION

Carefully check the proper setting of the different functions according to the configuration of the protected system, the safety regulations and the co-ordination with other equipment.

1.8 SAFETY PROTECTION

Carefully check that all safety means are correctly mounted, apply proper seals where required and periodically check their integrity.

1.9 HANDLING

Notwithstanding the highest practicable protection means used in designing M.S. electronic circuits, the electronic components and semiconductor devices mounted on the modules can be seriously damaged by electrostatic voltage discharge which can be experienced when handling the modules.
The damage caused by electrostatic discharge may not be immediately apparent but the design reliability and the long life of the product will have been reduced. The electronic circuits produced by M.S. are completely safe from electrostatic discharge (15 KV IEC 255.22.2) when housed in their case; withdrawing the modules without proper cautions expose them to the risk of damage.

a. Before removing a module, ensure that you are at the same electrostatic potential as the equipment by touching the case.

b. Handle the module by its front-plate, frame, or edges of the printed circuit board. Avoid touching the electronic components, printed circuit tracks or connectors.

c. Do not pass the module to any person without first ensuring that you are both at the same electrostatic potential. Shaking hands achieves equipotential.

d. Place the module on an antistatic surface, or on a conducting surface which is at the same potential as yourself.

e. Store or transport the module in a conductive bag.

More information on safe working procedures for all electronic equipment can be found in BS5783 and IEC 147-OF.

1.10 MAINTENANCE

Make reference to the instruction manual of the Manufacturer ;
maintenance must be carried-out by specially trained people and in strict conformity with the safety regulations.

1.11 FAULT DETECTION AND REPAIR

Internal calibrations and components should not be alterated or replaced.
For repair please ask the Manufacturer or its authorised Dealers.

Misapplication of the above warnings and instruction relieves the Manufacturer of any liability.

2 GENERAL CHARACTERISTICS AND OPERATION

2.1 Digital inputs :

Two optoisolated inputs with antirebound logic:

- One clock sync. input.
- One general purpose input.

Electrical characteristics:
- Input voltage (guaranteed active logic state): 4.5 – 32VDC.
- Max. power consumption: 0.5W

2.2 Outputs

- One NE diagnostic relay (R1). Electrical characteristics:

  Rating : 5A 380V
  AC resistive switching : 1100W max 380V
  Make: 30A (peak) 0,5 sec.
  Break: 0,5A 125VDC, L/R = 40ms, 10 ops.

- One opto-relay (R2) for time synchronization of slave devices.
  Electrical characteristics:
  Max. voltage: 150V
  Max. current: 100mA (resistive load)

2.3 Power supply

Power supply input (terminals 12-13) is multi-voltage autoranging 2kV isolated has no polarity and can accept any AC or DC voltage in the range a or b - Consumption ≤3VA.

Type a) - { **24V(-20%) / 110V(+15%) a.c.** ; **24V(-20%) / 125V(+20%) d.c.** }

Type b) - { **80V(-20%) / 220V(+15%) a.c.** ; **90V(-20%) / 250V(+20%) d.c.** }

2.4 Serial Communication

Three ports are available for serial communication:

- An RS232 serial communication port (MODBUS @ 9600bps) is located on relay's front (9 pins SUB-D connector). Such port allows the user both to configure/test the unit and to completely monitor it.
- A second RS485 serial communication port (IEC 870-5, ZVEI protocol or MODBUS) allows the MC-R to be connected to a central telecontrol system. A fiber optic interface (ST connectors, 9600bps) is available on request.
- The third serial port features an RS485 interface (max. baud rate 38400bps) and connects the MC-R to a maximum of 8 slave MODBUS devices.

2.5 Data recording functions.

When properly configured the unit can act as an event recorder for MS microprocessor relays. The MC-R continuously polls its slave relays to detect new trips and collect relevant data.
Up to 100 date tagged events and 5 oscillographic data records can be stored into a non-volatile memory and made available to a central supervision system. Recorded data can also be read by a P.C. via the front panel serial port.

Date tags have a 10ms resolution if slave relays are provided with on board real time clocks. Otherwise guaranteed time resolution drops down to 1s.

2.6 Signalizations and controls.

Led Ax/I.R.F:

- Lit-on during normal operation.
- Flashing in case of internal fault.

Led R2:

- Lit-on when output relay R2 is energised.

Led S1/HOST:

- Signals activity on serial interface #1 (telecontrol system) (green on data reception / red on data trasmission, yellow in case of fast data exchange).

Led S2/SLAVE:

- Signals activity on serial interface #2 (slave relays) (green on data reception / red on data transmission, yellow in case of fast data exchange).

2.7 Real time clock.

2.7.1 Overview.

The unit features a built in clock calendar with Years, Months, Days, Hours, Minutes, Seconds, Tenths of seconds and Hundredths of seconds.

2.7.2 Clock synchronization.

The clock can be synchronized via digital input 10-11 or the IEC870-5 serial communication interface. The following synchronization periods can be set: 5, 10, 15, 30, 60 minutes. Synchronization can also be disabled, in which case any synchronization command is ignored by the relay.
In case synchronization is enabled, the unit expects to receive a sync signal at the beginning of every hour and once every T_{syn} minutes. When a sync signal is received, the clock is automatically set to the nearest expected synchronization time.
For example: if T_{syn} is 10min and a sync signal is received at 20:03:10 January the 10th, 98, then the clock is set to 20:00:00 January the 10th, 1998.
On the other hand, if the same sync signal had been received at 20:06:34, the clock would have been set to 20:10:00, January the 10th 98.
Note that if a sync signal is received exactly in the middle of a T_{syn} period, the clock is set to the previous expected synchronization time.

WARNING

If time is adjusted (via the serial port) while synchronization is enabled, the clock stops and can be restarted only by sending a sync. message.

2.7.3 Latency time.

Latency time is the time taken by a synchronization message to reach destination. Such time (and generally speaking all known delays) can be automatically compensated by the unit. A special setting (TLat) is available for such purpose. TLat is added to the current time when a synchronization command is received.

2.7.4 Resolution.

The clock has a 10ms resolution.

2.7.5 Operation during power off.

The unit features an on board Real Time Clock which maintains time information for at least 1 hour in case of power supply failure.

2.7.6 Time tolerance.

During power on, time tolerance depends on the on board crystal (+/-50ppm typ, +/-100ppm max. over full temperature range).
During power off, time tolerance depends on the RTC's oscillator (+65 –270 ppm max over full temperature range).

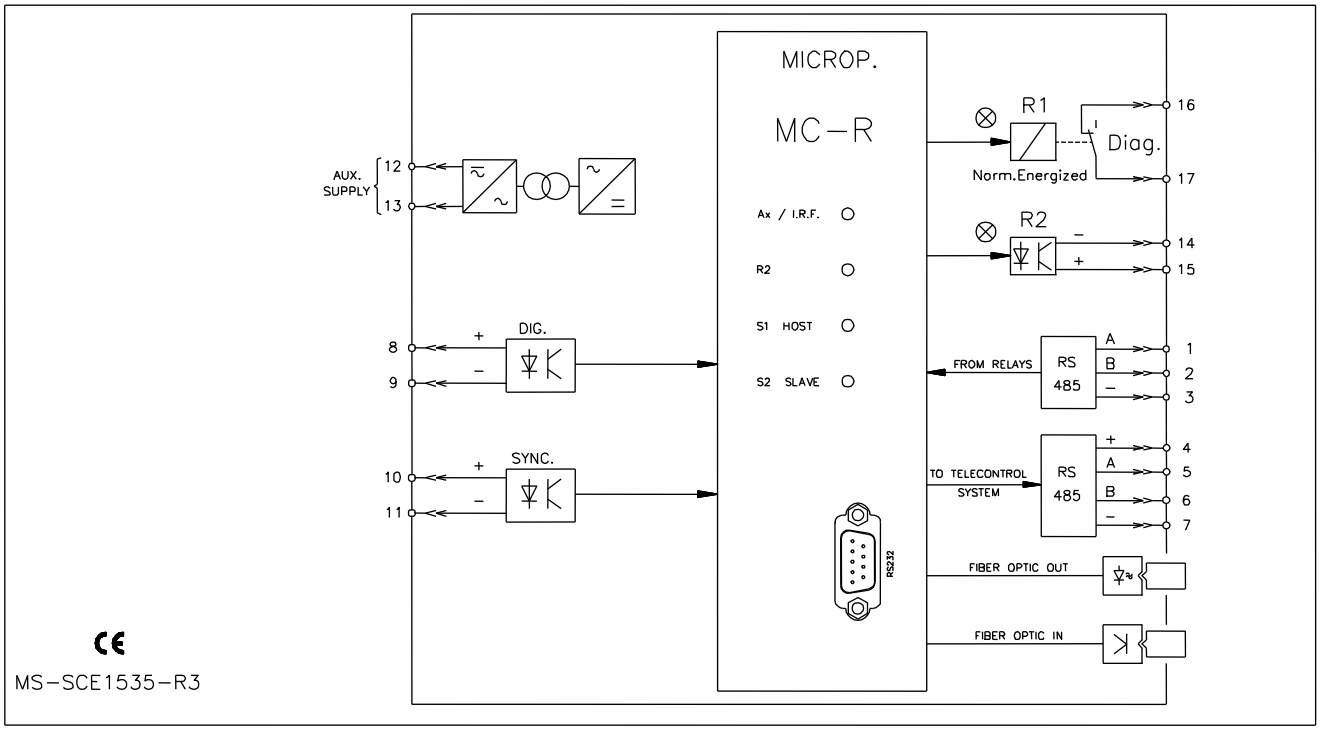
2.8 Diagnostics

The unit features three different self-test procedures:

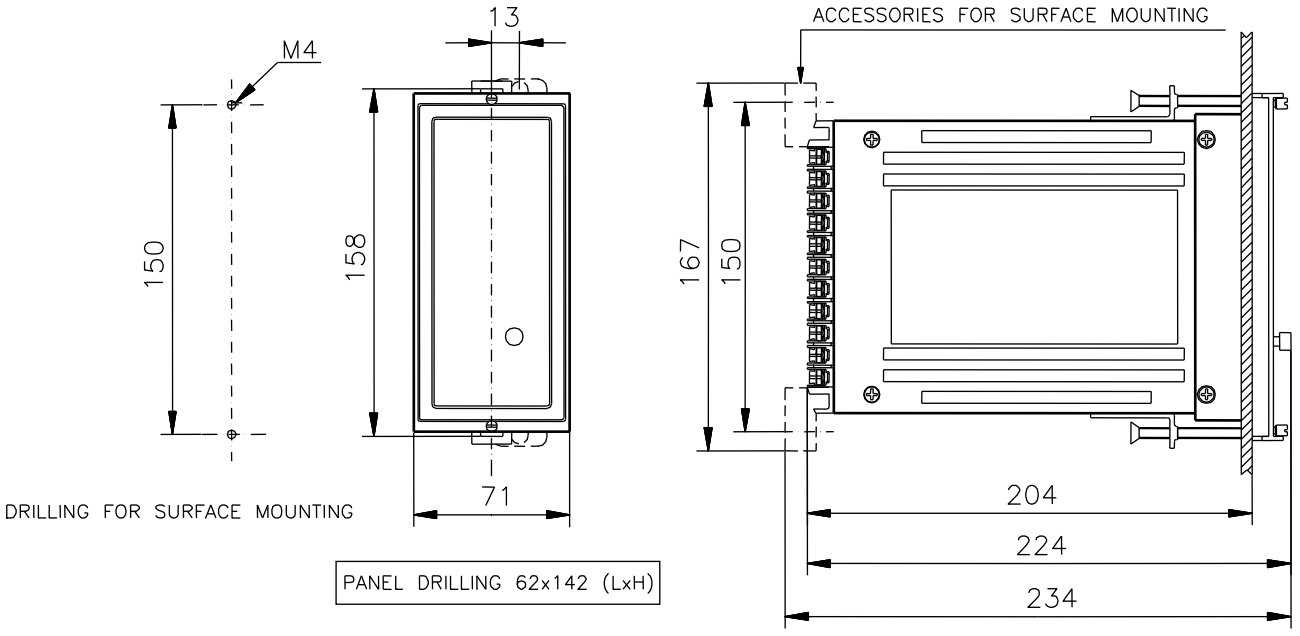
- Start-up test: this is activated at power-up. The on board memories and peripherals are tested.
- Periodic test: this is activated every 10mins and checks the contents of the on board non-volatile memories.
- User-requested test: this is activated whenever a test command is issued to the unit. The on-board non-volatile memories are tested.

In case errors are detected the Ax/I.R.F. green led starts flashing.

3 CONNECTION DIAGRAM (SCE1535 Rev.3)



4 OVERALL DIMENSIONS



5 MAINTENANCE

No maintenance is required. Periodically a functional check-out can be made by operating the TEST button on relay's front. In case of malfunctioning please contact Microelettrica Scientifica Service or the local Authorised Dealer mentioning the relay's Serial No reported in the label on relays enclosure.

IMPORTANT NOTICE

In case of E2PROM error (green led Ax/I.R.F. flashing after power-up or a test) please contact Microelettrica Scientifica Service or the local Authorised Dealer

6 ELECTRICAL CHARACTERISTICS

Reference standards	IEC870-5, IEC 255, 801; CEI 41-1; IEEE C37; CE
Dielectric test voltage	2000 V, 50 Hz, 1 min.
Impulse test voltage	5kV (MC), 1kV (MD) - 1,2/50μμs
Immunity to high frequency burst	1 kV (MC), 0,5 kV (MD) - 0,1 MHz 2,5 kV (MC), 1 kV (MD) - 1 MHz
Immunity to electrostatic discharge	15 kV
Immunity to sinusoidal wave burst	100 V - (0,01-1) MHz
Immunity to radiated E.M. field	10 V/m - (20-1000) MHz
Immunity to 50-60 Hz magnetic field	1000 A/m
Immunity to impulse magnetic field	1000 A/m - 8/20μs
Immunity to magnetic burst	100A/m - (0,1-1) MHz
Resistance to vibration and shocks	10-500 Hz - 1 g - 0,075 mm
Average power supply consumption	2,5 VA
Output relays	rating 5 A; 250V AC Max switching power = 1250VA Max switching current = 5A (resistive) Max switching voltage = 250V AC - 110V DC Max make current = 0,2A, 110V DC, L/R=40ms
Operation ambient temperature	-20°C / +60°C
Storage temperature	-30°C / +80°C

Microelettrica Scientifica S.p.A. - 20089 Rozzano (MI) - Italy - Via Alberelle, 56/68
Tel. (##39) 2 575731 - Fax (##39) 2 57510940 - Telex 351265 MIELIT I

http://www.microelettrica.com