Modular Signal Recorder

The solution for efficient measurement data logging

Modular Signal Recorder

The new dimension in metrology

The MSR 12 provides you with a mobile measuring instrument that is tailored to your particular field of application. This handy and user-friendly unit precisely records a wide range of data.

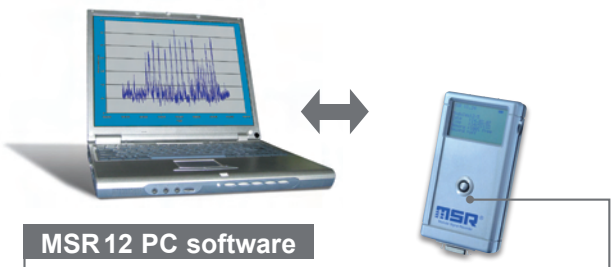
The MSR 12 system

The MSR 12 is a **practical, portable signal acquisition instrument** for measuring, displaying and recording a range of physical parameters. Its unique **modular design** means that users can **customise** the unit according to their specific requirements.

Thanks to the MSR 12's modular design users are able to record and store over 100 physical parameters simultaneously and at different measurement frequencies.

The MSR 12 system comprises a basic unit together with optionally available additional modules. Alongside a real-time clock, the basic unit includes the following modules as standard: 3-axis accelerometer, air pressure and ambient temperature sensors. The unit's functionality may be expanded at any time with an almost unlimited range of external additional modules, allowing it to be customised to the required level.

MSR 12 basic specification



MSR 12 PC software

- Setup
- Reader
- Viewer
- Online

- Ambient temperature
- Air pressure
- 3-axis accelerometer

Additional plug-in modules

- Breathing rate
- Breathing pattern
- ECG
- Fluid pressure
- Velocity
- Heart rate
- Body temperature
- Air pressure
- Voltage/current (elec.)

etc.

Each additional module has a range of sensors – mostly of a similar type. Connecting existing, commercially available sensors is also straightforward. For test purposes the gradient curve and the actual measurement parameters for the selected sensor can be shown on the unit's display. The sensor's signals are processed by the module's own processor and the values saved in the module's memory.

Gains in efficiency

The Modular Signal Recorder can be easily adapted to satisfy your **specific requirements**. It allows comprehensive evaluations to be undertaken that were previously either impossible or which involved great effort – for example, requiring the use of many devices. With the MSR 12 you **only need one measurement device to record a wide range of different physical measurement parameters**. The signal recorder can be expanded at any time using the additional modules.

The modular design, portability and the practical format of the MSR 12 guarantee unprecedented levels of flexibility and efficiency in use.

The technology

Technical specifications for the MSR 12 basic unit:

Description:	Hand-held unit, mains-independent, integrated graphic online-display of the measured parameters, real-time clock, menu-driven operation with internal joystick
Standard modules:	3-axis accelerometer, air pressure, ambient air temperature
Expansion:	Two expansion slots available for at least two further internal modules
Size:	137 x 74 x 27 mm
Weight:	Approx. 180 g
Colour:	Silver, anthracite
Batteries:	3 x rechargeable (NiMH) 880mAh
Connection to unit:	Multifunction socket
PC software:	Setup, Reader, Viewer and Online software (Windows 95 or higher)
System requirements:	PC interface - USB or RS232

Technical specifications for the MSR 12 additional modules:

Memory capacity:	Over 1 000 000 measurements per module
Sampling rate:	Up to 10 000 measurements per second
Storage rate:	Up to 1000 measurements per second
Input signals:	Analogue and digital

Datasheets for the individual modules are available separately.

Fields of application

In many research, development and monitoring situations it is necessary to record various measurement parameters simultaneously, precisely and efficiently – inside the laboratory or outside in the field. The MSR 12 provides a tailor-made solution in every case.

Selected examples of MSR 12 applications:

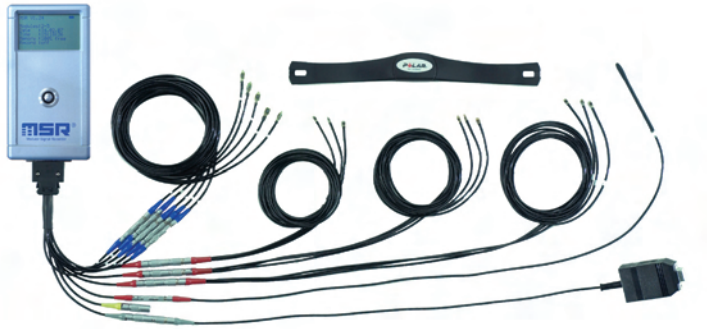
Field	Example of use
Aviation	Pilot monitoring, aircraft and flight attitude monitoring
Research and development	Monitoring of prototypes, quality measurements
Competitive sports	Telemonitoring, human and material testing
Engineering	Monitoring of process flows
Medicinal technology	Prediagnostics and telediagnostics
Pharmaceuticals industry	Long-term data acquisition, medicament testing
Textile industry	Quality measurements
Environment	Air, soil and climate measurements

A practical example

Empa – Materials Science and Technology in St. Gallen, Switzerland required a measuring instrument for tests in the field of clothing physiology. The chosen instrument should simultaneously be able to record the temperature and humidity of a test person in several locations on the body and within the clothing, together with his/her heart rate.

Taking these requirements as a reference, the following MSR 12 unit was made up:

5 x humidity to an accuracy of ± 2% between 10% and 90% relative humidity
9 x temperature to an accuracy of ± 0.2°C between 10°C and 50°C 1 x core temperature to an accuracy of ± 0.2°C between 10°C and 50°C
1 x air pressure to an accuracy of ± 1.5 mbar between 300mbar and 1100mbar abs.
1 x 3-axis accelerometer (for determination of position) to an accuracy of ± 0.2 G between -10 G and +10 G
1 x heart rate via a Polar transmitter chest strap



The range: Measurement modules à la carte

You can put together your custom MSR 12 unit from a wide range of different measurement modules. Should one of your required measurement parameters not be listed below, then please let us know what you need. We will be happy to advise.

The following measurement modules are already either in daily use or under development:

- 3-axis accelerometer
- Breathing rate
- Breathing pattern
- Blood pressure
- ECG
- Field strength
- Fluid pressure
- Gas analysis
- Velocity
- Heart rate (via radio)
- Strength
- Body temperature (core)
- Air pressure
- Atmospheric humidity
- Position (GPS)
- Pulse
- Voltage/current (elec.)
- SPO_2 (oxygen)
- Speech/noise recording
- Ambient temperature

Further modules can be produced to client specifications.

The following are included in the basic package:

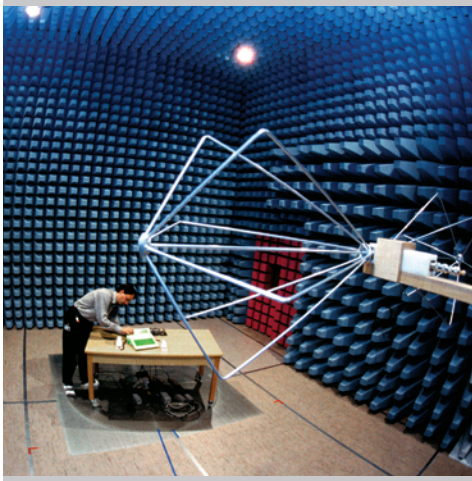
- MSR 12 basic unit with the three basic modules: 3-axis accelerometer, air pressure, ambient temperature
- MSR PC software: Online, Reader, Viewer, Setup
- Mains adapter, MSR 12 RS232 cable
- User manual
- Guarantee card
- Servicing details

We would be pleased to provide you with a quotation to your exact requirements.

References

The MSR 12 has already proven itself in use at the following companies and institutions.

Company	MSR 12 application
Autoflug GmbH & Co., Rellingen (D)	Capacitive fill level monitoring
Empa – Materials Science and Technology, St. Gallen (CH)	Heart, sweat and temperature monitoring
EPFL, Ecole polytechnique fédérale de Lausanne (CH)	Fall monitoring
Festo AG, Esslingen (D)	Process monitoring
Lantal Textiles AG, Langenthal (CH)	Pressure monitoring
LSS, Life Support Systems, Zürich (CH)	Pilot monitoring
Swiss Federal Institute for Snow and Avalanche Research SLF, Davos (CH)	Heart, sweat and temperature monitoring
US AIR FORCE Research Laboratory, Wright-Patterson (USA)	Pilot monitoring
W.L. GORE & Associates, Putzbrunn (D)	Heart, sweat and temperature monitoring



Advantages

- Measuring instrument that is optimally tailored to your field of application
- Can be expanded at any time using the additional modules
- A single MSR 12 can be used in place of several other instruments
- Common time-base allows simple synchronisation of measurement data
- User-friendly data analysis software
- Automatic recognition of various sensors
- Commercially available sensors can be used with the MSR 12
- Handy, portable and rugged unit
- Proven application, first class references
- Worldwide patents pending on measuring method

Contact

We would be pleased to advise you personally.

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