Thermocouple Multiplexer

Accurate recording of up to 8 x thermocouples of any length and type including flexible alarm function

Extension module for the fully automated monitoring and recording of up to **8 x thermocouples of various types and lengths** in an **enormously wide measuring range** from **-210°C to +1800°C and in high precision through sensor linearization!**

The **Thermocouple Multiplexer - Module** is one of the most modern extension systems for the analysis of temperatures with thermocouples.

This **Universal Sensor® (extension module)** for our flexible data loggers (e.g. Thermofox Universal, Materialfox, ...) has been specially developed for the use of thermocouples. By this means, all the advantages of the widespread and high precision thermocouple sensor technology can easily be used with the data loggers of Scanntronik Mugrauer GmbH.
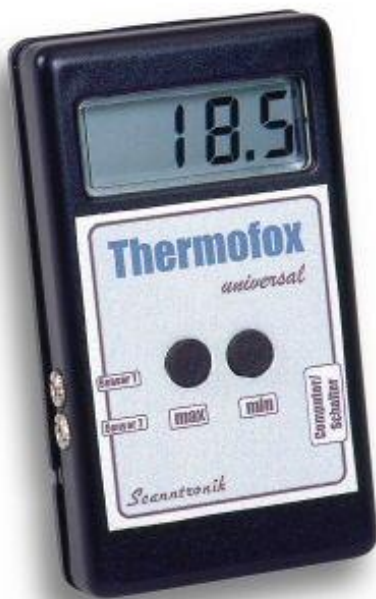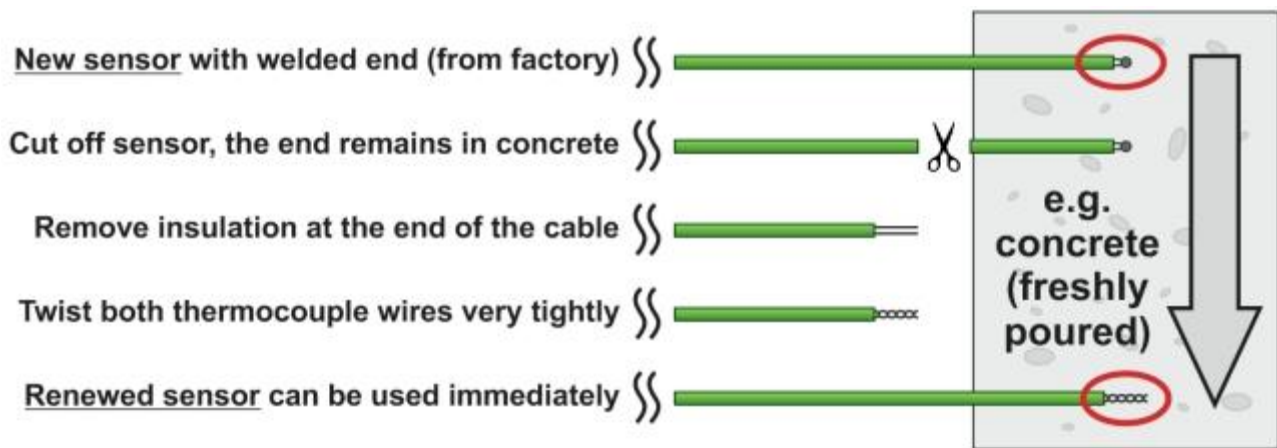
The system has **8 x sensor inputs**, which allows the simultaneous analysis of up to eight different temperatures. The thermocouples are connected by high-quality screw terminals (with Elevator-Style® clamping mechanism) guaranteeing reliable and permanent contact with the sensors.

The Multiplexer system supports the **thermocouple types: K, J, N, R, S, T, E and B** and provides an **extraordinarily large measuring range of -210°C to +1800°C**. This way, very cold temperatures such as of e.g. liquid nitrogen (-196°C), can easily be measured, but also very high temperatures, such as of e.g. exhaust gases from internal combustion engines (+700°C to +1000°C). Normal room and ambient temperatures can of course also be measured, thus making the system extremely versatile and very flexible. The integrated and **fully automated correction of the sensor linearity for all thermocouple types** also enables very high accuracy in the determination of the measurements.

A further advantage of the thermocouple sensor technology is, that **no special sensor head, no sensor element or sensor component is required for the measurement of the temperature at the end of the sensor cable**. The simple and secure connection of the two thermocouple wires at the end of the test lead forms the temperature point that is measured.

This makes the **Thermocouple Multiplexer system** particularly suitable **for applications where the sensor end is lost or destroyed during use**. A typical example for this is the temperature measurement of freshly poured concrete elements or floor slabs. In this case, simply cut off the thermocouple after measurement, twist or weld the two wire ends together and immediately use the sensor again. The positive results are low operating costs and fast on-site response time.

New sensor with welded end (from factory)

Cut off sensor, the end remains in concrete

Remove insulation at the end of the cable

Twist both thermocouple wires very tightly

Renewed sensor can be used immediately

e.g. concrete (freshly poured)

In many cases, the **Thermocouple Multiplexer** is combined with our convenient data logger Thermofox Universal. Its large, clear display, memory for up to 64,000 readings, an internal temperature sensor and two external temperature sensor inputs for NTC thermistors (-30°C to +120°C, **wired sensors** or **wireless sensors**) as well as its **Universal Sensor® bus for numerous extensions** make this data logger especially flexible.

If you also need reliable alerting in addition to the analysis and recording of temperatures, this is also easily possible with the **Thermocouple Multiplexer**. The system features a **highly flexible and independent alarm output**, which can be individually configured for all sensor inputs. There are **alarm functions** for exceeding or falling below a temperature threshold, but also for the entry or exit of an alarm range. The freely programmable **alarm delay** setting completes the range of alarm functions. Alarm systems include our **SMS-Alarm-System** for the mobile sending of SMS alarm messages to one or more recipients, our **SMS-Power-Pack** or our **Acoustic-Alarm**.

If you do not want to read out the **Thermocouple Multiplexer system** and the associated data logger (e.g. Thermofox Universal) manually on site, you can also easily connect the measuring system with our mobile Remotefox - Remote Data Transmission System. This way, you **regularly get all measurement data via mobile service, internet and email** even if you are hundreds of kilometers away from the measurement site. As all our data loggers, the Remotefox also operates completely battery-powered and does not require any access to the power grid. This allows effortless stand-alone use, also for several months or even years!

This way, even very extensive and geographically dispersed long-term recordings of, for example, surface temperatures, curing processes, refrigerators, temperature distributions, measurements in the laboratory or elsewhere can easily be performed. The field of application of the **Thermocouple Multiplexer** ranges from civil engineers over architects and pharmacies through to scientific institutes, research and testing institutes, universities and many more ...

The power supply of the extension module uses **four standard mignon AA batteries** that supply the system with up to 2 years of energy, depending on the set measuring rhythm and the number of active sensors. If required, the batteries can be replaced at any time so that each planned measuring task can start without delay.

The programming of the **Thermocouple Multiplexer system** and the used data logger (logger type depending on application) as well as the data evaluation is done via the SoftFOX - Universal Analysis Software under Microsoft Windows® XP, 7 ,8 or 10. Newer operating systems are naturally also supported. After the corresponding data logger is connected to the computer via a PC interface cable, the system can be read out or configured immediately. The software offers numerous general functions like for example dynamic project management, graphic data analysis, guide lines, PC controlled measurement series, calculation of dew point, statistical curve analysis, export function, auto backup, flexible zoom and many more. Besides that the **Thermocouple Multiplexer** as well as the used data logger system itself can be configured arbitrarily. Functions like setting the measuring rhythm, min./max.

monitoring for extreme value recording without interruption for even slow measuring rhythms, configuration of the real time clock, precise battery test, digital serial number and many more are available here.
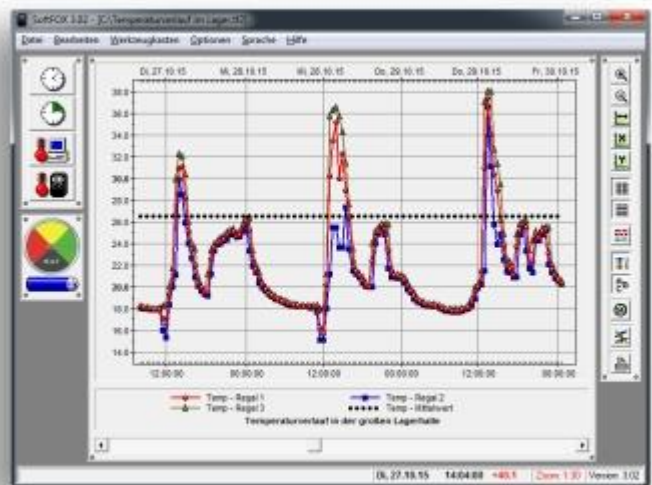
Features:

- Up to **8 x thermocouples** (accessories) can be connected via high-quality screw terminals
- Extremely large **measuring range from -210°C to +1800°C** (thermocouple dependent)
- Support of the eight most common **thermocouple types: K, J, N, R, S, T, E and B**
- High-precision temperature measurement through **automated sensor-linearity-correction**
- Easy connection of different thermocouple lengths and different thermocouple types

- Free selection between **degrees Celsius (°C) and Fahrenheit (°F)** as a measuring unit
- System and battery status can be seen at any time with the aid of the "System Status LED"
- Can be used with different data loggers from our company (e.g. Thermofox Universal)
- Connection to the data logger is implemented using the flexible Scanntronik Universal Bus®
- Readings are saved directly in the data memory of the connected data logger (accessories)
- Collected readings remain in memory of the data logger even without batteries
- Min./max. monitoring for extreme value recording without interruption for up to 3 x sensors
- **Alarm output** for e.g. **SMS-Alarm-System**, **Acoustic-Alarm**, **Telephone-Alarm**, etc.
- **Alarm delay** and alarm thresholds/alarm ranges freely programmable for all sensor inputs
- Clock with crystal oscillator accuracy integrated in the Multiplexer for the alarm delay
- Directly combinable with our Remotefox (remote data communication system) via plug&play
- Simple configuration of the entire measuring system using the SoftFOX analysis software
- Resolution of the Thermocouple Multiplexer: 0.1°C (in the range from -200°C to +200°C)
- Resolution of the Thermocouple Multiplexer: 1.0°C (in the range from -210°C to +1800°C)
- Maximum thermocouple full-scale error and linearity error: < ±0,05%FS (at 25°C - AT)
- Maximum cold junction temperature error: < ±0,7°C (from -20°C to +80°C - AT)
- 50Hz/60Hz - Noise rejection for the fundamental frequency and its harmonics: 91 dB
- **Calibration certificates** available for all sensors and systems upon request
- No thermocouples/wires are included in the package (please add them to your order)
- Power supply via four standard commercially available AA mignon batteries (4 x 1.5V)
- Battery lifetime up to two years (see configuration). Batteries can be replaced at any time
- Operating environment (humidity) for the system: 10 %rH to 90 %rH (no condensation!)
- Dimensions of the expansion module: 145 x 90 x 35 mm (HxWxD),
- Weight of the expansion module: 275g including batteries

Depending on the memory equipment of the used data logger system (e.g. Thermofox Universal), the active sensors and the selected measuring rhythm, the maximum measuring time can be calculated.

Here some examples:

Memory capacity	Active sensors	Measuring rhythm	Measuring time
4,000 readings	4 x thermocouples	15 minutes	10 days
4,000 readings	8 x thermocouples	1 hour	20 days
4,000 readings	8 x thermocouples	6 hours	120 days
16,000 readings	4 x thermocouples	15 minutes	40 days
16,000 readings	8 x thermocouples	1 hour	80 days
16,000 readings	8 x thermocouples	6 hours	480 days
64,000 readings	4 x thermocouples	10 minutes	110 days
64,000 readings	8 x thermocouples	30 minutes	160 days
64,000 readings	8 x thermocouples	1 hour	320 days