

Data Sheet

Scanning Adapter SC10 for all Metis and Sirius Pyrometers

The scanning adapter SC10 is based on a mechanically moved, gold plated mirror, which deflects the cone of vision of the pyrometers through about $90^\circ \pm \text{max. } 6^\circ$ with an adjustable scanning frequency of 1 – 5 Hz. It was initially developed for the temperature measurement of fine staves or wires in roller mills and wire manufacturing process. In conjunction with the peak picker (maximum value storage) of the pyrometer, it prevents the wire from wandering out of the measuring field causing fluctuating measured values. This combination, comprising of the scanner and peak picker, is also often used in inductive and conductive heating equipment in order to avoid loose scales, which exist sporadically at the target the pyrometer is aimed at, causing low measurement results. Only in this way will it be assured that, in an automatic control process the work piece is not overheated or even melted. Other applications for the successful use of the pyrometer/scanner combination are spot and friction welding procedures. Furthermore there are also additional applications possible, in which the use of a pyrometer will be, only through the scanning attachment SC10, a reasonable, reliable and particularly low cost solution of the temperature measurement problem.



Fig.1: Scanning Adapter SC10 with *Metis* Pyrometer and Swivel Base HA21

Scanning Adapter	Pyrometer Model	Correction Factor
SC10-41 with Fused Quartz Window	Metis MS09, MI16	0,90
	Metis MI18, MP23	0,88
	Metis MP25	0,84
SC10-51 Fused Quartz Window	Sirius SS09, SI16	0,90
SC10-42 with CaF ₂ (Calcium Fluoride) Window	Metis MB35	0,94
	Metis MY34, MY39	0,94
	Metis MY51, MY68	0,94
	Metis MY80	0,94
	Metis MY81	0,94
SC10-43 with Zinc Sulphide-Window	Metis MY84	0,70

Model Description: The scanners will be delivered with various windows to protect against dust and water spray. (Table 1) For each window material, suitable Pyrometer Models are also listed. Since the scanning attachment simultaneously absorbs a part of the measured object radiated infrared energy, the pyrometer adjusted emission factor has to be corrected accordingly. Therefore you have to multiply the correction factor stated in Table 1 with the emission factor of the measured materials and enter the result as the new emission factor in the pyrometer.

Calculation Example: Pyrometer: *Metis MP25*
 Emission Factor without Scanner: 0,75
 Corrector Factor: 0,84 (SC10-01)
 Adjusted Emission Factor: $0,75 \times 0,84 = 0,63$

Table 1: Scanning adapter with pyrometer and correction factor

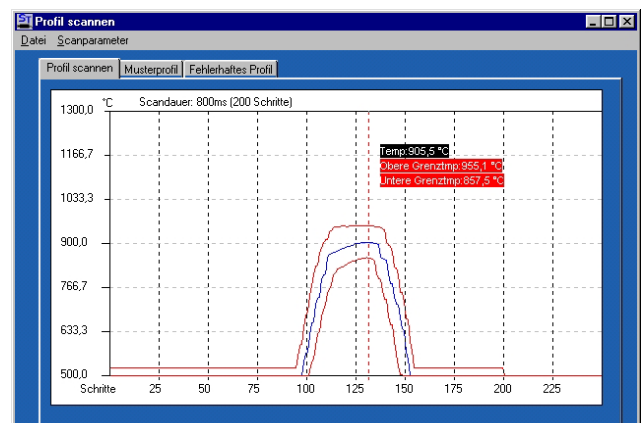
Optical Alignment and Equipment Adjustment: For the optical alignment of the system to the target, the laser-pointer installed in the pyrometer is used. In scanning operation, the laser projects a line onto the object being measured. At an adjusted scanning angle of $\pm 6^\circ$, the length of the line is about $\pm 10\%$ of the measurement distance. At the same time, this is also the area in which the temperature measurement is achieved and collated respectively, from maximum value. The use of pyrometers with an integrated monochrome camera only makes sense if the mirror can be moved very slowly.

The fastest **Scanning Frequency** averages 5Hz and the maximum **Scanning angle** $12^\circ (\pm 6^\circ)$. The result of this is, at a measuring distance of 1 m an approximately 1m long section (5 x 20 cm) will be measured by the Pyrometer in one second. The **Exposition Time** of the pyrometer should therefore be fast enough to measure safely a small hot area on the measured object. For the previously mentioned example, we recommend therefore to employ only pyrometers with an exposition time of 1ms, 5ms or 10ms. Slower pyrometer versions should also work with smaller angles and/or lower scanning frequencies.

Automatic Monitoring of a Temperature Profile with SC10:

A special design of the scanner attachment SC10 makes it possible for selective controlling of the scanning mirror. Thereby one or more temperature profiles of a measured object can be collected and displayed simultaneously through an addition to the standard software *SensorWin*.

The creation of a sample profile with an envelope curve (tolerance band) allows the display of alternative temperature profiles. If desired, a switching module is available for the connection to the RS232 PC-Interface which offers an additional alarm output through galvanically isolated interfaces in case the limits of the tolerance band are exceeded.

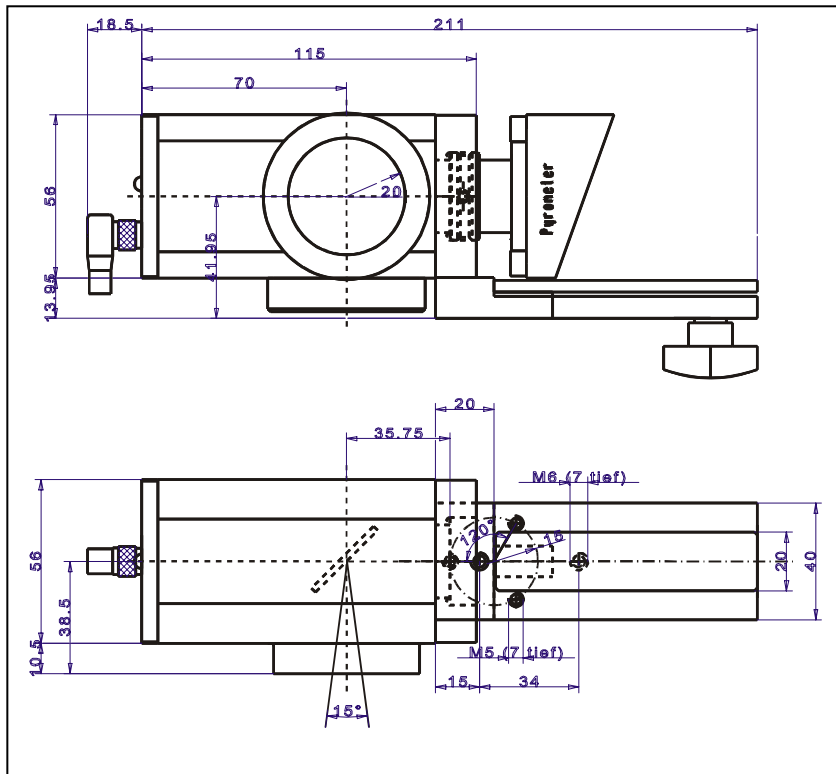


Technical Data at a Glance:

Scanning angle:	0° to ± 6°, infinitely variable via potentiometer
Scanning frequency:	1 to 5 Hz, infinitely variable via potentiometer
Optical way	70 mm (Leading edge pyrometer objective up to window of the scanner)
Ambient temperature range:	0 - + 70°C at the housing
Storage temperature range:	-20 - + 85°C
Supply voltage:	15 - 30 V AC/DC, 0,7 VA
Protection category:	IP 65 (in accordance with DIN 40 050) with fixed pyrometer and protective window
Weight:	0,75 kg, without pyrometer
CE Mark:	According to EU Guidelines for Electro-Magnetic Compatibility

Physical Dimensions (in Millimetres):

Scanning Attachment SC10 with Mounting Rail for *Metis*-Pyrometer



Indication: By changing the installation of the mounting rail which is attached to the scanner, the 90° direction of the pyrometer beam can be shifted through 90° steps. The status shown in the illustration determines that the course of beam will be horizontally diverted to the left.

With the scanner SC10 installed together with a Pyrometer with focusable objective, the objective will be rigidly connected to the scanner. It is possible, by releasing the thumb screw underneath the pyrometer, to slide the pyrometer along the mounting rail and thereby focus the laser beam. The focused state of the system will be visible through the sharpness of the laser spot on the measured object.

Connection: The power supply to the scanning attachment is achieved via a 4-Pole connector on the SC10 housing. Together with a *Metis*-Pyrometer (without fibre optic cable), the connection cable combination AK15 should be ordered, where the angle connector is additionally connected with a short cable for the scanner.

In conjunction with a pyrometer of the *Metis* series with fibre optic cable, we recommend, for the connection of the pyrometer, the cable AK10 and to employ a secondary connection cable AK30 for the scanner. The AK30 is available in 2 m or 5 m lengths and will be hooked-up parallel to the power supply for the pyrometer.

Order Numbers:

Description	Order Number
Scanning Attachment with Quartz Glass Window for focusable <i>Metis</i> -pyrometer	SC10-41
Scanning Attachment with Quartz Glass Window for pyrometer series <i>Sirius</i>	SC10-51
Scanning Attachment with Quartz Glass Window for <i>Metis</i> -pyrometer with fixed-focus objective	SC10-61
Scanning Attachment with Quartz Glass Window for <i>Metis</i> -pyrometer with fibre optic cable lens OL25	SC10-71
Scanning Attachment with CaF2 Window for focusable <i>Metis</i> -pyrometer	SC10-42
Scanning Attachment with CaF2 Window for <i>Metis</i> -pyrometer with fixed-focus objective	SC10-62
Scanning Attachment with ZnS Window for focusable <i>Metis</i> -pyrometer	SC10-43
Scanning Attachment with ZnS Window for <i>Metis</i> -pyrometer with fixed-focus objective	SC10-63

Available Accessories:

Description	Model
5 m connection cable for SC10 and <i>Metis</i> -Pyrometer without fibre optic cable	AK15-05
2m con. cable for SC10 with <i>Metis</i> fibre optic lens OL25	AK30-02
5 m con. cable for SC10 with <i>Metis</i> fibre optic lens OL25	AK30-05
Air Purge Attachment	BL12-00
Swivel-Base Attachment for Scanner with Pyrometer	HA21-00
Water cooled Front Plate	KG22-00

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