

Technical Data Sheet

Infrared Line Scanner Accessory *Galaxy SC11 and Galaxy SC12* For all *Metis* Pyrometers

The line scanner accessory *Galaxy* greatly enhances the potential applications of the *Metis* line of pyrometers. When measuring stationary objects, this accessory allows a profiled temperature measurement based on individual data points. Or, if the object is moving, it creates a two-dimensional thermographic image from a profile measurement. This process is made possible by a mirror which tilts precisely in the cone of vision of the pyrometer. The temperature profile acquired by means of the tilting movement is displayed on the screen or can be used as an analog output signal.



Illustration.1: Line scanner with Pyrometer

Galaxy SC11 represents the standard version which is operated using the interface and ASCII commands or by way of a PC or Notebook and *GalaxyWin* software. The unit supplies 0/4-20 mA analog output signals for the temperature profile and for the angular position of the mirror. The object being measured can be covered with up to 4 zones in which four digital temperature data are contained. These can be: the current, the maximum, the minimum or the average value of the relevant zones. The position and the width of the each zone can be programmed as desired. While it is not necessary that they be contiguous, there shouldn't be any overlap. The scanner accessory is therefore comparable to having four pyrometers installed in parallel and having the ability to make adjustments of spot sizes. Nevertheless, temperature variations among the individual pyrometers can be eliminated.

Galaxy SC12 offers, in addition, a digital display and control console allowing the system to be operated without the need for a local computer. Furthermore, temperature information on the zones is available as analog output.

Model	SC11-01, SC12-01	SC11-02, SC12-02	SC11-04, SC12-04
Window material	Borosilicate glass	Calcium fluoride	Sapphire
Pyrometer connected	Metis MS09, MI16, MI18 Metis High Speed* HS09, HI16, HI18	MY51, MY68, MY80	Metis MP23, MP25, MB35, MY34, MY39, MY45, MY46

Chart 1 Galaxy models and compatible *Metis* Pyrometer series

* need RS 232 com. port

As shown in **Chart 1**, the scanner is supplied with different windows for protection against dust and water jets. The appropriate pyrometer for each window material is indicated as well. The standard SW recognizes the attached pyrometer and compensates for any transmission loss from the scanner window automatically.

Optical Alignment: The laser marker built into the pyrometer is designed for the optical alignment of the system on the object to be measured. In scanning mode, the laser projects a scanning line onto the object, while during individual point measurement, the laser or the monitor displays the current measuring point.

Installation and Parameterizing: *GalaxyWin*, a standard software included in the equipment price, is the ideal way to operate the pyrometer and the scanner. The automatic, process-dependant installation performed using interface commands is available as well. Only *Galaxy SC12* can be installed using the control console and without a computer.

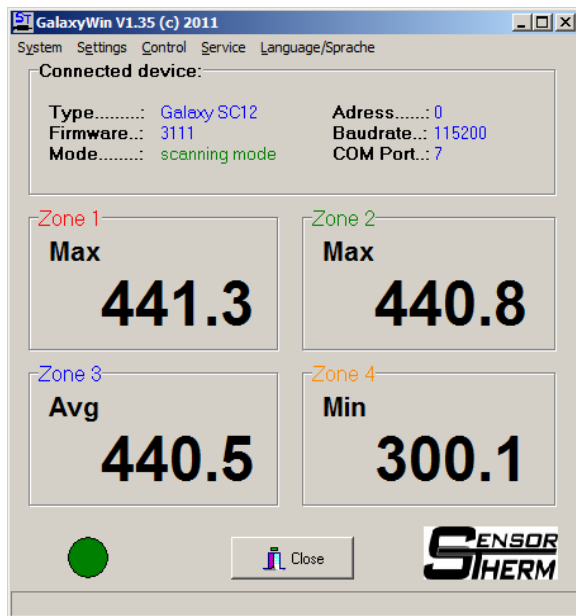
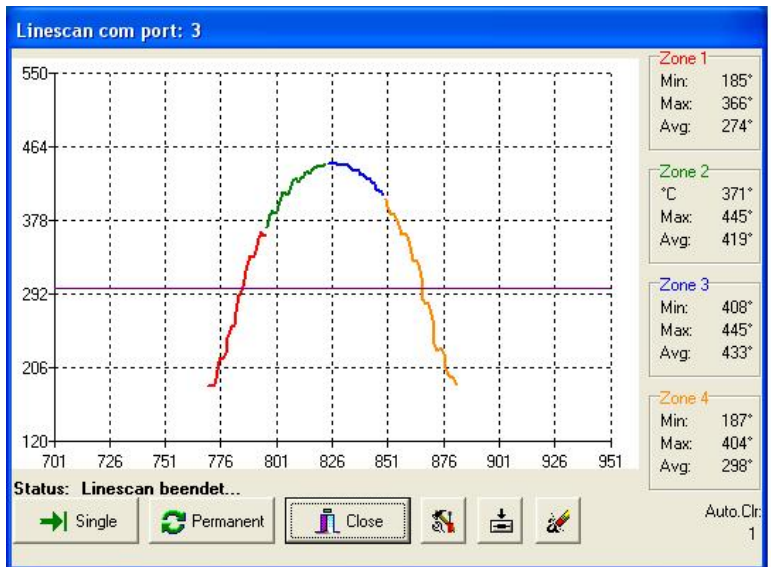
The highest **scanning speed** available is 225°/s or 4000 steps/s with the maximum **scanning angle** at 90°. Thus, the maximum **scanning frequency** is 2.5 Hz. If, however, a scanning angle of only 45° is necessary due to the measuring distance and the size of the object, the scanning frequency increases automatically to 5 Hz. The recording time of the pyrometer should be taken into account. If this is 1 ms, a scanning speed of 1000 steps/s is sufficient for an optimal temperature resolution.

If one looks at the ideal measurement distance, the length of the object is not the only criterion. A tin plate with a width of two meters requires a distance of only one meter, but the ambient temperature at this distance could require excessive cooling capacity. If, on the other hand, a high scanning frequency with a large measurement distance is required, the optical resolution of the pyrometer connected should be considered as well.

Additional *GalaxyWin* Software adjustments:

In addition, *GalaxyWin* permits the easy installation of the zones in steps, angles or millimeters and the cartographic display of the temperature profile. The X-axis represents the position of the mirror, taking into account the selected areas of the zones. The Y-axis corresponds to the initially installed measurement range of the pyrometer, but improved resolution is possible for the graphical representation. Each position on the scanning line can be reached and the temperature at each point can be displayed as well.

Illustration right: Profile temperature measurements and zone temperatures using

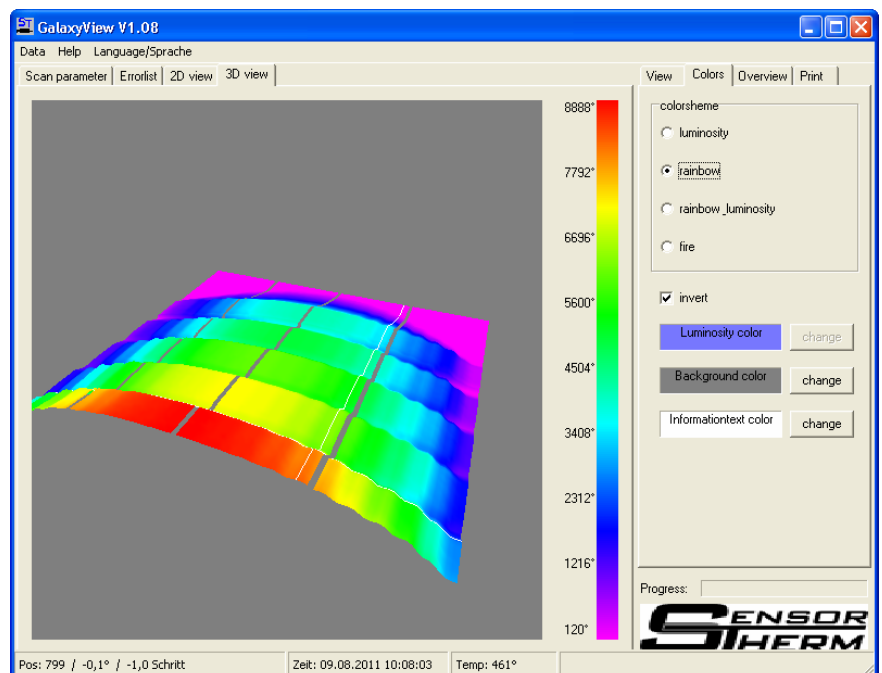


Under normal conditions the temperature measurement and display occur during the back and forth movement of the mirror at the prescribed speed. The return motion can be done during “no load” intervals at maximum speed. Applications with larger empty or “cold” intervals between the individual hot parts, e.g., temperature measurement of several billets at the end of a continuous casting line, require the rapid bridging of the intermittent spaces, all of which is feasible as well. These characteristics are not only available manually in the software program, but also can be set up automatically and in accordance with the needs of a particular process by using the program interface.

Illustration left: Large digital indication of Zone temperatures using different filters

The optional available Software *GalaxyView* offers 2- and 3-dimensional mapping of the temperature profiles saved with help of *GalaxyWin* before.

Illustration right shows also the borders of 4 user defined Zones.



Output Signals and Filters: The scanning series *Galaxy* produces analog as well as digital output signals for temperature indication and control or for storage of temperature data. The isolated analog output signals can be switched from 0 to 4 up to 20 mA; the start and end of the temperature range can be programmed as desired within the temperature range of each pyrometer connected. The minimum adjustable range is 51°C. The output signal of the temperature profile corresponds to either current or maximum value of each scan. The zones of the relevant analog temperature information of SC12 offer, in addition, the choice of minimum or average values. In order to allocate the individual temperature values to the object, the current angular position of the mirror is also indicated as an analog or digital signal.

RS 232 or RS 485 max. 115.2 kBd are available as standard features via interconnecting cable with this product line. Additionally there is an **USB-service port** beneath the rear cover of housing available for service purposes as well as for configuration of Galaxy scanner.

Applications: Among the most popular applications for the successful implementation of line scanners are the management and control of smoothing and drying processes in the textile and paper industry, of cooling processes in the case of float or hollow glass production, the profile temperature measurement of slabs, heavy plate and thin sheet in the steel industry, of the measuring of wall temperatures of rotary kilns and the spotting of glowing clusters on conveyor belts.

Technical Data: an Overview

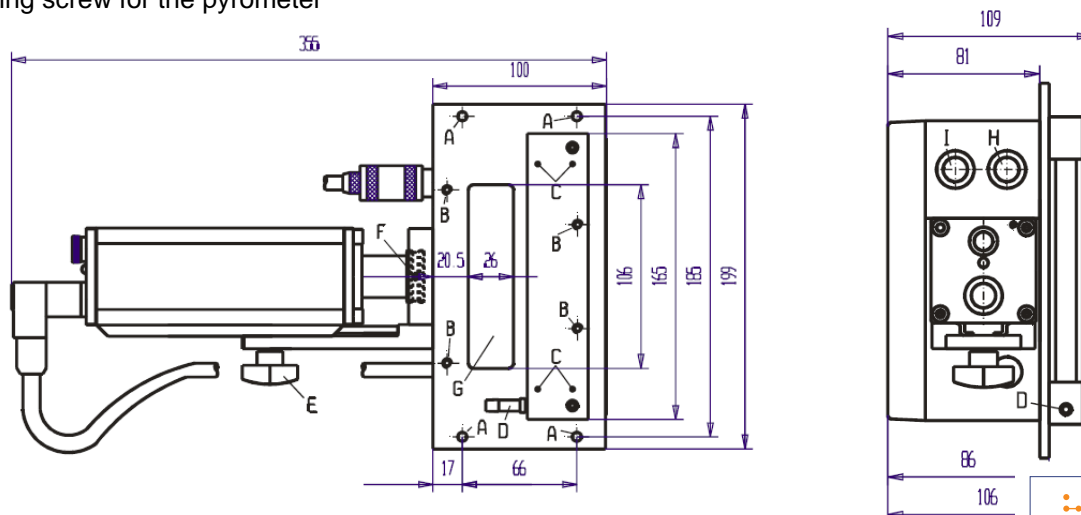
Scanning angle:	3,6° to 90° adjustable in steps of in 0,05625°
Scanning speed:	max. 225°/s, adjustable in 1 to 4000 steps/s (1step = 0,05625°)
Zones:	max. 4 zones, adjustable in 1 to 1600 steps, no overlap
Analog output signals SC11:	1 x temperature profile 0 or 4 – 20 mA according to pyrometer settings
Only SC12:	1 x mirror position 0 or 4 – 20 mA corresponds to step 0 – 1600, or. 0 - 90° 4 x zone output 0 or 4 – 20 mA according to the pyrometer settings
Measurement uncertainty:	Zone output = 0,15% of input value
Digital interfaces	RS232C or bus-enabled RS485 via external connection. Half-duplex USB via type B connector, access only after removing rear cover of housing
Baud rates:	Adjustable from 2400 Bit/s to 115200 Bit/s
Ambient temperature range:	0 - + 53°C on the housing
Storage temperature range:	-20 - + 60 °C
Power supply:	18 V ... 36 V DC, max. 600 mA , depends on the pyrometer connected
Isolation:	Power supply, analog and digital output are galvanically separated from each other
Rating:	IP 65 (DIN 40 050) with closed lid, mounted pyrometer, mounted protective window and inserted plugs
Weight:	2,2 kg, without the pyrometer
CE Label:	According to EU directives for electromagnetic immunity

Mechanical Measurements:

Scanner Accessory Galaxy with air purge accessory and pyrometer

A: Mounting holes \varnothing 5.2 mm for front mounting
 B: Mounting bracket for optional cooling plate
 C: Mounting holes for air purge
 D: Connection for air pressure hose $\varnothing_1 = 6$ mm
 E: Locking screw for the pyrometer

F: Security screw for Pyrometer lens
 G: Optical window. Beam path in the middle
 H: Connector for standard cable
 I: Connector plug for analog cable



Available Accessories:

Description	Modell
5 m connector cable for the power supply, analog output and RS-communication	AK43-05
5 m connector cable for analog output angular position	AK41-05
5 m connector cable for analog output of the angular position and zone temperature (SC12 only)	AK40-05
Swivel Base for scanner with pyrometer, without cooling	HA21-00
Water-cooled front plate with air purge	KG21-00
Water cooling housing with air purge	KG23-00



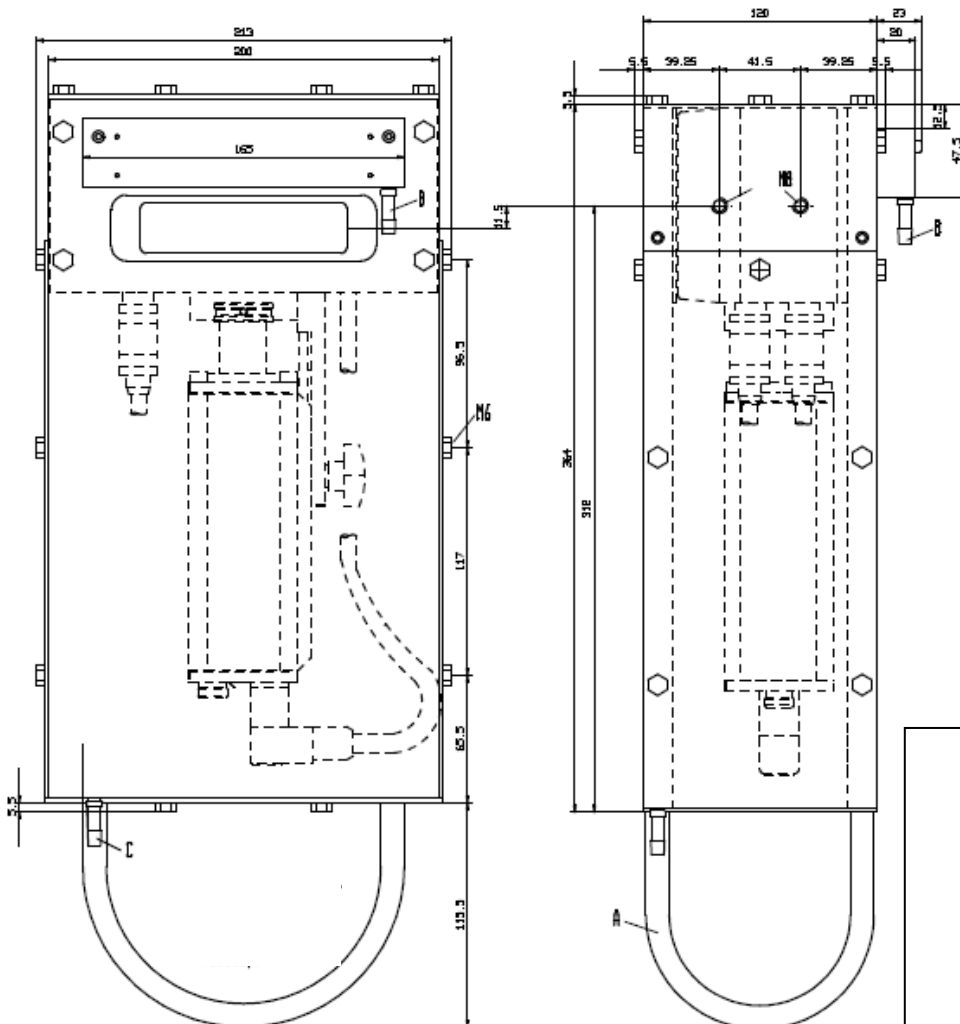
Illustration 4: water cooling jacket KG 23, protects not only against heat radiation on the front side but also against high ambient temperatures up to 140°C.

Illustration 3: Swivel mounting Base HA21

The pan- and tilt-head, which can be released with a single movement of the hand and as easily locked, facilitates the optical alignment of the pyrometer on the object.



Mechanical measurements of the optional water-cooling housing KG23-00



A: Connecting tube between front and rear cooling plate

B: Purging connection for air hoses with inside diameter of 8 mm

C: Coolant connection for water hoses with inside diameter of 9 mm

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