

PYROSPOT DS 10N/DS 10NV

Pyrometers for industry and research

Overview

Digital pyrometers with RS-485 interface



Features

- For temperature measurements between 550 °C and 3000 °C
- Keys and display for parameterization and representation of temperature
- Vario optics with aiming light, through-lens sighting or camera module
- Short response times from 2 ms
- Temperature linear output 0/4 to 20 mA

Description and applications

The digital pyrometers PYROSPOT DS 10N/DS 10NV are specifically designed for industry and research applications. The devices are suitable for temperature measurement from 550 °C on many different surfaces for example metals, ceramics or graphite.

The solid construction in form of a compact housing with a protection window for optics allows usage even under rough environmental conditions. With a short response time of only 2 ms (t_{95}) these pyrometers are also suitable for fast measuring processes. The vario optics with quartz glass protection window realise measuring field diameters from 0.8 mm.

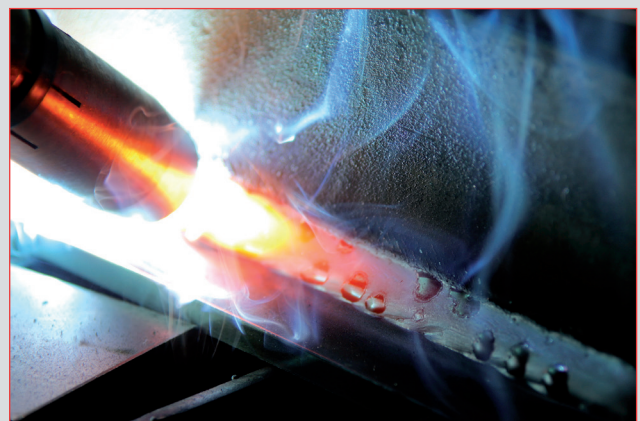
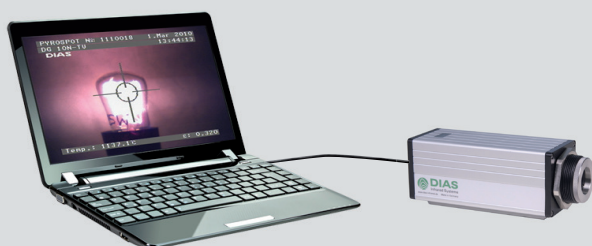
The integrated LED or laser aiming light or the alternative through-lens sighting, enables an exact focus on the measurement object. With the optional color video module (PYROSPOT DS 10NV) the alignment of the pyrometers to the target can be monitored visually and the entire process can be recorded and documented.

The temperature linear standard output signal of 0/4 to 20 mA allows easy implementation in existing measurement and control systems. The device is equipped with a galvanically isolated RS-485 interface which allows parameterising and software evaluation even in bus systems.

All parameters are adjustable via push-buttons and display directly at the device or by using the convenient parameterizing and evaluation software PYROSOFT Spot.

Typical pyrometer application areas:

Steel industry, metal industry, kiln engineering, hardening, welding



PYROSPOT DS 10N/DS 10NV

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Technical data				
Type	DS 10N/DS 10NV	DS 10N/DS 10NV	DS 10N/DS 10NV	DS 10N/DS 10NV
Temperature range	550 °C to 1500 °C	600 °C to 1800 °C	800 °C to 2500 °C	900 °C to 3000 °C
Distance ratio	approx. 200 : 1	approx. 300 : 1	approx. 300 : 1	approx. 300 : 1
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C			
Spectral range	0.8 µm to 1.1 µm			
Optics	vario optics with quartz glass protection window, measuring field diameters from 1.2 mm			
Measurement uncertainty ¹	0.5 % of measured value in °C + 1 K			
Reproducibility ¹	0.1 % of measured value in °C + 0.5 K			
Transmittance	50 % to 100 %			
Ambient radiation	adjustable within temperature range			
NETD ^{1,2}	0.1 K			
Response time (t ₉₅)	2 ms ³ , adjustable up to 100 s			
Emissivity	0.050 to 1.000, adjustable at the device or via interface			
Storage	minimum and maximum value storage, adjustable via RS-485 interface			
Output	0/4 to 20 mA, switchable via software, temperature linear, max. burden 500 Ω (galvanically isolated)			
Interface	RS-485 (galvanically isolated), half duplex, baudrate up to 115 kBd, data protocol Modbus RTU			
Switching output/threshold	1 Opto relay, R _{load} min. 48 Ω/adjustable within temperature range			
Aiming	LED aiming light, laser aiming light (630 to 680 nm, class II, < 1 mW), through-lens sighting or camera module (DS 10NV)			
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro			
Parameters ⁴	emissivity, transmittance, ambient radiation, response time, temperature unit °C or °F, storage settings, sub temperature range of measurement output, switching thresholds of switching output, key lock			
User controls	keys for „Parameter Menu“, „Enter“, „Up“ and „Down“, aiming light push-button, display			
Power supply	24 V DC ± 25 %			
Power consumption	max. 1.5 W (without load at switching output)			
Operating temperature	0 °C to 70 °C			
Storage temperature	–20 °C to 70 °C			
Weight	approx. 520 g			
Dimensions	54 × 54 mm, length 170 mm			
Housing	compact housing with plug connector, display, push-buttons and optics protection window			
Safety class	IP 65 (DIN 40 050)			
CE symbol	according to EU regulations (EN 50 011)			
Scope of delivery	PYROSPOT DS 10N/DS 10NV, mounting screw nut, inspection sheet, manual, PYROSOFT Spot for Windows® (without connection cable, please order separately)			

¹T_{ambient} = 23 °C, ε = 1, t₉₅ = 1 s. ²Noise equivalent temperature difference. ³With dynamic adaption at low signal level. ⁴Adjustable via software and interface or directly at the device.

Dimensional drawing pyrometer (with through-lens sighting)



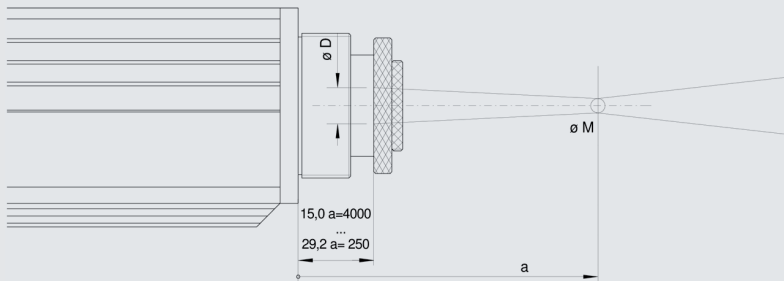
PYROSPOT DS 10N/DS 10NV

Pyrometers for industry and research

Vario optics

Measuring distance a [mm]	250	300	350	500	800	4000	Aperture diameter Ø D [mm]		Order number	
Optics pullout [mm]	29.2	25.5	23.5	20.3	18.0	15.0	at		LED aiming light	Laser aiming light
Temperature range	Measuring field diameter M [mm]						a = 250 mm	a = 4000 mm	Through-lens sighting	Camera module
550 °C to 1500 °C	1.2	1.5	1.7	2.5	4.0	20.0	13.0	10.5	5100001201	5100011201
									5100021201	5100031201
600 °C to 1800 °C	0.8	1.0	1.2	1.7	2.7	13.3	8.0	6.5	5100001202	5100011202
									5100021202	5100031202
800 °C to 2500 °C	0.8	1.0	1.2	1.7	2.7	13.3	10.0	8.5	5100001203	5100011203
									5100021203	5100031203
900 °C to 3000 °C	0.8	1.0	1.2	1.7	2.7	13.3	5.5	4.3	5100001204	5100011204
									5100021204	5100031204

Maßzeichnung Variooptik

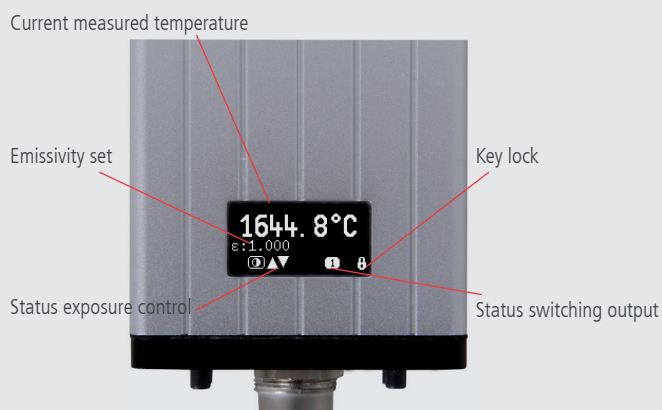


Technical data video camera (DS 10NV)

Video signal	Composite video signal approx. 1Vss at 75 Ω (galvanically isolated, video signal can be deactivated via software)
Video norm	PAL (B), 50 Hz (optional video norm NTSC (M), 60 Hz)
Resolution	1/3 inch video chip 628 $\times$ 586 pixels (NTSC option: 510 $\times$ 496 pixels)
Exposure control	Automatic or manual via software or device
Visible field	approx. 8 % $\times$ 6 % of adjusted measurement distance (NTSC option: 6.5 % $\times$ 5 %)
Date/Time	Real-time clock with minimum 3 days power reserve, adjustable via software
Durable image displays	Target mark in measurement spot size; spectral pyrometers: measurement temperature, emissivity
Optional displays	Via software: serial number, device name or user-defined text (16 characters), date, time, temperature unit °C/°F, 12/24 hours display
White balance	Automatic or manual via software or device

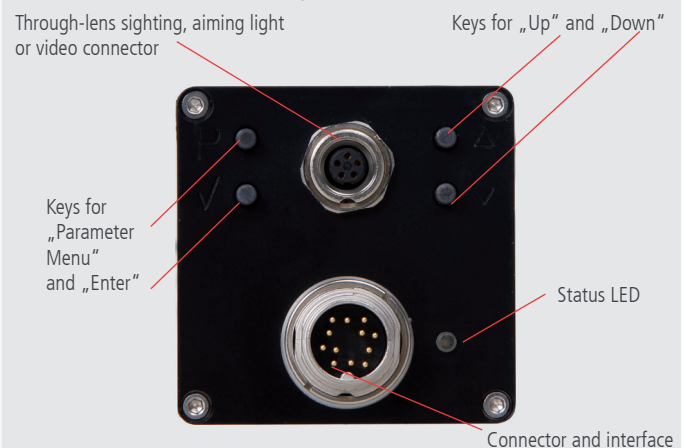
Detailed view: Display

The digital display shows the current measured value and the emissivity set as well as further information.



Detailed view: Rear side

The parameters can be adjusted with the keys at the rear side of the device. The set value is taken over directly.



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Electrical, mechanical and optical accessories (more accessories on request)			Part number	
Connection cable, 12 pin, angled plug		Length 2 m	3310A11131	
		Length 5 m	3310A11132	
		Length 10 m	3310A11133	
		Length 15 m	3310A11134	
		Length 20 m	3310A11135	
		Length 25 m	3310A11136	
		Length 30 m	3310A11137	
Video connection cable		Length 2 m	3310A16521	
		Length 5 m	3310A16522	
		Length 10 m	3310A16523	
		Length 15 m	3310A16524	
		Length 20 m	3310A16525	
		Length 25 m	3310A16526	
		Length 30 m	3310A16527	
Interface adapter		RS-485 to USB	3310A14020	
Power supply PSU 15		24 V DC, 0.6 A	3310A12010	
Mounting angle		Adjustable	3310A21020	
Air purge unit		Stainless steel, purge air 0.1 to 0.5 bar, oil-free	3310A22020	
Window slide		without window	3310A21210	
Vacuum flange		KF 16	3310A24015	
		with quartz glass	3310A34021	
		with sapphire glass (scratch-proof)	3310A34051	
Cooling jacket		including air purge unit	3310A23031	
Mounting angle		for cooling jacket	3310A23036	
ATEX housing			3310A23100	
Handheld programming device DHP 1040		mobile device for pyrometer parameterization	3310A17010	
TFT display	TFT display industrial	3.5" with 2 m cable	3310A16110	3310A16120
Adapter		Video/USB	3310A14030	

Selected accessories – images

Mounting angle, adjustable

Part number: 3310A21020



Ball and socket mounting

Part number: 3310A21025



Cooling jacket

Part number: 3310A23031



Cooling plate

Part number: 3310A23020



Air purge unit

Part number: 3310A22020



ATEX housing

Part number: 3310A23100

