

# KELLER

*infrared  
temperature  
solutions*

# ITS

# NO1

in terms of  
ACCURACY  
RELIABILITY  
INNOVATION



## Infrared thermometer CellaTemp® PR

for optical temperature measurements  
from 0 °C to + 1600 °C



## Range of models

Compact infrared thermometer



Type	Measuring range	Application
<b>Single-colour infrared thermometer</b>		
PR 11	0 - 1000 °C	Non metals
PR 18	0 - 500 °C	Non metals in aggressive measuring environment
PR 21	250 - 1600 °C	Metals, ceramics, molten glass

## CellaTemp® PR series

The infrared thermometer CellaTemp® PR records the infrared radiation emitted by an object and converts it into an electrical signal. The detected temperature is output via the digital IO-Link interface.

A unique combination of analogue and digital linearisation features provides the CellaTemp® PR with a high-resolution signal processing unit. Therefore, even with wide measuring ranges, the infrared thermometer has a very high temperature resolution while its noise equivalent temperature difference (NETD) is extremely low. The pyrometer thus supplies stable measurement readings even when the response times are extremely short (from 2 ms) and the measured temperatures are very low.

### CellaTemp® PR 18

The CellaTemp® PR 18 comes with an especially resilient lens, allowing its use even in extreme environmental conditions, such as in asphalt and concrete mixing plants, preventing the lens from damage by aggressive vapours and dust.

## Analogue output

The analogue output supplies a signal linear to the temperature; 0/4 – 20 mA are optionally available. The range setting can be configured via IO-Link. The outputs deactivate and a warning appears on the display when the internal temperature reaches > 75 °C.



# Infrared thermometer CellaTemp® PR

## Special features

- Compact infrared thermometer
- Standardized PLC and fieldbus-independent IO-Link interface
- Analogue output 0/4 - 20 mA
- Large measuring ranges with high temperature resolution at the same time
- High optical resolution and accuracy due to wide band anti-reflective precision lenses
- Configurable switching output
- Easy mounting thanks to the M30 screw thread

## Switching output

With a hot object in the sensor's field of vision, a switching contact is triggered when a pre-defined temperature threshold is exceeded. Optionally, the switch can operate as a normally closed or normally open contact. This configurable switch on/switch off delay permits a suppression of short interference pulses and for the adaptation of the switching output to the response time of a PLC.

**A variety of possible applications includes:**

- Monitoring of limit temperatures
- Determination of temperature peak values

## Optical system

An infrared thermometer uses an optical measuring method for non-contact temperature measurements. The quality of the optical system has a great influence on the measurement accuracy of the device as a whole.

This influence is defined as "size of source effect". Light scattered into the optical path will result in false temperature data. When the distance to the target or the size of the object change, the temperature reading may change as well depending on the quality of the optical system.

The excellent imaging characteristics of the precision lenses provide a high optical resolution and a minimum sensitivity to stray light. The anti-reflective coated lenses are extremely durable, easy to clean and therefore suitable for rough industrial applications.

## Diagnostic function

The diagnostic function ensures a high operational reliability. Unstable supply voltages, unacceptable ambient temperatures or out-of-range object temperatures are indicated via the IO-Link.

## Service function

The service function is used to output a temperature value during setup or running operation via the analogue output for simulation. This feature checks the correct functioning and range setting for the downstream signal processing units (display, controller, PLC) quickly and safely even without a hot object.

## Reverse polarity protection

- for the power supply voltage
- for the analogue output
- for the switching output

## Troubleshooting

- Excess temperature in the sensor
- Measuring range too high/too low
- Unstable supply voltage

## EMV standard

- DIN EN IEC 61000-6-2:11/2019
- DIN EN IEC 61000-6-4:09/2020
- BS EN IEC 61000-6-2:2019
- BS EN IEC 61000-6-4:2019

## Scope of delivery

- Infrared thermometer
- Operating manual
- 2 fastening nuts

**i** The connecting cable VK 02/L (length as required) must be ordered separately.

## Adjustable parameters (via IO-Link)

### Analogue output

- Analogue output 0/4 - 20 mA
- Scaling of the analogue output

### Switching output

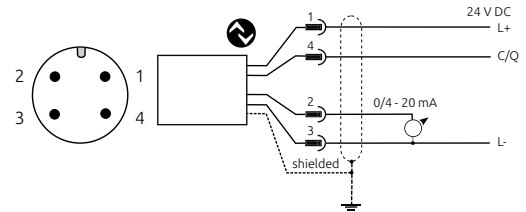
- ON and reset
- Switching function: NC and NO contacts
- Switch-on and switch-off delay

### General parameters

- Emissivity
- Smoothing function
- Hold time for peak value
- Reset to factory setting
- Temperature simulation for diagnostic purposes

## Connector pin assignment

### CellaTemp® PR Infrared thermometer



**i** It is imperative to use a cable with shielding.

## Technical data\*

### Analogue output

- 0/4 - 20 mA linear according to NAMUR 43, scalable
- max. burden 500 Ω

### Switching output

- PNP open collector active from positive supply voltage
- NC or NO
- current-carrying capacity 150 mA
- clocked overload safety shut-off  $\geq 250$  mA

### Interface

- IO-Link V1.1 (COM 2)

### Resolution of power output

- 0.2 K + 0.03 % of the set span

### Power supply

- 18 - 32 V DC

### Power consumption

- $\leq 50$  mA ( $\leq 75$  mA with spot light) at 24 V DC without load current

### Ambient temperature

- 0 - 65 °C

### Storage temperature

- -20 - +80 °C

### Housing material

- Stainless steel V2A (1.4305)

### Permissible humidity

- 95 % r.H. max. (non-condensing)

### Protection

- IP65 acc. to DIN 40050 protection class III

### Connection

- M12 connector, 5-pole A coding (DIN EN 61076-2-101)

### Weight

- approx. 0.4 kg

### Shock resistance

- (EN60068-2-27)
- 30 g (11 mg)

### Vibration resistance

- (EN60068-2-6)
- 5 g (10 - 2000 Hz)

\* Specifications of the technical data according to DIN IEC TS 62492-1 and DIN IEC TS 62492-2  
Calibration of the pyrometers according to VDI / VDE 3511 sheet 4.4

## Technical data - Compact infrared thermometer CellaTemp® PR

Type	Measuring range	Spectral sensitivity	Focal distance	Target size	Measurement uncertainty*1	Response time $t_{90}$	Repeatability	Temperature coefficient*2
<b>Single-colour infrared thermometer</b>								
PR 11 AF 1	0 - 1000 °C 32 - 1832 °F	8 - 14 µm	0.3 m	Ø 11 mm	0.75 % of measured value [°C] plus 2.0 K	≤ 60 ms	1 K	0.1 K/K (For T < 250 °C)
PR 18 AF 1	0 - 500 °C 32 - 932 °F							0.04 %/K (For T > 250 °C)
PR 21 AF 1	250 - 1600 °C 482 - 2912 °F	1.0 - 1.7 µm	1.5 m	Ø 10 mm	0.3 % of measured value [°C] plus 2.5 K	≤ 2 ms for T > 600 °C		0.07 %/K

\*1 at  $\epsilon = 1$  and  $T_a = +23$  °C      \*2 deviation to  $T_a = +23$  °C

## Dimensions

### Compact infrared thermometer



### • Field-of-view calculator

The field-of-view calculator is a useful tool for determining the complete field-of-view, the size of the measuring area in relation to the distance, the maximum measuring distance and the minimum spot size depending on the optical properties of the device when selecting and commissioning the device.

### • Applications

The Industrial Solution Guide is used to select the appropriate measuring system for the conditions and measuring location in the production plant after selecting the industry and application.

### • Mediacenter

Here you'll find application and technical reports on optical temperature measurement in addition to product information.

### • Contacts

Service hotline for support with the installation and commissioning of the devices or other technical questions.

## KITS – The digital Service App



Modern information and communication technology offers innovative solutions for the location-independent provision of data and information far beyond common practice. Thus, digitisation provides interesting new fields of action for companies, especially in the service sector. For this purpose, KELLER ITS follows this development and has developed the **KITS** App. It meets the various possibilities of a modern digital service management to get the necessary information quickly and easily via the app in 16 languages using a tablet or smartphone.

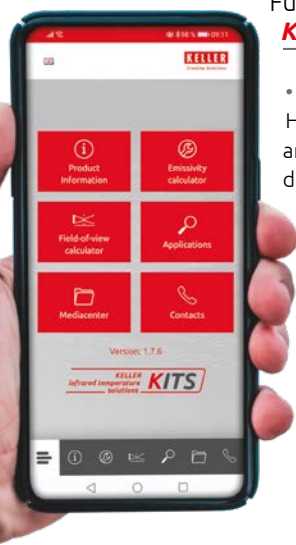
### Functions of the service app **KITS** at a glance

#### • Product information

Here you will find all technical data and the operating instructions for our devices.

#### • Emissivity calculator

The emissivity calculator is an important tool for commissioning a pyrometer. It determines the correct value to be set on the device from the emissivity preset on the device, the measured temperature and a reference temperature.



## IO-Link Interface

All devices of the CellaTemp® PR series are equipped with the new IO-Link communication interface according to IEC 61131-9.

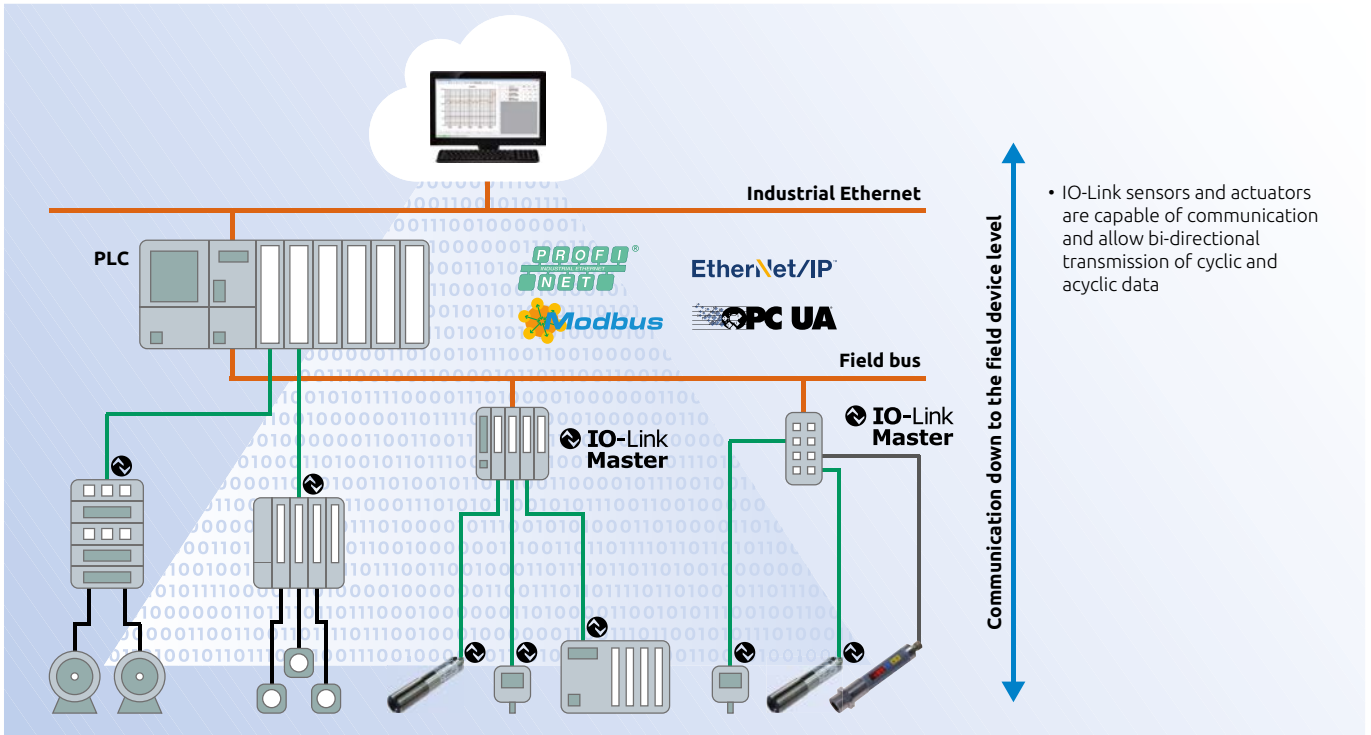
### Advantages of IO-Link interface

- Standardized manufacturer and fieldbus independent interface
- Cost-effective and simple point-to-point connection with standard cable
- Low wiring costs
- Simple commissioning
- Interference-free data transmission
- Automatic parameterization with central data backup
- Full transparency down to the lowest field level
- Systematic diagnostic concepts
- Device exchange by plug and play

### Open, system and company independent communication interface

- Internationally approved standard according to IEC 61131-9
- IO-Link consortium with all leading manufacturers of control systems
- Uniform system description of communication and device properties in the IODD device description file
- Certified IO-Link hardware components





### Easy project planning and integration

- Can be integrated in all common field bus and automation systems
- Fast project planning and easy system documentation
- Any combination of analogue and IO-Link device in one system control system
- Downward compatible – IO-Link devices can also be operated in standard mode (SIO) as conventional sensors with switching or analogue output
- Existing wiring can continue to be used

### Simple, fast and safe installation and maintenance

- Simple point-to-point connection – low wiring time
- Uniform and „correct“ wiring by standard cable with M12 plug (plug & play)
- Easy and accurate replacement of sensors
  - Avoidance of incorrect exchange thanks to clear device identification in the vendor and device ID
  - Avoidance of incorrect settings, as parameters are stored in the master and transferred automatically on device exchange
- Condition-oriented maintenance and targeted service
- Minimum effort for troubleshooting
- Modern, manufacturer-independent tools for commissioning
- Minimum variety of types and stock-keeping

### High operational safety

- Tamper-proof, as incorrect settings by the operator can be excluded
- Immediate, central fault diagnosis (wire breakage, short circuit etc.)
- Retrieval of diagnostic data for preventive maintenance and repair and therefore reduced risk of failure

### Simple parameterisation

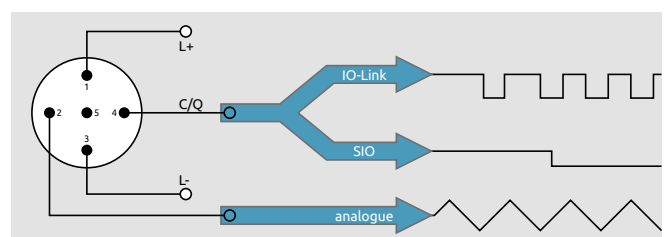
- Central parameterisation and storage of configuration data
- Dynamic parameterisation during operation for adaptive system control during recipe, material or tool changes reduces downtimes and increases flexibility and production diversity
- Automatic sensor parameterisation, plug and play on device exchange
- Simple duplication of parameters

### Safe and continuous digital communication

- Process data, diagnostic data, device information and configuration parameters
- EMC-technically interference-free transmission of measured values with 2 V signal level and protection by checksum
- Continuous communication from the lowest field level up to the ERP system
- One sensor for several measured values and switching points
- Worldwide remote maintenance and teleservice down to the lowest field level

### Cost saving

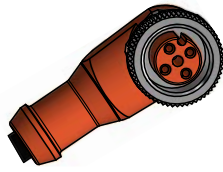
- Reduced installation and cabline costs
- Saving of analogue input cards by using standardized fieldbus switching groups



Accessories



Shielded cable  
VK 02/L AF 1: 5 m  
VK 02/L AF 2: 10 m



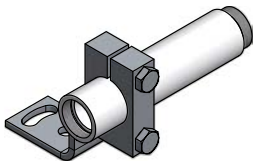
Shielded cable  
VK 02/R AF 1: 5 m



Thermal insulating tube  
PS 01/K



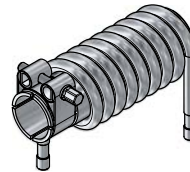
Axial air nozzle  
PS 01/A AF 1 (M30)  
PS 01/A AF 2 (1 1/4")



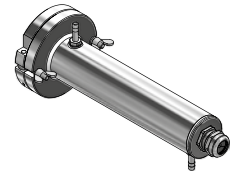
Clamping collar  
with angle  
PS 11/K-35 AF 2



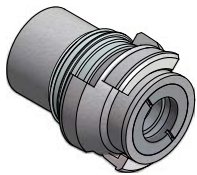
Set of mounting brackets  
PS 11/U



Cooling jacket  
PK 01/B AF 1



Cooling jacket, sealed  
PK 01/C AF 1 (M30)  
PK 01/C AF 2 (M65)



Bayonet coupling  
PS 11/N AF 4 (G1.1/4")  
PS 11/N AF 5 (M30)



Mounting bracket  
PS 11/P



Quartz window  
PS 01/I AF 2  
ZnS window adapter  
PS 11/D AF 2



Ball flange  
ZA 01/D



Bluetooth adapter  
EIO330



IO-Link master Field bus  
AL1100



IO-Link master USB  
AL1060



Software moneo

Further details on accessories at [www.keller.de/its](http://www.keller.de/its)

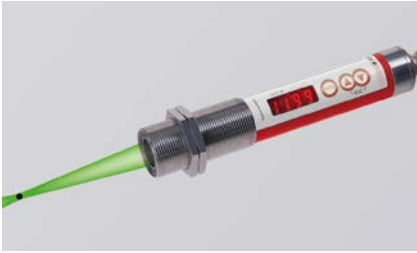


The **KITS** app is available for Android users in the Google Play Store and for iOS users in the Apple App Store. Scanning the QR codes shown below will take you directly to the respective installation menu.



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## Other products



**CellaTemp® PK(L)**  
Compact infrared thermometer for cramped environments. Optional with LED spot light.



**CellaTemp® PKF**  
Compact infrared thermometer with optical fibre and optical sensor head.



**CellaCast PT**  
Portable pyrometer for non-contact temperature measurement of molten metal at automated casting machines and blast furnaces.



**CellaPort PT**  
Portable single-colour and two-colour pyrometers with through-the-lens sighting and USB interface.



**CellaTemp® PX**  
Pyrometers with IO-Link interface, focusable lens, through the lens sighting or laser spot light.



**CellaTemp® PX-LWL**  
Pyrometers with IO-Link interface, fibre optics, focusable measuring heads and laser spot light.



**CellaTemp PA**  
Versatile pyrometers with focusable lens, through-the-lens sighting/ laser spotlight or video camera.



**Mikro PV**  
Intensity comparison pyrometer for ultra accurate measurement.

Since 1967, the Division Infrared Thermometer Solutions (ITS) of KELLER HCW GmbH develops and manufactures precision instruments and systems solutions for non-contact temperature measurements. Thanks to the continuous development of its range, KELLER ITS now is one of the leading providers for infrared thermometers and pyrometers worldwide.

With its very large product range of more than 250 models and systems KELLER ITS offers solutions for all standard applications and a variety of special measuring tasks.

Following the KELLER philosophy, the key focus in the development and production of the devices is set to the high measuring accuracy and reliability. Therefore, KELLER grants a warranty of 5 years on its products.

A global network of distributors and service points ensures competent and personal consultation on site.



# KELLER

Creating Solutions


infrared  
temperature  
solutions

## ITS



- Headquarters
- Sales and Service Center
- Sales abroad



 **IO-Link**

**PROFI**  
BUS

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