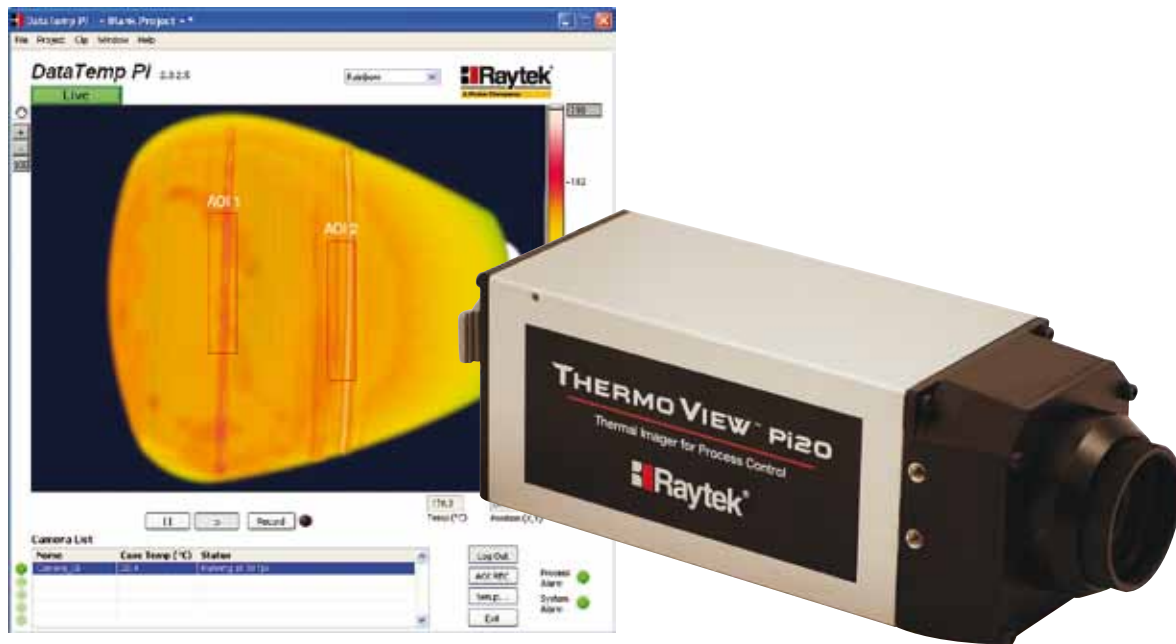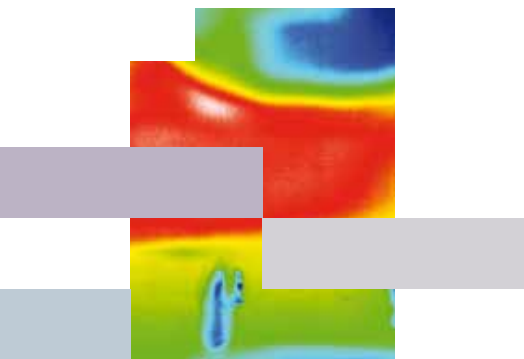# Raytek Thermoview Pi20

## High Performance Thermal Imager for Industrial Applications



### ThermoView Pi20 Key Features:

■ Thermal imaging for moving or stationary targets

■ DataTemp® Pi thermal imaging software

■ Multiple temperature ranges and lens options

■ On-board Ethernet

■ Full complement of accessories

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# ThermoView Pi20 Highlights

- ThermoView Pi20 is a rugged thermal imaging camera designed for industrial process control applications. The camera is designed with an IP54 rating.

- ThermoView Pi20 cameras are offered in two temperature ranges: -40 to 500 °C (-40°F to 932°F) and 200 to 2000 °C (392 °F to 3632 °F). For each temperature range, two lens options are available: 21.7° x 16°, 30° x 22° or 45.2° x 33.7°.

- ThermoView Pi20 is available with remotely adjustable focus optics.

- ThermoView Pi20 provides easy networking over long distances using the standard Ethernet interface. This interface allows for the PC operating the DataTemp Pi (DTPi) software to be located far away. The Ethernet interface transmits up to 30 frames per second of imaging data and also allows for camera control. For long Ethernet cable runs beyond 90 m (300 ft), additional fiber optic Ethernet accessories are available.

- A full complement of hardware accessories includes:

    **High temperature and outdoor enclosures**: To meet specifications for the demanding environments Raytek® products are typically installed into, an IP67 (NEMA 4) rated enclosure is available with integrated cooling and air purge options.

    **Integrated Junction Box:** Allows I/O modules, power supply, and other accessories to be placed in a DIN rail backplane sealed enclosure.

    **Industrial power supply**: A DIN rail backplane mounted power supply is provided standard with every ThermoView Pi20 camera. The power supply is capable of operating the ThermoView Pi20 camera, as well as the remote I/O modules.

    **Analog and digital I/O modules:** Ethernet based modules provide digital inputs, analog outputs and relay outputs when connected to DTPi software.

    **Fiber optic Ethernet cable and converters**: For extremely long Ethernet cable runs, Raytek offers converters and fiber optic cable options.

    **Mounting bracket**: This allows for easy installation of the ThermoView Pi20 camera. The mounting bracket provides an easy base mounting capability for the Pi20 camera and is also suitable for tripod mounting.

**Raytek offers the following software solutions to meet your application requirements:**

- The ThermoView Pi20 camera is easily interfaced to the DataTemp Pi software. This software is fully featured to allow for real time viewing, saving and playback of images from the ThermoView Pi20 camera. The software is intuitive, easy-to-use and is designed to be set up and operational for your application within minutes. With this PC based software, you can view and analyze live or archived images. In addition, the software interfaces to remote I/O modules to be used as triggering inputs, process alarm hand analog outputs.

- Raytek also offers a LabVIEW and C++ based Software Development Kit (SDK) for users who need to develop their own customized software solutions.

The ThermoView Pi20 camera, combined with our easy-to-use, fully featured DataTemp DTPi software, allows us to target applications in furnace refractory monitoring, semiconductor and solar, fire detection and prevention, glass, plastics, automotive, building, food & beverage, and petrochemical manufacturing. In addition, we have developed customized solutions for the following applications:

- Engine Testing
- Steel Coating
- Metal Forming
- Materials Testing
- Solar Module Testing
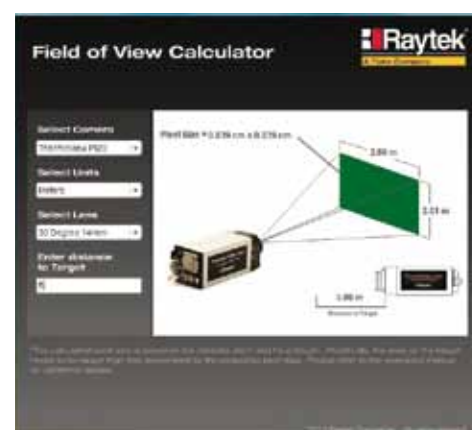- Automotive Fabrication Applications

# ThermoView Pi20 Camera Specifications

| Measuring range | RAYPi20LT Ranges below are user selectable | | RAYPi20HT |
|---|---|---|---|
| | -40 to 120 °C (-40 to 248 ºF) | 0 to 500 °C (32 to 932 ºF) | 200 to 2000 °C (392 to 3632 ºF) |
| Measurement accuracy | ±2 °C or ±2 % (reading) | | |
| Spectral range | 8-14 µm | | |
| Detector | Uncooled focal plane array | | |
| ThermoView Pi20 lens options | **21.7° LENS (MA) Manual Focus** | **30° LENS (MB) Manual Focus** | **45° LENS (RC) Remote Focus** |
| Field of view    Horizontal | 21.7° | 30° | 45.2° |
|                  Vertical | 16.4° | 22.7° | 33.7° |
| I.F.O.V | 1.2 mrad | 1.7 mrad | 2.4 mrad |
| Focus range | 300 mm (12 inch) to ∞ (21.7º, 30°, 45.2° Lens) | | |
| Ethernet Frame time | 30 frames/sec | | |
| Number of pixels | 320 x 240 | | |
| Emissivity correction | 0.10 to 1.00 | | |
| Video output | NTSC/PAL, Composite video | | |
| Interface | Ethernet, RS-232C (requires optional cable accessory) | | |
| LED display | To indicate power is supplied to camera | | |
| Operating temperature | -15 to 50 °C (5 to 122ºF) | | |
| Storage temperature | -40 to 70 °C (-40 to 158ºF) | | |
| Humidity | Up to 90% non-condensing | | |
| Power supply | DC + 12 V (nominal) | | |
| Power consumption | 8 W (Typical) 13 W (MAX) | | |
| Shock resistance | 294 m/sec$^2$ (30G), (IEC60068-2-27) | | |
| Vibration resistance | 29.4 m/sec$^2$ (3G), (IEC60068-2-6) | | |
| Environmental Protection | IP54, (IEC60529) | | |
| Dimensions (W x H x D) | Approx 65 x 65 x 208 mm (2.5 x 2.5 x 8.1 inch) | | |
| Weight | Approx 1.0 kg (2.20 lbs) | | |

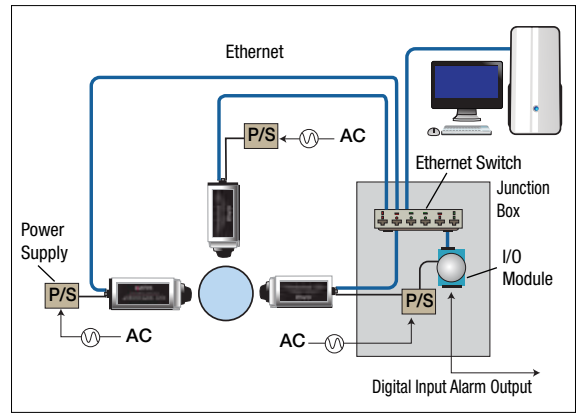# Standard Package Components

**ThermoView Pi20 Thermal Imager package includes:**

| Model | Standard RAYPi20 camera shipment |
|---|---|
| ■ RAYPi20XXXX | RAYPi20 camera |
| ■ XXXPi20PSC | Power supply cable 7.5 m (24 ft) |
| ■ XXXPi20EC1 | Ethernet cable 7.5 m (24 ft) |
| ■ XXXPi20ECC | Ethernet crossover adapter |
| ■ XXXPi20PS1 | Industrial power supply |
| | Quick Start instructions |
| | Installation and operations manual and ThermoView start-up software application (TSA) on CD |

# ThermoView Pi20 Camera Ordering Information

## Cameras

| Raytek Model | Description | Field of View |
|---|---|---|
| RAYPi20LTMA | -40 to 500 °C (-40 to 932 °F), 21.7° lens | 21.7° x 16° |
| RAYPi20HTMA | 200 to 2000 °C (392 to 3632 °F), 21.7° lens | 21.7° x 16° |
| RAYPi20LTMB | -40 to 500 °C (-40 to 932 °F), 30° lens | 30° x 22° |
| RAYPi20HTMB | 200 to 2000 °C (392 to 3632 °F), 30° lens | 30° x 22° |
| RAYPi20LTRC | -40°C to 500 °C (-40 to 932 °F), 45.2° lens | 45.2° x 33.7° |
| RAYPi20HTRC | 200°C to 2000 °C (392 to 3632 °F), 45.2° lens | 45.2° x 33.7° |



ThermoView Pi20 multi camera set-up example

## Accessories

| Part Number | Item | Description |
|---|---|---|
| XXXPi20ENCAP | Protective enclosure (water-cooled/air purge) | IP65 Sealing, integrated water cooling 0 to 200 °C (32 to 392 °F). Includes air purge. |
| XXXPi20OENCAP | Outdoor Enclosure | For use in outdoor applications |
| XXXPi20PS1 | Industrial Power Supply | DIN rail backplane mountable power supply to power a single camera as well as Analog and Digital I/O Modules |
| XXXPi206060 | Digital Input/Relay Output Module | Ethernet based to provide (6) digital inputs and (6) relay outputs |
| XXXPi206024 | Digital I/O and Analog Output Module | Ethernet based providing (2) digital inputs, (2) digital outputs and (2) analog outputs |
| XXXPi20MB | Mounting Bracket | Includes 1/4-20 holes for tripod mounting |
| XXXPi20PSC | Power Supply Cable 7.5 m (24 ft) | 7.5 m (24 ft) Power supply cable |
| XXXPi20EC1 | Ethernet Cable 7.5 m (24 ft) | 7.5 m (24 ft) Straight Ethernet cable uses the following connectors: (1) IP67 RJ45 (camera) (1) IP20 RJ45 (PC or switch) |
| XXXPi20EC3 | Ethernet Cable 25 m (82 ft) | 25 m (82 ft) Straight Ethernet cable |
| XXXPi20ECC | Ethernet Crossover Adapter | Ethernet crossover adapter for direct connect to camera |
| XXXPi20MC | Fiber Optics Media Converter | Fiber optic to RJ45 Ethernet converter (Requires two for a set) |
| XXXPi20FO1 | Fiber Optic Cable 150 m (492 ft) | 150 m (492 ft) Fiber Optic patch cord |
| XXXPi20FO2 | Fiber Optic Cable 300 m (984 ft) | 300 m (984 ft) Fiber Optic patch cord |
| XXXPi20SC | Serial Cable | RS-232C Cable optional camera connection |
| XXXPi20SWH1 | Ethernet Switch 5 Port 1 Gigabit | 5 Port 1 Gigabit accessory used to allow I/O modules, camera, and PC to be connected on a single network |
| XXXPi20ECS | Ethernet Cable (short) for Junction Box | Ethernet cable to allow the I/O modules to easily be connected to switch inside Junction Box |
| XXXPi20CAB | Junction Box | DIN rail backplane designed to contain P/S, I/O modules, switch, etc. (These items must be ordered separately) |
| XXXPi20CC | Carrying Case | Carrying case designed to contain RAYPi20 camera and standard package components |
| XXXPI20DTPi | DataTemp Pi Software | PC based process control/monitoring software |
| XXXPi20SDK | Raytek SDK | LabView Based SDK (Software Development Kit) for ThermoView Pi20 camera |
| XXXPi20SDK1 | Raytek C++ SDK | C++ Based SDK (Software Development Kit) for ThermoView Pi20 camera |