

## P/N: T300312

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### Website

<http://www.flir.com>

### Customer support

<http://support.flir.com>

### Disclaimer

Specifications subject to change without further notice. Camera models and accessories subject to regional market considerations. License procedures may apply. Products described herein may be subject to US Export Regulations. Please refer to [exportquestions@flir.com](mailto:exportquestions@flir.com) with any questions.



### General

When a camera is ordered the following must be selected, as a minimum:

1. one of the camera bodies:
  - FLIR A400 Thermal Core
  - FLIR A700 Thermal Core
2. one of the configurations:
  - Smart Sensor configuration
  - Image Streaming configuration
3. one (or several) of the lenses:
  - IR lens, f=70 mm (6°) with case
  - IR lens, f=29 mm (14°)
  - IR lens, f=17 mm (24°)
  - IR lens, f=10 mm (42°)

For orders of more than one lens, select the primary lens to be mounted on the Thermal Core camera body at delivery. The additional lenses are then delivered in separate boxes. Due to its size, the IR lens, f=70 (6°), is always delivered in a case.

Please note that other P/Ns are used when the lenses are ordered as accessories.

The following options are available:

- Antenna WLAN 2.4/5 GHz + Wi-Fi
- Option, Visual camera including MSX
- Advanced Smart Sensor configuration
- Advanced Image Streaming configuration
- Option, Macro mode 50/71/101  $\mu\text{m}$  for 24°

### NOTE

The *Advanced Smart Sensor configuration* and the *Advanced Image Streaming configuration* require the *Smart Sensor configuration* and the *Image Streaming configuration*, respectively.

Imaging and optical data	
Infrared resolution	Depending on Thermal Core used; see Thermal Core specification
Thermal sensitivity (NETD)	<ul style="list-style-type: none"> <li>• &lt;30 mK, 42° @ +30°C (+86°F)</li> <li>• &lt;40 mK, 24° @ +30°C (+86°F)</li> <li>• &lt;50 mK, 14° @ +30°C (+86°F)</li> </ul>
Field of view (FOV)	Depending on lens used; see lens specification
Minimum focus distance	Depending on lens used; see lens specification
Focal length	Depending on lens used; see lens specification
Spatial resolution (IFOV)	Depending on lens used; see lens specification
Lens identification	Automatic
f-number	Depending on lens used; see lens specification



## Smart Sensor configuration (FLIR A400/A700)

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<b>Imaging and optical data</b>	
Image frequency	30 Hz
Focus	<ul style="list-style-type: none"> <li>• One-shot contrast</li> <li>• Motorized</li> <li>• Manual</li> </ul>
<b>Detector data</b>	
Focal plane array/spectral range	Uncooled microbolometer/7.5–14 $\mu\text{m}$
Detector pitch	<i>Depending on Thermal Core used; see Thermal Core specification</i>
<b>Measurement</b>	
Camera temperature range	<ul style="list-style-type: none"> <li>• –20 to 120°C (–4 to 248°F)</li> <li>• 0 to 650°C (32 to 1202°F)</li> <li>• 300 to 2000°C (572 to 3632°F)</li> </ul>
Object temperature range and accuracy (for ambient temperature 15–35°C (59–95°F))	<ul style="list-style-type: none"> <li>• Range –20 to 120°C (–4 to 248°F):               <ul style="list-style-type: none"> <li>◦ –20 to 100°C (–4 to 212°F), accuracy <math>\pm 2^\circ\text{C}</math> (<math>\pm 3.6^\circ\text{F}</math>)</li> <li>◦ 100 to 120°C (212 to 248°F), accuracy <math>\pm 2\%</math></li> </ul> </li> <li>• Range 0 to 650°C (32 to 1202°F):               <ul style="list-style-type: none"> <li>◦ 0 to 100°C (32 to 212°F), accuracy <math>\pm 2^\circ\text{C}</math> (<math>\pm 3.6^\circ\text{F}</math>)</li> <li>◦ 100 to 650°C (212 to 1202°F), accuracy <math>\pm 2\%</math></li> </ul> </li> <li>• Range 300 to 2000°C (572 to 3632°F):               <ul style="list-style-type: none"> <li>◦ accuracy <math>\pm 2\%</math></li> </ul> </li> </ul>
<b>Measurement analysis</b>	
Standard functions	<ul style="list-style-type: none"> <li>• 10 Spotmeters</li> <li>• 10 Boxes</li> <li>• 3 Deltas (difference any value/reference/external lock)</li> <li>• 1 Isotherm (above/below/interval)</li> <li>• 1 Iso-coverage</li> <li>• 1 Reference temperature</li> </ul>
Automatic hot/cold detection	Max./min. temperature value and position shown within Box
Schedule response	sftp (image), SMTP (image and/or measurement data/result)
Measurement presets	Yes
Atmospheric transmission correction	Based on inputs of distance, atmospheric temperature, and relative humidity
Lens transmission correction	Automatic, based on signals from internal sensors
Emissivity correction	Variable from 0.01 to 1.0
Reflected apparent temperature correction	Based on input of reflected temperature
External optics/windows correction	Based on input of optics/window transmission and temperature
Measurement corrections	<ul style="list-style-type: none"> <li>• Global object parameters</li> <li>• Local parameters per analyze function</li> </ul>

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<b>Measurement analysis</b>	
Measurement frequency	Up to 10 Hz
Measurement result read-out	<ul style="list-style-type: none"> <li>Ethernet/IP (pull)</li> <li>Modbus TCP slave (pull)</li> <li>MQTT (push)</li> <li>Query over REST API (pull)</li> </ul> Measurements and still image (radiometric JPEG, visual 640 × 480, visual 1280 × 960), read access only. <ul style="list-style-type: none"> <li>Web interface</li> </ul>
<b>Alarm</b>	
Alarm functions	<ul style="list-style-type: none"> <li>On any selected measurement function</li> <li>Digital in</li> <li>Internal camera temperature</li> </ul>
Alarm output	<ul style="list-style-type: none"> <li>Digital out</li> <li>E-mail (SMTP) (push)</li> <li>EtherNet/IP (pull)</li> <li>File transfer (FTP) (push)</li> <li>Modbus TCP slave (pull)</li> <li>MQTT (push)</li> <li>Query over RESTful API (pull)</li> <li>Store image or video</li> </ul>
<b>Configuration of camera</b>	
Web interface	Yes
<b>Recording of still images/video</b>	
Image storage	<ul style="list-style-type: none"> <li>Format: FLIR radiometric JPEG</li> <li>Number of images: 100</li> <li>Storage as function of:               <ul style="list-style-type: none"> <li>Alarm</li> <li>Scheduling</li> <li>User interaction (camera web)</li> </ul> </li> </ul>
Video storage	<ul style="list-style-type: none"> <li>Format: H.264</li> <li>Number of videos: 10</li> <li>Storage as function of alarm; 5 sec. before alarm and 5 sec. after alarm.</li> </ul>
<b>Video/Radiometric streaming RTSP</b>	
Protocol	RTSP
Unicast	Yes
Multicast	Yes
Multiple image streams	Yes
<b>Video streaming</b>	
Image quality	Bit rate set through Camera web
<b>Video streaming, Image source 0:</b>	
Resolution (source 0)	640 × 480 pixels
Contrast enhancement	FSX / Histogram equalization (IR only)
Overlay (source 0)	With / Without
Image source (source 0)	Visual / IR / MSX
Pixel format (source 0)	YUV411
Encoding (source 0)	H.264 / MPEG4 / MJPEG
<b>Video streaming, Image source 1:</b>	



## Smart Sensor configuration (FLIR A400/A700)

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<b>Video/Radiometric streaming RTSP</b>	
Resolution (source 1)	1280 × 960 pixels
Overlay (source 1)	No
Image source (source 1)	Visual
Pixel format (source 1)	YUV411
Encoding (source 1)	H.264 / MPEG4 / MJPEG
<b>Radiometric streaming</b>	
Resolution (radiometric)	N/A
Source	N/A
Pixel format (radiometric)	N/A
Encoding (radiometric)	N/A
<b>Ethernet</b>	
Interface	<ul style="list-style-type: none"> <li>Wired</li> <li>Wi-Fi (option)</li> </ul>
Connector type	<ul style="list-style-type: none"> <li>M12 8-pin X-coded, Female</li> <li>RP-SMA, Female</li> </ul>
Ethernet, purpose	Control, result, image, and power
Ethernet, type	1000 Mbps
Ethernet, standard	IEEE 802.3
Ethernet, communication	TCP/IP socket-based FLIR proprietary
Ethernet, power	Power over Ethernet, PoE IEEE 802.3af class 3
Ethernet, protocols	<ul style="list-style-type: none"> <li>EtherNet/IP</li> <li>IEEE 1588</li> <li>Modbus TCP Slave</li> <li>MQTT</li> <li>SNMP</li> <li>TCP, UDP, SNTP, RTSP, RTP, HTTP, HTTPS, ICMP, IGMP, sftp (server), FTP (client), SMTP, DHCP, MDNS (Bonjour), uPnP</li> </ul>
<b>Digital Input/ output</b>	
Connector type	M12 12-pin A-coded, Male (shared with external power)
Digital input	2x opto-isolated Vin(low)= 0–1.5 V, Vin(high)= 3–25 V
Digital input, purpose	<ul style="list-style-type: none"> <li>NUC</li> <li>NUC disable</li> <li>Alarm</li> </ul>
Digital output	<ul style="list-style-type: none"> <li>3x opto-isolated, 0–48 V DC, max. 350 mA (derated to 200 mA at 60C)</li> <li>Solid state opto relay</li> <li>1x dedicated as Fault output (NC)</li> </ul>
Digital output, purpose	<ul style="list-style-type: none"> <li>As function of alarm, output to external device</li> <li>Fault (NC)</li> </ul>
Digital I/O, isolation voltage	500 VRMS

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<b>Power system</b>	
Connector type	M12 12-pin A-coded, Male (shared with Digital I/O)
Power consumption	<ul style="list-style-type: none"> <li>7.5 W at 24 V DC typical</li> <li>7.8 W at 48 V DC typical</li> <li>8.1 W at 48 V PoE typical</li> </ul>
External power operation	24/48 V DC 8 W max
External voltage	Allowed range 18–56 V DC
<b>RS-232/485 serial interface</b>	
Connector type	M8 A-coded, Male
Prerequisite for use	<i>See Advanced Smart Sensor configuration</i>
Serial communication, purpose	<i>See Advanced Smart Sensor configuration</i>
Serial communication, standard	<i>See Advanced Smart Sensor configuration</i>
Serial communication, HW interface	<i>See Advanced Smart Sensor configuration</i>
Scanlist support	<i>See Advanced Smart Sensor configuration</i>
<b>Wi-Fi (Option)</b>	
Connector type	RP-SMA, Female
Standard	<i>See Wi-Fi option</i>
Antenna	<i>See Wi-Fi option</i>
Connection type	<i>See Wi-Fi option</i>
<b>Environmental data</b>	
Operating temperature range	–20 to 50°C (–4 to 122°F) Cooling plate is needed in temperatures above 40°C (104°F). Maximum camera case temperature: 65°C (149°F)
Storage temperature range	IEC 68-2-1 and IEC 68-2-2, –40 to 70°C (–40 to 158°F) for 16 hours
Humidity (operating and storage)	IEC 60068-2-30/24 hours, 95% relative humidity, 25–40°C (77–104°F)/2 cycles
EMC	<ul style="list-style-type: none"> <li>ETSI EN 301 489-1 (radio)</li> <li>ETSI EN 301 489-17 (radio)</li> <li>EN 61000-4-8 (magnetic field)</li> <li>FCC 47 CFR Part 15 Class B (emission US)</li> <li>ISO 13766-1 (EMC - Earth-moving and building construction machinery)</li> <li>EN ISO 14982 (EMC - Agricultural and forestry machinery)</li> </ul>
Radio spectrum	<ul style="list-style-type: none"> <li>FCC 47 CFR Part 15 Class C (2.4 GHz band US)</li> <li>FCC 47 CFR Part 15 Class E (5 GHz band US)</li> <li>RSS-247 (2.4 GHz and 5 GHz band Canada)</li> <li>ETSI EN 300 328 V2.1.1 (2.4 GHz band EU)</li> <li>ETSI EN 301 893 V2.1.1 (5 GHz band EU)</li> </ul>
Encapsulation	IEC 60529, IP 54, IP66 with accessory
Shock	IEC 60068-2-27, 25 g
Vibration	<ul style="list-style-type: none"> <li>IEC 60068-2-6, 0.15 mm at 10–58 Hz and 2 g at 58–500 Hz, sinusoidal</li> <li>IEC 61373 Cat 1 (Railway)</li> </ul>



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<b>Environmental data</b>	
Safety	IEC 62368-1 (IT equipment audio-visual products)
Corrosion	<ul style="list-style-type: none"><li>• ISO 12944 C4 G or H</li><li>• EN60068-2-11</li></ul>
<b>Physical data</b>	
Weight (including 24° lens)	0.82 kg (1.8 lb)
Size (L x W x H)	123 x 77 x 77 mm (4.84 x 3.03 x 3.03 in)
Base mount	4x M4 on 4 sides
Tripod mounting	UNC 1/4"-20 on 2 sides
Housing material	Aluminium
Color	Black
<b>Warranty and service</b>	
Warranty	<a href="http://www.flir.com/warranty/">http://www.flir.com/warranty/</a>