

# TC-336 AND TC-640

Assembly thermal modules 336x256 or 640x512

## DESCRIPTION

The TC-336 or TC-640 is a thermal module to be built-in the ATEX (EX) and the marine and industrial (SA) camera housings from Siqura. Thermal imaging can be used 24/7 for all sorts of monitoring or detection purposes. The Thermal module is fitted with video analytics to actively help with perimeter surveillance, fire detection, flare monitoring, and hotspot detection.

## FEATURES

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Fully Integrated in the Siqura EX- or SA-housings

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Uncooled thermal imager

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Choice of resolution (36x256 or 640x512)

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Choice of different lenses up to 100 mm

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Choice of frame rate (Fast or Slow)

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Plug & Play

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Built-in analytics

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ONVIF Profile S

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## Description

### Marine, Offshore, Oil and Gas

The TC-336 or TC-640 thermal modules are essential parts of the Marine, Offshore, Oil and Gas solutions from Siqura. The module is fitted inside the 316L thermal camera housing and forms the digital heart of the camera.

### Integrated thermal camera

The thermal module is fitted with a highly sensitive uncooled microbolometer for thermal imaging. It detects temperature differences as small as 50 mK and can spot heat sources invisible to the naked eye. When the darkness obscures the vision of an ultra-low light CCTV camera, the thermal camera gives a clear overview of what's going on.

### Multi-streaming and multicasting

The Thermal module has multi-streaming capabilities for simultaneous transmission of one or more H.264 streams combined with MJPEG. This guarantees interoperability with existing VMS systems. Multiple combinations of resolution and frame rate can be configured to satisfy different live-viewing and recording scenarios. In addition, multicasting is supported for complex, multi-user video networks.

### Open standards

The SA- or EX- thermal camera integrates with the common VMS systems. Being ONVIF Profile S compliant, the camera is supported by most video management systems. When needed, the camera can be controlled through a comprehensive HTTP API (Siqura Programming Interface). This specifically enables deployment in projects with custom requirements.

### Built-in video analysis

The thermal module is fitted with on-board analytics, called FlameGuard and FenceGuard. FlameGuard is a specialized algorithm for 24/7 flare monitoring or fire/hotspot detection. If FenceGuard is used the camera detects intrusion detection or crossing of virtual fences in the highest possible accuracy and lowest number of nuisance alerts.

### Export restrictions (Dual Use)

The Slow thermal modules are controlled for export under US Department of Commerce, Export Administration Regulations (EAR), Export Control Classification Number (ECCN) 6A993. They may be exported under ECCN 6A993, NLR (No License Required) to all



countries except terrorist supporting countries (Country Group E:1), unless otherwise prohibited.

The Fast thermal modules (25/30 fps) are controlled for export under US Department of Commerce (DOC), Export Administration Regulations (EAR), Export Control Classification Number (ECCN) 6A003.b.4.b. These cameras contain a focal plane array controlled to 6A002.a.3.f. In most cases an export licence is required.

### Thermal imager (TC-336-xy; TC-640-xy)

|                                  |  |            |           |         |         |           |
|----------------------------------|--|------------|-----------|---------|---------|-----------|
| Imager                           | uncooled micro-bolometer   |            |           |         |         |           |
| Pixel pitch                      | 17 µm  |            |           |         |         |           |
| Resolution                       |  |            |           |         |         |           |
| - TC-336-xy, TCR1-336-xy         | 366x256  |            |           |         |         |           |
| - TC-640-xy, TCR1-640-xy         | 640x512  |            |           |         |         |           |
| Max frame rate (x)               |  |            |           |         |         |           |
| - TC-336-Fy, TC-640-Fy (x=F)     | 25/30 fps  |            |           |         |         |           |
| - TCR1-336-Fy, TCR1-640-Fy (x=F) | 25/30 fps  |            |           |         |         |           |
| - TC-336-Sy, TC-640-Sy (x=S)     | 8.3/7.5 fps  |            |           |         |         |           |
| - TCR1-336-Sy, TCR1-640-Sy (x=S) | 8.3/7.5 fps  |            |           |         |         |           |
| Focal length (y=)                | 7.5 mm   | 9 mm       | 13 mm     | 19 mm   | 25 mm   | 35 mm     |
| - Field of view (640)            | 90°x69°  | 69°x56°    | 45°x37°   | 32°x26° | 25°x20° | 18°x14°   |
| - f-number                       | f/1.4  | f/1.4      | f/1.25    | f/1.25  | f/1.1   | f/1.5     |
| - Field of view (336)            | 45°x35°  | 35°x27°    | 25°x19°   | 17°x13° | 13°x10° | 9.3°x7.1° |
| - f-number                       | f/1.4  | f/1.25     | f/1.25    | f/1.25  | f/1.1   | f/1.5     |
| Focal length (y=)                | 50 mm  | 60 mm      | 100 mm    |         |         |           |
| - Field of view (640)            | 12.4°x9.9°   | 10.4°x8.3° | 6.2°x5°   |         |         |           |
| - f-number                       | f/1.2  | f/1.25     | f/1.6     |         |         |           |
| - Field of view (366)            | 6.5°x5°  | 5.5°x4.2°  | 3.3°x2.5° |         |         |           |
| - f-number                       | f/1.2  | f/1.25     | f/1.6     |         |         |           |
| Spectral bandwidth               | 7.5 µm to 13.5 µm (LWIR)   |            |           |         |         |           |
| Sensitivity (NEdT)               | 50 mK @ f/1.0 or better  |            |           |         |         |           |
| Time to image                    | less than 60 s (boot time)   |            |           |         |         |           |
| Digital zoom                     | Optional   |            |           |         |         |           |
| Color palette                    | 10 selectable color palettes with freely adjustable temperature thresholds |            |           |         |         |           |

### Video stream

|                                    |   |
|------------------------------------|---|
| Number of streams                  | 2x streams  |
| Aspect ratio                       | 16:9, 16:10, 5:4, 4:3 (cropped, no scaling, one setting for both sensors)                         |
| Compression algorithm(s)           | H.264 BP/MP/HP (H.264/MPEG-4 AVC), MJPEG  |
| Supported output resolutions       | Output images are up/down scaled<br>720x576; 704x480; 704x240; 640x512, 352x288; 336x256, 176x120 |
| Compression bit rate control       | Variable bit rate (VBR)   |
| Output bit rate (per H.264 stream) | Up to 6Mb/s   |
| Number of video output streams     | Up to 20 (RTSP) per input   |
| Total output data rate (max)       | 50Mb/s  |
| Video overlay                      | 3x Text, 1x bitmap (BMP, GIF)   |

### Analytics

|                  |  |
|------------------|--|
| FenceGuard       | Intrusion detection. Free form zones or detection lines                              |
| - Detection line | Touch, Cross (directional sensitive), Cross  |
| - Detection zone | Touch, Enter, Inside, Exit   |
| FlameGuard       | Hotspot detection in two zones or Flare-on, Flare-off and Flare-too-large monitoring |

# Specs



## Analytics

|                   |   |
|-------------------|---|
| - Measuring range | -40°C to 550°C  |
| - Accuracy        | +/- 20 °C (T 100 °C)                                      |
| Hot-spot meter    | Temperature reading in ROI (TCR1 radiometric models only) |
| Event time        | 0 to 10 s   |
| Event output      | generic ONVIF, digital I/O, SPI                           |

## Network

|                    |  |
|--------------------|--|
| Interface(s)       | 100 Mb Ethernet, auto negotiating, MDI/MDX   |
| Protocols          | IPv4, TCP/IP, UDP, RTP, RTSP, HTTP, HTTPS, ICMP, FTP, SMTP, DHCP, UPnP, IGMP, SNMP, QoS, ONVIF, IEEE802.1x, TLS1.2, NTCIP-1205 |
| Password levels    | User and Administrator   |
| Supported browsers | Internet Explorer (9.0+), Chrome, Firefox, Safari  |
| User accounts      | 20   |

## Ordering information

|              |   |
|--------------|---|
| (Please Note | Export restrictions apply to 30 Hz thermal cameras. Dual use) |
| TC-336-S7.5  | Assembly thermal module 336x256 , 7.5Hz, 7.5 mm               |
| TC-336-S9    | Assembly thermal module 336x256 , 7.5Hz, 9 mm                 |
| TC-336-S13   | Assembly thermal module 336x256 , 7.5Hz, 13 mm                |
| TC-336-S19   | Assembly thermal module 336x256 , 7.5Hz, 19 mm                |
| TC-336-S25   | Assembly thermal module 336x256 , 7.5Hz, 25 mm                |
| TC-336-S35   | Assembly thermal module 336x256 , 7.5Hz, 35 mm                |
| TC-336-S50   | Assembly thermal module 336x256 , 7.5Hz, 50 mm                |
| TC-336-S60   | Assembly thermal module 336x256 , 7.5Hz, 60 mm                |
| TC-336-S100  | Assembly thermal module 336x256 , 7.5Hz, 100 mm               |
| TC-336-F7.5  | Assembly thermal module 336x256 , 30Hz, 7.5 mm                |
| TC-336-F9    | Assembly thermal module 336x256 , 30Hz, 9 mm                  |
| TC-336-F13   | Assembly thermal module 336x256 , 30Hz, 13 mm                 |
| TC-336-F19   | Assembly thermal module 336x256 , 30Hz, 19 mm                 |
| TC-336-F25   | Assembly thermal module 336x256 , 30Hz, 25 mm                 |
| TC-336-F35   | Assembly thermal module 336x256 , 30Hz, 35 mm                 |
| TC-336-F50   | Assembly thermal module 336x256 , 30Hz, 50 mm                 |
| TC-336-F60   | Assembly thermal module 336x256 , 30Hz, 60 mm                 |
| TC-336-F100  | Assembly thermal module 336x256 , 30Hz, 100 mm                |
| TC-640-S7.5  | Assembly thermal module 640x512 , 7.5Hz, 7.5 mm               |
| TC-640-S9    | Assembly thermal module 640x512 , 7.5Hz, 9 mm                 |
| TC-640-S13   | Assembly thermal module 640x512 , 7.5Hz, 13 mm                |
| TC-640-S19   | Assembly thermal module 640x512 , 7.5Hz, 19 mm                |
| TC-640-S25   | Assembly thermal module 640x512 , 7.5Hz, 25 mm                |
| TC-640-S35   | Assembly thermal module 640x512 , 7.5Hz, 35 mm                |
| TC-640-S50   | Assembly thermal module 640x512 , 7.5Hz, 50 mm                |
| TC-640-S60   | Assembly thermal module 640x512 , 7.5Hz, 60 mm                |
| TC-640-S100  | Assembly thermal module 640x512 , 7.5Hz, 100 mm               |

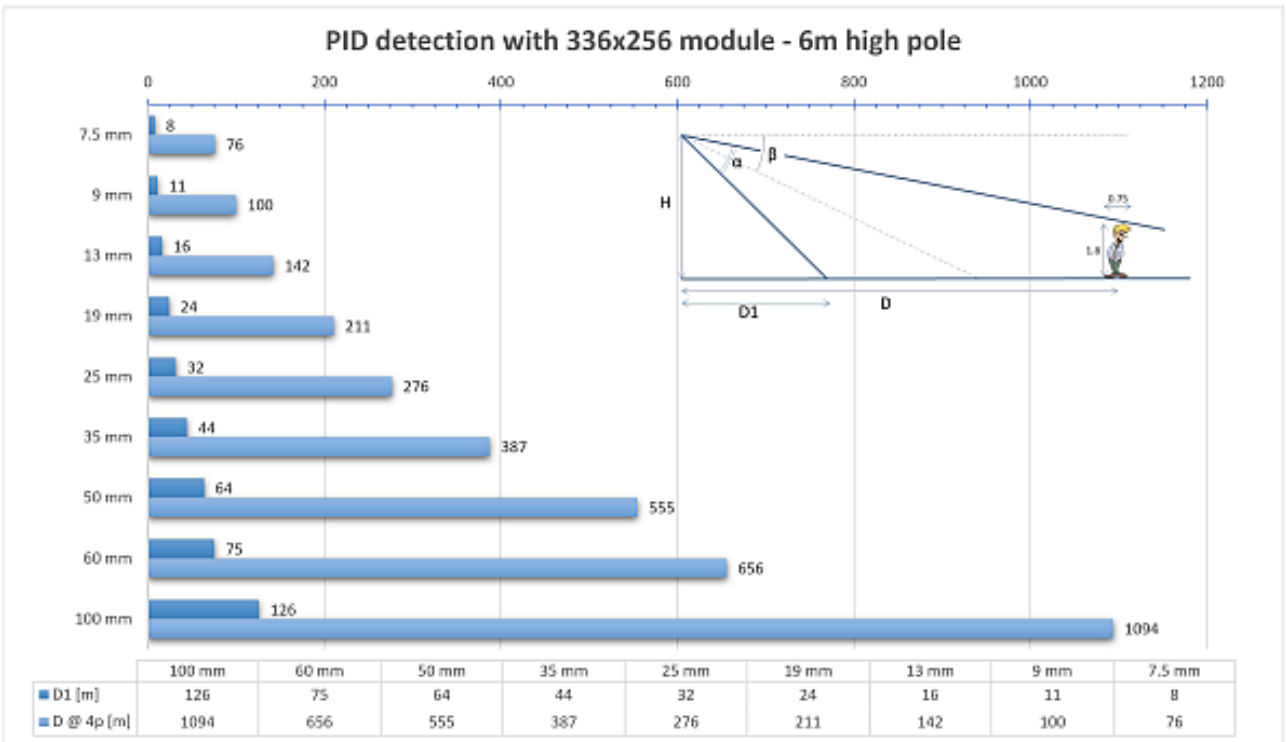
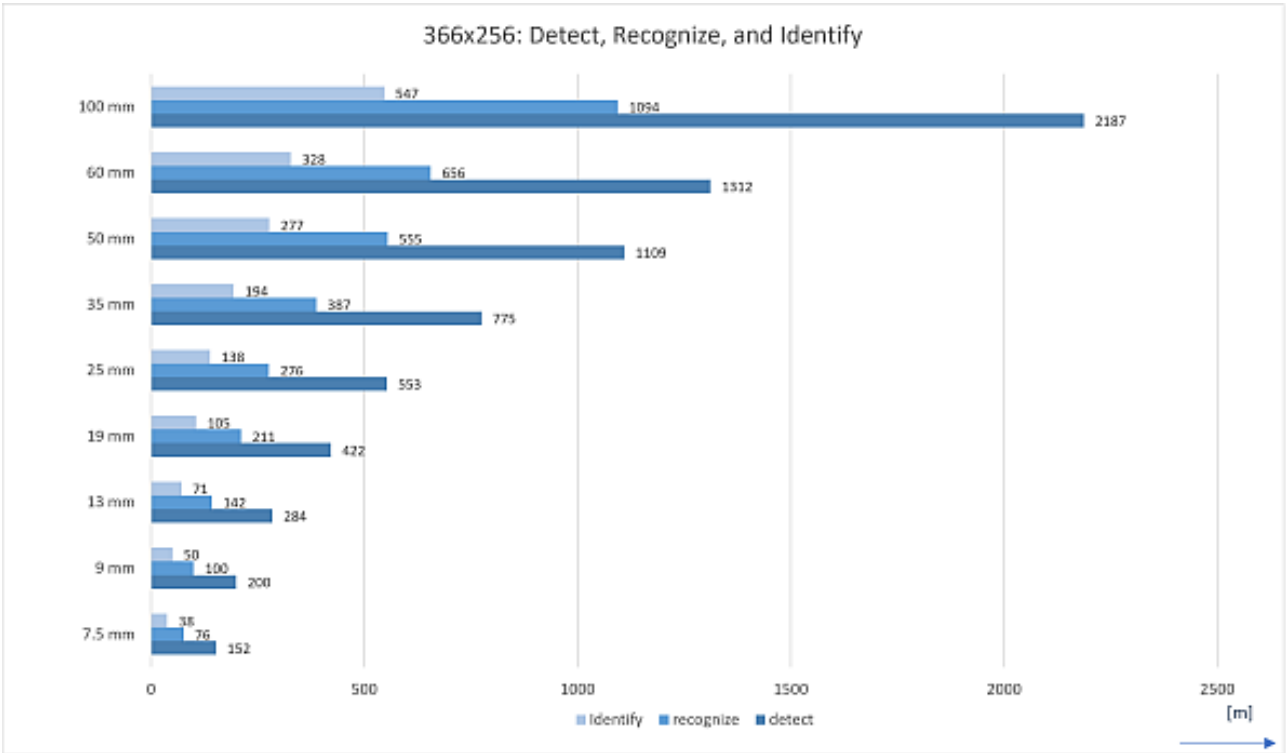
| Ordering information |  |
|----------------------|--|
| TC-640-F7.5          | Assembly thermal module 640x512 , 30Hz, 7.5 mm               |
| TC-640-F9            | Assembly thermal module 640x512 , 30Hz, 9 mm                 |
| TC-640-F13           | Assembly thermal module 640x512 , 30Hz, 13 mm                |
| TC-640-F19           | Assembly thermal module 640x512 , 30Hz, 19 mm                |
| TC-640-F25           | Assembly thermal module 640x512 , 30Hz, 25 mm                |
| TC-640-F35           | Assembly thermal module 640x512 , 30Hz, 35 mm                |
| TC-640-F50           | Assembly thermal module 640x512 , 30Hz, 50 mm                |
| TC-640-F60           | Assembly thermal module 640x512 , 30Hz, 60 mm                |
| TC-640-F100          | Assembly thermal module 640x512 , 30Hz, 100 mm               |
| TCR1-336-S7.5        | Assembly thermal module 336x256 , 7.5Hz, 7.5 mm, radiometric |
| TCR1-336-S9          | Assembly thermal module 336x256 , 7.5Hz, 9 mm, radiometric   |
| TCR1-336-S13         | Assembly thermal module 336x256 , 7.5Hz, 13 mm, radiometric  |
| TCR1-336-S19         | Assembly thermal module 336x256 , 7.5Hz, 19 mm, radiometric  |
| TCR1-336-S25         | Assembly thermal module 336x256 , 7.5Hz, 25 mm, radiometric  |
| TCR1-336-S35         | Assembly thermal module 336x256 , 7.5Hz, 35 mm, radiometric  |
| TCR1-336-S50         | Assembly thermal module 336x256 , 7.5Hz, 50 mm, radiometric  |
| TCR1-336-S60         | Assembly thermal module 336x256 , 7.5Hz, 60 mm, radiometric  |
| TCR1-336-S100        | Assembly thermal module 336x256 , 7.5Hz, 100 mm, radiometric |
| TCR1-640-S7.5        | Assembly thermal module 640x512 , 7.5Hz, 7.5 mm, radiometric |
| TCR1-640-S9          | Assembly thermal module 640x512 , 7.5Hz, 9 mm, radiometric   |
| TCR1-640-S13         | Assembly thermal module 640x512 , 7.5Hz, 13 mm, radiometric  |
| TCR1-640-S19         | Assembly thermal module 640x512 , 7.5Hz, 19 mm, radiometric  |
| TCR1-640-S25         | Assembly thermal module 640x512 , 7.5Hz, 25 mm, radiometric  |
| TCR1-640-S35         | Assembly thermal module 640x512 , 7.5Hz, 35 mm, radiometric  |
| TCR1-640-S50         | Assembly thermal module 640x512 , 7.5Hz, 50 mm, radiometric  |
| TCR1-640-S60         | Assembly thermal module 640x512 , 7.5Hz, 60 mm, radiometric  |
| TCR1-640-S100        | Assembly thermal module 640x512 , 7.5Hz, 100 mm, radiometric |
| TCR1-640-F7.5        | Assembly thermal module 640x512 , 30Hz, 7.5 mm, radiometric  |
| TCR1-640-F9          | Assembly thermal module 640x512 , 30Hz, 9 mm, radiometric    |
| TCR1-640-F13         | Assembly thermal module 640x512 , 30Hz, 13 mm, radiometric   |
| TCR1-640-F19         | Assembly thermal module 640x512 , 30Hz, 19 mm, radiometric   |
| TCR1-640-F25         | Assembly thermal module 640x512 , 30Hz, 25 mm , radiometric  |
| TCR1-640-F35         | Assembly thermal module 640x512 , 30Hz, 35 mm , radiometric  |
| TCR1-640-F50         | Assembly thermal module 640x512 , 30Hz, 50 mm, radiometric   |
| TCR1-640-F60         | Assembly thermal module 640x512 , 30Hz, 60 mm, radiometric   |
| TCR1-640-F100        | Assembly thermal module 640x512 , 30Hz, 100 mm, radiometric  |

| Housing   | Optical camera |            | Thermal camera |        |                     | Interface |                     |        |                     |
|-----------|----------------|------------|----------------|--------|---------------------|-----------|---------------------|--------|---------------------|
|           | BC822v2H3-SA   | TC(R1)-336 | TC(R1)-640     | INT-RJ | INT-RJ5<br>INT-RJ10 | INT-SM    | INT-SM5<br>INT-SM10 | INT-MM | INT-MM5<br>INT-MM10 |
| EX-FIX24  | ✓              |            |                | ✓      | ✓                   | ✓         | ✓                   | ✓      | ✓                   |
| EX-FIX24W | ✓              |            |                | ✓      | ✓                   | ✓         | ✓                   | ✓      | ✓                   |
| EX-FIX24T |                | ✓          | ✓              | ✓      | ✓                   | ✓         | ✓                   | ✓      | ✓                   |
| EX-PTZ24  | ✓              |            |                | ✓      | ✓                   | ✓         | ✓                   | ✓      | ✓                   |
| EX-PTZ24T |                | ✓          | ✓              | ✓      | ✓                   | ✓         | ✓                   | ✓      | ✓                   |
| EX-PTZ24D | ✓              | ✓          | ✓              | ✓      | ✓                   |           |                     |        |                     |

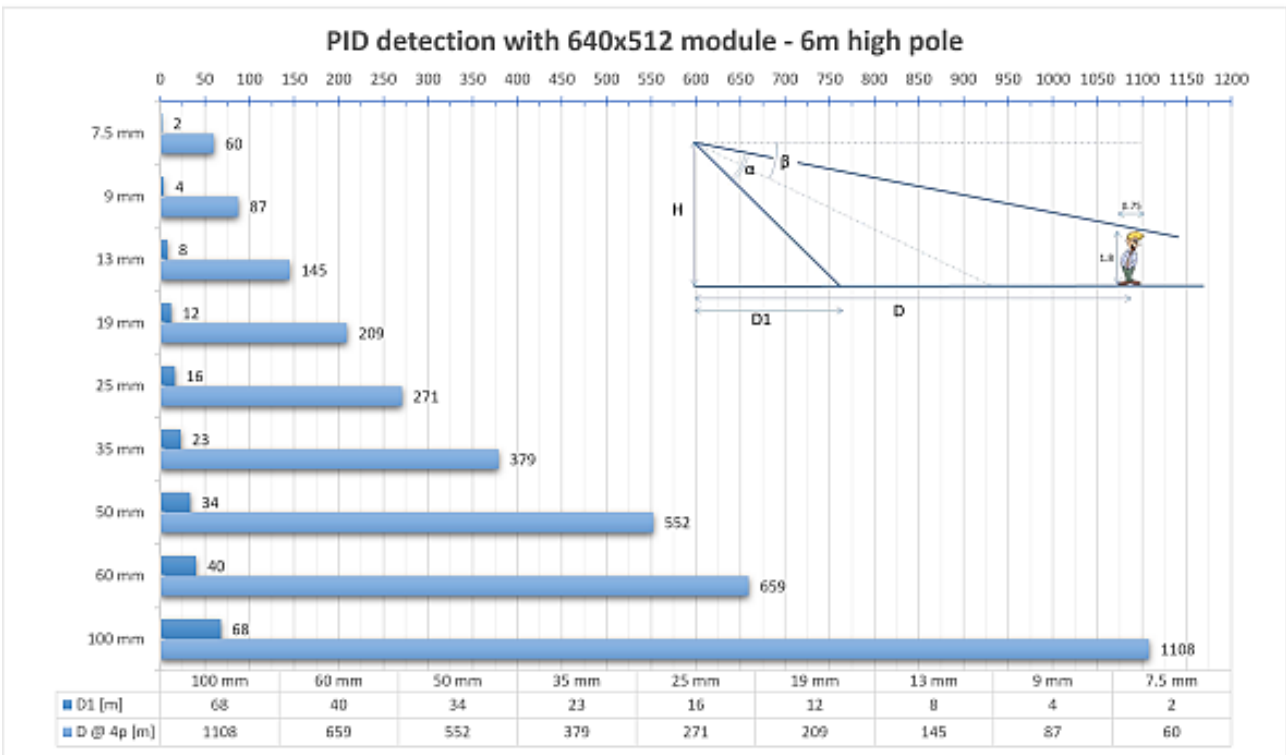
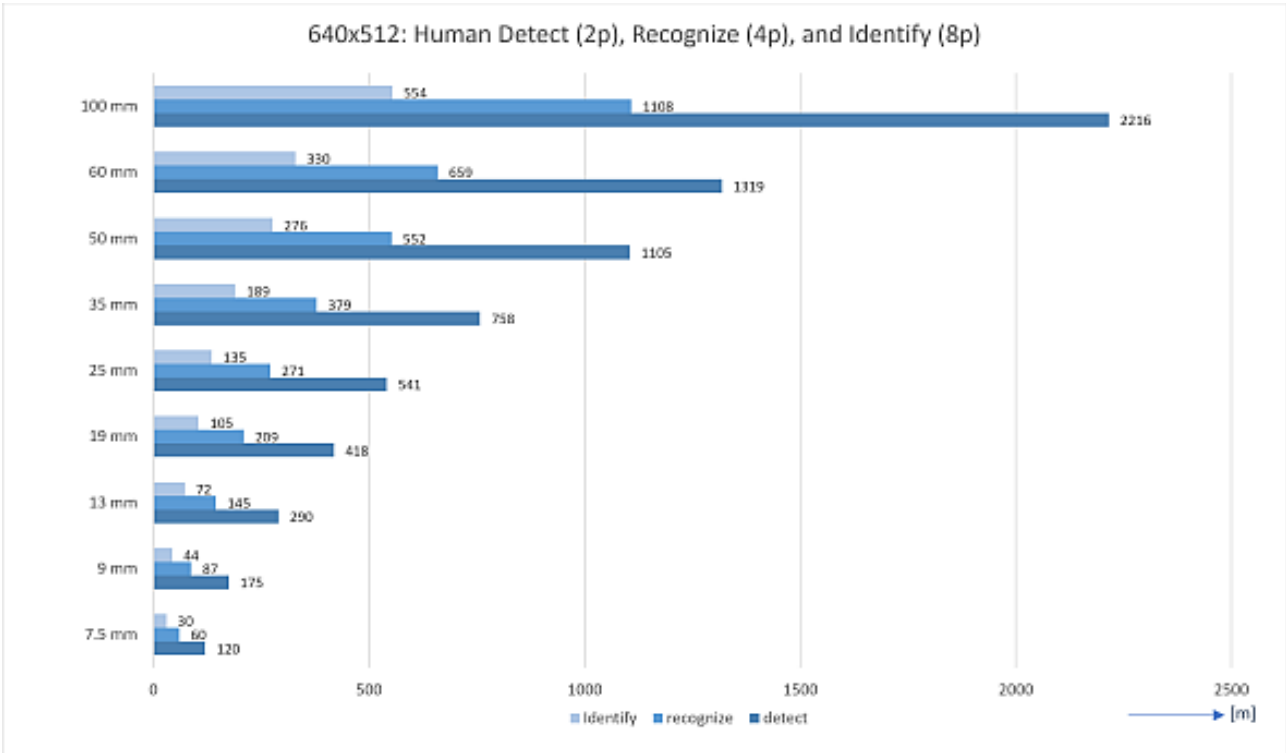
*This charts also applies to the EX cameras versions for 115 Vac and 230 Vac.*

| Housing   | Optical camera |            | Thermal camera |        |                     | Interface |                     |        |                     |
|-----------|----------------|------------|----------------|--------|---------------------|-----------|---------------------|--------|---------------------|
|           | BC822v2H3-SA   | TC(R1)-336 | TC(R1)-640     | INT-RJ | INT-RJ5<br>INT-RJ10 | INT-SM    | INT-SM5<br>INT-SM10 | INT-MM | INT-MM5<br>INT-MM10 |
| SA-FIX24  | ✓              |            |                | ✓      |                     | ✓         |                     | ✓      |                     |
| SA-FIX24W | ✓              |            |                | ✓      |                     | ✓         |                     | ✓      |                     |
| SA-FIX24T | ✓              | ✓          | ✓              | ✓      |                     | ✓         |                     | ✓      |                     |
| SA-PTZ24  | ✓              |            |                | ✓      |                     |           |                     |        |                     |
| SA-PTZ24T |                | ✓          | ✓              | ✓      |                     |           |                     |        |                     |
| SA-PTZ24D | ✓              | ✓          | ✓              | ✓      |                     |           |                     |        |                     |

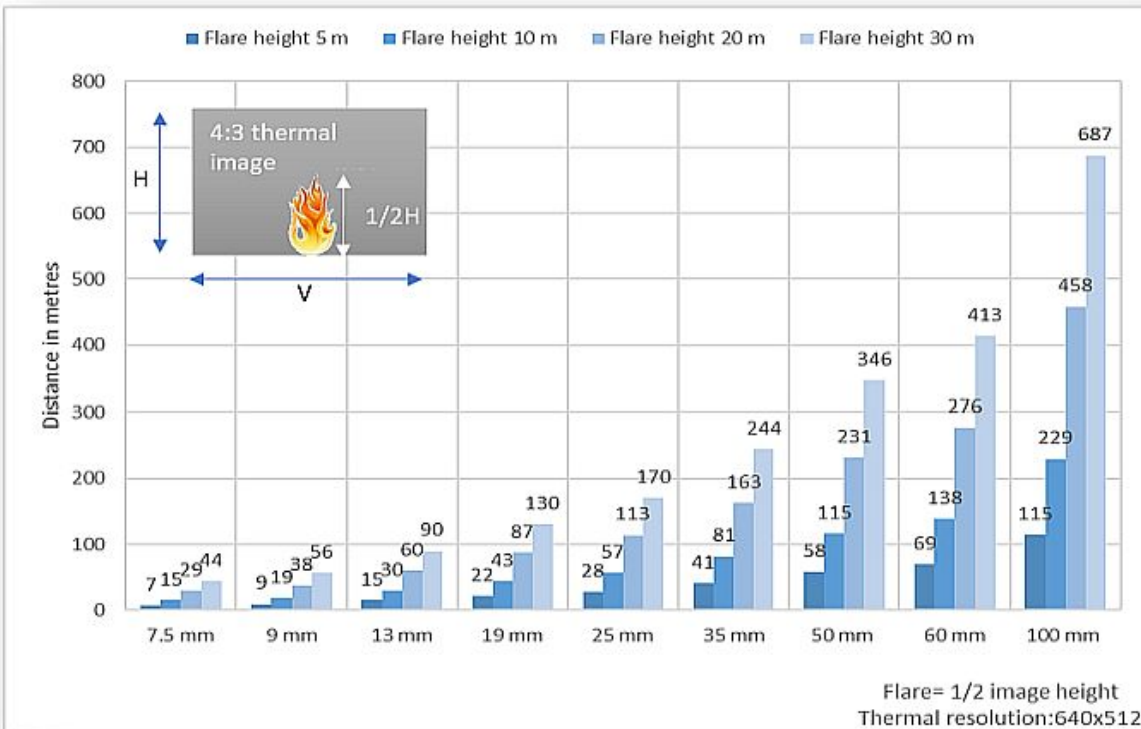
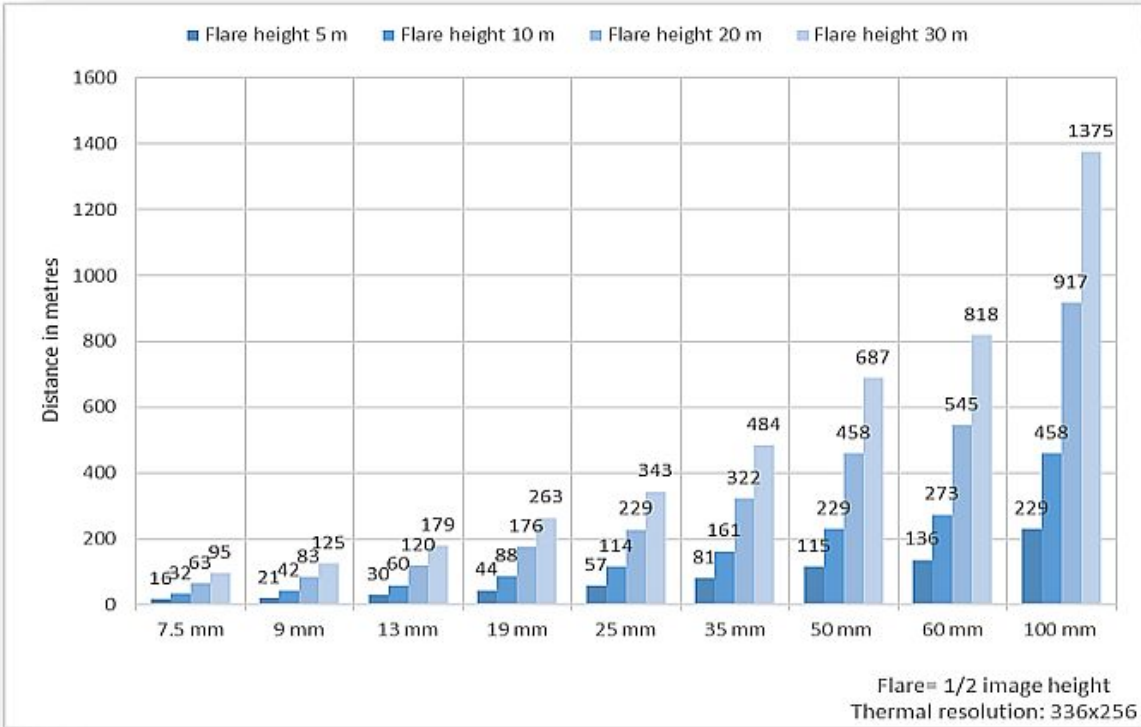
*This charts also applies to the SA cameras versions for 115 Vac and 230 Vac.*

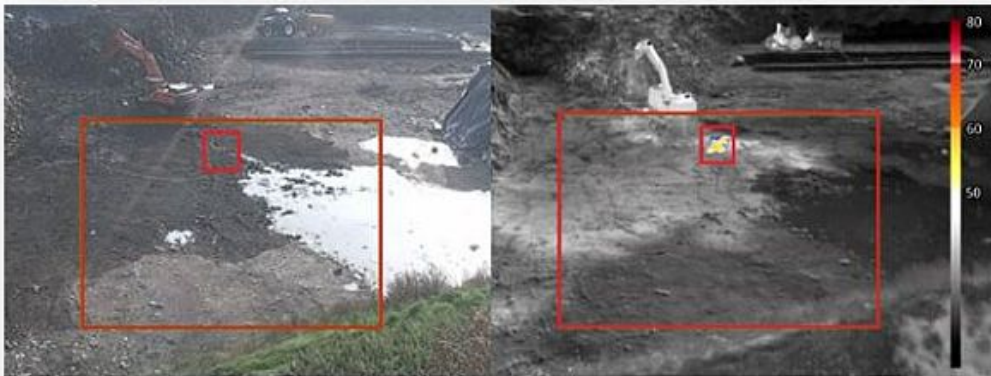






# DISTANCE FLARE MONITORING





*FlameGuard: Hotspot detection at a waste management site*



*Flame Guard: Fire detection in a machine room*



*FenceGuard: Perimeter intrusion detection*



*Fire detection, hot-spot and flare monitoring*