**CSI 2010 Specification for:**

**FLIR FB-Series ID Thermal Fixed Camera**

**Notes to Specifier:**

1. **This CSI 2010-compliant specification is designed to allow the specifier to specify FLIR or similar products for any type of project. Specifier can easily customize this specification to his/her needs.**
2. **The specification is not proprietary to FLIR. Any suitable brand can be specified using this specification.**
3. **FLIR has placed Text Boxes such as this in bold to alert the specifier of important information. Delete all Text Boxes after editing.**
4. **FLIR has also placed edit prompts “[ ]” throughout the specification to prompt the specifier to add or modify information relative to the paragraph at hand. Delete all Edit Prompts “[ ]” after editing.**
5. **Delete this section after editing this document.**

# PART 1 - GENERAL

# Summary

# This Specification is for a fixed thermal security camera with embedded video analytics (FB-Series ID) for installation into a fully operational Digital Video System. This Specification is part of a larger project which may be covered in one or more of the Specification Sections listed below.

# Section Contents and Related Specification References

# This Specification may be part of a larger Security System project. *[If so, utilize the appropriate specification sections below.]* Refer to the appropriate CSI 2010 Specification Sections as referenced below: *[Delete any sections not for coordination to this work.]*

# 000000 – Procurement and Contracting Requirements (Division 0)

# 010000 – General Requirements (Division 1)

# 020000 – Existing Conditions (Division 2)

# 080000 – Openings (Doors, Door Hardware and other Openings) (Division 8)

# 101400 – Signage (Division 10)

# 111200 – Parking Control Equipment (Division 11)

# 142000 – Elevators (Division 14)

# 250000 – Integrated Automation Systems (Division 25)

# 260000 – Electrical (Division 26)

# 270000 – Communications (Division 27)

# 271000 – Data Communications Network Equipment (including Firewalls, Routers, Codecs, Switches and Access Points)

# 272200 – Data Communications Hardware (including Servers, Storage, Workstations, Printers, etc.)

# 273000 – Voice Communications

# 280000 – General Security System Specification (Division 28)

# Section 280800 – Commissioning of Electronic Safety and Security

# Section 281000 – Electronic Access Control and Intrusion Detection

# Section 281600 – Intrusion Detection

# Section 281619 – Intrusion Detection Remote Devices and Sensors

# Section 282000 – Electronic Surveillance

# Section 282300 – Video Surveillance

# Section 282313 – Video Surveillance Control and Management Systems

# Section 282316 – Video Surveillance Monitoring and Supervisory Interfaces

# Section 282323 – Video Surveillance Systems Infrastructure

# Section 282329 – Video Surveillance Remote Devices and Sensors

# Drawings and Specifications:

# Drawings:

# *[Include this paragraph if Drawings were included.]* Drawings delivered with these Specifications show device locations, and may show conduits, details, device schedules and single-line or detailed schematics.

# *[Include this paragraph if Drawings were not included.]* Drawings are not included. See the descriptive narratives in Articles 1.5 and 1.7 below.

# Specifications: The Specifications describe the Scope of Work including:

# Section 1 – System Descriptions, all items to be delivered and installed and all services to be performed.

# Section 2 – Products, describes acceptable products.

# Section 3 – Execution, describes the standards and practices to be used by the installer for this work.

# Project Background and Site Conditions:

# *[Fill in Project Background and Site Conditions for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# See Section 282313 – Video Surveillance Control and Management Systems

# Product Description:

# Provide a quantity of fixed thermal security cameras with embedded video analytics (FB-Series ID) as shown on the associated Purchase Order or Bill of Quantities.

# Submittals:

# *[Fill in Submittal Requirements for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# See Section 013300 – Submittal Procedures

# FB-Series Camera Quick Connect Guide

# FB-Series Camera Installation and User Guide

# Delivery, Storage and Handling:

# *[Fill in Submittal Requirements for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# See Section 016000 – Product Requirements

# Quality Assurance:

# *[Fill in Submittal Requirements for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# Manufacturer:

# Minimum 10 years’ experience in manufacture and design of IP Thermal Analytic Video Surveillance Systems.

# ISO 9001:2008 certification

# Installer:

# Minimum 5 years’ experience in installing IP Thermal Analytic Surveillance Systems.

# All camera installation, configuration and commissioning shall be performed by technicians fully authorized by manufacturer.

# Applicable Codes and Standards:

# *[Fill in Applicable Codes and Standards for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# Thermal Camera

# Electromagnetic compatibility

# CE: EN 55032 Class A (2012/AC:2013), AS/NZS CISPR 32:2015, EN 61000-6-4 (2007+A1:2011), AS/NZS 61000.6.4:2012, IEC/EN 61000-3-2 (2014), IEC/EN 61000-3-3 (2013), EN 50130-4 ((2011/A1:2014), (IEC/EN 61000-4-2 (2009(/-3 (2006+A2: 2010)/-4 (2012)/-5 (2014)/-6 (2014)/-8 (2010)/-11 (2004))

# FCC Part 15, Subpart B § 15.109/15.107 Class A, ICES-003 Issue 6 January 2016, ANSI C63.4-2014

# Environmental: IP66

# Safety: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013, IEC 60950-1:2005+A1+A2

# Material: RoHS Directive 2011/65/EU; WEEE 2012/19/EU

# ONVIF 2.3 Profile S

# Warranty:

# *[Fill in specific services for this work here or delete this paragraph and include the paragraph below if this is part of a complete system.]*

# Manufacturer’s warranty will cover three years for replacement or repair of defective equipment and a ten-year warranty for the thermal core.

# PRODUCTS

# Acceptable Manufacturer and Model:

# Acceptable Manufacturers: *[FLIR and/or name acceptable alternative manufacturers here, or indicate to submit all for review.]*

# Models: *[FLIR Thermal model FB-Series ID* *and/or name acceptable alternative models here, or indicate to submit all for review.]*

# General Product Description:

# A thermal video surveillance system consisting of a fixed thermal security camera with embedded video analytics (FB-Series ID).

# Detailed Product Description:

# Basic Description:

# The integrated system shall operate either as a stand-alone fixed thermal security camera with embedded video analytics or as part of an integrated network or DVR configuration. There shall be no need for additional hardware or software to perform the video analytics.

# Field software upgrades shall be distributable across the network.

# The camera shall be available in at least five lens variants.

# The camera shall provide both analog and digital video outputs.

# The integrated system shall include dry contact input and output.

# The integrated system shall not require illumination, Infrared Illuminators, active visible (Day TV) or image intensifiers to detect and identify images.

# The integrated system shall allow the user to view images, thermal patterns, and contrast despite smoke, low light, light fog, and haze.

# The integrated system shall be passive and not produce any energy or emit light in any bandwidth.

# The integrated system shall include athermalized optics that automatically adjust to ambient temperature changes, and therefore do not require re-adjustment and/or thermal refocusing.

# The integrated system shall not be susceptible to “image blooming” that results from brightly lit objects that appear as intense glows that might hide nearby detail and might blind the camera by flooding the scene with light.

# The integrated system shall utilize flat-field correction (FFC) to compensate for temperature variations and eliminate the need for focal plane array temperature stabilization.

# The integrated system shall feature a variety of colorization modes including WhiteHot and BlackHot. In the default WhiteHot mode, warmer objects and areas will be displayed in white or lighter shades of gray than cooler objects and areas. In the BlackHot mode, warmer objects and areas will be displayed as black or dark gray compared to cooler objects and areas.

# The integrated system shall include a web interface for remote control/configuration of the bundle without requiring the use of a VMS.

# The integrated system shall be compatible with 3rd party Network Video Management Software (NVMS), analog video displays or recording devices.

# The integrated system shall digitally encode images into a compressed IP video stream and send metadata and events over IP to a VMS.

# The integrated system shall embed analytic metadata in an encoded video stream to a Video Management System (VMS), and include detection overlays and on-screen display information on the encoded video.

# Setup and Configuration:

# Single-handedly install and setup one or more cameras for recording without requiring another person’s assistance.

# It shall be possible to configure the thermal camera and its analytic capabilities via its web interface.

# The camera shall support an SDK for comprehensive system control and integration.

# The camera shall support a CGI for HTTP command interfaces.

# The integrated analytic capabilities shall provide a high probability of intelligent video detection while maintaining a low false alarm rate.

# The camera shall enable the following additional functionality:

# Via the unit’s web interface, set up and configure the unit.

# Perform scheduled actions. The unit will perform actions on a specific date or time or on a recurring basis over a defined time period according to a predefined schedule.

# Perform automatic responses to a pre-defined triggering event during a defined monitoring period.

# Utilize the unit’s relay outputs to control external devices.

# Support for ONVIF 2.3 Profile S.

# The Thermal Camera shall include the following specifications:

# Basic Camera Specifications:

# Imager/Processor Specifications:

# Uncooled Vanadium Oxide Microbolometer Sensor (imager)

# Spectral Range (LWIR): 8 – 14 µm

# Sensitivity (NEDT): <50 mK

# Focus Range: Athermalized, Focus-Free

# Array Format (NTSC):

# FB-3xx ID: 320x256 pixel array

# FB-6xx ID: 640x512 pixel array

# The camera is available in two sensor frame rate options: 25Hz (PAL) and 30Hz (NTSC).

# The following models are available:

| **Model** | **Pixel Pitch** | **FOV** | **Focal Length** | **f/** |
| --- | --- | --- | --- | --- |
| FB-393 ID | 17 | 93**°** x 70**°** | 3.7 | 1.3 |
| FB-349 ID | 17 | 49**°** x 37**°** | 6.8 | 1.3 |
| FB-324 ID | 17 | 24**°** x 18**°** | 12.8 | 1.0 |
| FB-312 ID | 12 | 12° HFoV | 18 | 1.0 |
| FB-309 ID | 12 | 9° HFoV | 24 | 1.0 |
| FB-695 ID | 12 | 95**°** HFoV | 4.9 | 1.1 |
| FB-650 ID | 12 | 50**°** HFoV | 8.7 | 1.0 |
| FB-632 ID | 12 | 32**°** HFoV | 14 | 1.0 |
| FB-618 ID | 12 | 18**°** HFoV | 24 | 1.0 |

# The following optimal detection distances are supported with analytics:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** | **Human** | | **Vehicle** | |
| **[m]** | **[ft]** | **[m]** | **[ft]** |
| FB-393 ID | 32 | 105.0 | 45 | 147.6 |
| FB-349 ID | 60 | 196.9 | 85 | 278.9 |
| FB-324 ID | 123 | 403.5 | 174 | 570.9 |
| FB-312 ID | 246 | 807.1 | 347 | 1138.5 |
| FB-309 ID | 329 | 1079.4 | 463 | 1519.03 |
| FB-695 ID | 62 | 203.4 | 88 | 288.7 |
| FB-650 ID | 118 | 387.1 | 167 | 547.9 |
| FB-632 ID | 185 | 607.0 | 260 | 853.0 |
| FB-618 ID | 329 | 1079.4 | 463 | 1519.03 |

The range predictions above are configured with the indicated lenses, assuming the following:

# Optimal performance

# Clear weather and thermal contrast

# Width of human object is 0.5m (1’8”)

# Height of vehicle object is 1.5m (4’11”)

# Pixels for detection under optimal conditions:

|  |  |
| --- | --- |
| **Human** | **Vehicle** |
| 3.1 | 6.6 |

# Other assumptions apply

**NOTE:** Performance may vary according to weather conditions, thermal contrasts, and other environmental conditions. System integrator should design the site based on the specific conditions.

# The following optimal recognition distances are supported with analytics:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** | **Human** | | **Vehicle** | |
| **[m]** | **[ft]** | **[m]** | **[ft]** |
| FB-393 ID | 24 | 78.7 | 34 | 111.5 |
| FB-349 ID | 46 | 150.9 | 65 | 213.3 |
| FB-324 ID | 93 | 305.1 | 133 | 436.4 |
| FB-312 ID | 186 | 610.2 | 266 | 872.7 |
| FB-309 ID | 248 | 813.6 | 355 | 1164.7 |
| FB-695 ID | 47 | 154.2 | 67 | 219.8 |
| FB-650 ID | 89 | 292.0 | 128 | 420.0 |
| FB-632 ID | 140 | 459.3 | 200 | 656.2 |
| FB-618 ID | 248 | 813.7 | 355 | 1164.8 |

The range predictions above are configured with the indicated lenses, assuming the following:

# Optimal performance

# Clear weather and thermal contrast

# Width of human object is 0.5m (1’8”)

# Height of vehicle object is 1.5m (4’11”)

# Pixels for recognition under optimal conditions:

|  |  |
| --- | --- |
| **Human** | **Vehicle** |
| 4.1 | 8.6 |

# Other assumptions apply

**NOTE:** Performance may vary according to weather conditions, thermal contrasts, and other environmental conditions. System integrator should design the site based on the specific conditions.

# The following optimal human detection, recognition, and identification distances are supported *without Analytics* (Johnson’s Criteria):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** | **Detection** | | **Recognition** | | **Identification** | |
| **[m]** | **[ft]** | **[m]** | **[ft]** | **[m]** | **[ft]** |
| FB-393 | 99 | 324.8 | 25 | 82.0 | 12 | 39.4 |
| FB-349 | 187 | 613.5 | 47 | 154.2 | 23 | 75.5 |
| FB-324 | 382 | 1253.3 | 95 | 311.7 | 48 | 157.5 |
| FB-312 | 764 | 2506.7 | 191 | 626.7 | 95 | 311.7 |
| FB-309 | 1019 | 3343.3 | 255 | 836.7 | 127 | 416.7 |
| FB-695 | 193 | 633.2 | 48 | 157.5 | 24 | 78.7 |
| FB-650 | 367 | 1204.1 | 92 | 301.9 | 46 | 150.9 |
| FB-632 | 573 | 1880.0 | 143 | 469.2 | 72 | 236.2 |
| FB-618 | 1019 | 3343.3 | 255 | 836.7 | 127 | 416.7 |

The range predictions above are configured with the indicated lenses, assuming the following:

# Optimal performance

# Clear weather and thermal contrast

# Human critical dimension is 0.75m (29.5”)

# Pixels for detection under optimal conditions: 1.5

# Pixels for recognition under optimal conditions: 6

# Pixels for identification under optimal conditions: 12

# Other assumptions apply

**NOTE:** This table refers to human observation of the video and ***should not*** be used for analytic site design.

# Video Specifications

# 14-bit WDR

# Image Polarity:

# White Hot/Black Hot

# Rainbow/Rainbow-Invert

# Contrast/Contrast-Invert

# IronBow2/IronBow2-Invert

# Arctic/Arctic-Invert

# Icefire/Icefire-Invert

# White Hot/Black Hot

# Image Processing

# Pixel Pitch:

# FB-393 ID/FB-349 ID/FB-324 ID: 17μm

# All other models: 12μm

# Thermal Image Settings

# AGC Region of Interest: Full-screen (default), presets, and user-definable Custom setting for optimal image quality on subjects of interest

# AGC: Brightness, contrast, sharpness, AGC filter

# Image Uniformity Optimization: Automatic flat-field correction (FFC) - thermal and temporal triggers

# Video Outputs

# Digital:

# Video Compression: Two independent and concurrent channels streaming H.264 and MJPEG

# Streaming Resolution:

# FB-3xx ID: 320x256 (native)

# FB-6xx ID: 640x480 (VGA) & 320x240 (QVGA)

# User-Definable Frame Rate: 5-30 fps @ MJPEG; 5-30 fps @ H.264

# Bit Rate: For H.264, restricted CBR (100 Kbps-5000 Kbps)

# Services and protocols: IPV4, HTTP, UPnP, DNS, NTP, RTSP, RTCP, TCP, UDP, ICMP, IGMP, DHCP, ARP, SCP

# File Transfer: FTP

# Email and Notifications: SMTP

# Video: RTP/RTSP unicast/multicast

# Analog:

# 1 BNC 75Ω

# Composite Video: 1V p-p (NTSC/PAL)

# Electrical:

# Power Requirements:

# PoE (802.3af): 48VDC, 0.27A

# 12VDC: 1.35A

# 24VAC: 50/60Hz, 0.54A

# Power Consumption:

|  |  |  |
| --- | --- | --- |
| **PoE (802.3af)** | **12VDC** | **24VAC (VA)** |
| <13W | <17W | <13VA |

# 12VDC/24VAC Connector: 2-pin terminal block connector

# Mechanical:

# Dimensions (with sunshield): 96 x 94 x 285 mm/3.8 x 3.7 x 11.1 in. (W x H x L)

# Weight: 2.3 lbs. (1 kg) with sunshield

# Enclosure: Tamper-resistant IP66

# Control Inputs and Outputs (I/O)

# In: 1x dry contact (5-pin terminal block connector)

# Out: 1x relay contact (130 mA max at 300V AC / DC) (5-pin terminal block connector)

# Communication

# 10/100 Mbps Ethernet

# Software:

# Integrated web server

# Discovery Network Assistant (DNA) tool to discover and configure the camera’s IP addressing and DNS server settings; set device properties and user credentials; set the TV system (PAL/NTSC); upgrade the camera’s firmware; reset defaults; reboot the analytics firmware; and display camera properties.

# Environmental:

# Operating Temperature Range: -40ºC to 50ºC (-40ºF to 122ºF) cold start

# Storage Temperature Range: -20° to 70°C (-4° to 158°F)

# Relative Humidity: 10-90%

# Anti-fogging provided

# Protection for dust and water: System sealed to IP66

# Certifications:

# Electromagnetic compatibility

# CE: EN 55032 Class A (2012/AC:2013), AS/NZS CISPR 32:2015, EN 61000-6-4 (2007+A1:2011), AS/NZS 61000.6.4:2012, IEC/EN 61000-3-2 (2014), IEC/EN 61000-3-3 (2013), EN 50130-4 ((2011/A1:2014), (IEC/EN 61000-4-2 (2009(/-3 (2006+A2: 2010)/-4 (2012)/-5 (2014)/-6 (2014)/-8 (2010)/-11 (2004))

# FCC Part 15, Subpart B § 15.109/15.107 Class A, ICES-003 Issue 6 January 2016, ANSI C63.4-2014

# Environmental: IP66

# Safety: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013, IEC 60950-1:2005+A1+A2

# Material: RoHS Directive 2011/65/EU; WEEE 2012/19/EU

# ONVIF 2.3 Profile S

# The thermal camera shall include an embedded analytic engine according to the following technical specifications:

# Rule-Driven Video Analytics

# Embedded analytics:

# Region Entrance/Intrusion Detection

1. Human entrance to the scene or user-defined region in all or a specific direction
2. Vehicle entrance to the scene or user-defined region in all or a specific direction

# Crossover/Fence Trespassing: The analytic engine shall support the declaration of a real or virtual fence, such as entering into an exit way at an airport terminal secured boundary in order to detect motion of persons or objects across the threshold.

# Depth Setup: The camera supports automatic and manual depth configuration.

# Rules: Detected objects are classified according to whether human or vehicle, thus reducing false alarms due to movements of animals and other objects in the scene.

# The analytic engine shall allow for automatic responses following pre-defined events.

# Video analytics can be configured and operate when the camera is rotated, resulting in a larger effective detection area per camera.

# The camera supports automatic and manual masking of analytic detection areas.

# Analytic sensitivity can be easily configured in high, medium and low levels.

# Remote Site Monitoring and Management

# Built-in utility program that provides web-based configuration of analytics.

# Enables remote camera access from any PC with Chrome, IE, Mozilla, Safari over Windows and iOS.

# Transmits high quality live video and backup local recordings from sites with low-bandwidth.

# Enables remote I/O control.

# Optional Accessories:

# CB-WLBX-62/FB-WALL-00: IP66 wall mount junction box

# CB-PLBX-62/FB-POLE-00: IP66 pole mount junction box

# Required System Elements to Complete a Workable System

# Digital Video Software or Video System See Section 282313 – Video Surveillance Control and Management Systems

# EXECUTION

# Examination:

# See Section 282313 – Video Surveillance Control and Management Systems

# Installation:

# See Section 282313 – Video Surveillance Control and Management Systems

# Preparation:

# See Section 282313 – Video Surveillance Control and Management Systems

# Quality Control:

# See Section 282313 – Video Surveillance Control and Management Systems

# Testing and Commissioning:

# See Section 282313 – Video Surveillance Control and Management Systems

# Handing Over:

# See Section 282313 – Video Surveillance Control and Management Systems

--- End of Specifications ---