FS-1600T-10GE-NNM

1.6 megapixel 3-CMOS multispectral

- *Multispectral prism camera with three 1/2.9" CMOS imagers*
- *Simultaneously captures images in visible monochrome and two near-IR wavebands*
- *Prism technology insures all three images share the same optical path*
- *3.45 x 3.45 µm pixel sizes with support for 1x2, 2x1, or 2x2 binning on NIR channels*
- *Up to 213 fps over high performance 10GBASE-T (10 gigabits per second) interface*
- *Backwards compatible to NBASE-T (5GBASE-T/2.5GBASE-T) and standard GigE (1000BASE-T)*
- *Single and multi-ROI modes provide higher speeds with lower processing loads*
- *8, 10, or 12-bits per channel**
- *Supports separate or unified control of key camera parameters for each channel*
- *Excellent shock and vibration resistance*
- *GigE Vision 2.0 interface with triple-stream output*
- *C-mount lens mount*

* Some video processing functions not available with 12-bit output

Specifications for FS-1600T-10GE-NNM

Specifications

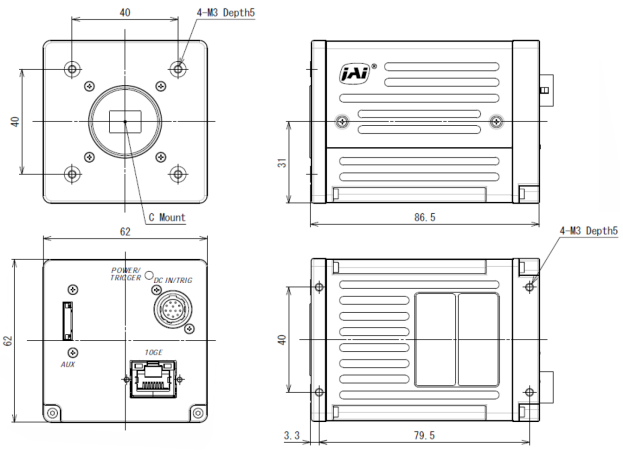
Specifications	FS-1600T-10GE-NNM
Sensor	1/2.9" 3-CMOS global shutter (IMX273)
Active pixels	1440 (h) x 1080 (v) x 3 (Mono / NIR / NIR)
Frame rate, full frame	213.6 frames/sec. @ 8-bit
Active area	5.02 mm (h) x 3.75 mm (v) - 6.27 mm diagonal
Pixel size	3.45 µm x 3.45 µm
System clock	74.25 MHz (for pulse generator)
Read-out modes Full ROI (single) ROI (multi) Binning	1440 (h) x 1080 (v) for each channel H: 16 to 1440 pixels in 16 pixel steps V: 8 to 1080 lines in 4 line steps Up to 4 areas can be defined. No overlap. 1x2, 2x1, 2x2
EMVA 1288 Parameters Absolute sensitivity Maximum SNR	12-bit output format TBD p (λ = 525 nm), TBD p (λ = 810 nm) TBD dB green, TBD dB NIR
Traditional SNR* color NIR	>60 dB (0 dB gain, 10-bit) >60 dB (0 dB gain, 10-bit)
Video signal output† (Three streams)	Visible: Mono8, Mono10, Mono10Packed, Mono12, Mono12Packed NIR: Mono8, Mono10, Mono10Packed, Mono12, Mono12Packed
Video modes	Normal, Single ROI, Multi ROI, Sequencer (2 modes)
Gain - Analog	Manual control - master mode 0 to +24 dB Auto gain control - off, continuous, one-push
Gamma/LUT	0.45 to 1.0 (9 steps) or 257-point programmable LUT
Shading correction	Flat shading
Trigger input	Opto In (2), Pulse Generators (4), Software, TTL In (2), NAND Out (2), User Output (4)
Exposure modes	Timed/EPS, Trigger Width (to ∞), Auto. Reset Continuous Trigger (RCT) option.
Electronic shutter	(can be set independently for each channel) 15.26 µs to 8 sec. in 1 µs steps
Auto Level Control (ALC)	Shutter range from 100 µs, gain range from 0 dB to +24 dB. Tracking speeds and max. values adjustable.
Blemish compensation	Up to 1736 px/sensor
Operating temp. (ambient)	-5°C to +45°C (20 to 80% non-condensing)
Storage temp. (ambient)	-25°C to +60°C (20 to 80% non condensing)
Vibration	3G (20 Hz to 200 Hz, XYZ directions)
Shock	50G
Regulations	CE (EN 55032:2015, EN 55035:2017), FCC Part 15 Class B, RoHS/WEEE, KC
Power 12-pin	+10V to +25V DC. 11.6 W typical @ +12 V
Lens mount	C-mount
Dimensions (H x W x L)	62 mm x 62 mm x 86.5 mm (excl. connectors)
Weight	270 g

Ordering Information

FS-1600T-10GE-NNM	3-CMOS multispectral camera with GigE Vision

*Traditional SNR is based on random noise in a single frame, where EMVA SNR measurements consider more comprehensive noise sources and variance over time.

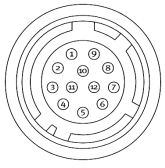
Dimensions



Outside size tolerance ± 0.3 mm

Connector pin-out

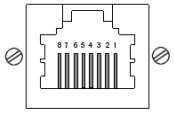
DC In / Trigger



HIROSE HR10A-10R-12PB(71)

Pin		
	1	Ground
	2	DC in +10V to +25V
	3	Opto In 2-
	4	Opto In 2+
	5	Opto In 1-
	6	Opto In 1+
	7	Opto Out 1-
	8	Opto Out 1+
	9	TTL out 1
	10	TTL in 1
	11	DC in +10V to +25 V
	12	Ground

GigE Vision Interface

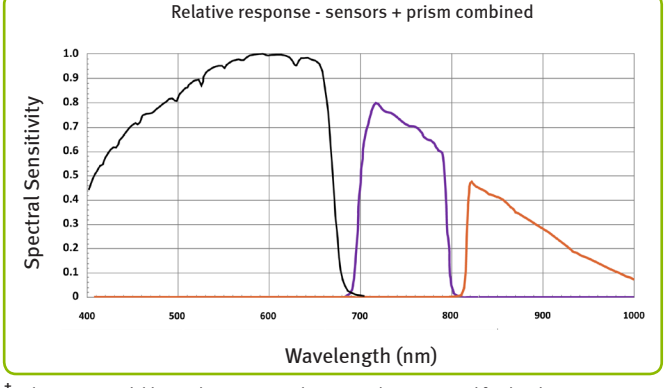


RJ-45 with locking screws

Pin	Signal
1	TRD+ (0)
2	TRD- (0)
3	TRD+ (1)
4	TRD+ (2)
5	TRD- (2)
6	TRD- (1)
7	TRD+ (3)
8	TRD- (3)

See manual for pin-out of auxilliary connector.

Spectral response



†12-bit output available in video processing bypass mode. See manual for details.

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