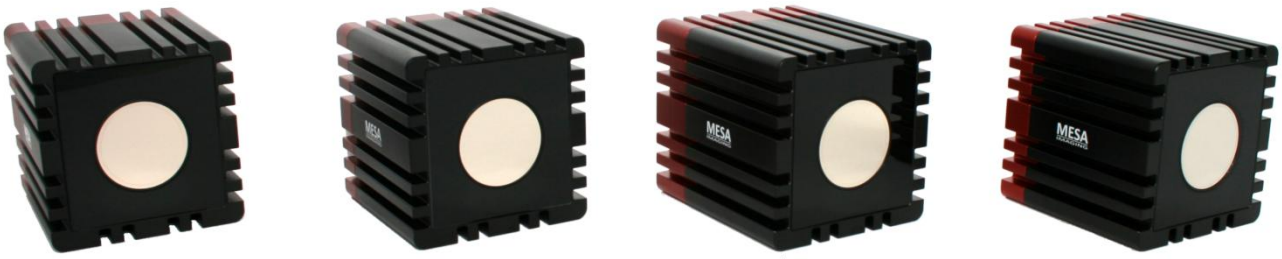
SR4000 Data Sheet



MESA IMAGING

1 Product Specific Specifications

Model Number	SR 00400001	SR 00400002	SR 00400006	SR 00400009	Comment
Communication interface	USB	Fast Ethernet	USB	Fast Ethernet	
Modulation Frequency	29/30/31 MHz		14.5/15/15.5 MHz		Frequency selectable, 3 cameras operating simultaneously possible
Non Ambiguity Range	5.0 m		10.0 m		Ranges are radial distances, not z distances
Calibrated Range	0.8 to 5.0 m		0.8 to 8.0 m		For 15 MHz: values from 8 - 10 m are extrapolated, not calibrated [1]
Absolute accuracy	+/- 10 mm (typ.)		+/- 15 mm (typ.)		At 100% target reflectivity, over calibrated range [1,2]
Repeatability (1 σ)	4 mm (typ.) 7 mm (max.)		6 mm (typ.) 9 mm (max.)		At 100% target reflectivity, 30 FPS, 2 m working distance. [1,2,3]

1 All values are indicated for 30 MHz or 15 MHz respectively. Values at adjacent frequencies will differ slightly.
2 All values are indicated for the central pixel of the camera.
3 Typical: @ 25°C. Max: over complete temperature range (+10 °C to +50°C)

2 General Specifications

Imager parameters (z)	Value	Comment
Illumination Wavelength	850 nm	Central wavelength
Optical filter	-	Bandpass / Glass substrate
Maximal Frame Rate	54 FPS	Camera setting dependent

Imager parameters (x,y)	Value	Comment
Pixel Array Size	176 (h) x 144 (v)	QCIF
Field of View	43.6° (h) x 34.6° (v)	
Pixel Pitch	40 µm	Horizontal and vertical
Angular Resolution	0.23°	Center pixel
Focus length / adjustment	10 mm	Optical working distance manually adjustable over operating range

Environmental	Value	Comment
External light disturbances	Designed for indoor use	Not to be used in direct sunlight
Operating Temperature	+10 °C to +50 °C (50 °F to 122 °F)	Housing temperature
Storage Temperature	-20 °C to +70 °C (-4 °F to 158 °F)	

Power Connections	Value	Comment
Electrical Power Requirements	12 V (-2%; +10%), Maximum 1.0 A, (Typical 0.8 A)	Power supply available from MESA
Trigger connector	Lumberg M8 Male 4-pin	Screw connector (on camera)
Power connector	Lumberg M8 Male 3-pin	Screw connector (on camera)

Software	Value	Comment
Software Drivers	Windows XP (on CD) Vista 32 and 64bit (on CD) Linux 32bit (downloadable)	
Software API	Control and access to multiple cameras from C, C++, Matlab	

Software features	Value	Comment
Modulation frequency selection	29/30/31 MHz or 14.5/15/15.5 MHz selectable	Depending on camera model
Acquisition mode	Continuous, Triggered	Trigger via Software or Hardware
Integration time	0.3 to 25.8 ms, steps of 0.1 ms	Selectable
Confidence Map	Measures quality of distance data, quality threshold to be set by user	

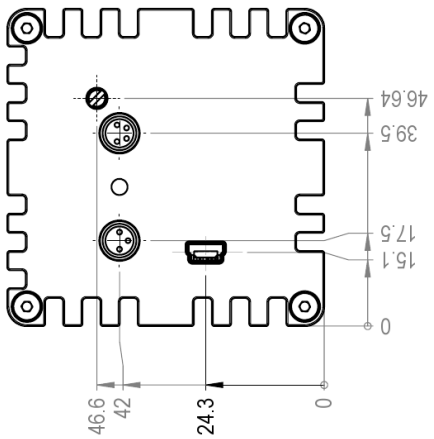
Data output	Value	Comment
Spherical distance (Range)	0-65535 (16 Bit) <--> 0-5 m 0-65535 (16 Bit) <--> 0-10 m	@ 30 MHz modulation @ 15 MHz modulation Data output from camera without Cartesian coordinate transfer
Cartesian XYZ coordinates	x,y,z (m)	Up to 5 m distance @ 30 MHz modulation Up to 10 m distance @ 15 MHz modulation
Signal amplitude	0-65535 (16 Bit)	Value above 32767 indicates saturation
Converted grayscale Image	0-65535 (16 Bit)	Value above 32767 indicates saturation
Confidence Map	0-65535 (16 Bit)	Quality threshold to be set by user

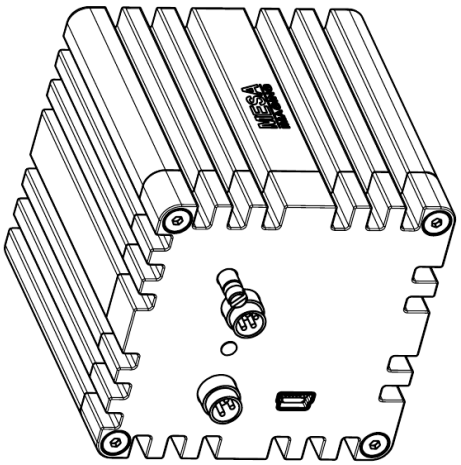
Ratings	Value	Comment
IP Code	IP-40	Protected against intrusion of solid objects over 1mm
Eye safety	EN 60825-1: 2002: Class 1	
EMC	EN 55022 : Class A EN 61000 EN 55024	

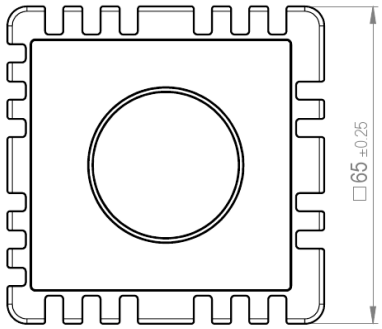
Mechanical	Value	Comment
Dimensions	65 x 65 x 68 mm 65 x 65 x 76 mm	For USB cameras For Ethernet cameras Excludes the connectors
Case Material	Anodized Aluminum	
Color front housing	Black	
Color back cover	Red	
Window Material	Polycarbonate	Illumination cover
	Borofloat glass	Objective cover
Mounting Holes	4 x M4; 2 x 4H7; 1 x 1/4”	
Weight	470 g 510 g	For USB cameras For Ethernet cameras
Cooling	Passive, no fan	Camera always to be connected to a heat sink

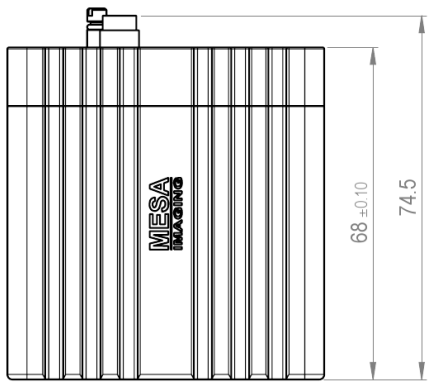
3 Mechanical

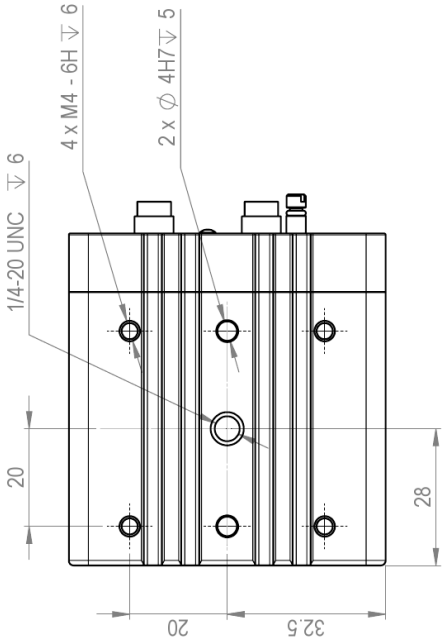
3.1 Camera Dimensions and Mounting - USB cameras (00400001 and 00400006)



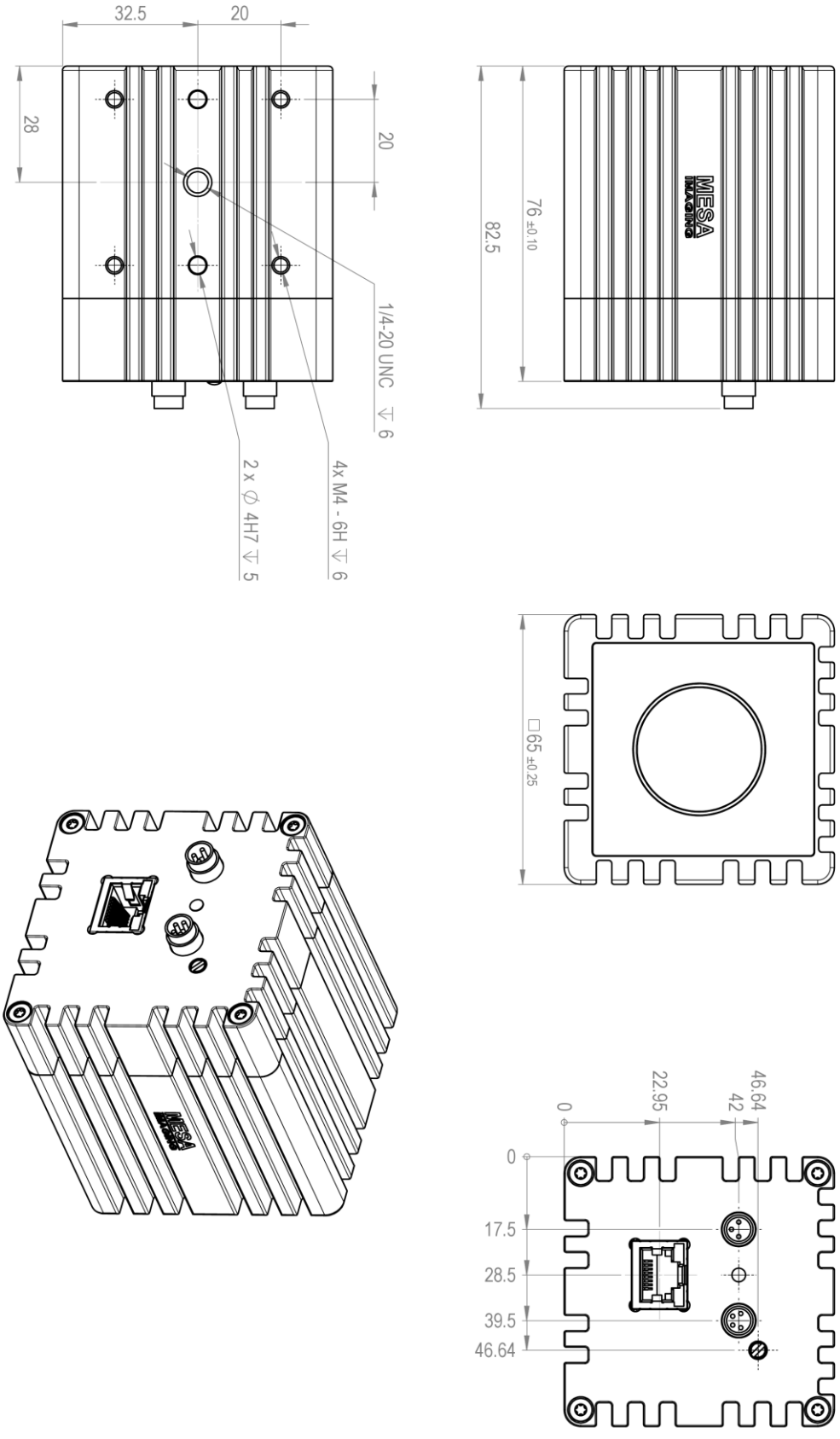






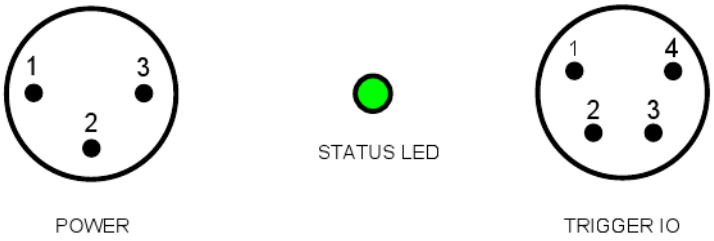


3.2 Camera Dimensions and Mounting - Ethernet cameras (00400002 and 00400009)



3.3 Camera power and trigger connectors

- ***Schematic view of the connectors on the backplane of the camera*** -



Deetailed description on the pin's functions is given in the next two paragraphs.
The camera also includes a status LED. Regular pulsing of the status LED indicates that the camera is powered; fast pulsing of the status LED indicates data transfer between camera and computer.

3.3.1 Power requirements

- ***Power Connections*** -

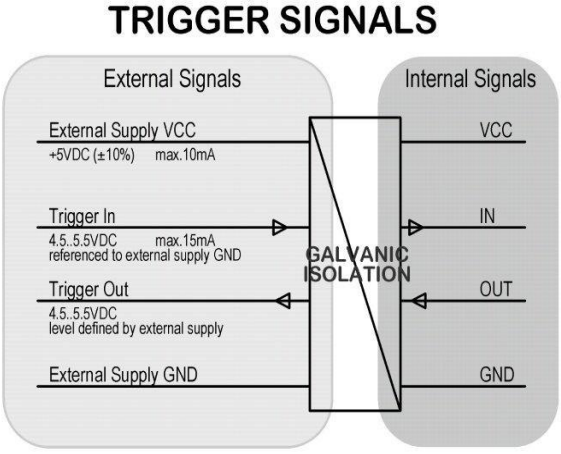
1	+12 VDC; Min -2%; Max +10%	Typ. 0.8 A @ 12 V, Min 0.6 A , Max 1.0 A
2	SHIELD	Connect to earth
3	GND	

3.3.2 Trigger requirements

- ***Trigger I/O Connections*** -

1	External Voltage	4.5 V – 5.5 V / 10 mA – defines the logic level of the trigger output
2	Trigger In	4.5 V – 5.5 V / 15 mA - Start acquisition frame (similar to external voltage supply)
3	Trigger Out	4.5 V – 5.5 V - Frame ready to fetch
4	External GND	In reference to External Voltage

- ***Schematic view of the hardware trigger logic*** -



3.4 Declaration of CE conformity

MESA IMAGING

Declaration of CE conformity

The undersigned, representing the following manufacturer

MESA Imaging AG
Technoparkstrasse 1
8005 Zürich
Switzerland

Herewith declare that the products:

SR 00400001	Hardware version 2.0 and higher
SR 00400002	Hardware version 2.0 and higher
SR 00400006	Hardware version 2.0 and higher
SR 00400009	Hardware version 2.0 and higher

have been tested and are in conformity with the following CE directives for industrial environments:

Eye Safety	EN 60825-1: 2002	Class 1
EMC	EN 55022	Class A
EMC	EN 55024	
EMC	EN 61000-6-1	
EMC	EN 61000-6-2	
EMC	EN 61000-6-4	

Therefore the above mentioned products are in conformity with all CE directives relating to industrial environments.

Place : Zürich

Date : 27th of August, 2008

James Lewis
CEO

Christian Waizenegger
Product Manager