

MATRIX 320™

Top performing 2D reader to empower shop floor and intralogistic traceability



Matrix 320 image based code reader has been designed to EMPOWER TRACEABILITY applications providing benefits for End Users and Machine Builders. Matrix 320 brilliantly solves traceability applications in Intralogistics, Distribution, 3PL, Retail logistics and the Shop Floor.

Matrix 320 offers a COMPLETE SOLUTION and TOP PERFORMANCE to achieve higher productivity at the best price/performance ratio with its superior 2MP sensor (1920 × 1080 pixels with a 16:9 form factor), achieving an extra large Field of View (FOV) on horizontal axis that competes against 3MP readers.

Matrix 320 has excellent reading performance on label and high resolution DPM with a powerful Smart configurable lighting allowing 3 color options able to solve extremely challenging traceability applications. To boost productivity in Intralogistics and Logistics segments, hands-free operations enjoy higher performance with Matrix 320 snappy reactivity and its outstanding Depth of Field (DOF).

Matrix 320 provides the highest market application flexibility with a modular design, a reduced number of models complemented by a complete portfolio of lenses, lightings, filters, and accessories.

The Premium platform is designed for superior performance, thanks to a new quad-core image processing platform that can double the processing power and halve the decoding time compared to the standard version. The main customer benefits of this increased computing power translate into increased throughput, and efficiency, as well as faster handling during multi-recipe mode. The Matrix 320 Premium can capture and process twice as many images as the standard version in a given time period.

Embedded electronic focus for the Liquid Lens models dramatically reduces installation time and allows easy reconfiguration improving production flexibility in line with Industry 4.0 requirements. Matrix 320 is very easy to install with its improved integrated aiming system, X-Press button HMI and DL.Code software powered by easy and intuitive autolearning/autosetup features.

C-Mount assembly modular design provides the highest flexibility in the selection and in the combination of the parts reducing the feasibility time and cost, helping system integrators to find effective powerful solutions for vertical applications in any industrial environment to grow the business opportunities.

Full industrial connectivity, overall compactness, rotating connectors and a top industrial grade make Matrix 320 extremely easy to fit into every industrial environment. New configurable 360-degree multicolor read-feedback and Green /Red Spot technology provide an outstanding visual feedback. Performance Analysis is also simplified by a new web interface to monitor the reader with a complete suite of diagnostics that leverages a new generation of FTP image saving. The new web Device Discovery simplifies the access and monitoring of all the readers in the network.

Matrix 320 2MP models compliment the current Matrix family of Matrix 120 and Matrix 220, once again establishing Datalogic leadership in Stationary Industrial Scanners.

HIGHLIGHTS

- Innovative 2MP sensor (1920 × 1080 pixels with 16:9 form factor) performs outstanding Depth of Field (DOF) and Horizontal Field of View (FOV_H)
- Smart configurable lighting solutions allowing 3 color options in two formats
- Electronic focus adjustment
- C-Mount models for maximum optical configurability and high intrinsic DOF
- Covers and filters accessories for easy stock management
- New Generation FTP Image saving
- Full industrial connectivity
- New web Device Discovery to quickly access all the readers in the network
- New configurable 360 degree multicolor visual feedback
- Top Industrial grade

APPLICATIONS

Manufacturing

Automotive, Food & Beverage, Pharmaceutical, Electronics, General Manufacturing

- Direct Part Marking Reading
- Component and Part Traceability
- Wip Traceability (Automatic)
- Print & Apply
- Secondary Packaging Traceability
- End of Line Traceability

Manufacturing, Transportation and Logistics, Retail

Intralogistics Automation, Automated Warehouse, Distribution Center

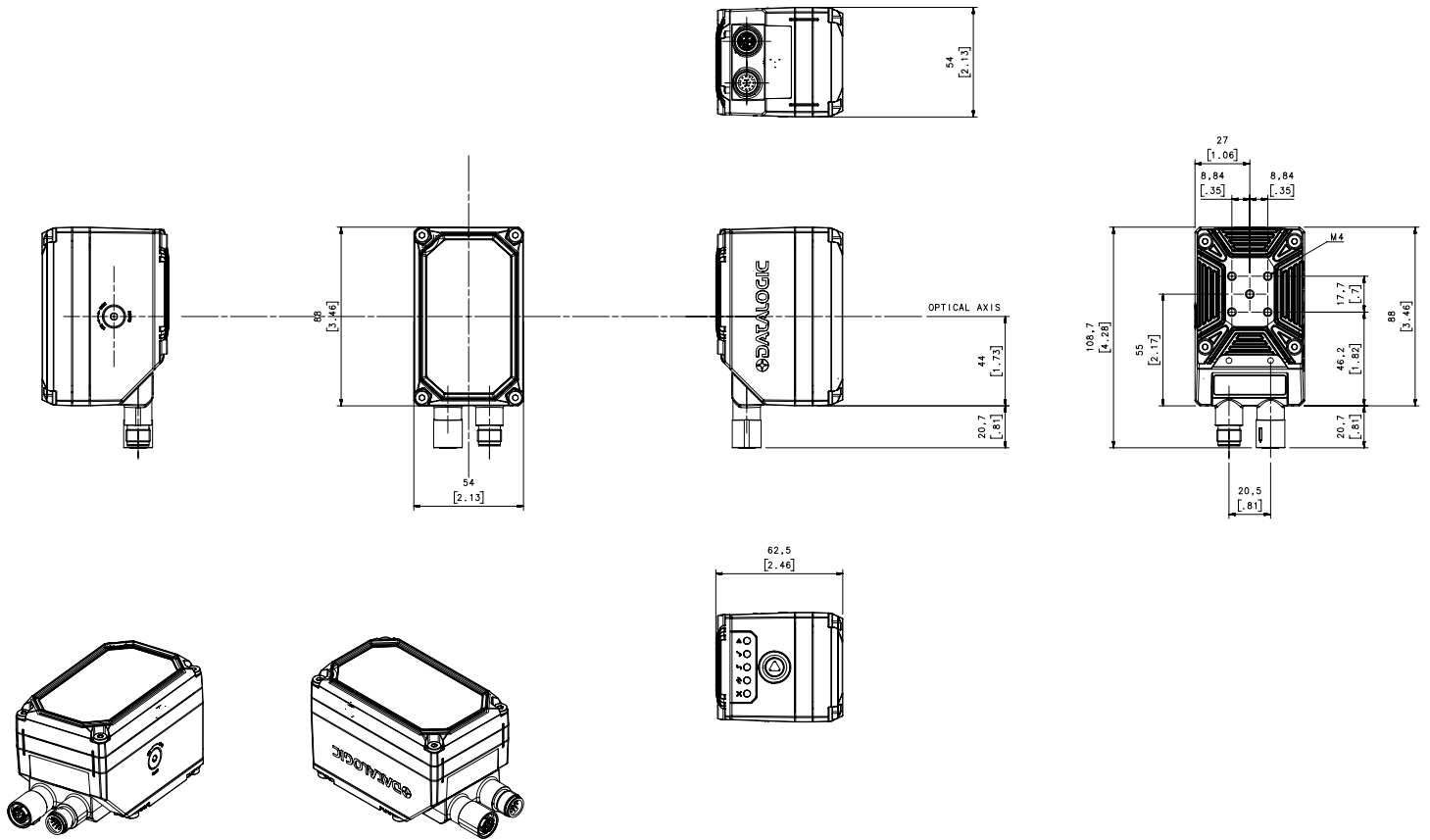
- Inbound, Pallet Picking (Forklift)
- Print & Apply verification (Re-labelling)
- Depalletizing, Part Traceability
- Order Fulfillment (Automatic, Manual)
- Palletizing (Automatic, Manual), Cage Preparation
- Pallet Traceability, Pallet Wrapping
- Retrieval for outbound (Forklift)
- Reverse Logistics

TECHNICAL DATA

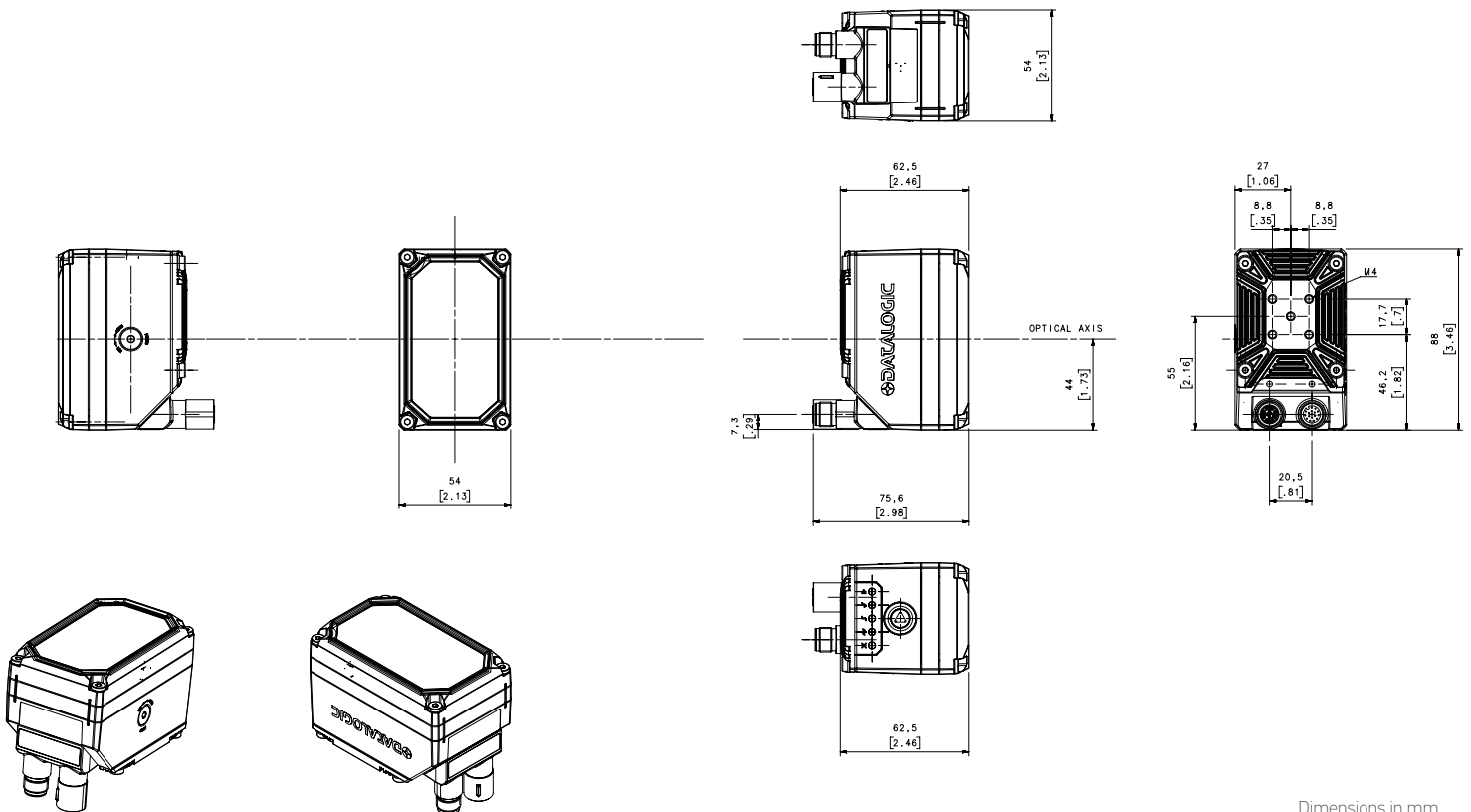
	14 Led Illuminator Model	36 Led Illuminator Model
Sensor	Image resolution 2.0 MP (1920 x 1080) 16:9 form factor - 1/3" CMOS global shutter	
Frame Rate	60 frames/s	
LIQUID LENS MODELS		
Reading Range	6mm: Minimum: 50 - Maximum: 550 mm 9mm: Minimum: 35 - Maximum: 1000 mm 16mm: Minimum: 70 - Maximum: 1500 mm	
Optical Models (Viewing Angles)	Liquid Lens 6mm (48°), Liquid Lens 9mm (34°), Liquid Lens 16 mm (20°)	
Optical Focus Control	Electronic focus control	
Illumination	Internal illuminators colors: Blue, Red, White lights (only for Liquid Lens 9 mm and 16 mm)	
	Internal illuminator power: High Power 14 LEDs	Internal illuminator power: Very High Power 36 LEDs
C-MOUNT MODELS		
Optical Models (Viewing Angles)	C-Mount Lens 4 mm (68°), 6 mm (48°), 8 mm (37°), 12 mm (25°), 16 mm (19°), 25 mm (12°), 35 mm (9°)	
Optical Focus Control	Manual focus adjustment	
Illumination	Internal illuminators colors: Blue, White, IR, UV	
	Not available	Internal illuminators power: Very High Power 36 LEDs
Polarizing Filter	Available as front cover accessory	
Code Quality Metrics	1D CQ Standard: ISO/IEC 15416	
	2D CQ Standard: ISO/IEC 16022/18004, ISO/IEC 29158 (AIM-DPM), ISO/IEC 15415	
Power Supply	24 VDC ± 10%	
Max Power Consumption	0.42 A, 10 W max	0.62 A, 15 W max.
Protection Class EN60529	IP65 and IP67	
CPU	Standard models: 4 cores @ 900 MHz - Premium models: 4 cores @ 1600 MHz	
Operating Temperature	Liquid lens models: -0 to 45 °C / 32 to 113 °F	
	C-MOUNT models: -10 to 50 °C / 14 to 122 °F Part Number listed with (*) in the models table: 0 to 50 °C / 32 to 122 °F	
Storage Temperature	-20 to 70 °C / -4 to 158 °F	
Case Material	Aluminium case and plastic protective window cover	
Dimensions	H 108.7 x W 54 x L 55.5 mm / 4.3 x 2.1 x 2.2 in, Connector at 0° H 88 x W 54 x L 75.6 mm / 4.3 x 2.1 x 2.2 in, Connector at 90°	H 115.5 x W 126 x L 70.3 mm / 4.6 x 4.9 x 2.8 in, Connector at 0° H 101 x W 126 x L 90.7 mm / 4.6 x 4.9 x 2.8 in, Connector at 90°
	Liquid lens 14 LED illuminator: 380 gr / 13.4 oz	Liquid lens 36 LED illuminator: 650 gr / 22.9 oz
Weight	---	C-MOUNT 36 LED illuminator: reader body 300 gr / 10.6 oz illuminator adapter 300 gr / 10.6 oz illuminator 300 gr / 10.6 oz
Sulfur Gas Resistance	Available for all models according to ISO EN 60068-2-43	
ESD Safe	Available as front cover accessory	Not Available
YAG Laser Protection	Available as filter accessory (compatible with ESD cover)	
Flexible Cables	Available as accessories	
Embedded Communication Interfaces	- Ethernet 10/100/1000 Mbit/s: TCP/IP, UDP, FTP, SFTP and Fieldbus PROFINET IO, Ethernet IP, Modbus TCP - Serial RS-232/RS-422/RS-485 up to 115.2 Kbit/s + Serial Aux RS-232 up to 115.2 Kbit/s - OPC UA	
Reader Networking	Datalogic ID-NET™	
Connectivity Modes	Pass Through, Master/Slave, Ethernet point to point	
Digital Inputs	2 inputs opto-coupled and polarity insensitive Max. Voltage 30 VDC Max. Input Current 10 mA	
Digital Outputs	3 Outputs: configurable NPN, PNP and PP short-circuit protected VOUT (ILOAD = 0 mA) max. 24 VDC VOUT (ILOAD = 100 mA) max. 3 VDC ILOAD max. 100 mA Using CBX connection box the first 2 outputs are opto-coupled	
Aiming System	Laser cross red projection aiming	
User Interface	Configurable 360° multicolor visual feedback Green Spot and Red Spot LEDs X-PRESS™ Human Machine Interface Beeper, X-PRESS™ Push Button, 7 LEDs (Status, Communication , Trigger, Good-read, Ready, Power on, Network) Web Monitoring Interface	
	DL.CODE™ Windows-based software (programming via Ethernet or Serial Interface) with Javascript output formatter Serial Host Mode programming X-PRESS™ Human Machine Interface	
Warranty	2-Year Factory Warranty	

DIMENSIONS

MATRIX 320 14 LED ILLUMINATOR LIQUID LENS MODELS - STRAIGHT 0° CONNECTORS

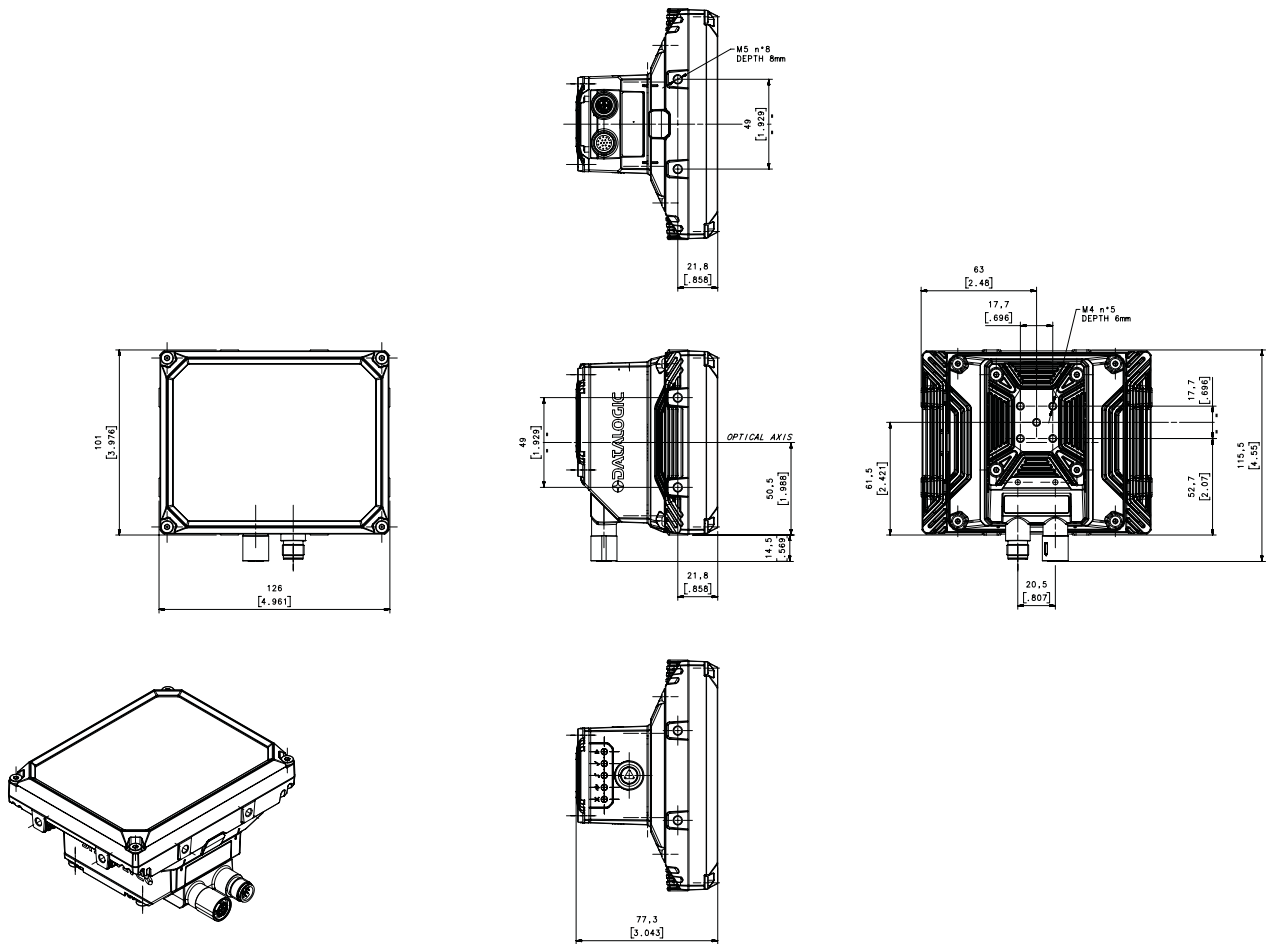


MATRIX 320 14 LED ILLUMINATOR LIQUID LENS MODELS - 90° CONNECTORS

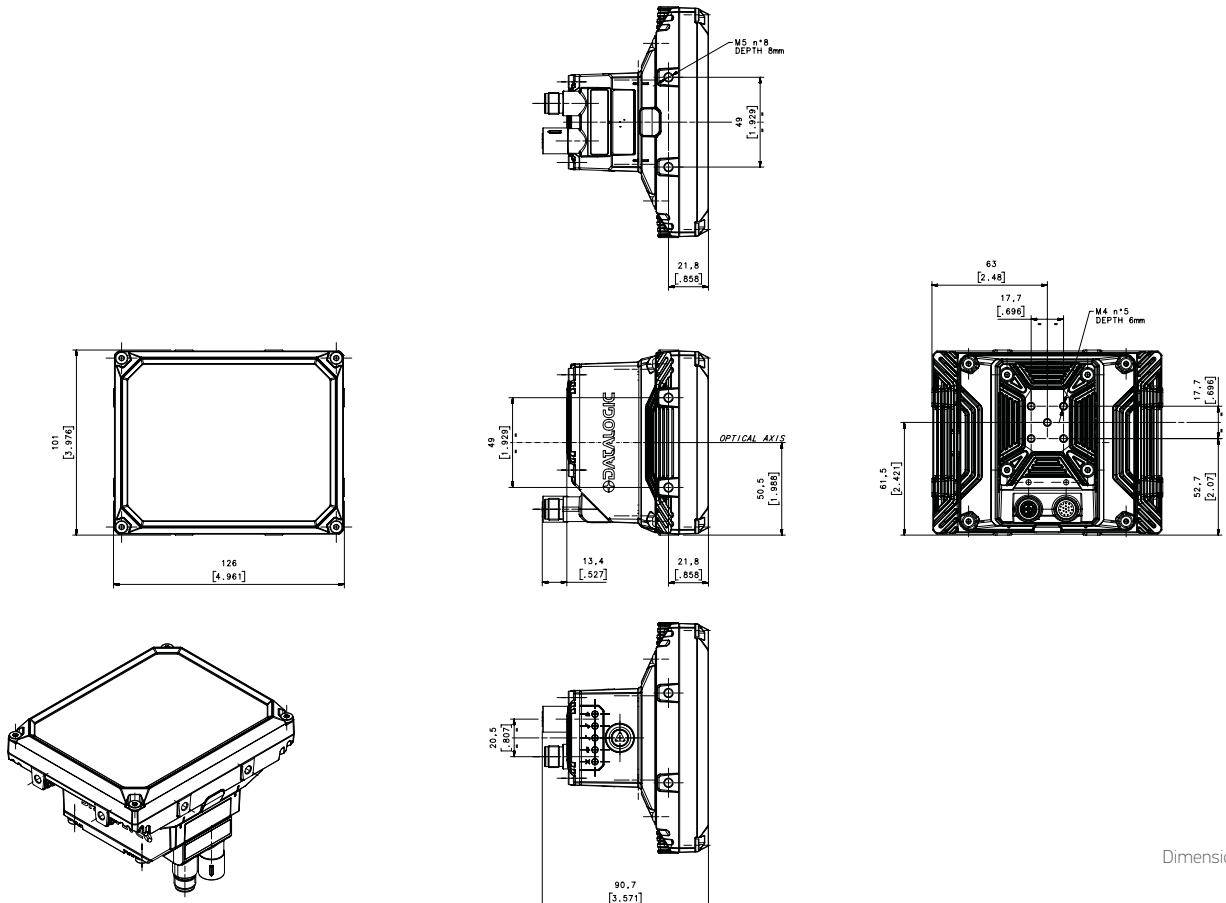


Dimensions in mm

MATRIX 320 36 LED ILLUMINATOR LIQUID LENS MODELS - STRAIGHT 0° CONNECTORS

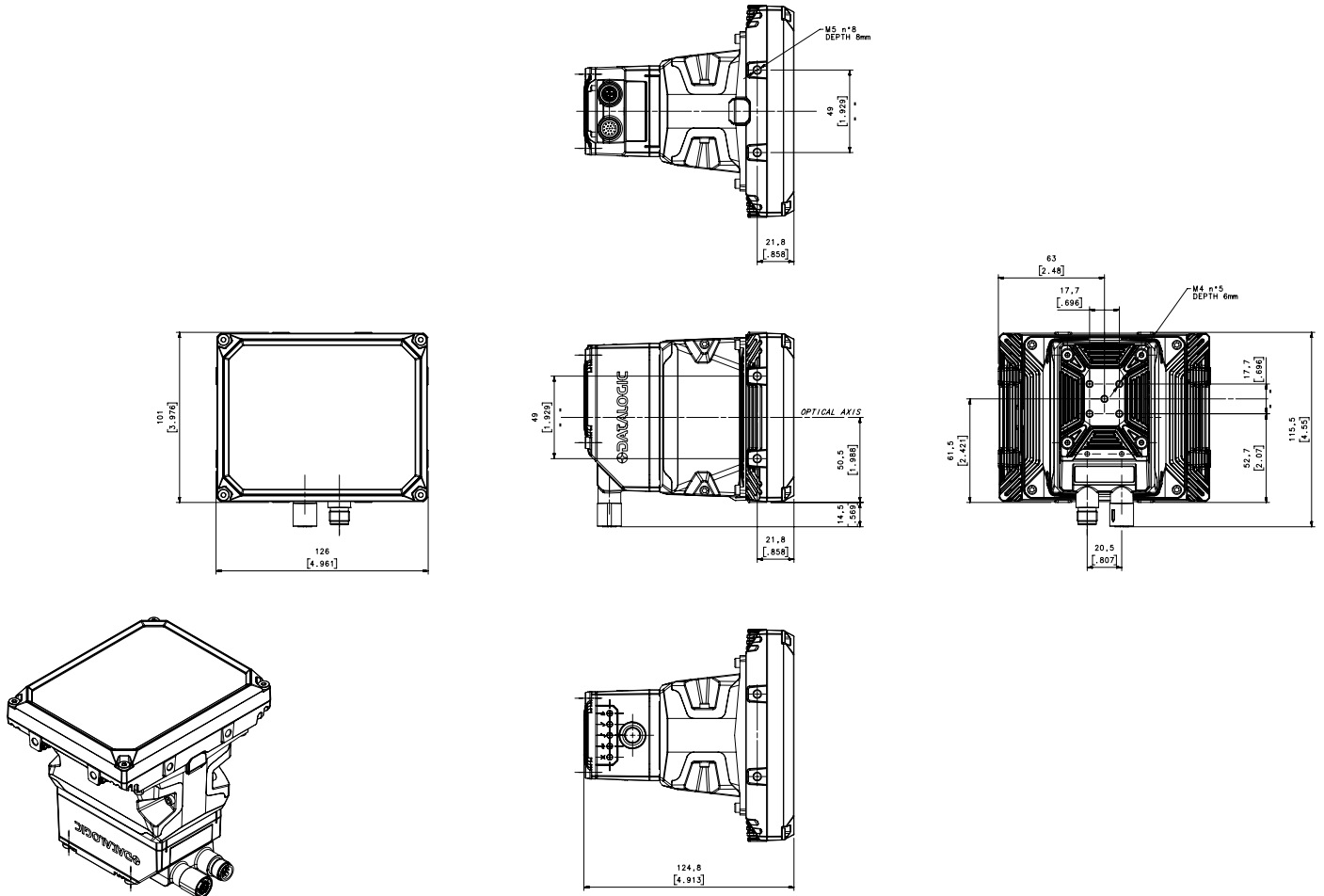


MATRIX 320 36 LED ILLUMINATOR LIQUID LENS MODELS - 90° CONNECTORS

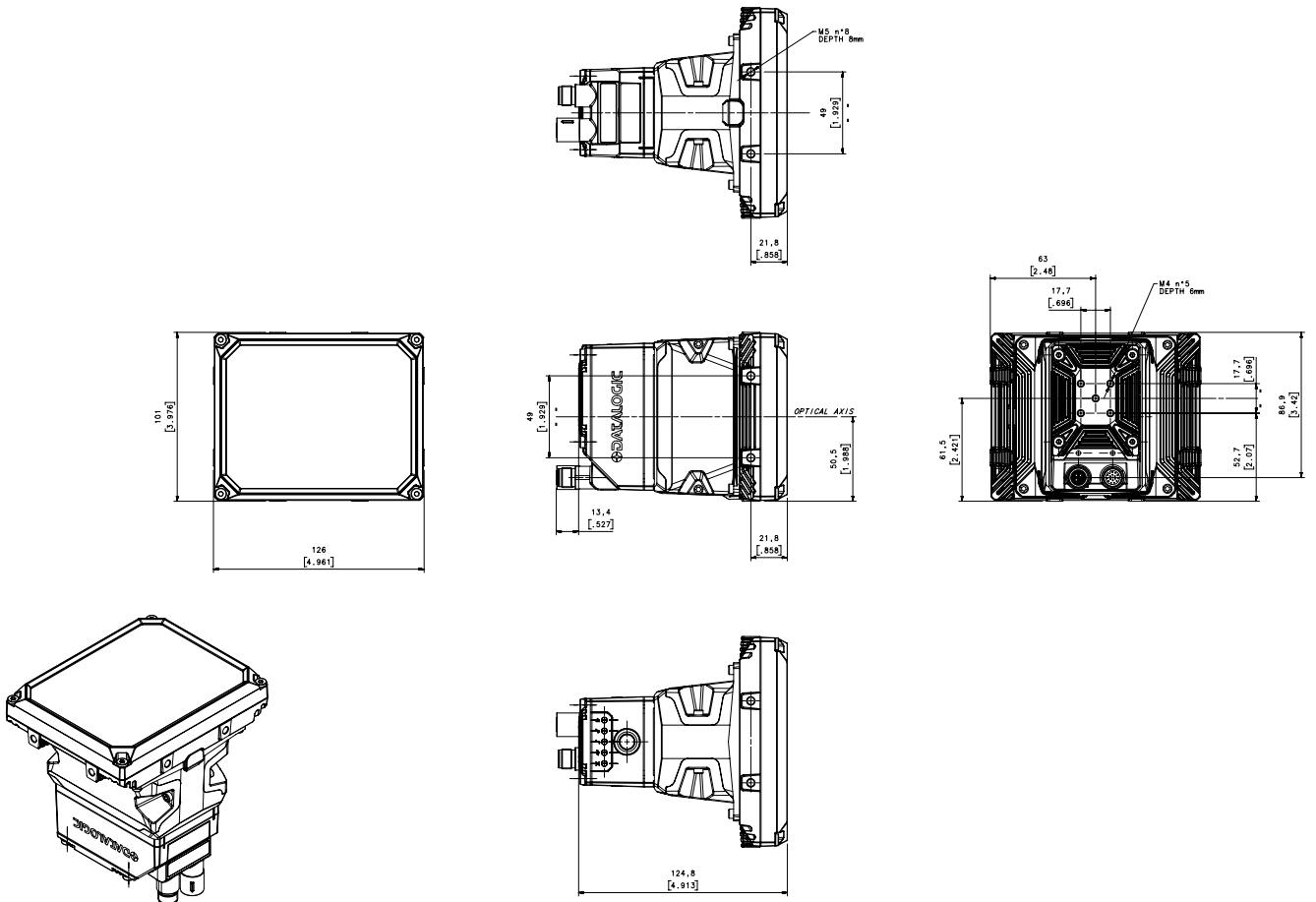


Dimensions in mm

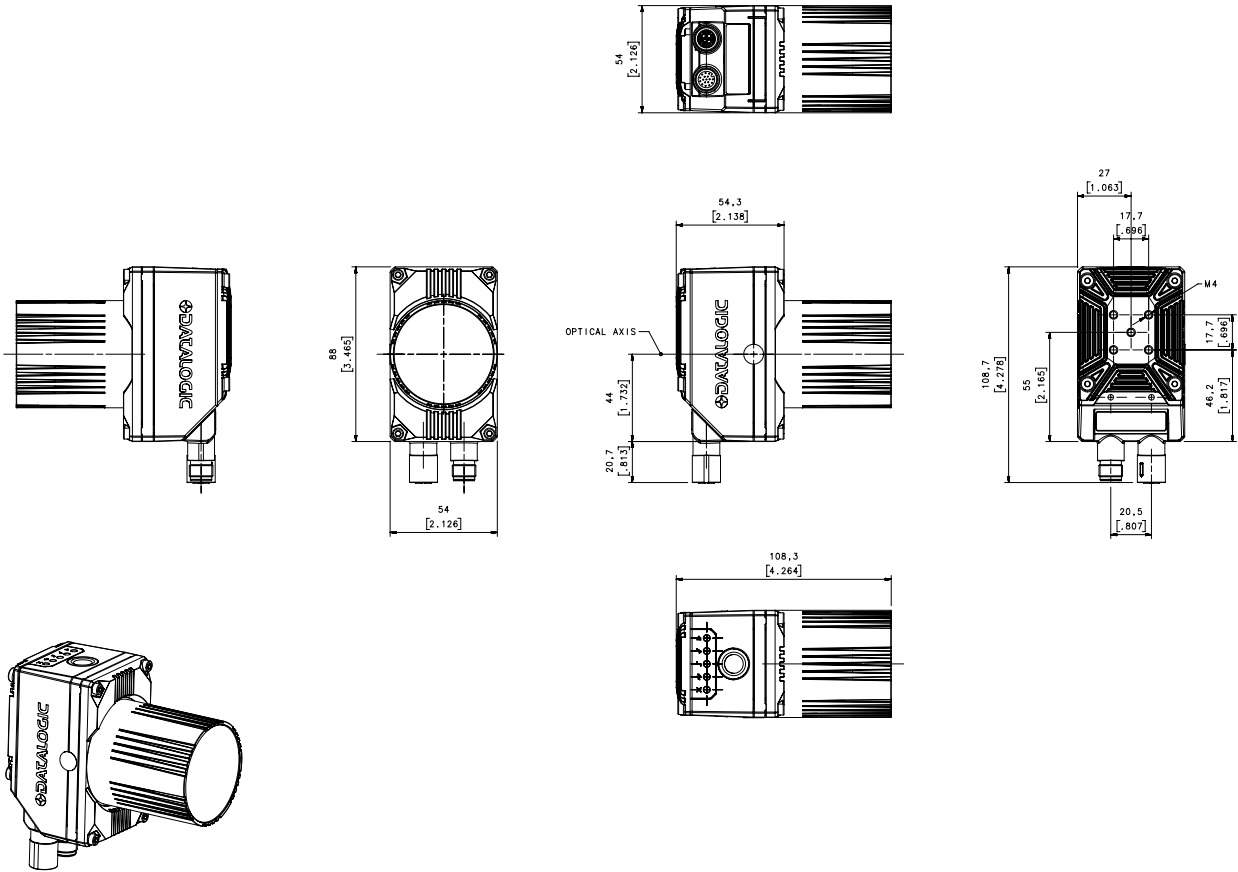
MATRIX 320 C-MOUNT FULL PRODUCT - STRAIGHT 0° CONNECTORS



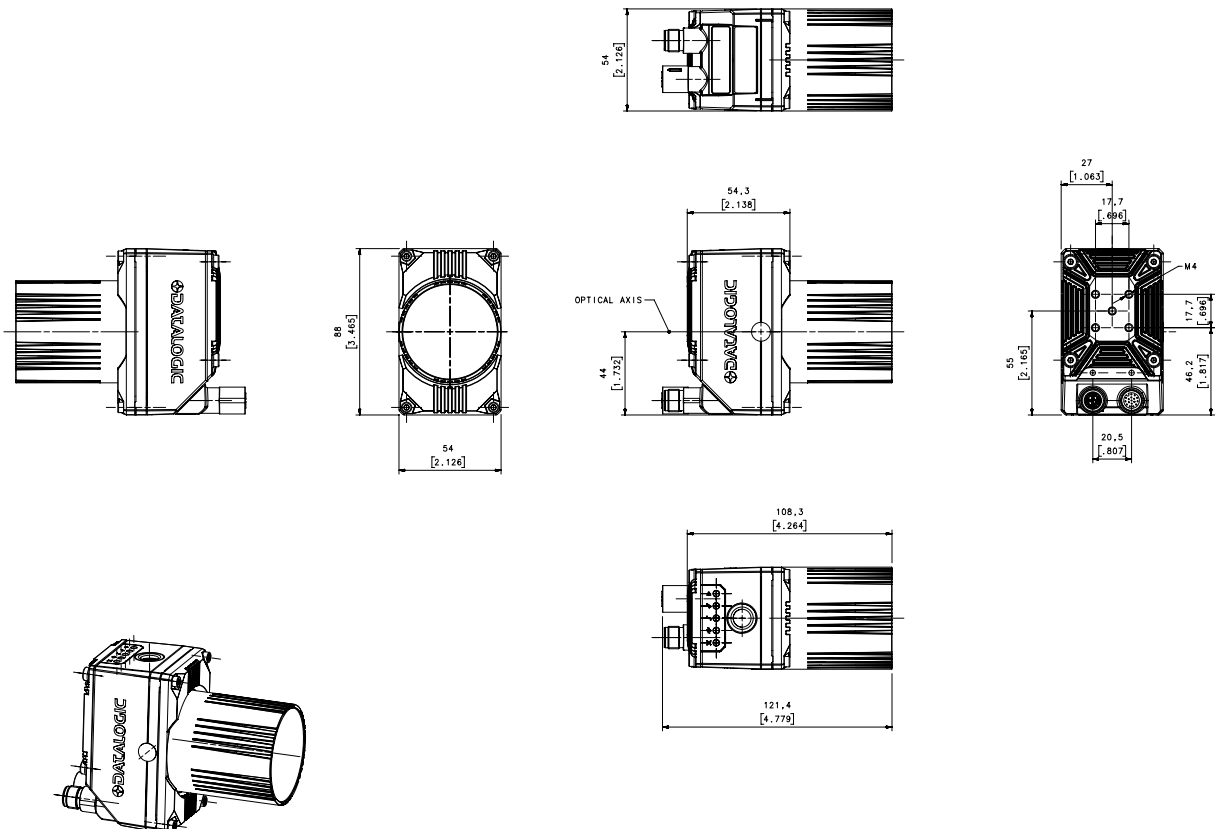
MATRIX 320 C-MOUNT FULL PRODUCT - 90° CONNECTORS



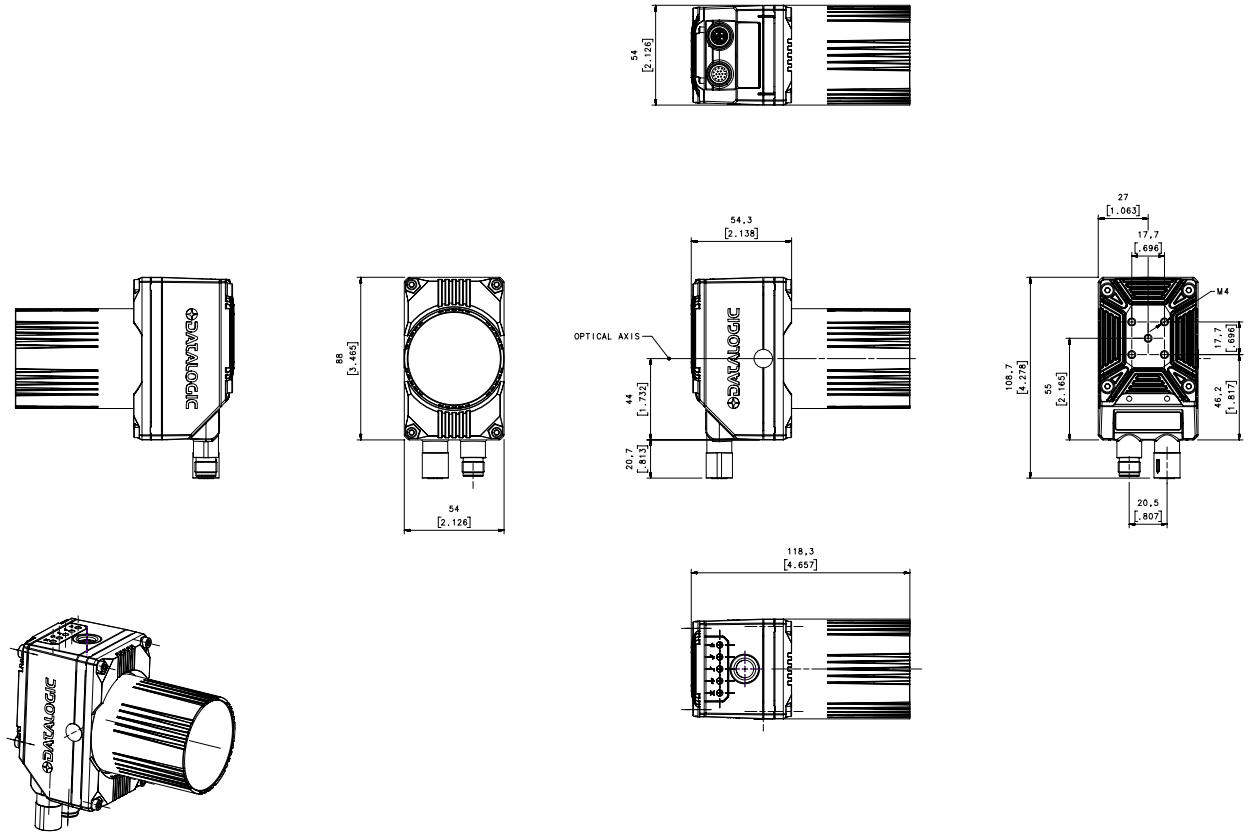
MATRIX 320 C-MOUNT READER and COVER LENS SHORT - STRAIGHT 0° CONNECTORS



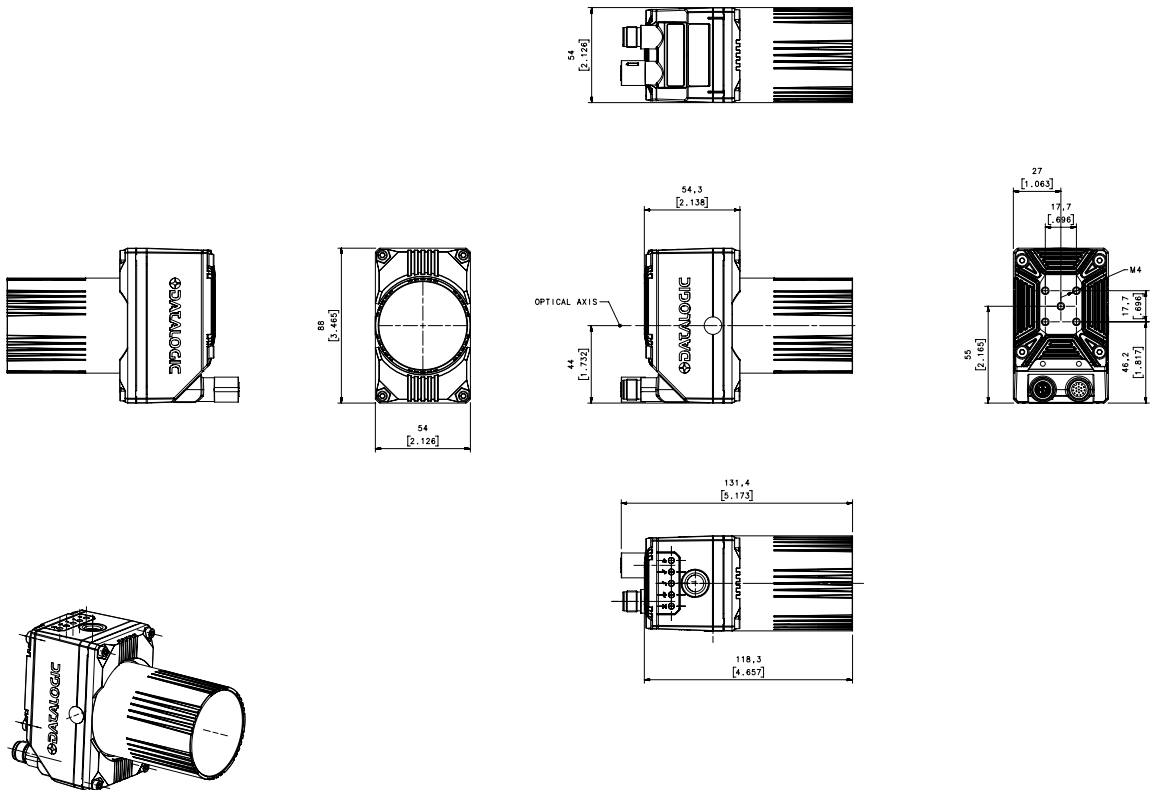
MATRIX 320 C-MOUNT READER and COVER LENS SHORT - 90° CONNECTORS



MATRIX 320 C-MOUNT READER and COVER LENS LONG - STRAIGHT 0° CONNECTORS



MATRIX 320 C-MOUNT READER and COVER LENS LONG - 90° CONNECTORS



MODELS

MATRIX 320 2MP LIQUID LENS MODELS

P/N	DESCRIPTION	OPTICAL MODELS			ILLUMINATOR POWER		ILLUMINATOR LIGHT COLOR		
		Liquid Lens 6 mm	Liquid Lens 9 mm	Liquid Lens 16 mm	14 LED High Power	36 LED Very High Power	BLUE	RED	WHITE
938100053	Matrix 320 701-230 LL6 14L 60D RED X	x			x			x	
938100055	Matrix 320 703-230 LL6 14L 60D BLU X	x			x		x		
938100056	Matrix 320 705-330 LL9 14L 45D RED X		x		x			x	
938100057	Matrix 320 706-330 LL9 14L 45D WHT X		x		x				x
938100058	Matrix 320 707-330 LL9 14L 45D BLU X		x		x		x		
938100059	Matrix 320 709-430 LL16 14L 25D RED X			x	x			x	
938100060	Matrix 320 710-430 LL16 14L 25D WHT X			x	x				x
938100061	Matrix 320 711-430 LL16 14L 25D BLU X			x	x		x		
938100062	Matrix 320 717-230 LL6 36L 60D RED X	x				x		x	
938100064	Matrix 320 719-230 LL6 36L 60D BLU X	x				x	x		
938100065	Matrix 320 721-330 LL9 36L 45D RED X		x			x		x	
938100066	Matrix 320 722-330 LL9 36L 45D WHT X		x			x			x
938100067	Matrix 320 723-330 LL9 36L 45D BLU X		x			x	x		
938100068	Matrix 320 725-430 LL16 36L 25D RED X			x		x		x	
938100069	Matrix 320 726-430 LL16 36L 25D WHT X			x		x			x
938100070	Matrix 320 727-430 LL16 36L 25D BLU X			x		x	x		

MATRIX 320 2MP C-MOUNT MODELS

P/N	DESCRIPTION	
938100071 (*)	Matrix 320 700-030 CM 2MP 1/3" X	Matrix 320 2MP reader body
93ACC0281	Adapter LT to CM M320	ILLUMINATOR ADAPTER to Matrix 320 reader body

P/N	DESCRIPTION	C-MOUNT LENSES				
		Focal length (mm)	Max Sensor Format	Aperture (f/#)	Min working distance (mm) from lens front	Max working distance (mm) from lens front
93ACC0285	LNM 000-021 CM 4MM VF1.8 1/2" ED	4	1/2"	f/1.8-f/11	0	∞
93ACC0286	LNM 001-031 CM 6MM VF1.85 1/2" ED	6	1/2"	f/1.85-f/11	50	∞
93ACC0287	LNM 003-021 CM 8MM VF1.8 1/2" ED	8	1/2"	f/1.8-f/11	50	∞
93ACC0288	LNM 005 021 CM 12MM VF1.8 1/1.8" ED	12	1/2"	f/1.8-f/11	100	∞
93ACC0289	LNM 007-021 CM 16MM VF1.8 1/1.8" ED	16	1/2"	f/1.8-f/11	200	∞
93ACC0290	LNM 009-031 CM 25MM VF1.85 1/1.8" ED	25	1/2"	f/1.85-f/16	200	∞
93ACC0292	LNM 030-011 CM 35MM VF1.85 1/1.8" ED	35	1/2"	f/1.85-f/16	200	∞

P/N	DESCRIPTION	ILLUMINATOR KIT (includes illuminator, standard cover, adapter, bracket)								Illuminator adapter	Mounting bracket
		36 LED Very High Power	RED	BLU	WHT	IR	UV	Aiming			
93ACC0391	KIT LTM 002-001 S36L 120D WHT white NL	x			x				cross	93ACC0281 included in the illuminator KIT	93ACC0283 included in the illuminator KIT
93ACC0356	KIT LTM 002-601 S36L 60D WHT white	x			x				cross		
93ACC0357	KIT LTM 002-451 S36L 45D WHT white	x			x				cross		
93ACC0392	KIT LTM 222-451 SA36L 45D WHT white	x			x				grid		
93ACC0394	KIT LTM 002-351 S36L 35D WHT white	x			x				cross		
93ACC0395	KIT LTM 002-151 S36L 15D WHT white	x			x				cross		
93ACC0396	KIT LTM 002-000 S36L 120D RED 625nm NL	x	x						cross		
93ACC0397	KIT LTM 002-600 S36L 60D RED 625nm	x	x						cross		
93ACC0398	KIT LTM 002-450 S36L 45D RED 625nm	x	x						cross		
93ACC0399	KIT LTM 002-350 S36L 35D RED 625nm	x	x						cross		
93ACC0400	KIT LTM 002-150 S36L 15D RED 625nm	x	x						cross		
93ACC0358	KIT LTM 002-002 S36L 120D BLU 475nm NL	x		x					cross		
93ACC0359	KIT LTM 002-602 S36L 60D BLU 475nm	x		x					cross		
93ACC0360	KIT LTM 002-452 S36L 45D BLU 475nm	x		x					cross		
93ACC0361	KIT LTM 002-352 S36L 35D BLU 475nm	x		x					cross		
93ACC0362	KIT LTM 002-152 S36L 15D BLU 475nm	x		x					cross		
93ACC0401	KIT LTM 002-003 S36L 90D IR 850nm NL	x				x			cross		
93ACC0363	KIT LTM 002-453 S36L 45D IR 850nm	x				x			cross		
93ACC0402	KIT LTM 002-353 S36L 35D IR 850nm	x				x			cross		
93ACC0403	KIT LTM 002-253 S36L 25D IR 850nm	x				x			cross		
93ACC0364	KIT LTM 002-004 S36L 130D UV 365nm NL	x					x		cross		

P/N	DESCRIPTION	ILLUMINATOR (includes standard cover)								Illuminator adapter	Mounting bracket
		36 LED Very High Power	RED	BLU	WHT	IR	UV	Aiming			
93ACC0294	LTM 002-001 S36L 120D WHT white NL	x			x				cross	Not included in the illuminator box	
93ACC0298	LTM 002-601 S36L 60D WHT white	x			x				cross		
93ACC0302	LTM 002-451 S36L 45D WHT white	x			x				cross		
93ACC0330	LTM 222-451 SA36L 45D WHT white	x			x				grid		
93ACC0306	LTM 002-351 S36L 35D WHT white	x			x				cross		
93ACC0354	LTM 002-151 S36L 15D WHT white	x			x				cross		
93ACC0293	LTM 002-000 S36L 120D RED 625nm NL	x	x						cross		
93ACC0297	LTM 002-600 S36L 60D RED 625nm	x	x						cross		
93ACC0301	LTM 002-450 S36L 45D RED 625nm	x	x						cross		
93ACC0305	LTM 002-350 S36L 35D RED 625nm	x	x						cross		
93ACC0353	LTM 002-150 S36L 15D RED 625nm	x	x						cross		
93ACC0295	LTM 002-002 S36L 120D BLU 475nm NL	x		x					cross		
93ACC0299	LTM 002-602 S36L 60D BLU 475nm	x		x					cross		
93ACC0303	LTM 002-452 S36L 45D BLU 475nm	x		x					cross		
93ACC0307	LTM 002-352 S36L 35D BLU 475nm	x		x					cross		
93ACC0355	LTM 002-152 S36L 15D BLU 475nm	x		x					cross		
93ACC0296	LTM 002-003 S36L 90D IR 850nm NL	x				x			cross		
93ACC0300	LTM 002-453 S36L 45D IR 850nm	x				x			cross		
93ACC0304	LTM 002-353 S36L 35D IR 850nm	x				x			cross		
93ACC0308	LTM 002-253 S36L 25D IR 850nm	x				x			cross		
93ACC0309	LTM 002-004 S36L 130D UV 365nm NL	x					x		cross		

(*) Please see the Operating Temperature Technical Data

LIQUID LENS MODELS

Matrix 320 7 XX - XX 0

Sensor
7 = 2MP

Interface
3 = Gigabit Ethernet (GIGE)

Options
0 = Standard

Internal Illuminators

- 01 = 14 LED TIR Lens Aperture 60 Degree Red Light
- 03 = 14 LED TIR Lens Aperture 60 Degree Blue Light
- 05 = 14 LED TIR Lens Aperture 45 Degree Red Light
- 06 = 14 LED TIR Lens Aperture 45 Degree White Light
- 07 = 14 LED TIR Lens Aperture 45 Degree Blue Light
- 09 = 14 LED TIR Lens Aperture 25 Degree Red Light
- 10 = 14 LED TIR Lens Aperture 25 Degree White Light
- 11 = 14 LED TIR Lens Aperture 25 Degree Blue Light
- 17 = 36 LED TIR Lens Aperture 60 Degree Red Light
- 19 = 36 LED TIR Lens Aperture 60 Degree Blue Light
- 21 = 36 LED TIR Lens Aperture 45 Degree Red Light
- 22 = 36 LED TIR Lens Aperture 45 Degree White Light
- 23 = 36 LED TIR Lens Aperture 45 Degree Blue Light
- 25 = 36 LED TIR Lens Aperture 25 Degree Red Light
- 26 = 36 LED TIR Lens Aperture 25 Degree White Light
- 27 = 36 LED TIR Lens Aperture 25 Degree Blue Light

Optics

- 2 = 6 mm electronic focus (liquid lens)
- 3 = 9mm electronic focus control (liquid lens)
- 4 = 16mm electronic focus control (liquid lens)

C-MOUNT MODELS

Matrix 320 700-030

Sensor
7 = 2MP

Interface
3 = Gigabit Ethernet (GIGE)

LNM 0XX-0XX

Focal length
01 = 4mm
02 = 6mm
03 = 8mm
05 = 12mm
07 = 16mm
09 = 25mm
10 = 35mm

Min F number
2 = F1.8
3 = F1.85

Lens Type
1 = Edmund

LTM XXX-XXX

0=M320 2MP and M320 5MP
1=M320 2MP only
2=M320 5MP only

Aiming type
0 = cross aiming
2 = grid aiming

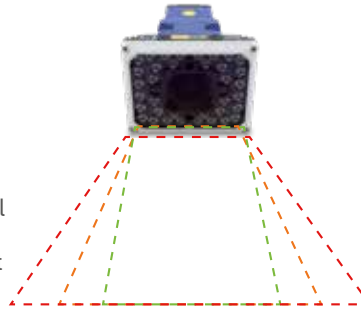
Illuminator size
2 = 36 LED

Illuminator LED lens aperture
15 = ultra narrow (15D)
35 = narrow (35D)
45 = narrow (45D)
60 = wide (60D)
00 = ultra wide (90/120/130D)

Color
0 = red
1 = white
2 = blue
3 = IR
4 = UV



Different options of Total Internal Reflection (TIR) lenses on the illuminator LEDs to match smart camera lens aperture



14 LED ILLUMINATOR MODELS AND LED CHAIN CONFIGURATION

Lights ON	LEDs COLOR
All Chains	White, Red, Blue
Central Chain	White, Red, Blue
Top/Bottom Chain	White, Red, Blue



36 LED ILLUMINATOR MODELS AND LED CHAIN CONFIGURATION

Lights ON	LEDs COLOR
All Chains	White, Red, Blue
Top Left	White, Red, Blue
Top right	White, Red, Blue
Bottom left	White, Red, Blue
Bottom right	White, Red, Blue
Left	White, Red, Blue
Right	White, Red, Blue
Any combination of the above chain options	White, Red, Blue



ILLUMINATOR LEDS COLOR

Illuminator Power	LEDs COLOR
14 LED	White, Red, Blue
36 LED	White, Red, Blue



360 DEGREE VISUAL FEEDBACK DEFAULT COLOR

Default configuration	LEDs COLOR
Good Read	Green
No Read	Red
Configuration	Blue



ACCESSORIES

CATEGORY	PART NUMBER	DESCRIPTION
CABLE	93A050058	M12-IP67 Cable To CBX or QL (1M)
	93A050059	M12-IP67 Cable To CBX or QL (3M)
	93A050060	M12-IP67 Cable To CBX or QL (5M)
	93A051390	M12-IP67 Cable To CBX or QL (10M)
	93A050116	M12-IP67 17p Flexible Cable To CBX or QL (1M)*
	93A050117	M12-IP67 17p Flexible Cable To CBX or QL (3M)*
	93A050118	M12-IP67 17p Flexible Cable To CBX or QL (5M)*
	93A050122	M12-IP67 GIGA Ethernet Cable X-Coded (1M)
	93A050123	M12-IP67 GIGA Ethernet Cable X-Coded (3M)
	93A050124	M12-IP67 GIGA Ethernet Cable X-Coded (5M)
	93A050140	M12-IP67 GIGA Ethernet Cable X-Coded (10M)
	95A900058	CV-N1-48-F-05 GigETH-X, Drag chain, 5m
	95A900059	CV-N1-48-F-10 GigETH-X, Drag chain, 10m
	95A900060	CV-N1-48-F-15 GigETH-X, Drag chain, 15m
	93ACC0268	Serial RS232 HID E Keybrd Converter Cbl
	93A050141	Adapter Cable FULL GIGA Ethernet X-Coded M12 to RJ45
	93A050076	CAB-GD03 M12 F/L 3M
93A050077	CAB-GD05 M12 F/L 5M	
93A050078	CAB-GD10 M12 F/L 10M	
COVER	93ACC0271	Cover STD LT 14L M320/P2
	93ACC0272	Cover STD LT 36L M320/P2
	93ACC0273	Cover Polarizer LT 14L M320/P2
	93ACC0274	Cover Polarizer LT 36L M320/P2
	93ACC0278	Cover ESD LT 14L M320/P2
	93ACC0279	Cover Lens and CM Base Short
	93ACC0280	Cover Lens and CM Base Long
FILTER	93ACC0275	Filter Half Polarizer LT 14L M320/P2
	95A900016	Filter BLU Bandpass 475nm LT 14L M320/P2
	95A900015	Filter RED Bandpass 625nm LT 14L M320/P2
	95A900017	Filter IR Bandpass 850nm LT 14L M320/P2
	95A900039	Filter UV Cut Longpass 415 LT 14L M320/P2
	95A900020	Filter BLU Bandpass 475nm LT 36L M320/P2
	95A900019	Filter RED Bandpass 625nm LT 36L M320/P2
	95A900021	Filter IR Bandpass 850nm LT 36L M320/P2
	95A900040	Filter UV Cut Longpass415 LT 36L M320/P2
	95A900018	Filter YAG Cut LT 14L M320/P2
95A900022	Filter YAG Cut LT 36L M320/P2	
BRACKET	93ACC0282	BK-32-000 STD FIX BRACKET M320/P2 BODY
	93ACC0283	BK-32-010 PIVOT FIX BRACKET M320/P2 BODY



* Suitable for robotic arms applications