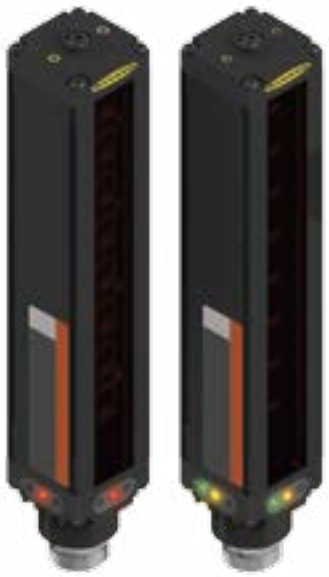
MINI-ARRAY® Series



Measuring Light Screens

The MINI-ARRAY® is a programmable measuring light screen for inspections and profiling with a long range up to 16.5 m.

- Offers programmable controller with a selection of measurement modes, scan modes and output configurations
- Available with 9.5 or 19 mm beam spacing for detecting objects as small as 12.7 mm
- Advanced software GUI
- Highly visible indicators for status monitoring

MINI-ARRAY® 19.1 mm Beam Spacing

Max Range	Minimum Object Size	Total Beams	3-Piece Models*			2-Piece Models		
			Length (L)	Emitter	Receiver	Length (L)	Emitter	Receiver
16.5 m	Interlaced Mode: 25.4 mm Other scan modes: 38.1 mm	8	201 mm	BMEL616A	BMRL616A	231 mm	MAE616Q	MAR616NX485Q
		16	356 mm	BMEL1216A	BMRL1216A	384 mm	MAE1216Q	MAR1216NX485Q
		24	505 mm	BMEL1816A	BMRL1816A	536 mm	MAE1816Q	MAR1816NX485Q
		32	659 mm	BMEL2416A	BMRL2416A	689 mm	MAE2416Q	MAR2416NX485Q
		40	810 mm	BMEL3016A	BMRL3016A	841 mm	MAE3016Q	MAR3016NX485Q
		48	963 mm	BMEL3616A	BMRL3616A	993 mm	MAE3616Q	MAR3616NX485Q
		56	1115 mm	BMEL4216A	BMRL4216A	1146 mm	MAE4216Q	MAR4216NX485Q
13.5 m	Interlaced Mode: 25.4 mm Other scan modes: 38.1 mm	64	1267 mm	BMEL4816A	BMRL4816A	1298 mm	MAE4816Q	MAR4816NX485Q
		72	–	–	–	1451 mm	MAE5416Q	MAR5416NX485Q
		80	1572 mm	BMEL6016A	BMRL6016A	1514 mm	MAE6016Q	MAR6016NX485Q
		88	–	–	–	1667 mm	MAE6616Q	MAR6616NX485Q
		96	1877 mm	BMEL7216A	BMRL7216A	1819 mm	MAE7216Q	MAR7216NX485Q

For more specifications see page 255.

QD models: A model with a QD requires a mating cordset (see page 254).

* One controller and an emitter/receiver pair (of matching length and resolution) required per system.

MINI-ARRAY® 9.5 mm Beam Spacing

Max Range	Minimum Object Size	Total Beams	3-Piece Models*			2-Piece Models		
			Length (L)	Emitter	Receiver	Length (L)	Emitter	Receiver
6.1 m	Interlaced Mode: 12.7 mm Other scan modes: 19.1 mm	16	201 mm	**BMEL632A**	**BMRL632A**	231 mm	**MAE632Q**	**MAR632NX485Q**
		32	356 mm	**BMEL1232A**	**BMRL1232A**	384 mm	**MAE1232Q**	**MAR1232NX485Q**
		48	505 mm	**BMEL1832A**	**BMRL1832A**	536 mm	**MAE1832Q**	**MAR1832NX485Q**
		64	659 mm	**BMEL2432A**	**BMRL2432A**	689 mm	**MAE2432Q**	**MAR2432NX485Q**
		80	810 mm	**BMEL3032A**	**BMRL3032A**	841 mm	**MAE3032Q**	**MAR3032NX485Q**
		96	963 mm	**BMEL3632A**	**BMRL3632A**	993 mm	**MAE3632Q**	**MAR3632NX485Q**
		112	1115 mm	**BMEL4232A**	**BMRL4232A**	1146 mm	**MAE4232Q**	**MAR4232NX485Q**
		128	1267 mm	**BMEL4832A**	**BMRL4832A**	1298 mm	**MAE4832Q**	**MAR4832NX485Q**
4.6 m	Interlaced Mode: 12.7 mm Other scan modes: 19.1 mm	144	–	–	–	1451 mm	**MAE5432Q**	**MAR5432NX485Q**
		160	1572 mm	**BMEL6032A**	**BMRL6032A**	1603 mm	**MAE6032Q**	**MAR6032NX485Q**
		176	–	–	–	1755 mm	**MAE6632Q**	**MAR6632NX485Q**
		192	1877 mm	**BMEL7232A**	**BMRL7232A**	1908 mm	**MAE7232Q**	**MAR7232NX485Q**

MINI-ARRAY® Controllers*, 16-30 V DC

Inputs	Solid-State Discrete Outputs	Analog Outputs	Serial Output	Controller Models
1 Sensor pair & Trigger (Gate)	1 Reed & 1 NPN	–	RS-232 & RS-485	**MAC-1**
	2 NPN	–		**MACN-1**
	2 PNP	–		**MACP-1**
	1 NPN	(2) 0-10 V Sourcing	RS-232	**MACV-1**
	1 NPN	(2) 4-20 mA Sinking		**MACI-1**
1 Sensor pair & Trigger (Gate)	16 NPN	–	RS-232	**MAC16N-1**
	16 PNP	–		**MAC16P-1**

For more specifications see page 255.

QD models: A model with a QD requires a mating cordset (see page 254).

* One controller and an emitter/receiver pair (of matching length and resolution) required per 3-piece system.

Used with 2-Piece Arrays

Euro-Style with Shield
Straight connector models only

8-Pin
MAQDC-806
2 m (6')
MAQDC-8015
4.5 m (15')
MAQDC-830
9 m (30')
MAQDC-850
15 m (50')

Additional cordset information is available
See page 758

Used with 3-Piece Arrays

Communication Cordsets
Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDMC-506RA**)

5-Pin
MQDMC-506
2 m (13')
MQDMC-515
4 m (13')
MQDMC-530
9 m (30')

DIN-35-..

MSMB-3

Additional bracket information is available
See page 725

Stands

Additional information is available
See page 802

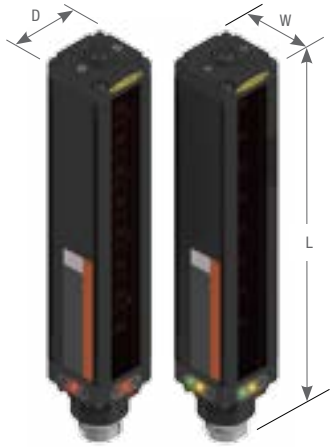
Enclosures

Additional information is available
See page 808

Lens Shields

Additional information is available
See page 812

MINI-ARRAY Controller



MINI-ARRAY Sensors

W = 38.1 mm D = 38.1 mm
L = Length (see model chart)

MINI-ARRAY® 3-Piece Set, Emitter/Receiver Specifications

Max Emitter/Receiver Range	**9.5 mm beam spacing:** **Length 201 to 1115 mm:** 6.1 m **Length 1267 to 1877 mm:** 4.6 m	**19.1 mm beam spacing:** **Length 201 to 1115 mm:** 16.5 m **Length 1267 to 1877 mm:** 13.5 m
Minimum Object Sensitivity	**9.5 mm Beam Spacing:** **Straight, Edge Modes:** 19.1 mm **Interlaced Mode:** 12.7 mm* **Skip Mode:** Multiply the above by the number of skipped beams, plus 1 **Interlaced Mode:** 12.7 mm* *Assumes sensing is in the middle 1/3 of sensing range	**19.1 mm Beam Spacing:** **Straight, Edge Modes:** 38.1 mm **Interlaced Mode:** 25.4 mm* **Skip Mode:** Multiply the above by the number of skipped beams, plus 1 **Interlaced Mode:** 25.4 mm*
Sensor Scan Time	55 microseconds per beam, plus 1 millisecond post process time per scan	
Power Requirements †Maximum current is for a 6' sensor	**9.5 mm beam spacing:** 12 V dc ±2%, supplied by controller **Emitter:** 0.10 A @ 12 V dc **Receiver:** 0.75 A @ 12 V dc†	**19.1 mm beam spacing:** 12 V dc ±2%, supplied by controller **Emitter:** 0.10 A @ 12 V dc **Receiver:** 0.50 A @ 12 V dc†
Status Indicators	**Emitter:** Red LED lights to indicate proper emitter operation **Receiver:** Green indicates sensors aligned (> 3x excess gain) Amber indicates marginal alignment of one or more beams (1x -3x excess gain) Red indicates sensors misaligned or one or more beam(s) blocked	
Construction	Aluminum, with black anodized finish; acrylic lens cover	
Environmental Rating	NEMA 4, 13; IP65	
Certification	CE c UL US	

MINI-ARRAY® 3-Piece Set, Controller Specifications

Power Requirements	16 to 30 V dc @ 1.25 amps max. (see current requirements for sensors); controller alone, (without sensors connected) requires 0.1 amp.
Inputs	**Sensor input (5 connections):** Emitter and receiver wire in parallel to five terminals **Trigger (Gate) input:** Optically isolated, requires 10 to 30 V dc (7.5K input impedance) for gate signal
Discrete Outputs	**MACN-1:** (2) Open collector NPN transistor outputs **MAC16P-1:** Sixteen open collector PNP transistor outputs **MAC16N-1:** Sixteen open collector NPN transistor outputs 30 V dc max, 150 mA max., short circuit protected **OFF-state leakage current:** less than 10 µA **ON-state saturation voltage:** less than 1 V @ 10 mA; less than 1.9 V @ 150 mA
Serial Data Outputs	RS-232, ASCII or binary data format **Baud Rate:** 9600, 19.2K, or 38.4K, 8 data bits, 1 start bit, 1 stop bit, even parity Clear data may be suppressed Header string may be suppressed in binary format
Analog Outputs	**Resolution:** Span/(Number of sensor channels) Linearity: 0.1% of Full Scale **Temperature variation:** 0.01% of Full Scale/ °C
Controller Programming	Via RS-232 PC-compatible computer running Windows XP, 2000, Vista, Windows 7 or Windows 8 and using Banner supplied software
Sensor Scan Time	**All models:** 55 microseconds per beam plus processing time Processing time is dependent on the scan analysis and the number of active outputs. This timing assumes a straight scan, continuous, and TBB mode **MACN-1:** 1 millisecond processing time **MAC16N-1 & MAC16P-1:** 2.3 to 7 milliseconds processing time
System Response Time	Outputs are not active for 5 seconds after system power up. Maximum response time for the system is two sensor scan cycles. A scan cycle includes a sensor scan plus any serial data transmission. Serial transmission (if activated) follows every sensor scan.
Status Indicators	The following status LEDs are located on the top surface of the module: **MACN-1:** OUT 1 (Red) - Indicates that output 1 is energized **MAC16N-1 & MAC16P-1:** OUT (Red) - Indicates that at least one output is active ALARM (Red) - Indicates that Output 2 is active/MAC16N-1 & MAC16P-1: Indicates output 16 is active GATE (Red) - Indicates voltage is applied to Trigger (Gate) input ALIGN (Green) - Indicates sensor aligned (excess gain > 1x) DIAG1 (Green) - Indicates power is applied to the module DIAG2 (Red) - Indicates receiver failure DIAG3 (Red) - Indicates emitter failure
Construction	Polycarbonate
Environmental Rating	NEMA 1; IP20
Operating Conditions	**Temperature:** -20 to +70 °C **Relative humidity:** 95% (non-condensing)
Certifications	CE UL LISTED

MINI-ARRAY® 2-Piece Set, Emitter/Receiver Specifications

Emitter/Receiver Range	**9.5 mm beam spacing:** **Array Length 231 to 1146 mm:** 6.1 m **Array Length 1298 to 1908 mm:** 4.6 m	**19.1 mm beam spacing:** **Array Length 231 to 1146 mm:** 16.5 m **Array Length 1298 to 1908 mm:** 13.5 m
Minimum Object Sensitivity	**9.5 mm Beam Spacing:** **Straight, Edge Modes:** 19.1 mm **Interlaced Mode:** 12.7 mm* **Skip Mode:** Multiply the above by the number of skipped beams, plus 1 **Interlaced Mode:** 12.7 mm* *Assumes sensing is in the middle 1/3 of sensing range	**19.1 mm Beam Spacing:** **Straight, Edge Modes:** 38.1 mm **Interlaced Mode:** 25.4 mm* **Skip Mode:** Multiply the above by the number of skipped beams, plus 1 **Interlaced Mode:** 25.4 mm*
Sensor Scan Time	0.9-27.1 ms depending on scan mode, array length and beam spacing	
Supply Voltage and Power	16 V dc to 30 V dc; maximum power 12 watts	
Status Indicators	**Emitter:** Red LED lights to indicate proper emitter operation **Receiver:** Green indicates sensors aligned (> 3x excess gain) Amber indicates marginal alignment of one or more beams (1x -3x excess gain) Red indicates sensors misaligned or one or more beam(s) blocked	
Construction	Aluminum, with black anodized finish; acrylic lens cover	
Environmental Rating	NEMA 4, 13; IP65	
Certification	CE cULus	