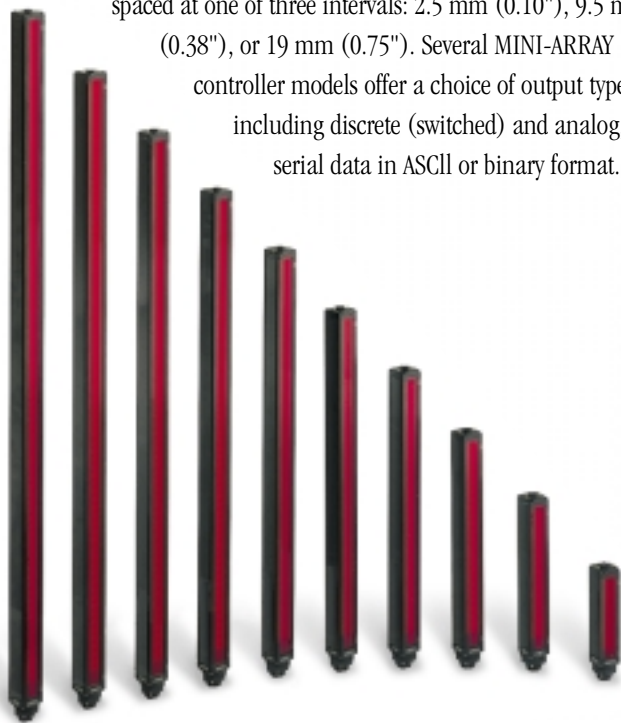# MINI-ARRAY™ Measuring Light Screens

The MINI-ARRAY is a programmable measuring light screen system ideally suited for inspection and profiling applications. Each system consists of a controller module, emitter/receiver pair, and two inter-connecting cables. Controller modules are programmable for a variety of measurement modes, scanning modes, and output configurations. Features:

- Compact sensors measure only 38 mm (1.5") square
- Choose models with either 9.5 mm (0.38") or 19 mm (0.75") beam spacing (see selection chart for range and resolution information)
- Ten sensing array lengths are available (see selection chart)
- Highly-visible status indicators are visible from front, right and left side of he sensors
- Sensors connect to choice of several controllers (see selection chart), including models with DeviceNet™ BUS network interface
- Advanced MINI-ARRAY configuration software is supplied
- Also available in a 16 discrete out put version

Choose from 10 emitter/receiver heights.

MINI-ARRAY sensors are available in 10 array lengths from 130 mm (5") to 1.8 m (6'), and with beams spaced at one of three intervals: 2.5 mm (0.10"), 9.5 mm (0.38"), or 19 mm (0.75). Several MINI-ARRAY controller models offer a choice of output types, including discrete (switched) and analog, plus serial data in ASCII or binary format. Heated enclosures are available for toll booth and similar outdoor applications. Versatile and compact MINI-ARRAY sensors are available in 10 array lengths from 130 mm (5") to l.8 m (6'), and with beams spaced at one of three intervals: 2.5 mm (0.10"), 9.5 mm (0.38"), or 19 mm (0.75"). Several MINI-ARRAY controller models offer a choice of output types, including discrete (switched) and analog, plus serial data in ASCll or binary format.

Optional built-in DeviceNet™ fieldbus.

This model provides the user with the ability to centrally monitor and control the operating status and diagnostics of several light screens at once over a DeviceNet control network. The following MINI-ARRAY communications are available through DeviceNet, and can be utilized through change of state or polled communication protocol.

Device Information: manufacturer, product name, device type, model and revision.

Configuration: analysis mode selections, scan control selection, output settings (set point, hysteresis and invert), and blanking selections.

Sensor Alignment Information: total number of sensor beams, beam status and alignment status.

**Status Information:** measurement modes result, alignment status, beam status and blanked beam status.

Diagnostic Information: number of emitter beams, number of receiver beams, and MINI-ARRAY System status.

A choice of heated enclosures for difficult environments.

The MINI-ARRAY is available with heated enclosures for outdoor applications such as toll booth vehicle scanning and similar uses. They are available in 1.2, 1.5 and 1.8 m (4, 5, and 6') array lengths in both painted aluminum and stainless steel materials for all environments. Power supplies for these enclosures are also available. See page 49.

MINI-ARRAY™ Model Selection
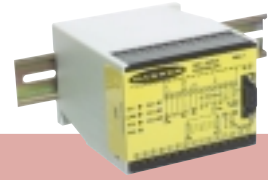
MINI-ARRAY Controller Models (one required per system)

Models Data Sheet*	Supply Voltage	Inputs	Output 1	Output 2	Serial Output	Dimensions (h x w x d)
MAC-1 43298	16 to 30V dc	1 Sensor pair 1 Gate	Discrete Reed relay	Discrete NPN	RS-232 and RS-485	110 x 100 x 75 mm (4.3 x 3.9 x 3.0")
MACN-1 43298			Discrete NPN			
MACP-1 43298			Discrete PNP	Discrete PNP		
MACV-1 48439			(2) Analog 0 to 10V dc Sourcing	Discrete NPN	RS-232	
MACI-1 48439			(2) Analog 4 to 20 mA Sinking			

* Download datasheet at www.baneng.com

MINI-ARRAY Controllers with 16 Discrete Outputs (one required per system)

Models Data Sheet*	Supply Voltage	Inputs	Outputs	Serial Data Outputs	Dimensions (h x w x d)
MAC16N-1 59115	16 TO 30V dc	1 Sensor pair 1 Gate	16 discrete NPN	RS-232	110 x 100 x 75 mm (4.3 x 3.9 x 3.0")
MAC16P-1 59115			16 discrete PNP		

* Download datasheet at www.baneng.com

MINI-ARRAY Controllers with DeviceNet™ (one required per system)

Models Data Sheet*	Supply Voltage	Inputs	Outputs	Databus Protocol	Dimensions (h x w x d)
MACNXDN-1 59437	16 TO 30V dc	1 Sensor pair 1 Gate	2 discrete NPN	DeviceNet™ (EDS file included)	110 x 100 x 75 mm (4.3 x 3.9 x 3.0")
MACPXDN-1 59437			2 discrete PNP		

* Download datasheet at www.baneng.com

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MINI-ARRAY Measuring Light Screen Sensor Models

Models		Array Height	Total Beams	Minimum Object Size	Range	Cable
Array of 16 beams/foot						
BMEL616A **BMRL616A**	Emitter Receiver	143 mm (5.6")	8	38.1 mm (1.5") Interlaced Mode: 25.4 mm (1.0")	0.9 to 17 m (3 to 55')	5-pin QD cable (ordered separately) **Model** Length **QDC-515C** 4.6 m (15') **QDC-525C** 7.6 (25') **QDC-550C** 15.2 m (50') **MAQDC-575C** 22.7 m (75') **MAQDC-5100C** 30.3m (100') **MAQDC-5125C** 37.9 m (125') **MAQDC-5150C** 45.5m (150')
BMEL1216A **BMRL1216A**	Emitter Receiver	295 mm (11.6")	16			
BMEL1816A **BMRL1816A**	Emitter Receiver	448 mm (17.6")	24			
BMEL2416A **BMRL2416A**	Emitter Receiver	600 mm (23.6")	32			
BMEL3016A **BMRL3016A**	Emitter Receiver	752 mm (29.6")	40			
BMEL3616A **BMRL3616A**	Emitter Receiver	905 mm (35.6")	48			
BMEL4216A **BMRL4216A**	Emitter Receiver	1057 mm (41.6")	56			
BMEL4816A **BMRL4816A**	Emitter Receiver	1210 mm (47.6")	64			
BMEL6016A **BMRL6016A**	Emitter Receiver	1514 mm (59.6")	80		0.9 to 14 m (3 to 45')	
BMEL7216A **BMRL7216A**	Emitter Receiver	1819 mm (71.6")	96			
Array of 32 beams/foot						
BMEL632A **BMRL632A**	Emitter Receiver	143 mm (5.6")	16	19.1 mm (0.75") Interlaced Mode: 12.7 mm (0.50")	0.6 to 6.1 m (2 to 20')	5-pin QD cable (ordered separately) **Model** Length **QDC-515C** 4.6 m (15') **QDC-525C** 7.6 m (25') **QDC-550C** 15.2 m (50') **MAQDC-575C** 22.7 m (75') **MAQDC-5100C** 30.3m (100') **MAQDC-5125C** 37.9 m (125') **MAQDC-5150C** 45.5m (150')
BMEL1232A **BMRL1232A**	Emitter Receiver	295 mm (11.6")	32			
BMEL1832A **BMRL1832A**	Emitter Receiver	448 mm (17.6")	48			
BMEL2432A **BMRL2432A**	Emitter Receiver	600 mm (23.6")	64			
BMEL3032A **BMRL3032A**	Emitter Receiver	752 mm (29.6")	80			
BMEL3632A **BMRL3632A**	Emitter Receiver	905 mm (35.6")	96			
BMEL4232A **BMRL4232A**	Emitter Receiver	1057 mm (41.6")	112			
BMEL4832A **BMRL4832A**	Emitter Receiver	1210 mm (47.6")	128			
BMEL6032A **BMRL6032A**	Emitter Receiver	1514 mm (59.6")	160		0.6 to 4.6 m (2 to 15')	
BMEL7232A **BMRL7232A**	Emitter Receiver	1819 mm (71.6")	192			

For dimension drawings, see page 47.

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High-Resolution MINI-ARRAY™ Measuring Light Screens

Ultra-precise monitoring & inspection.

The High-resolution MINI-ARRAY™ excels at high-speed, precise monitoring and inspection applications. A system consists of a high resolution emitter/receiver pair, one of four compact controller modules (see selection chart), and two interconnecting quick-disconnect cables. Software is included which allows any PC running Windows® 3.1, 95, 98, or NT to configure the system.

Features:

- Reliable 2.5 mm (0.10") minimum detection throughout the entire array
- Controllers available with either discrete or analog outputs (see chart)
- Comprehensive configuration options: 7 measurement modes, 3 scanning methods, beam blanking, selectable scan initiation control modes, programmable hysteresis at high and low limits, and choice of serial communication mode
- Sensors have wide field of view for easy and reliable alignment
- Low cost, compared with competitive measuring light screen systems

A choice of 12 array heights to fit your precision measurement applications.

Choose models from 163 mm to 1951 mm (6.4" to 76.8") to meet all your application needs, including on-the-fly sizing, profiling, precision edge and center guiding, hole detection and similar process monitoring and inspection applications.

Excellent range & easy alignment.

The High-Resolution MINI-ARRAY features a 2 m (6') range with easy, forgiving alignment and a unique, TEACH setup routine that equalizes the gain of each sensing channel to the optimum level and automatically blanks any blocked areas along the length of the light curtain.

High Resolution MINI-ARRAY Controller Models (one required per system)

Models Data Sheet*	Supply Voltage	Inputs	Output 1	Output 2	Serial Output	Dimensions (h x w x d)
MAHCN-1 55233	16 to 30V dc	1 sensor pair 1 Gate	Discrete NPN	Discrete NPN	RS-232 and RS-485	110 x 100 x 75 mm (4.3 x 3.9 x 3.0")
MAHCP-1 55233			Discrete PNP	Discrete NPN		
MAHCV-1 55233			(2) Analog 0 to 10V dc Sourcing	Discrete NPN	RS-232	
MAHCI-1 55233			(2) Analog 4 to 20 mA Sinking			

* Download datasheet at www.baneng.com

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High Resolution MINI-ARRAY Measuring Light Screen Sensor Models

Models		Array Height	Total Beams	Minimum Object Size	Range	Cable
MAHE6A	Emitter	163 mm	64	2.5 mm (0.10")	0.4 to 1.8 m (15 to 72")	5-pin QD cable (ordered separately)
MAHR6A	Receiver	(6.4")				
MAHE13A	Emitter	325 mm	128			
MAHR13A	Receiver	(12.8")				
MAHE19A	Emitter	488 mm	192			
MAHR19A	Receiver	(19.2")				
MAHE26A	Emitter	650 mm	256			
MAHR26A	Receiver	(25.6")				
MAHE32A	Emitter	813 mm	320			
MAHR32A	Receiver	(32.0")				
MAHE38A	Emitter	975 mm	384			
MAHR38A	Receiver	(38.4")				
MAHE45A	Emitter	1138 mm	448			
MAHR45A	Receiver	(44.8")				
MAHE51A	Emitter	1300 mm	512			
MAHR51A	Receiver	(51.2")				
MAHE58A	Emitter	1463 mm	576			
MAHR58A	Receiver	(57.6")				
MAHE64A	Emitter	1626 mm	640			
MAHR64A	Receiver	(64.0")				
MAHE70A	Emitter	1788 mm	704			
MAHR70A	Receiver	(70.4")				
MAHE77A	Emitter	1951 mm	768			
MAHR77A	Receiver	(76.8")				

Cable models:

Model	Length
QDC-515C	4.6 m (15')
QDC-525C	7.6 m (25')
QDC-550C	15.2 m (50')

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106.0 mm (4.17")
115.0 mm (4.53")
81.0 mm (3.19")

38.1 mm Square (1.50")

71 mm (2.8")

R13 mm(0.5") Minimum Bend

System Configuration

Many options, yet easy to program

The software included with the control module makes it easy to configure the **MINI-ARRAY** using your PC-compatible computer*. Simply load the software, access the program, perform the "Ping" procedure to select the desired controller, and access the Edit PSF Configuration screen, shown below. Each option is easily selectable, using your mouse and the pop-up menu-style selections.

Running Windows® 3.1, 95, 98, or NT - High Resolution MINI-ARRAY Programming shown here

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Selected Controller
Identifies the specific control module being configured.

Analysis (Measurement) Mode Selection
Choose the measurement option that best tells you the size and/or position of objects as they relate to the array.

Serial Communication
Changes the identification and baud rate of the controller being configured.

Serial Transmission
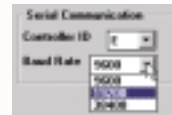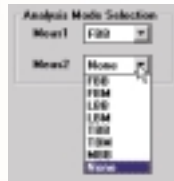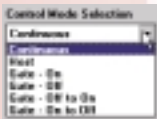Specifies the type of data transmitted from the control module to its host after each scan.
Measurement Mode Result: Data transmitted will reflect the Analysis Mode selections.
All Mode: Transmits all data.
Max. Meas. Mode: Sends only the largest measurement in each measuring event, to decrease transmission size and speed response. Choose to send when the array is clear or send at the host's request.
Transmission Type: ASCII or Binary, defines the format in which the data will be sent.
Serial Options: Suppress Clear Data or Suppress Header to decrease transmission size and speed response.

Control Mode Selection
Continuous Mode: The control module constantly polls the array for status.
Host Mode: The control module polls the array for status when prompted by a host controller.
Gate Mode: The control module polls the array for status when prompted by an input from a Gate sensor.

Scanning Method
Straight scan polls each beam sequentially to determine the target object's overall size. This is the most accurate and precise measurement, but also the most time-consuming.

Single Edge scan requires the target object to block beam 1 (closest to the sensors' cabled ends), then conducts a time-saving binary search to "hunt" for the target's overall height (one variable edge).

Double Edge scan conducts a binary search of the entire array to "hunt" for the target's overall width (two variable edges).
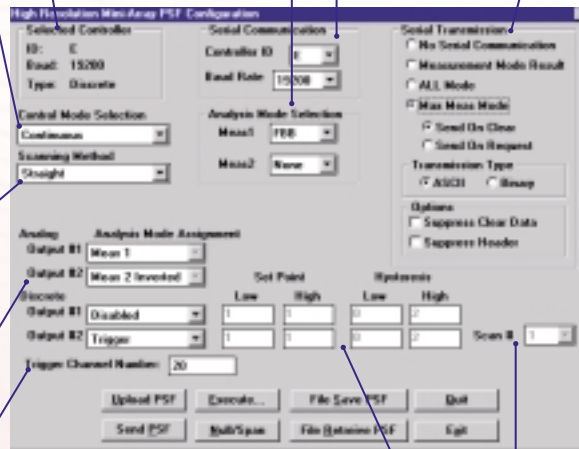
Trigger/Trigger Channel Number
May be used to trigger (or gate) the scan sequence of another **A-GAGE High-Resolution MINI-ARRAY** controller; in straight scanning mode, it defines when during each scan discrete Output #2 will change state.

Scan #: (1-9) Analog outputs are updated with an average value of the data received during the selected number of scans; discrete outputs respond only if the received data is identical for all of the selected number of consecutive scans.

Analog and Discrete Output Assignment
Assigns an analysis (measurement) mode to each output.
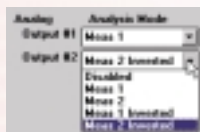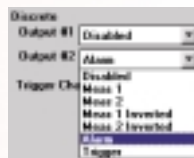
Set Point and Hysteresis Selection
Assigns the set point to determine where within the array the output(s) will respond and hysteresis values to smooth output response.

Alarm: Causes the control module to turn on discrete Output #2 whenever the System detects a sensing error or if the optical signal becomes marginal.