AG4
Safety Laser Scanners

- Two-dimensional laser scanners effectively protect personnel, as well as stationary and mobile systems within a user designated area.
- Persons or objects entering the protection field will be detected and a protective (safety) stop signal will be generated.
- Eight protective and warning field pairs are individually defined using a PC.
- Protective field resolution is from 30 to 150 mm with ranges up to 4 or 6.25 m.
- The warning field can be set for up to 15 m with a resolution of 150 mm.
- Scanner has a 0.36° lateral resolution and detects objects in a 190° working zone.
- Two solid-state OSSD safety outputs (250 mA) and two solid-state auxiliary outputs (100 mA).
- The highly flexible protective and warning fields can be set to match the shape of the work area.
- Exceeds OSHA/ANSI Control Reliability requirements, certified to cTUVus, and CE certified to Type 3, Cat 3 PLd, and SIL 2
- Response time is 80 milliseconds (default), adjustable to 640 milliseconds.
- Compact design, simple installation and easy-to-use software provide efficient integration into work areas.
- Rugged, die-cast aluminum housing withstands the rigor of factory floors.
- 5-LED display presents system status and diagnostics of devices without connecting to a PC.

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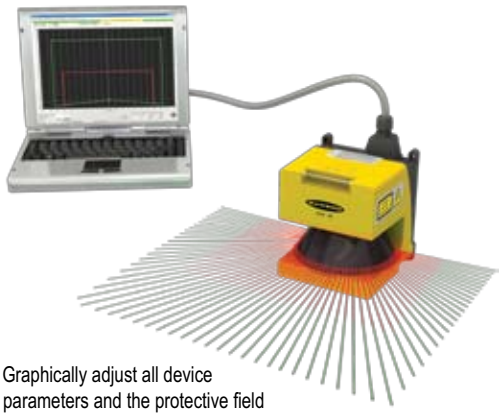
Configuration and diagnostic software



Graphically adjust all device parameters and the protective field contours to both local conditions and required safety distances.

Configuration parameters are permanently stored in the configuration plug, providing easier storage and device replacement without a PC.

ONLINE
AUTOCAD, STEP, IGES & PDF

AG4 Safety Laser Scanner, 24V dc

Range		Safety Output	Aux. Outputs	Scanning Angle	Response Time	Model*
Protective Fields	Warning Fields					
30 mm Resolution = 1.6 m 40 mm Resolution = 2.2 m 50 mm Resolution = 2.8 m 70 mm Resolution = 4.0 m 150 mm Resolution = 4.0 m	150 mm Resolution = 15 m	2 PNP OSSD	2 PNP	190°	80 ms (Default) adjustable to 640 ms	**AG4-4E**
30 mm Resolution = 1.6 m 40 mm Resolution = 2.2 m 50 mm Resolution = 2.8 m 70 mm Resolution = 6.25 m 150 mm Resolution = 6.25 m						**AG4-6E**

* Model includes scanner, plugs and CD with diagnostic and configuration software. Cordset ordered separately (see page 506).

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AG4-TB1 Test Box

With the test box it's possible to test the following Scanner functions without hooking it up to the machine interface:

- Switch over between the different field pairs
- Indication of the Safety OSSD outputs (when entering protective field)
- Indication of the Alarm outputs (when entering warning field)
- Can be used as a "cloning" device to load the same configuration into multiple scanners
- Machine Interface-to-Test Box cordset included
- Power supply not included

AG4 Safety Laser Scanner Kits

You can purchase a kit that contains a laser scanner, optional interfacing solutions and cordsets.

- *Scanner* *page 503*
- *Interfacing Options* *506*
- *Cordsets* *506*

To Order:

1. Choose an optional interfacing solution, such as an **UM-FA-9A** or **-11A** universal input safety module.
2. Choose a DB15 machine interface cordset, such as **AG4-CPD15...**
3. Choose a PC communication cordset, such as **AG4-PCD9...**

See www.bannerengineering.com for complete documentation and a current listing of accessories.

Kit Model Key

Scanner	Kit		Range		Interfacing Options	Machine Interface Cordset Options	PC Cordsets
AG4	K	—	4E	—	10	M10	P10

Kit
K = Kit

Range
4E = 4 m
6E = 6 m

Interfacing Options
Blank = None
10 = UM-FA-9A
11 = UM-FA-11A
12 = MMD-TA-11A
13 = MMD-TA-12A

Machine Interface Cordset Length Options
M5 = 5 m
M10 = 10 m
M25 = 25 m
M50 = 50 m

PC Cordsets (optional)
P3 = 3 m
P5 = 5 m
P10 = 10 m

AG4 Laser Scanner Specifications

Supply Voltage (UB)	24V dc (+20% / -30%) Power supply in acc. with IEC 742 with safe supply isolation and compensation with voltage dips of up to 20 milliseconds in acc. with EN 61496-1. **Over current protection:** Via 1.6 A fuse, melting fuse in the cabinet **Over-voltage protection:** Over-voltage protection with safe limit stop **Protective earth conductor:** Connection not permitted	
Supply Current	420 mA approx. (use 2.5 A power supply)	
Fuse (power supply)	1.6A normal blow, medium time lag fuse (user supplied)	
Response Time	Min. 80 milliseconds (2 scans) Max. 640 milliseconds (16 scans)	
Wavelength	905 nm	
Protection Field (Sensing Range)	**AG4-4E:** **150 mm resolution:** 200 mm to 4.0 m (radius) **70 mm resolution:** 200 mm to 4.0 m (radius) **50 mm resolution:** 200 mm to 2.8 m (radius) **40 mm resolution:** 200 mm to 2.2 m (radius) **30 mm resolution:** 200 mm to 1.6 m (radius) **Sensing object reflectance:** Minimum 1.8%	**AG4-6E:** **150 mm resolution:** 200 mm to 6.25 m (radius) **70 mm resolution:** 200 mm to 6.25 m (radius) **50 mm resolution:** 200 mm to 2.8 m (radius) **40 mm resolution:** 200 mm to 2.2 m (radius) **30 mm resolution:** 200 mm to 1.6 m (radius) **Sensing object reflectance:** Minimum 1.8%
Warning Field	**Resolution:** 150 mm (at 15 m) **Sensing range (radius):** 200 mm to 15 m **Sensing object reflectance:** Minimum 20%	
Monitored Area	0-50 m	
Scanning Angle	max. 190°	
Output Signal Switching Devices (OSSD1, OSSD2)	**PNP open-collector transistor 2 outputs:** short circuit proofed **Rated operating voltage:** supply voltage (UB) -3.2 V **Max. source current**: 250 mA **Residual voltage:** 3.2 V or less **Operation mode:** **No object in protection field:** ON **Object inside protection field:** OFF **Response Time:** Min. 80 milliseconds (2 scans) to max. 640 milliseconds (16 scans) switching method	
Alarm (Auxiliary) Outputs 1 & 2	PNP open-collector transistor **Rated operating voltage:** supply voltage (UB) -4 V **Max. source current:** 100 mA **Residual voltage:** 4 V or less **Operation mode:** Switching method of operation mode (set below) **Scanner at normal operation:** ON **Abnormal operation:** OFF **No object inside Warning Field:** ON **Object inside Warning Field:** OFF **Response Time:** Min. 80 milliseconds (2 scans) to max. 640 milliseconds (16 scans) switching method	
Start-restart	+24V opto-uncoupled, dynamically monitored	
Field Pair Switchover	Selection of 4 or 8 field pairs via 4 control lines, +24V opto-uncoupled, dynamically monitored, logically 1 = field pair activated	
Input Signal Definition	**High/logical 1:** 16-30V **Low/logical 0:** less than 3V	
Laser Protection Class	Class 1 (IEC 60825-1)	
Number of Field Pair Configurations	8 Field Pairs in combination of Protective Field and Warning Field can be switched over by external input. Field Pair number 8 is not user configurable.	
Environmental Rating	IP65 (per IEC 60529)	
Housing Material	Die-cast aluminum with a thermoplastic resin window	
Weight	2.1 kg	
Operating Conditions	**Temperature:** 0° to 50°C **Humidity:** Max. 95%	
Indicators	Five LEDs on front show Safety Sensor Status	
Shock and Vibration	10 to 150 Hz frequency, 5 G max. (50 m/s^2 approx.) in X, Y and Z directions for twenty times each	
Max Cordset Length	**15-pin plug:** 50 m **9-pin plug:** 10 m (RS-232C), 50 m (RS-422)	

More on next page

AG4 Laser Scanner Specifications (cont'd)

Design Standards	IEC 61496-1/-3 (Type 3), ISO 13849-1 (Category 3, PLd), IEC 61508-1 to -7 (SIL2) and IEC 62061 SIL CL2
Certifications	TUV Rheinland of North America, a Nationally Recognized Test Laboratory (NRTL) in the United States according to OSHA 29 CFR 1910.7, and accredited by the Standards Council of Canada to test and certify products to Canadian National Standards, has certified the AG4 Laser Scanner to all applicable U.S. and Canadian National Standards. The cTUVus mark is recognized throughout the United States and Canada by OSHA and the SCC.
Wiring Diagrams	WD020, WD021, WD022 (pp. 786-787)

AG4 Interfacing Products

		Description	Models	Product Information
Interface Modules and Controllers		• Universal input safety modules monitors both contact-based and PNP solid-state input devices. • Convenient plug-in terminal blocks on a 22.5 mm DIN-rail mountable housing.	**UM-FA-9A** (3 NO)	Page 539
			UM-FA-11A (2 NO/1NC)	
		• One controller provides configurable monitoring of multiple safety devices. • 22 input terminals can monitor both contact-based and PNP solid-state input devices. • 3 pairs of independent solid-state safety outputs can be used with selectable one- or two-channel external device monitoring. • Ten configurable non-safety status outputs track inputs, outputs, lockout, I/O status and other functions. • All SC22-3 modules use 24V dc. • 10/100 Base TX Ethernet communication option using EtherNet/IP and Modbus TCP protocols (SC22-3E models).	**SC22-3-S...**	Page 526
			SC22-3-C...	
			SC22-3E-S...	
			SC22-3E-C...	
Muting Modules		• The Muting Module temporarily inhibits a safety laser scanner so materials can safely pass through the screen without stopping the machinery. • The module uses redundant microcontroller-based logic.	**MMD-TA-12B**	Page 544
			MMD-TA-11B	

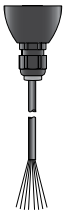
NC = Normally closed, NO = Normally open

Cordsets

DB15 Machine Interface

See page 704

Length	Model
5.00 m	**AG4-CPD15-5**
10.0 m	**AG4-CPD15-10**
25.0 m	**AG4-CPD15-25**
50.0 m	**AG4-CPD15-50**



DB9 PC Communication*

See page 703

Length	Model
3.00 m	**AG4-PCD9-3**
5.00 m	**AG4-PCD9-5**
10.0 m	**AG4-PCD9-10**

* RS-232 Serial protocol

DB9 to USB†

See page 704

Length	Model
1.00 m	**AG4-PCD9USB-1**

† Not recommended for use with AG4-PCD9-10

Additional cordset information available. See page 679.

Bracket

Swivel

pg. 628

AG4-MBK1

Additional bracket information available. See page 620.

Test Box

Configuration & Test Box

AG4-TB1

Misc. Replacement Parts

Description	Model
Replacement window	**AG4-WIN1**
Replacement configuration plug, straight	**AG4-CPD15**
Replacement PC plug, straight	**AG4-PCD9**

Description	Model
Cleaning set (150 ml fluid)	**AG4-CLN1**
Cleaning set (1000 ml fluid)	**AG4-CLN2**