Safety Laser Scanner

F3G-C

- Protective field 6 m
- Warning field 7.5 m
- Scanning angle range 3oo degrees
- Type 3 / Category 3
- BIA approval
- Safety relay outputs
- Simple connection and setup

Flexible safeguarding of areas and advanced warning functionality for 300 degree angle.

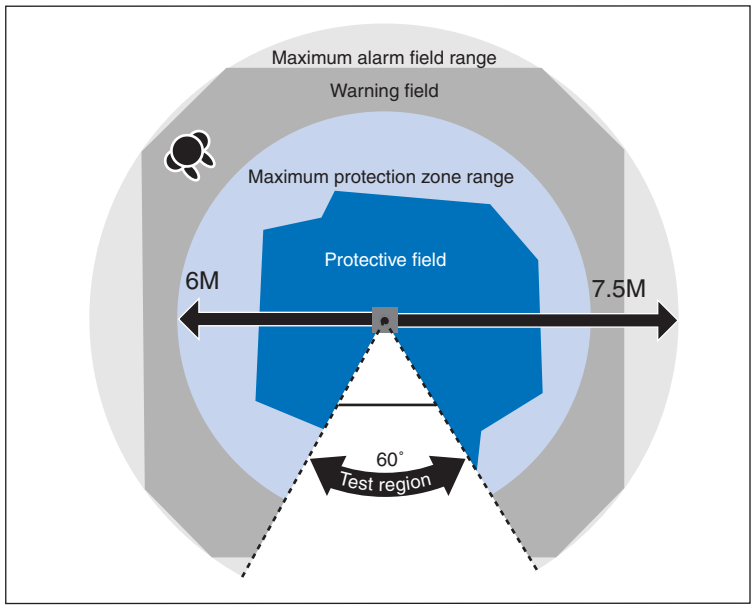
Features

Wider Scan Area

Sensing Range

Long range sensing is provided up to a 6 m radius for the protective field and a 7.5 m radius for the warning field.

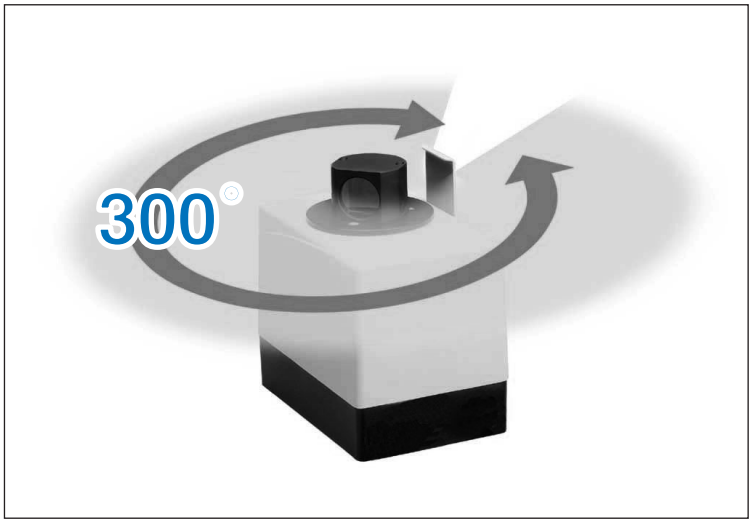
The zone dimensions and shape settings are defined by the user with the software provided with the sensor.



Scanning Angle

Generally, safety laser scanners have a scanning angle of 180° to 190°, but the F3G-C can sense movement within 300° range.

For example, normally two scanners would be required to monitor two surfaces of a large machine, but only one F3G-C Scanner is required if it is installed at the corner of the machine.



Easy Setup

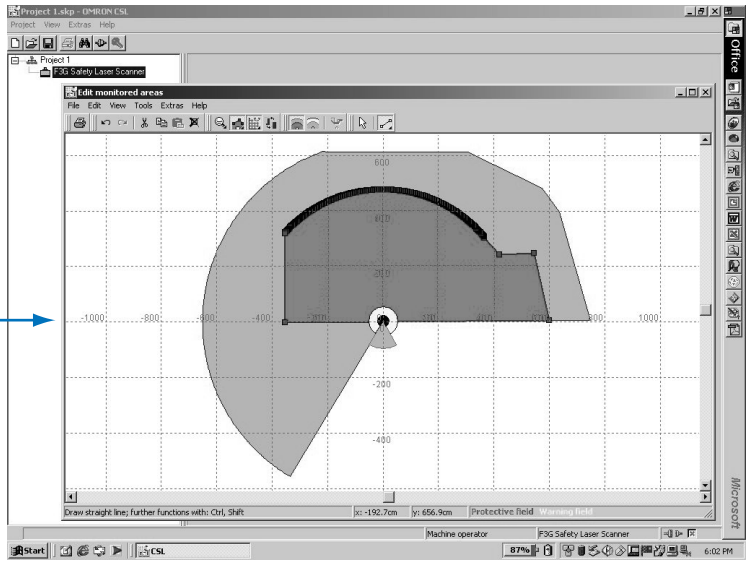
The protective field and warning field can be easily set up from a personal computer using the CSL Setup Sotware provided with the scanner

Settings can be protected from changes by using a password preventing unintentional changes.

The system requirements for running CSL Setup Software are as follows:
- CPU: Intel Pentium PC, 233 MHz or higher
- RAM: 64 MB or higher
- RS-232C: Serial interface*

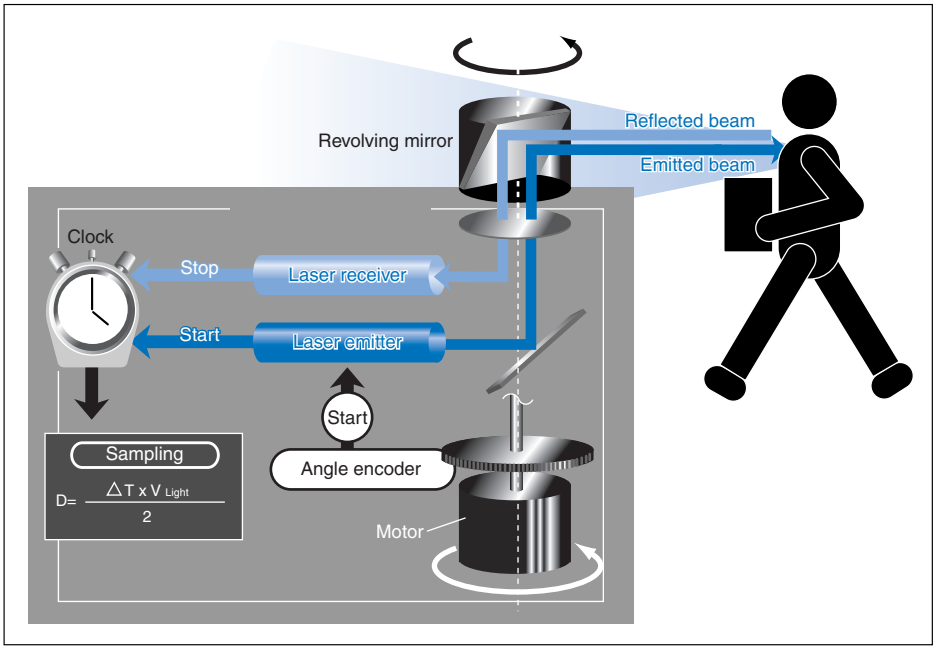
* The software may not function properly if a USB/RS-232C Serial Conversion Adapter is used, ask your OMRON representative

- OS: Microsoft Windows 95, 98, NT 4.0, ME, 2000 Professional or XP
- CD-ROM Drive



Principle of Operation

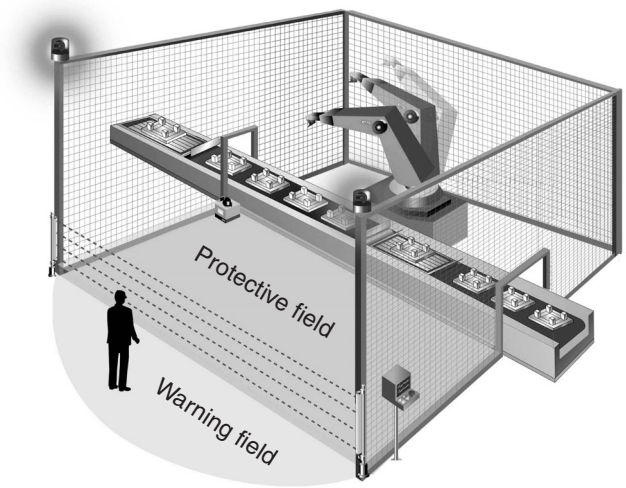
The F3G-C1R70 Safety Laser Scanner emits a pulse laser beam in all directions over a 360° range using a revolving mirror. The laser pulses are reflected of surrounding objects and the sensor receives reflected light through a photodiode. The distance to the object is calculated according to the time from when the laser emits the beam until the sensor receives the light. The direction of the measurement beam ist determined by the angle encoder. Of the total scanning range of 360°, the actual scanning angle is 300° after subtracting 60° due to reflection from the base target.



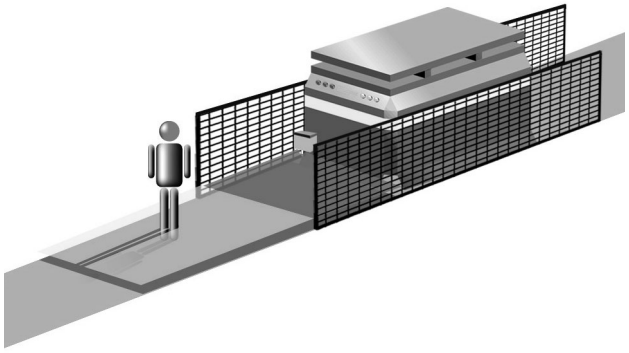
Application

Safety laser scanner guards and protects the hazardous area of a handling robot.

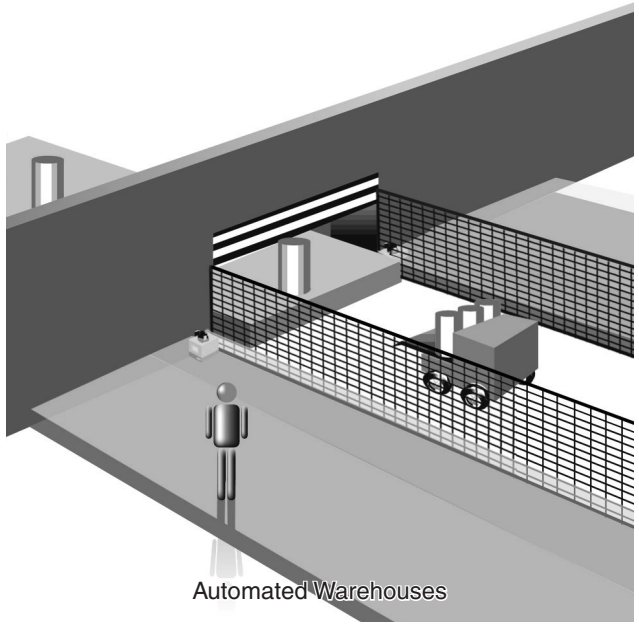
The safety laser scanner monitors the warning and protective field between the robot and the safe area. If a person intrudes the warning field a signal is generated and the person has the possibility to turn without shutting down the machine. If the person is entering the protective field he is to close to the hazard, the machine shut down to a safe status. As soon as the protective field is free , the machine can be restarted safely.



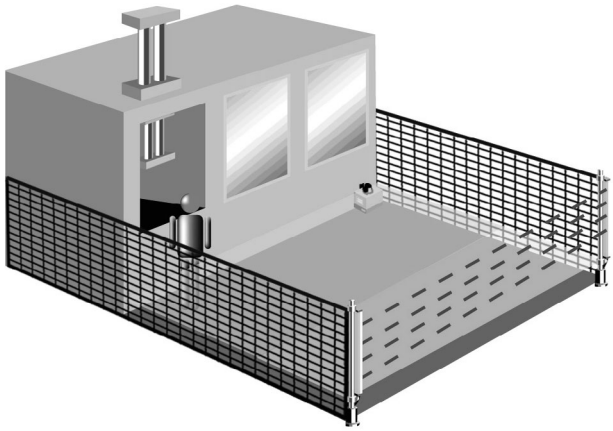
Robots



AGV pathways



Automated Warehouses



Automated machinery

List of Models

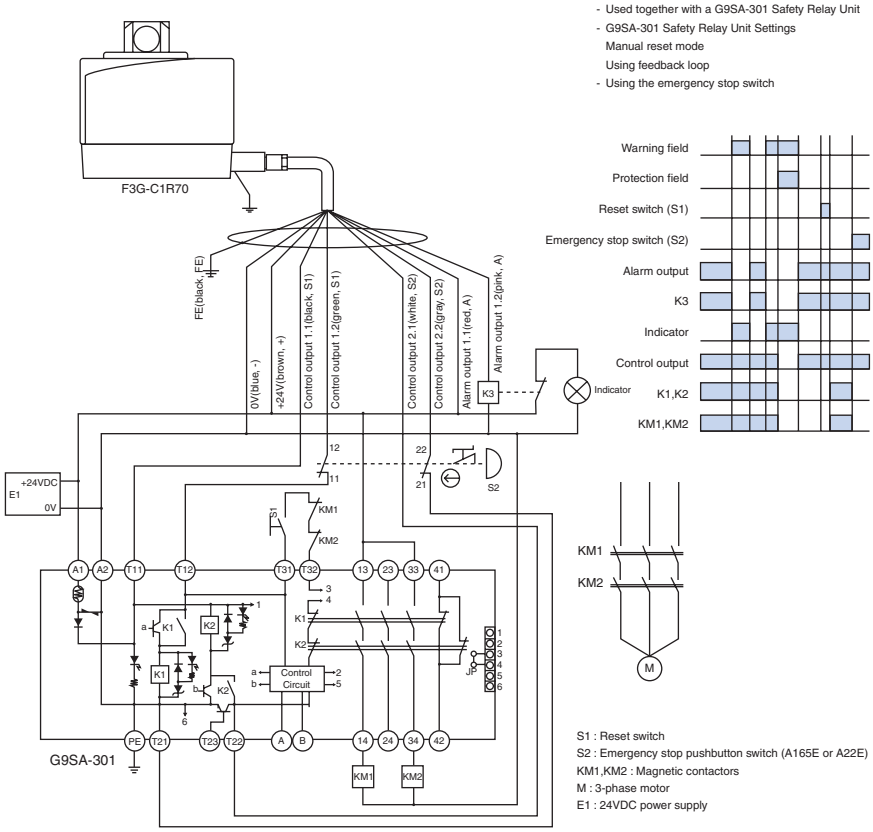
Appearance	Product Name	Model	Remarks
	Safety laser scanner	F3G-C1R70	Includes setup software CD
	Power supply cable	F39-JG5A	One cable required for each sensor
	Communications cable	F39-JG5R	Required for setup only

Ratings and Performance

Item	Model	F3G-C1R70
Safety category		Conforms to Type 3 ESPE EN/IEC 61496-1
Sensing range (includes area of permitted deviation)		Protective field: 0 to 6 m Warning field: 0 to 7.5 m
Scanning angle		300°
Detection capability		Non-transparent, 70 mm in diameter (reflective rate of 1.8% min.)
Response time		280 ms max.
Reactivation time		200 to 5,000 ms (adjustable)
Supply voltage		24 VDC ±25% (ripple: 5 V p-p max, except for voltage drop due to cable extension
Power consumption		24 W
Light source		Infrared laser diode (wavelength: 905 nm)
Laser protection class		Laser class 1 product conforms to following standards: EN 60825-1, IEC 825-1, JIS C 6802, and 21 CFR 1040.10
Control output (output signal switching device)		Relay output: SPST-NO contact x 2 outputs, 30 V, 2 A (cos =1) max. Switch life expectancy: 2,000,000 operations
Warning output (non-safety output)		Relay output: SPST-NO contact, 30 V, 2 A (cos =1) max. Switch life expectancy: 2,000,000 operations
Protection		Control circuit: 3.15 A fuse (medium slow blow) Output: 2 A self resetting fuse
Connection method		Power supply, output 8-pin round connector (manufactured by Binder, 423 Series) Computer connection: 14-pin round connector (manufactured by Binder, 423 Series)
Communication method with computer		RS-232C
Ambient temperature		Operating 0 to 50 °C, Storage -20 to 70 °C
Ambient humidity		Operating/Storage: 5% to 95% (with no condensation)
Vibration resistance (malfunction)		10 to 55 Hz with a 0.7 mm double amplitude, 20 sweeps each in X, Y, and Z directions
Shock resistance		100 m/s², 1,000 times each in X, Y, and Z directions
Degree of protection		IP65 (IEC 60529)
Cable (sold separately)	Power supply, output	0.5 mm², 8-wire, mesh shield; maximum extension length: 20 m; allowable bending radius: 90 mm
	Connection to computer	Maximum extension length: 5 m; allowable bending radius: 112 mm
Materials		Case: Aluminium; Optical surface, display: Glass
Weight		Sensor only: Approximately 3,0 kg; In packaging: Approximately 4.4 kg
Accessories		Instruction manual, CSL Setup Software (CD-ROM), and mounting screws (four M4x10)

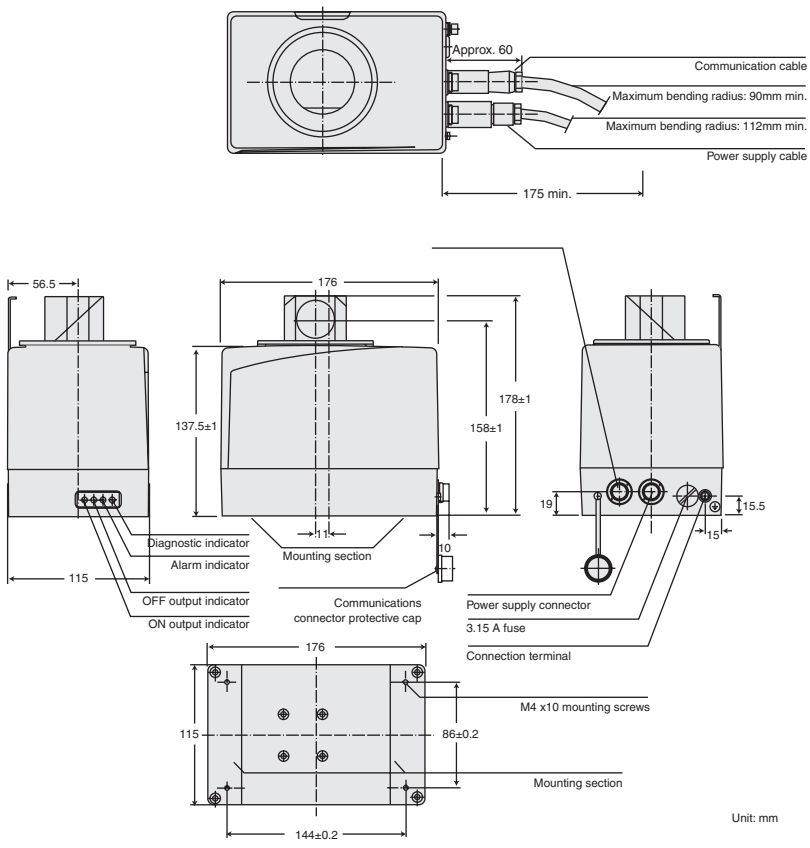
Connection Example (Category 3)

Connection with a G9SA-301 Safety relay Unit



Dimensions

F3G-C1R70



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. E16E-EN-01