

Installation Instructions

SafeShield DeviceNet™ Interface

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Specifications

Connection Cable Selection Guide

Catalog Number	Description
1485R-P3D5-C	5-pin micro QD to conductors—3m (9.8ft)
1485R-P3M5-C	5-pin mini QD to conductor—3m (9.8ft)
1485K-P3F5-C	KwikLink right angle 5-pin micro to conductor—3m (9.8ft)

Electrical

Supply Voltage	11–25V DC
Current Consumption	50mA
Power Consumption	1W
Response Time	3ms
Protection	Output: Short circuit protected Power: Reverse polarity (300ms power ON delay)

Mechanical

Housing Material	Polyamide PA 6.6
Indicators	See Table 1

Environmental

Operating Temperature	0° to +55° C (0° to +131° F)
Operating Environment	IP20
Vibration	10–55Hz, 0.35mm
Shock	10g, 16ms, 100 shocks
Relative Humidity	5% to 95% noncondensing
Approvals	UL, CSA, CE marked for all applicable directives, ODVA compliant

DeviceNet

Network Interface	DeviceNet
Protocol	Selectable Change-of-State (COS) and Strobing
Autobaud Detect	Selectable ON/OFF
Communication Rate	Selectable 125kb, 250kb, 500kb
Supported Node Address	Selectable 0 to 63

The SafeShield DeviceNet Interface is designed to provide nonsafety monitoring of status and diagnostic information from SafeShield light curtains over a DeviceNet network.

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley Guardmaster does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley Guardmaster publication SGI–1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid State Control* (available from your local Allen-Bradley Guardmaster office), describes some important differences between solid–state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this document we use notes to make you aware of safety considerations:



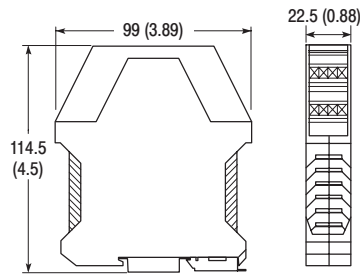
ATTENTION: This notation identifies information about practices and circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- Identify a hazard
- Avoid the hazard
- Recognize the consequences

IMPORTANT: This notation identifies information that is critical for successful application and understanding of the product.

Dimensions—mm (in)

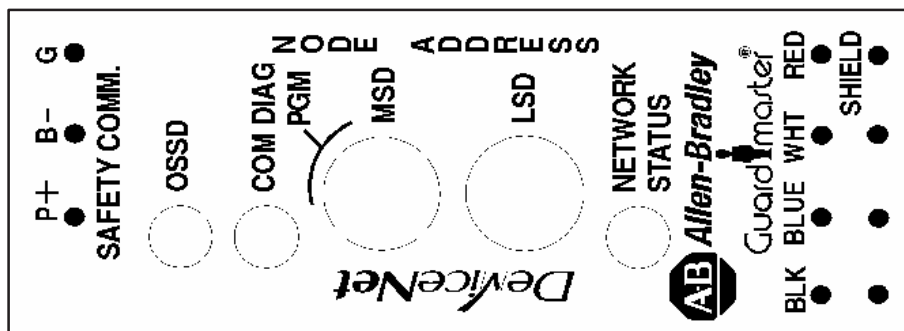


Accessories

Description	Catalog Number
RS-232 PC Interface Module	1770-KFD
RS Network Software	9357DNETL3
PCMCIA DeviceNet Interface Card	1784-PCD1
DeviceNet Hand-Held Configurator	2707-DNC

User Interface

The user interface panel contains node-address switches and LED indicators for configuring and viewing the sensor's operation and status. A more complete description of each item is described below.



LED Indicators

Three LED indicators are provided to indicate a variety of conditions making it easy for installation and troubleshooting. The function of each is described in the table below.

Table 1: LED Function

Label	Color	State	Status
Network Status	Red/Green	OFF	Interface not powered, or waiting for Autobaud
		Green ON Steady	Interface active and allocated by master
		Green Flashing	Interface active but not allocated by master
		Red Flashing	Minor correctable fault (baud rate)
		Red ON Steady	Major fault (possible duplicate address)
		Green-Red-Flash	Power up sequence
Comm Diag	Orange	Off	Internal Fault
		Flashing	Fault or Warning Require User intervention
		On	No Faults or Warnings
OSSD	Red/Green	Off	No Safety Communication
		Red	Not Safe, OSSD not active
		Green	Safe, OSSD active

Wiring the Sensor

Network Connections

All external wiring should conform to the National Electric Code and all applicable local codes. See the SafeShield Safety Light Curtain Hardware User Manual, 75035–144–01 for other SafeShield connections.

Pin	Designation	Wire Color	Function
J1	DeviceNet to Network Connection		
All pins	Shield	Bare	Drain
J2			
Pin 1	Blk	Black	V-
Pin 2	Blue	Blue	CAN_L
Pin 3	Wht	White	CAN_H
Pin 4	Red	Red	V+

Pin	Designation	Wire Color	Function
J3	Safety Comm. to SafeShield Receiver Connection		
Pin 1	G	Blue	0V DC (Voltage supply)
Pin 2	B-	Black	Communication
Pin 3	P+	Purple	Communication
Pin 4	NA	NA	NA
NA	NA	Green	Ground

Configuration

After securing to a stable surface or support and connecting to the network, it will be necessary to configure some of the parameters shown on Table 2 using a suitable network configuration tool such as the Rockwell RS Network. For remote configuration the DeviceView Hand-Held Configurator (2707–DNC) is available. Note that the node address setting can be made locally using the two switches located on the user interface panel. The address can also be made over the network by setting the MSD switch to PGM.

SafeShield Receiver Connections

SafeShield J3	Blank	DeviceNet J2	DeviceNet J1
Blue 1		4 Red	4 Bare
Black 2		3 White	3
Purple 3		2 Blue	2
4		1 Black	1

Change of State and Strobe Input Assembly

Response time is assembly dependant (see Note 1 for detail).

Input Assembly = Status (0)

Byte 1, Bit	7	6	5	4	3	2	1	0
Status Data	Restart	Beam Strength	Device Warning	Device Fault	0	0	0	OSSD

Input Assembly = Modes (1)

Byte 2, Bit	7	6	5	4	3	2	1	0
Modes	Restart Mode	Range Mode	Floating Blanking Mode	Fixed Blanking Mode	Resolution Mode	EDM Mode	0	0

Input Assembly = Diagnostic (2)

Byte 3, Bit	7	6	5	4	3	2	1	0
Diag. Code	Diagnostic Codes							

Input Assembly = Beams (3)

Byte 4, Bit	7	6	5	4	3	2	1	0
Beam Data	Count of Beams							

Note 1—Response Time

Input Assembly Type	Response time
Standard & Modes	3 mS + unit(s) Response Time
Diagnostics & beams	110 ms/unit

Table of Assembly Bit Definitions

Bit	"1"	"0"
OSSD (Output Signal Switching Device)	OSSD Output Active	OSSD Output Not Active
Beam Strength	Beam(s) are Weak	All Beams are Ok
Restart	Restart Input Active	Restart Input Not Active
EDM Mode (Electronic Device Monitoring Input)	EDM Mode Active	EDM Mode Not Active
Fixed/Floating Blanking Mode	Blanking Configured	No Blanking
Restart Mode	Int requires Restart	Ext Restart
Resolution Mode	Reduced Resolution	Application Resolution is the same as Hardware Resolution
Range Mode	Long Range 2 – 18 meters	Short Range 0 – 2.5 meters
Device Warning	Service is Required	No Warnings
Device Fault	Lockout Fault	No Fault

Table 2: Configuration Parameters

Type	Attribute	Options	Default
R	sOSSD	Active , Not Active, Unknown	Unknown
R	sInput Data	See byte 1 of Input Assembly	0000 0000
R	sRestart	Pressed, Not Pressed, Unknown	Unknown
R	sStatus	Normal, Check Diagnostic, Configuring, Lockout, Unknown	Unknown
R	sOperating Modes	See Byte 2 of Input Assembly	0000 0000
R	sResponse Time	14 – 255 mS	0
R	sUnits Active	Unknown, Host, Host Guest 1 Host Guest 1 Guest 2	Unknown
R/W	sUnit Select	Host, Guest1, Guest2	Host
R	sBeam Strength	All Beams Strong, Weak Beams, Unknown	Unknown
R	uOperating State	Powering Up, Red, Restart Required, Green, Lockout, Ready to Reset, Not Communicating	Not Communicating
R	uDiagnostic State	See Diagnostics Table 3	No Faults
R	uDiagnostic State Additional	See Diagnostics Table 3	No Faults
R	sDiagnostic State	See Diagnostics Table 3, Byte 3 of Assembly Data	No Faults
R	sDiagnostic State Additional	See Diagnostics Table 3	No Faults
R	uSeven Segment Display1	See Error Displays of the 7-Segment Display in 75035-144-01	“ “
R	uSeven Segment Display2	See above	“ “
R	uBeam Coding	Not Coded, Code 1, Code 2, Unknown	Unknown
R	uOptics Resolution	14, 30, Unknown	Unknown
R	uBlanking Modes	No Blanking, Fixed Enabled, Floating Enabled, Reduced Resolution, Unknown	Unknown
R	uModel Number	See list of model numbers in 75035-144-01	Unknown
R	uSerial Number	0 – 4294967295	0
R	uRevision	Value is a structure of Series, Rev (MSB, LSB)	0
R/W	uBeam Data Mode	State, Strong	State
R	uBeam Data 000_031	Bit map of the unit's State or Strong 1 = Receiving Light 1 = Strong 0 = indicates a blocked beam, or a weak beam.	00000000000000000000000000000000
R	uBeam Data 032_063		00000000000000000000000000000000
R	uBeam Data 064_095		00000000000000000000000000000000
R	uBeam Data 128_159		00000000000000000000000000000000
R	uBeam Data 160_191		00000000000000000000000000000000
R	uBeam Data 192_223		00000000000000000000000000000000
R	uBeam Data 224_240		00000000000000000000000000000000
R	uCount of Beam Data	Unit beams off or weak and fixed blanking beams	0
R	sCount of Beam Data	System beams off or weak and fixed blanking beams	0
R	uCount of Beams	0 – 240 Number of Beams in this Unit	0
R	MACID Switch	Not Changed, Changed	Not Changed
R	MACID Switch Value	0 – 99	63
R/W	Node Address	0 – 63	63
R/W	Autobaud	Enabled, Disabled	Enabled
R/W	BaudRate	125, 250, 500 KBaud	125 KB
R/W	Input Assembly Type	Status, Modes, Diagnostic, Beams	Status
R	Configuration Consistency Value	Count of times configured	0

Prefix note:

“u” = Unit, the parameter applies to the SafeShield unit selected

“s” = System, the parameter applies to all SafeShield units

See EDS parameter help for more details.

Table 3: Diagnostics

Code	Diagnostic
0	No Faults
1	Safety Com Failed
2	Interface Internal Error
3	Diagnostics Disabled
4	Invalid Unit Select
5	Busy Configuring
6-15	Reserved
16	Beam blocked Intermittent
17	Beam blocked
18	Blanking spacing is to close
19	Communication error, conflict
20	Communication error, not responding
21	Configuration error, Invalid Communication settings
22	Configuration error, Invalid Configuration Data
23	Configuration error, Value not allowed
24	Configuration error, Hardware doesn't match Configuration
25	Contamination error
26	Device Replaced
27	EDM Inactive when expected Active
28	EDM Active when not expected
29	Fixed blanking beam error
30	Fixed blanking error
31	Floating blanking beam error
32	Floating blanking speed
33	Fault in other unit
34	Unit Internal Error
35	No Sync Beam
36	Optical interference
37	OSSD error general
38	OSSD shorted to 24 Volt
39	OSSD shorted to earth
40	OSSD1 over current
41	OSSD1 shorted OSSD2
42	Power-up reset error
43	Restart Required
44	Sender test mode
45	Configuration has been changed
46	Unknown device detected
47	Voltage supply error