Simplex

*UL, ULC, CSFM Listed; FM Approved**

Datasheet

Addressable Detection Products

Auto-Aligning Reflective Beam Smoke Detectors with IDNet Communications

Features

Auto-aligning reflective beam smoke detector system with onboard IDNet addressable communications:

- Compatible with Simplex 4007ES, 4010ES, and 4100ES fire alarm control units (FACUs).
- Simplex addressable beam smoke detectors add IDNet communications to the FireRay 5000 Series beam smoke detection system.
- Communicates status information, and receives commands and sensitivity threshold selection from the host FACU.

Photoelectric transmitter and receiver are combined in a single, compact housing:

- Connect one or two remote detector heads to one ground level controller
- An onboard microprocessor analyzes infrared light, reflected from a matching prism.
- Operating range covers 26 ¼ ft to 330 ft (8 m to 100 m)
- Modular design with ***easyfit*** mounting system. The laser assisted prism mounting, enables easy mounting and adjustment.
- During installation, automatic beam alignment, conveniently rotates the beam to align to the prism center.
- AutoOptimise operation automatically maintains alignment for reliable operation
- UL 268 and ULC-S529 listed

Onboard microprocessor-controlled operation includes the following features:

- Ground level system controller with LCD
- Operating voltage range 14 VDC to 36 VDC
- Easy setup and alignment, with built-in electronic UL/ULC obscuration acceptance test, selectable from the host FACU.
- Automatic gain control, contamination compensation, building shift compensation with control and monitoring of alignment motors, and the ability to change **Delay to Fire** and **Delay to Fault** timing.

Host FACU operations include the following:

- Sensitivity selection from 10% to 60% (35% default).
- Point type selection (**Fire**, **Latched**, **Supervisory**, or **Utility**) and set **Almost Dirty** threshold.
- Initiate obscuration test.
- Reset latched conditions.
- **Enable**/**Disable**, and control beam head LED.

Host FACU information received includes the following:

- **Smoke** status, **Controller-to-Detector Communications** status, **Rapid Obscuration** status (beam blocked), **Self-alignment** status, **Almost Dirty** status, **Excessively Dirty** status, and general summary **Trouble** status
- Analog values for signal strength and compensation level, see Descriptions for more information



Figure 1: Addressable beam detector head



Figure 2: Addressable beam control station

Applications:

- Large open areas such as warehouses, hotel atriums, industrial plants, and school gymnasiums
- Public areas where cosmetics are of prime importance and detector heads need to be small and unobtrusive, such as shopping malls, libraries, theaters, and churches

Optional accessories:

- Detector adjustment bracket, back box, and cover plate.
- Controller back box.
- Extended prism mounting options.

* This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7260-0026:377 for allowable values and/or conditions concerning material presented in this document. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products

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Descriptions

Convenient installation and alignment

Simplex addressable beam smoke detector includes the proven FireRay 5000 system features, of auto-aligning infrared beam smoke detection combined with IDNet addressable communications. If the detector head is installed using the ***easyfit*** mounting system, an integral laser can be activated that aligns along the optical path of the infrared beam. Positioning the reflective prism is quick and accurate using the Auto-Align beam alignment feature.

AutoOptimise Beam Alignment

The AutoOptimise beam alignment system automatically directs and maintains the beam in the optimum position for reliable performance. The transmitter element generates the signal, the prism reflects it back to the receiver element, and then it is analyzed for the presence of smoke. The beam control station flags an alarm condition if it reaches the predetermined level. Alarm threshold levels are set using the host FACU. Time to Fire and Time to Fault are set using the beam control station.

Mounting reference

The maximum distance of the detector and the reflector from the ceiling must be 10% of the distance between the floor and ceiling. Lateral detection may be up to 30 ft (9.144 m) on either side of the beam, providing a maximum total coverage area of up to 19,800 square feet, 60 ft x 330 ft (18.29 m x 100 m).

Refer to the installation instructions supplied with the product and to NFPA 72 (National Fire and Signaling Code) for additional installation guidance.

Communications to the host control panel

To investigate the beam heads remotely, the host FACU receives status and numerical information from the beam controller. The beam controller receives commands and the Smoke and Almost Dirty threshold levels are set using the host FACU.

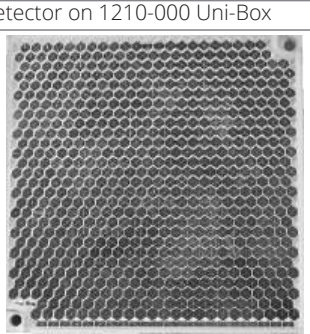
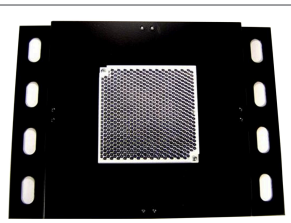
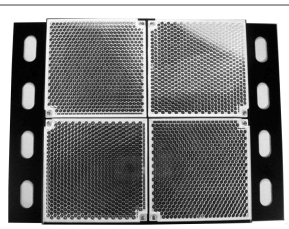
Numerical information received

Numerical information received includes Signal Strength in percent, to compare to alarm threshold level set by host FACU and Compensation Level, an indication of beam status and dirt accumulation.

Application note

Reflective beam smoke detectors may not be suitable for areas with highly reflective surfaces. Separate transmitter or receiver models may be required. Refer to NFPA 72 and contact your Simplex product representative for additional applications guidance.

Accessory reference

<table>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Beam Detector on 1210-000 Uni-Box</td><td colspan="2">5000-201 Adjustment Bracket</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>23901 Prism Reflector</td><td>One Prism on 1031-000 Mounting Bracket</td><td>Four Prisms on 1031-000 Mounting Bracket</td></tr>
</table>

Note: Images are not to scale.

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Product selection and ordering information

Table 1: Addressable beam detector selection

SKU	Description		Dimensions
4098-9019	IDNet Communications Addressable Reflective Auto Align Beam Smoke Detector System. Includes: one 4098-9020 controller, one 5000-031 detector head, and one 23901 prism reflector. Controls up to two detector heads.	Controller	9 1/4 in. x 7 7/8 in. x 2 13/16 in. H x W x D (235 mm x 200 mm x 71 mm)
		Head	5 9/32 in. x 5 5/16 in. x 5 9/32 in. H x W x D (135 mm x 134 mm x 132 mm)
		Prism	4 1/8 in. x 3 15/16 in. x 3/8 in. H x W x D (105 mm x 100 mm x 9.5 mm)
4098-9020	IDNet Communications Addressable Reflective Auto Align Beam Smoke Detector Controller only, for upgrade or replacement. Detector heads and prism reflectors not included.		9 1/4 in. x 7 7/8 in. x 2 13/16 in. H x W x D (235 mm x 200 mm x 71 mm)

Table 2: Beam detector heads, prisms, and accessories

Ordering Number, see note	Description	Dimensions
5000-031	Additional detector head and prism, select up to one additional head for each 4098-9019 system.	5 9/32 in. x 5 5/16 in. x 5 9/32 in. H x W x D (135 mm x 134 mm x 132 mm)
1210-000	Detector surface mount Uni-Box, with conduit knockouts on all sides. White in color. Universal back plate mounting. Captive screw lock on front plate. Mounting holes for optional 1000-018 wire cage. Use for 5000 and 3000 Series detector heads. 3000 Series heads require an additional 3000-202 Mounting Plate, not included.	NA
1220-000	Cover plate, pre-drilled to mount the reflective detector head to a double gang electric box. White in color.	NA
1030-000	Surface mount wall bracket for prisms. White in color. Hole pattern for one or four prisms and designed to fit on Unistrut. Order prisms separately.	NA
5000-201	Adjustment bracket for motorized reflective detector heads, with 360 degree rotation and 140 degree adjustment. White in color. Replaces the obsolete 5000-005 Bracket.	NA
5000-009	Controller back box. Surface or flush mount. Surface mount to single gang, double gang, or 4 in. square box.	8 7/16 in. x 7 7/16 in. x 1 3/4 in. H x W x D (214 mm x 189 mm x 45 mm)
5000-010	Controller back box semi-flush mount trim plate for the 5000-009 Box.	10 5/16 in. x 8 3/4 in. H x W (263 mm x 222 mm)
1031-000	Surface mount wall bracket for prisms. Black in color. Hole pattern for one or four prisms designed to fit on Unistrut. Order prisms separately.	NA
1040-000	Single prism alignment adaptor plate. White in color. Pre-drilled to mount one prism. Includes 1180-000 Universal Alignment Bracket. The prism is included with the reflective detector heads	NA
1050-000	Four prism alignment adaptor plate. White in color. Pre-drilled to mount four prisms. Includes the 1180-000 Universal Alignment Bracket. Order the 1010-000 Long Range Prism Kit separately.	NA
23901.01	Replacement prism reflector.	NA
1010-000	Long range prism kit, includes three additional prisms for installations between 164 ft and 328 ft (50 m and 100 m).	NA
1000-018	Protective wire cage for 5000 series detector heads.	NA
1000-019	Protective wire cage for 5000 series controllers.	NA
1140-000	Ceiling pendant mount for the reflective detector head, supplied with a 12 in. long nipple. White in color. Use for single or bi-directional applications.	NA
1141-000	Ceiling pendant mount for the end-to-end transmitter and receiver units, supplied with a 12 in. long nipple. White in color. Use for single or bi-directional applications.	NA
1142-000	Ceiling pendant mount for the reflective detector head, supplied with a 12 in. long nipple. White in color. Use for single or bi-directional applications.	NA
1143-000	Ceiling pendant mount for a single prism, includes ceiling pendant and a single prism mounting plate. White in color.	NA
1144-000	Ceiling pendant mount for long throw prism kit. Includes ceiling pendant and a four prism mounting plate. White in color. Order the long throw prisms separately.	NA

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Note: For internal ordering, these products can be found in Job Design under Fire Fighting Enterprises, OP category OPFFE.

Controller display

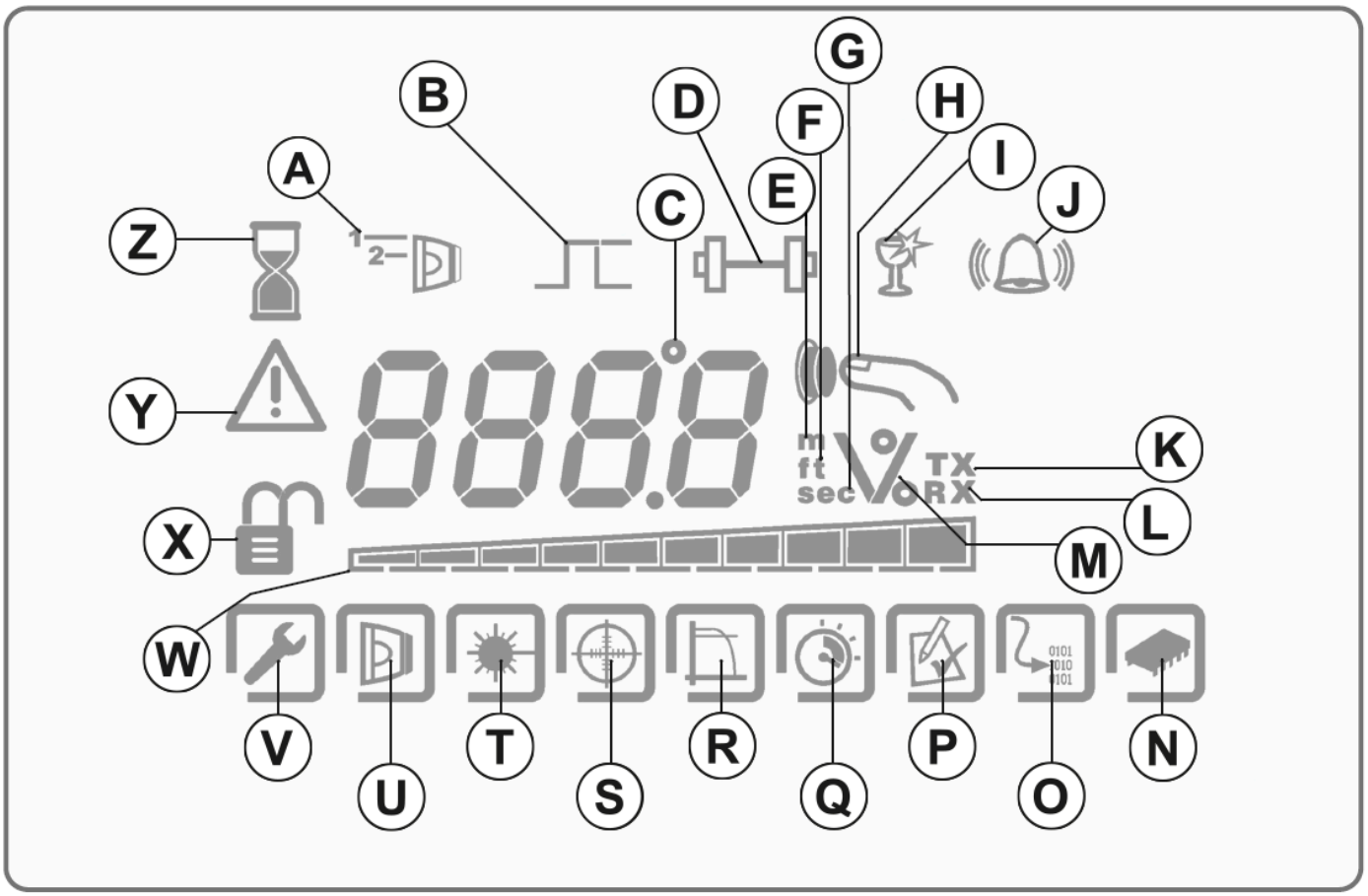


Figure 3: Controller display

Callout	Description	Callout	Description
A	Detector number	N	System controller settings
B	Latched or Reset	O	Event log
C	Degrees	P	Fire test
D	Signal strength	Q	Fire or Fault delay
E	Metres	R	Fire threshold
F	Feet	S	Beam alignment
G	Seconds	T	LASER targeting
H	User prompt	U	Detector settings
I	Compensation level	V	Set home positions
J	Fire	W	Bar graph
K	Transmit signal strength	X	System locked or Unlocked
L	Received signal strength	Y	Warning
M	% or V	Z	Busy

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Specifications

Table 3: Mechanical and general reference

Specification	Rating
Housing	Flame Retardant ABS, IP rating = IP54
Finish	Light grey/black
Simplex Addressable interface and host control panel programming instructions.	579-1039, additional operating and installation instructions ship with the product.
Head and accessories reference.	Fire Fighting Enterprises (A Halma Group Company); website: www.ffeuk.com/

Table 4: Electrical

Specification		Rating	
Input voltage		14 VDC to 36 VDC, supplied from agency listed fire alarm power supply.	
Input current		50 mA	
Power wiring to controller		Terminal block connections; 18 AWG to 14 AWG (0.82 mm^2 to 2.08 mm^2)	
Wiring, controller to head		328 ft (100 m) maximum distance, use twisted wire pair; 18 AWG to 16 AWG (1 mm^2 to 1.5 mm^2)	
Beam optical wavelength		850 nm	
Communications reference	**Details**	IDNet addressable communications, communications circuit is isolated from input power, and controller-to-head communications.	
	Compatibility reference (review for addition to installed systems)	**IDNet Communications source**	**Firmware/revision**
		4100ES and 4010ES Control Panels	System Firmware 2.02 or higher
		4100ES System Power Supplies (SPS)	Firmware 3.12.05 or higher
		4010ES Main System Supply (MSS)	Firmware 3.12.05 or higher
		4010ES Main System Supply 2 (MSS2)	Firmware 3.12.05 or higher
		Separate IDNet/IDNet+/IDNet 1+/IDNet 2+ 2 modules	Firmware 3.12.05 or higher
		IDNet communications PCC Chip 746-146	Revision 2.02.03 or higher
		4007ES	Compatible beginning with first release
Addressing		Onboard DIP switch selects a base address to communicate with the local controller and the first beam detector head. For systems with two heads for each controller, the next sequential address is automatically assigned.	

Table 5: Operating Specifications

Sensitivity threshold	Selectable from 10% to 60%; with 35% as default (this is % of beam obscuration drop from 100%). The value is selected using the host FACU and communicated by IDNet communications.
Operating distance range	26 ¼ ft. to 330 ft (8 m to 100 m)
Beam status indicators	Multi-color LED on bottom front of beam detector head: Normal = Green; Alarm = Red; Fault (Trouble) = Yellow; LED flash is every 10 seconds.
Service status indicators	One LED for each detector, located under the beam controller cover, indicates the status of the beam detector channel communications.
Point types	Fire, Latched Supervisory, or Utility selected using the host FACU.
Trouble conditions	Communications fault, Rapid Obscuration fault (blocked beam), Excessively Dirty, and Summary trouble (other general troubles not detailed).
UL listed temperature Range	32°F to 100°F (0°C to 38°C)
Operating temperature range	-4°F to 131°F (-20°C to 55°C), for indoor use only.
Operating humidity range	0% to 93% RH, non-condensing.

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