

HART HSSD

High Sensitivity Smoke Detection



The HART High Sensitivity Smoke Detection system (HSSD) is an Aspirating Smoke Detection system (ASD) designed to give very early indication of an incipient fire condition. This pre-emptive warning – before the transition into the flaming and heat stages – provides the time necessary to take corrective action and avoid the danger, damage and disruption to operations that a fire can cause. HART HSSD equipment is simple to install, commission, service and use. It has the highest levels of performance and reliability.



Two HSSD systems are available; HART Mini is suitable for protected spaces up to 800m². HART XL, with optional display/control, is designed for the protection of larger areas up to 2000m². A full range of red ABS aspirating smoke sampling pipe, SnifferPipe, is also available, ideal for use in HSSD systems.

Features

- Laser based particle counting – the superior technology
- Elegant, compact, lightweight design
- No particle filters required
- No recalibration during lifetime of detector
- Complete flexibility – four basic sub units provide installation options
- On site sensitivity selection 0.0025%/m to 1%/m
- LaserNet networking options
- Modular design for fast and easy servicing
- Configurable for integral or remote display options
- Attachable power supply and battery back up unit
- Individual pre-alarm and alarm levels

- Optical Self-Test (OST) which positively checks the condition of the detector
- Range of worldwide product approvals

Protecting assets worldwide

Developed in 1988, HART was the world's first laser-based HSSD detector using Kidde's patented particle counting technology. Now, over 40,000 Hart detectors are in use worldwide, protecting valuable assets for institutions and companies as diverse as Windsor Castle, London Underground, BP and HSBC bank.

Protecting your investment

There are major benefits from a very early indication of incipient fire. The problem can be dealt with through local corrective measures such as powering down equipment or the use of hand extinguishers, avoiding unnecessary evacuation or suppressant release.

HART HSSD can also be integrated into the main fire protection system, providing the first stage alert in an alarm organisation, the final stage of which could be suppressant release.

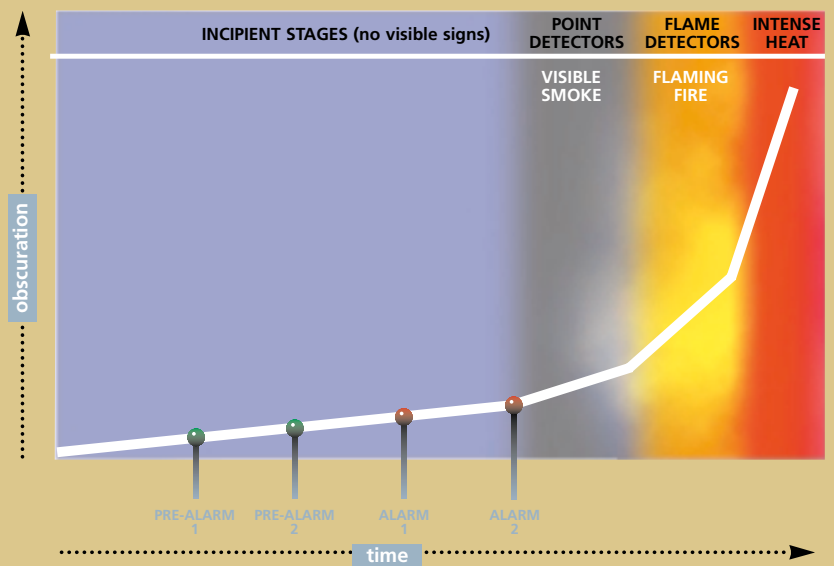


Stages of fire

Most fires start with some form of overheating. In this incipient stage, fine particles are released as the combustion process begins. The particles released at the incipient stage of a fire may not be detected by conventional smoke or heat detectors. In fact smouldering can continue for minutes, hours or even days before being detected by conventional detectors. The incipient stage of smouldering fires provides the widest window of opportunity to detect and control the spread of fire.

The HART HSSD unit will go through various alarm thresholds in these early stages, long before conventional point type smoke detectors will respond to the fire. Conventional point type smoke detectors are designed to detect smoke at approximately 5% obscuration per metre. This normally allows sufficient time for occupants to evacuate the area or building, although possibly not enough time to prevent damage to equipment. At this level there may also be an increased risk to anyone attempting to extinguish the fire.

HART HSSD units can be programmed to be up to 1000 times more sensitive than conventional point type smoke detectors. Alarm levels can be set as high as 0.0025% obscuration per metre for clean areas and up to 1% obscuration per metre for less controlled environments. This increased sensitivity allows the HART HSSD unit to detect and report an incident at the earliest possible stage, providing the time needed to help minimise or prevent fire damage.

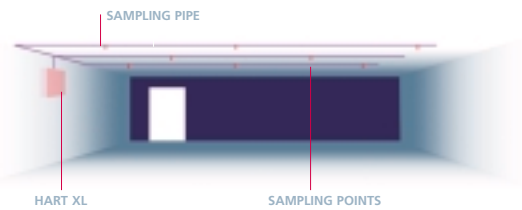
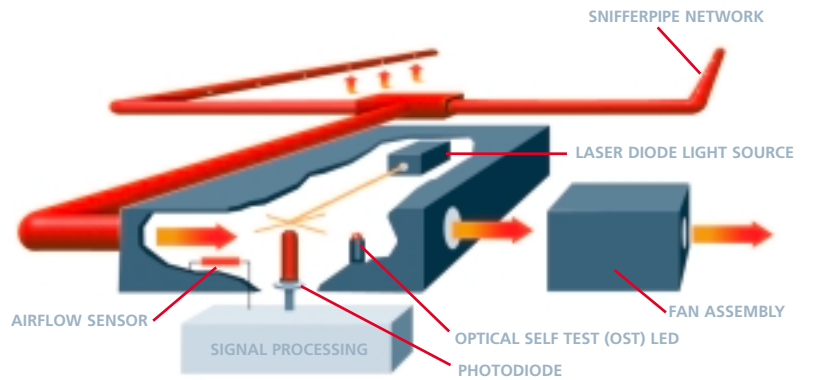


The HART XL has four stages of alarm and the HART Mini has two

Aspirating detection

The HSSD detector is mounted either inside or outside the area. It draws air from the protected area using an aspirating fan which is housed in the detection unit. The pipe network contains sampling holes at predetermined locations along the pipe network through which the air is drawn.

HSSD detectors can protect areas up to 2000 square metres to BS5839, or between 500 to 750 square metres to BS6266, in high air flow conditions. The pipework is configured in various ways according to the application. Typically it will comprise a pipe network with sampling points at intervals similar to point detection. It can also, for example, be arranged to monitor across air handling units or in ducts.

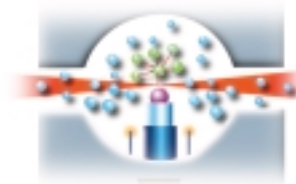
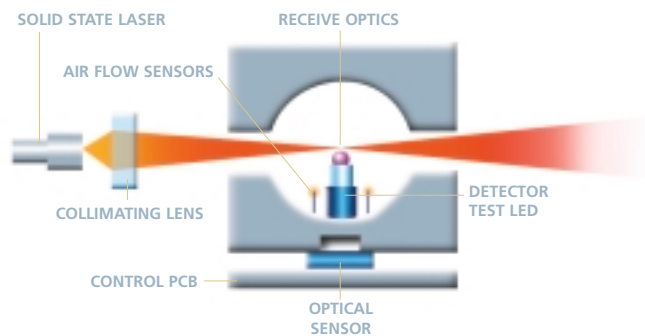


Individual particle counting

HART HSSD operates on a laser-based particle counting principle. The smoke particles pass through a focussed laser beam and scattered light from individual particles is picked up by a photodiode sensor and converted to an electrical pulse. The pulse rate is electronically counted and measured against alert and alarm thresholds.

The output signals are processed and presented on an LCD display on the HART XL. The data is communicated to the fire alarm control panel or BMS system.

Since the sensing process takes place in the beam in the centre of the sampling chamber, the detection performance is unaffected by any build up of particulate on the walls of the chamber over time. For this reason air filtering is unnecessary, which is an important maintenance benefit.





Particle discrimination

The pulse heights are proportional to the size of the particles. The electronics is set up only to count particles typical of products of combustion. This makes the HART HSSD detector less sensitive to other particles such as dust.

Benefits

- High immunity smoke discrimination
- Simple, low-cost maintenance
- High reliability
- High immunity to unwanted alarms
- Long term stability
- No recalibration required

Where to use HART HSSD

HART HSSD provides total protection in critical applications:

- When downtime must be minimised
- Where smoke is difficult to detect
- In extreme environments
- Where appearances are important
- When extra time is necessary

When downtime must be minimised with high cost equipment:

- Clean rooms
- Computer rooms
- Telecommunications
- Broadcast facilities

Where smoke is difficult to detect in areas with high ceilings or high air flow:

- Atria
- Warehouses
- Cold storage
- Indoor stadiums

In extreme environments that pose a problem to conventional smoke detection:

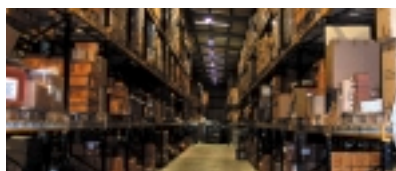
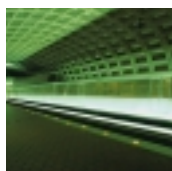
- Power stations
- Mines
- Offshore

Where appearances are important and preservation of priceless objects is a priority:

- Modern offices
- Heritage buildings
- Cathedrals
- Museums
- Libraries

When extra time is necessary to effect safe and orderly evacuation:

- Airports
- Underground railway systems
- Hospitals
- Theatres
- Cinemas





HART Product Range

The HART High Sensitivity Smoke Detection (HSSD) system is optimised in terms of performance, capability, reliability and serviceability. Featuring simplicity in both system configuration and operation, HART has a clean, aesthetic design and is compact and lightweight.

HART Mini

Designed for applications where the protected area is less than 800m². Top and bottom pipe entry options are available, and a single LED provides status indication.



HART XL

Designed for applications where the protected area is less than 2000m², HART XL offers complete flexibility – just four sub units provide all the configuration options.

Configuration options

HART XL single station detection unit.

The HART XL is shown with the display module installed as an integral part of the detection unit.

Installation Options

The HART XL detection unit can be wall or flush mounted and allows for top or bottom pipe entry and side or rear air exhaust.



HART XL with self-contained power supply

The self-contained power supply can be attached to the detection unit or located remotely, providing four hours battery back-up.



HART XL detection unit with remote display module

The display module can be integrated as part of the detection unit or located remotely. No separate cabinet is required. The detection unit retains a local status LED.



HART XL detection unit with system status LED

HART XL can be configured to provide a simple three-colour LED status indicator – green for normal, yellow for fault, flashing red for pre-alarm and continuous red for alarm.



HART XL network system

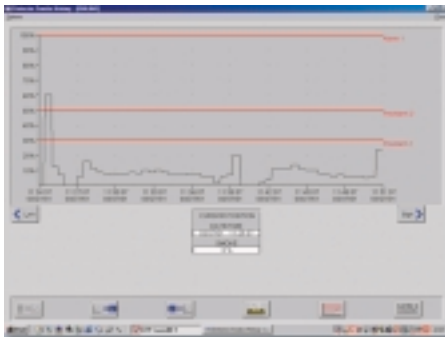
When used with the Intelligent Interface Module (IIM) and LaserNet software, up to 127 HART XL detection units can be networked and displayed on a PC monitor.





Display module

The graphical LCD on the HART XL display module provides information including system status, real time smoke levels and other operational parameters. The unit is operated by means of simple pushbutton controls. Password protection is used to restrict higher levels of access to authorised users.



LaserNet Smoke Level Graph

LaserNet

Programming and diagnostics

All HART HSSD detection units are programmed using a standard PC connection via a service port and LaserNet software. The software enables the user to monitor, interrogate, configure and download system data. No programmers or interfaces are required.

Optional Interface Cards

Interface Card

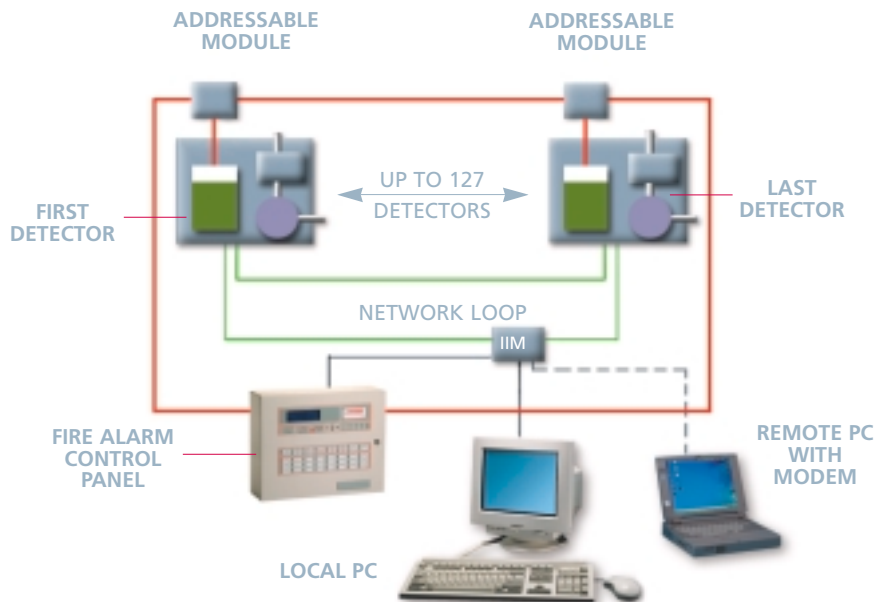
This card can be installed within the HART XL to provide a remote facility to silence, reset and isolate.

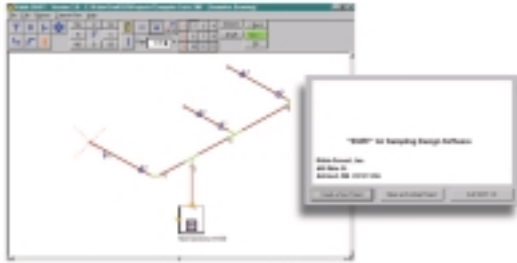
Apollo Interface Card

This card can be installed within the HART XL to allow interface to an Apollo protocol control panel. When interfaced to a Vega Control Panel, additional monitoring functions are available.

Networking Capability

With the LaserNet software and an IIM (Intelligent Interface Module), up to 127 HART XL and/or HART Mini detectors can be monitored, configured, isolated and downloaded from a single PC. Networking capability is standard on HART XL and an optional feature on HART Mini.





SNIFF

System Design Software

For use with the HART XL, SNIFF is the easy-to-use pipework design/calculation software that has been upgraded to be Windows™ compatible. It includes new features such as isometric system design drawings from different angles, easy operation and clear displays. Once all the system design information has been completed, the software will calculate the hole sizes needed to meet with the required parameters.



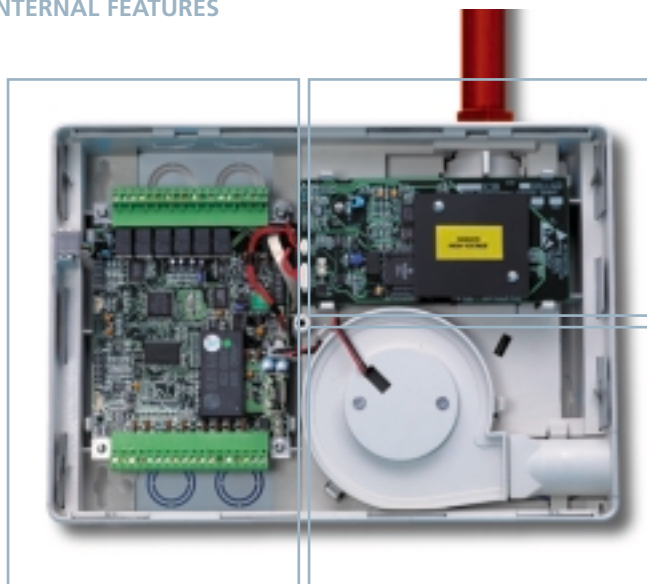
Maintenance

HART XL and HART Mini have been designed to facilitate servicing and maintenance. The modular design reduces service time and minimises downtime. The detection unit comprises only three main parts – the termination board, the detector head and the fan module.

HART XL INTERNAL FEATURES

DETECTOR HEAD

TERMINATION BOARD



FAN MODULE

Each part can be installed and removed quickly and easily. Routine maintenance and cleaning of the laser sensor unit is a simple process.

- Modular design concept
- Clip-on modules for quick and easy installation and removal
- Quick release interconnecting cable connections
- Easy access external cable connectors



Physical Specification

	HART XL Detection Unit	HART Mini
Enclosure	Light grey polycarbonate enclosure with steel mounting plate	Light grey polycarbonate enclosure with steel mounting plate
Overall dimensions	320mm x 228mm x 108mm	222mm x 226mm x 81mm
Weight	3.4kg	2.2kg
Enclosure rating	IP31 (NEMA-1)	IP31 (NEMA-1)
Operating temperature	0 to 52°C	0 to 49°C
Operating humidity	10 to 93% RH, non-condensing at 40°C	10 to 93% RH, non-condensing at 40°C
Voltage requirements	18 to 30V DC (24V DC nominal)	18 to 30V DC (24V DC nominal)
Current consumption	315mA	230mA
Alarm	380mA	260mA
Fault	365mA	245mA

	HART XL Display/Control Unit
Enclosure	Light grey polycarbonate enclosure with steel mounting plate
Dimensions	122mm x 145mm x 38mm
Weight	0.5kg
Enclosure rating	IP31 (NEMA-1)
Operating temperature	0 to 52°C

Ordering Information

	HART XL		HART Mini	
Detection unit	53836-K183		Bottom pipe entry	53836-K205K-00
Display module	53836-K182		Top pipe entry	53836-K205K-01
IIM without modem	53836-K190			
IIM with modem	53836-K191			
Interface card	44782-K165			
Apollo interface card	44782-K167			

Power Supplies

		Dimensions	Battery
Self-contained	53836-K185	317x114x105mm	2x12v-2Ah
2.5 Amp	53836-K235-00	460x350x120mm	2x12v-12Ah

Technical Specification

	HART XL	HART Mini
Displays	Optional Display Module with large format graphical LCD. Tri-colour LED on Detector Unit	Tri-colour LED
Operator controls	Optional Display Module contains 4 cursor controls (up, down, left, right) and Enter key	Single push button for reset and isolate functions
Sensitivity range	0.0025 to 1.0%/m obscuration	0.0025 to 1.0%/m obscuration
Alarm relay	Alarm 1, Alarm 2: Volt-free changeover relay contacts, rated 2A @ 30V DC resistive	Alarm 1: Volt-free normally open contacts, rated 2A @ 30V DC resistive
Pre-Alarm relay	Pre-Alarm 1, Pre-Alarm 2: Volt-free changeover relay contacts, rated 2A @ 30V DC resistive.	Pre-Alarm 1: Volt-free normally open contacts, rated 2A @ 30V DC resistive
Fault relay	Volt-free changeover relay contacts, rated 2A @ 30V DC resistive, energised when detector is in status normal	Volt-free normally open contacts, rated 2A @ 30V DC resistive, energised when detector is in status normal
Isolate relay	Volt-free changeover relay contacts rated 2A @ 30V DC resistive	N/A
Remote reset input		Momentary contact closure
Electrical connection	Up to 2.5mm external wiring to terminal blocks	Up to 2.5mm external wiring to terminal blocks
Service port connection	RJ12 jack, RS-232 communications	RJ12 jack, RS-232 communications
Smoke level history	40320 data points, up to 28 days at 60 sec sampling rate	40320 data points, up to 28 days at 60 sec sampling rate
Event history	128 events	128 events
Air inlet	3/4" threaded NPT (3/4" to 25mm adaptor supplied)	3/4" threaded NPT (3/4" to 25mm adaptor supplied)
Optional exhaust adaptor	1" Threaded NPT (1" to 25mm adaptor supplied)	3/4" Threaded NPT (3/4" to 25mm adaptor supplied)
Factory presets	Sensitivity default to 0.2%/m full scale on bar graph (adjustable with LaserNet software)	Sensitivity default to 0.2%/m (adjustable with LaserNet software)
Referencing	Controlled by LaserNet software	N/A
Programmable time delays	Delay before alarm registration – 0 to 60 seconds	Delay before alarm registration – 0 to 60 seconds
Signal averaging	2, 4 or 8 second averaging	2, 4 or 8 second averaging
Programming	Direct connection to PC (D-type RJ12) provided by LaserNet software	Direct connection to PC (D-type RJ12) provided by LaserNet software

Kidde Fire Protection operates a continuous programme of product development. The right is therefore reserved to modify any specification without prior notice and Kidde Fire Protection should be contacted to ensure that the current issues of all technical data sheets are used.
