



N & S SOLUTIONS PVT. LTD.
No: 37-38, Reliable Residency, 1st Main, 8th Cross, HSR Layout, Harlur Bangalore – 560102

ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

USER MANUAL

FOR

**ASPIRATION TYPE AUTOMATIC SMOKE/ FIRE
DETECTION WITH ALARM SYSTEM FOR INDIAN
RAILWAYS AC COACHES TO RDSO SPECN No.
RDSO/2008/CG-04, Rev-05 (SYSTEM FOR STAND
ALONE/RAKE FORMATION COACH CLAUSE-2.4 OF
SECTION-A AND WITH TCMS FOR TRAIN 18
APPLICATION SYSTEM)**

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THIS USER MANUAL IS PART A , PLEASE REFER PART B FOR
DRAWINGS & BOM

NSSPT PART NO. : NS1060.01 FIRELINK-25

RDSO SPEC. NO. : RDSO/2008/CG-04(REV-

5)

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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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2. STANDARD REFERRED TO CLAUSE NO 0.2

Doc.Name/No.	Description
IEC 60571	Electronic Equipment used on rail vehicles
IEC 61373	Railway Application-Rolling stock equipment-shock and vibration tests.
IEC 62236-1	Railway Application-Electromagnetic compatibility-Part-1:General
IEC 62236-3-1	Railway Application-Electromagnetic compatibility-Part 3-1 Rolling stock-Train and complete vehicle
IEC 62236-3-2	Railway Application-Electromagnetic compatibility-Part 3-2 Rolling stock-Apparatus
IEC 60068-2-75	Environmental testing Part- 2,Tests-Test Eh: Hammer Test
IEC 60068-2-77	Environmental testing Part- 2-77,Test 77-Body impact and strength Test
EN 50155	Railway Application-Electronic Equipment used on rolling stock
EN 50121-3-2	Railway Application-Electromagnetic compatibility-Part 3-2 Rolling stock-Apparatus
EN 54-7	Fire detection and Fire alarm systems-Part 7:Smoke detectors-Point detectors using scattered light, transmitted light or ionization
EN 54-20	Fire detection and Fire alarm systems-Part 20: Aspirating smoke detectors.
EN 54-4	Fire detection and Fire alarm systems-Part 4:Power supply equipment
EN 54-5	Fire detection and Fire alarm systems-Part 5:Heat detectors-Point detectors
BS-6266	Fire Protection for electronic equipment installation: Code of practice
UL 268	Smoke detectors for fire Alarm Signaling System
ARGE Directive	Fire Detection in Rolling stock
FM 3230	Approval standard for smoke actuated detectors for automatic alarm signaling
IS 2189	Selection, Installation and Maintenance of Automatic Fire Detection and Alarm system- code of Practice
IS 2175	Specification for Heat Sensitive Fire Detectors for use in Automatic fire alarm system.
EN 54-2	Fire detection and fire alarm systems-Part 2:Control and indicating equipment



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Declaration from M/s N & S SOLUTIONS PVT LTD,

Please refer QAP Document for complete detailed BOM For Each type of coaches.

NOTE:

WE ARE NOT USING T JOINTS IN OUR PIPING LAYOUT

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5. OBSCURATION LEVEL MEASUREMENT

Alarm	Threshold setting for						
	AC Coaches		Pantry car			Power car	
	Threshold (% Obs/m)	Delay period (Sec.)	Threshold (% Obs/m)	Delay period (Sec.)	Threshold (% Obs/m)	Delay period (Sec.)	Alarm
Alert	0.35	20	1.0	0.35	30	0.5	45
Action	0.6	30	1.2	0.6	30	0.8	30
Fire-1	1.6	45	1.8	1.6	45	1.6	45
Fire-2	3.0	10	3.0	3.0	10	3.0	10

6. INSPECTION AND ACCEPTANCE PROCEDURE

PROTOTYPE INSPECTION

One complete system as per this STR shall be installed/retrofitted by the NSSPT on a designated coach as prototype for checking/ verifying / clarifying the fitment and requirements of this STR. The installed/retrofitted system on the designed coach shall be checked for the functionality and performance as per Annexure 1, 2 & 3 of this STR.

TEST

- The acceptance test will be required to be done in the presence of inspecting authority at the time of inspection for which necessary equipment's & arrangements shall be provided by the nsst or at their cost.

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- Visual check of the entire system regarding material quality, work quality, effect on aesthetics of the coach etc.

ACCEPTANCE TEST

1.The Acceptance tests shall be as per the applicable standards of the system offered i.e. EN54-20 OR EN54-7. The test specified in Annexure-1,2 & 3 of this STR are Acceptance tests to be carried out on a designed coach by an inspecting authority nominated by the consignee/purchaser/IR on the samples picked up by from the inspection lot as specified in Clause 13 of this section. All the acceptance tests shall be carried out at the manufacture's cost. All acceptance Tests are mandatory for accepting a lot.

TYPE TEST:

The test specified in Annexure A shall constitute type test and is carried out at reputed National/International Test lab(s) at M/s N& S Solutions Pvt Ltd cost . The submission of test reports mentioned in Annexure A are mandatory for product approval and is submitted to purchaser/ Consignee by M/s N& S Solutions Pvt. Ltd.

All type test specified in Annexure a shall be repeated and submitted to purchaser / consignee after a period of 10 years irrespective of the manufacturer/vendor supply order to IR to conform that the system meets the specified requirements of STR. In addition to above the manufacturer/vendor shall also repeat the entire type test in following cases at their cost.(As per IEC 60571 clause- 10.1.1)

- Modification of equipment likely to affect its functional method of operation.
- Failure or variation established during type test
- Resumption of production after an interruption of more than five years.
- Visual check
- Performance check

For Type test, one complete system consist of fire /smoke detector and extinguishing system is subjected to following tests as applicable:

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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Unless otherwise specified in the test procedure, all Type Tests shall be carried out, after the test specimen (detector under test) has been allowed to stabilize in the standard atmospheric condition for testing as described in IEC/EN 60068-1 as follows:

- a. Temperature- 15 to 35 degree centigrade
- b. Relative Humidity-25 to 75%
- c. Air Pressure-86 to 106kPa

If a test method requires a specimen to be operational, then the specimen shall be connected to supply and monitoring equipment with the characteristics as required by the manufacture's data. Unless otherwise specified in the test method, the supply parameters applied to the specimen shall be set within the manufacture's specified range(s) and shall remain substantially constant throughout the tests. The value chosen for each parameter shall normally be the nominal value, or the mean of the specified range.

- Where a specimen under the test has multiple sensitivity settings, the sensitivity of the specimen (detector under test) during all tests shall be set at the highest sensitivity setting used during the fire sensitivity setting used during the fire sensitivity test(s). It is not intended that the environmental tests are conducted at all possible settings, only at the highest used during the fire sensitivity test.
- The specimen shall be mounted by its normal means of attachment in accordance with the manufacture's instructions. If these instructions describe more than one mounting method then the method considered to be most unfavorable shall be chosen for each test.
- The detector under test for measurement of response threshold value (RTV) shall have different Range of sensitivity, different working principal or different method to determine RTV. In such case the objective of any test method to chosen shall be to determine a measure of the aerosol concentration, which when passing through the detector, just cause an alarm.

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- Unless otherwise stated, the tolerance for environmental test parameters shall be as given in basic reference standards for the test. If a requirement or test procedure does not specify A tolerance or limits, then deviation limits of $\pm 5\%$ shall be applied.
- The details of the supply and the monitoring equipment and alarm criteria (As given in clause no. 12.4.1 of section-B) used shall be clearly mentioned in the test report

a. Type test

For Type test, one complete system consist of fire /smoke detector and extinguishing system is subjected to following tests as applicable:

- Visual check
- Performance check
- System level functional test
- Testing of fire /smoke detection
- Following tests to be certified by one of the Govt. testing laboratories on electronic equipment i.e. controller, power supply, sensors etc.as per IEC 60571-1:-
- Dry heat test
- Damp heat test
- Combined hear humidity and dust test
- Vibration and shock test.
- Voltage surge test
- Dielectric test/Applied High Voltage Test
- EMI/EMC test as per IEC 61000. (Electrical Fast transient/Burst immunity test as per IEC 61000-4-4)

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- Surge test as per IEC 61000-4-5, Electrostatic discharge test as per IEC 61000-4-2 and Radiated susceptibility test as per IEC 61000-4-3)
- The system has successfully passed all the type tests for proving conformity with this specification. If any one equipment fails in any of the type tests, the purchaser or his nominee at this discretion, may call for another equipment/card(s) of the same type and subject it to all tests or the test(s) in which failure occurred. No failure is permitted in the repeat test(s).

b. Acceptance Test

Acceptance Test is carried out on 20% of the lot offered (Minimum 2 of each lot).

- Visual
- Performance test
- System level function test

c. Routine Test

For Routine Test, complete is subjected to following tests by us

- Visual
- Performance test
- System level function test

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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• **Visual Inspection:**

a) The unit is checked for proper manufacturing, proper fitment in its enclosure, connection and dimension as agreed between us and purchaser.

b) Each equipment of the system is visually inspected to ensure compliance with the requirement of clauses of this specification. The visual inspection is broadly included:

I. System Level Checking:

- Construction Details
- Dimension Check
- General workmanship.
- Configuration

II. Card level Checking:

- General Track layout
- Quality of soldering and component mounting

III. Module level checking

- Indications and display
- Mounting and clamping of connectors

Performance Test:

- I. Fire/ smoke detection and extinguishing system is able to detect smoke, temperature and the rate of rise of temperature as per the following conditions.
- When the rate of temperature rise at the detector exceeds 10°C per minutes regardless of the actual temperature.
 -

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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- Audio Visual alarm is functional whenever the limits as above are exceeded
- Data downloading of fire event to be checked.

System Level Checking:

- Constructional details
 - Dimensional check.
 - General workmanship.
 - Configuration.
- Card Level Checking:
 - General track layout.
 - Quality of soldering and component mounting.
 - Conformal coating.
 - Legend printing.
- Module level checking:
 - Indications and displays.
 - Mounting and clamping of connectors.
 - Proper housing of cards.

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Other Tests:

The tests i.e. Dry heat test, Damp heat test, Combined heat Humidity and due test, Vibration, shock & bump test, Voltage surge test is conducted as per IEC 60571-1 latest either at RDSO or ERTL/Govt. approved test agency and results is submitted.

- We will furnish results of all the tests and inspection carried out internally and in the presence of Railway representative to RDSO.
- Any design improvement found necessary as a result of these tests/trails is carried out by the nsspt in the least possible time free of cost.

TECHNICAL SPECIFICATION

Environmental Conditions:

Operating Temperature Range

- For Fire panel : -20 to +65°c
- Aspirating Smoke Detector : -20 to +65°c

Electrical:

- Nominal Input supply : 65- 130VDC
- Aspirating Smoke Detector [Firelink-25] : 21.6V – 26.4V DC
- Fire panel operating supply : 24V DC

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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Mechanical:

Dimension

- Fire panel : 155 x 380 x 300 mm (W x L x H)
- Aspirating Smoke Detector : 160 X 100 X 230 mm (W x L x H)
- Part No : NS1060.01.FR
- Weight of complete system : 45kg(Approx)
- Suction Unit
 1. Sampling pipe Length : 25 metres
 2. Sampling Pipe Inlets : 01
 3. Sampling Pipe internal Diameter : 20mm

Connections:

- Programming : PC via RS232

Interfaces:

- Detection Unit
 1. Type : FireLink-25 ASD
 2. Detection Principle : Laser Light scattering mass detection & particle evaluation.

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WORKING PROCEDURE

Before Switch ON System, make sure that all connections are properly made.

When switch ON the system, the “OK” Green led on the front of the detector will flash for 15 minutes that it takes for the Fast learn process, and will then change to constant illumination to indicate that Fast learn process is completed.

Checking of airflow monitoring by following Fracture and Blockage method. Fracture method means Remove the pipe by loosening the gland connector. Blockage method means Close half of the suction openings using adhesive tapes.

Next checking of aspirating smoke detector, before that no alarm actions are triggering unintentionally. Smoke detector can be checked by spraying the test aerosol into the opening of the detector or using a bee hive fumigator held on one or several openings. The “FIRE” Red led on the front of the detector [Firlink-25] should glow and messages have passed to the “FIRE PANEL” through relay contacts.

During the operation if air flow rate is crosses the maximum and minimum of triggering threshold then fault led with fault relay will switch ON (Because of loose and damage inlet pipe), also in the remote control software, the function flow rate is display the value corresponding to the current airflow through the detector . If the airflow rate is comes to normal position the fault led with fault relay will switch off.

When the smoke is detected by smoke detector, the corresponding “FIRE” Red Led will be glow with corresponding relay will switch ON. In the remote control software the function Histogram Viewer is display the sensitivity, detector output, Fire 1 & 2 level and pre-alarm & aux alarm level. Also see the detector level and alarm level in chart recording function and in the fire panel “Fire” red led will be glow and also display the message.

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SOFTWARE:

For configuring the Aspirating smoke detector [FIRElink-25] used Remote control software 3.50.

HARDWARE :

Aspirating smoke detector – Firelink-25

Fire Panel - NS1060.01.FR

HARDWARE DESCRIPTION

FIRE PANEL - NS1060.01.FR

1. Product Description

1. Overview:

The Conventional Fire Panel can intelligently communicate with a wide variety of detectors and devices such as multi sensing detectors, Smoke and Heat Detector, Ionization Detector, Sounders, Beacons, and Indicators and so on. A complete system can also be formed by networking multiple such panels and accessories such as Repeater Panels, Mimic Panels to form a fire alarm system for a very large building complex. Conventional Fire Panels typically use a proprietary protocol to communicate with loop devices. N & S Automation has developed and manufactures such a Conventional Fire Panel for entire range of Apollo Detectors and interfaces. This document describes the function and scope of this panel. The panel has 2 conventional zones in addition to one addressable loop.

The system shall have aspiration type of smoke detector, which shall be installed at critical locations to detect smoke and send the signal to the control unit. This control unit shall be the central processing unit of the system, receiving and analyzing signals from smoke detector and providing audible and visual information to the user. It shall have suitable audio/visual alarms for indicating various events.

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The Control Unit shall have sufficient input ports for connecting various sensors/detectors along with their interfaces, if any, & shall have sufficient output ports for controlling fire extinguishing system.

The panel of the control unit shall have the facility of buzzer silence, alarm silence and alarm activate, & reset. The panel shall indicate the status like fire, fault, supply fault, battery fault, and earth fault by respective LEDs/other suitable means.

The control panel should have a GSM module and the system(s) shall send SMSs on GSM network to not less than 10 preselected GSM mobile numbers.



2. System Features

- LED indications for various modes on front panel.
- Supports English, Hindi or Tamil languages supported.
- Local buzzer indication for fire & and fault.
- 12 key keypad for configuration and programming the system.
- Provision of Conventional 4 zones and Addressable 95 zones.

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- Stand by battery backup of up to 24hrs.
- Real time clock.
- Normal fire detection
- Testing modes (Walk test, Loop Test, Device Test).
- Devices bypass facility
- One Notification Appliance Circuits (NAC) output for Siren.
- Three PFC outputs (1 Fire, 1 Fault output, . One1 PFC reserved for future use)
- Admin and user password protected system operations and functions.
- Records history events:
 - Total events: 10,000
 - All events: 10,000
 - Fire events: 1000
 - Fault events: 1000
- Built in GSM Auto dialer connectivity. (Support up to 10 mobile numbers).
- MODBUS connectivity.
- Optional Repeater Panel connectivity.

1.3 Technical Specifications

Power Supply	65-130VDC, Internal 24 V Battery Charger(OPTIONAL) 24 V Loop Supply. 24 V Operating Supply.
Indication	Front panel LED indications 128 x 64 Graphics LCD display Fire status, fault status, configuration menus, real time clock, Loop status Buzzer Indication Fire, Fault
Output	PFC Relay outputs: 3 outputs (1 Fire, 1 Fault output, 1 PFC reserved for future use) Notification Appliance Circuit (NAC) Voltage: 27.5 V DC, Current: 500 Ma maximum
Dimensions	(300 x 155 x 380) mm (L x W x H)
Operating Temperature	-20°c to +65°c

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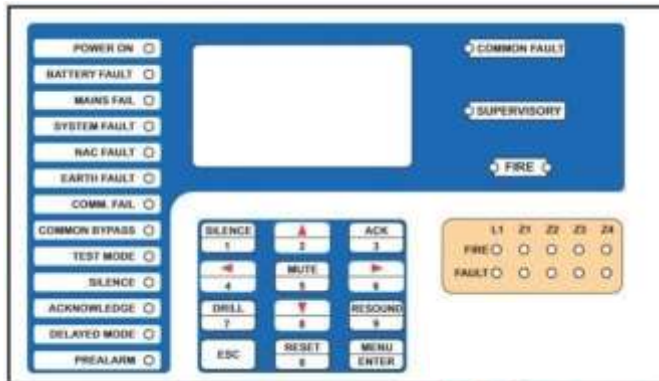
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Storage Temperature	-40°c to +90°c
Humidity	5 to 90% Rh
Enclosure	Stainless Steel with Buff Finish , 1.5mm thickness

4. Controls and Indications



1. Controls

Key name	Password Protection	Key function
MENU	User password protected	<ul style="list-style-type: none"> ○ Can view history events. ○ Configures system as per requirements. ○ Shows all system menus.
ENTER	User password protected	<ul style="list-style-type: none"> ○ Access the new menu. ○ Saves configures data, mode or value of the system. ○ Verify admin and user password.
RESET	User password protected	<ul style="list-style-type: none"> ○ Reset all the system.
ESC	User password protected	<ul style="list-style-type: none"> ○ Goes back to previous screen. ○ Exits from menu.
RESOUND	User password protected	<ul style="list-style-type: none"> ○ Resound the sounders. ○ Resound the NACs
DRILL	User password	<ul style="list-style-type: none"> ○ Activates NAC manually during

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	protected	evacuation drill action
MUTE	User password protected	<input type="radio"/> Mute the Buzzer
ACK	NA	<input type="radio"/> Reserved
SILENSCE	User password protected	<input type="radio"/> Silence the NACS. <input type="radio"/> Silence the sounders.
Num Keys 0-9 nos.	User password protected	<input type="radio"/> Enter numeric values from 0 to 9 during Configuration
Cursor Keys	User password protected	<input type="radio"/> Moves cursor of LCD left / right with the use of keys 4 and 6. <input type="radio"/> Moves cursor of LCD up / down with the use of keys 2 and 8.

1.4.2 LED Indications

There are different LED Indications given on front panel of fire Alarm system provided to alert the user when different events occur. Name of events along with colour of corresponding LED with description are as follows.

Refer the front panel interface as shown in above figure.

No.	Indication	LED Colour	Description
1	System ON	Green	This Indication shows system is Power ON
2	Battery Fault	Yellow	When Battery Fault Occurs, ON
3	Mains Fail	Yellow	When Mains Fail Occurs, ON
4	System Fault	Yellow	NA(Not Applicable)
5	NAC Fault	Yellow	NAC Fault has been occurred, ON
6	Earth Fault	Yellow	Earth Fault occurs
7	Comm. Fault	Yellow	When Communication Fails LED Blinks.
8	Common Bypass	Yellow	When anything is Bypassed, ON
9	Test Mode	Yellow	When in Test Mode, ON
10	Silence	Yellow	System has been Silenced, ON
11	Acknowledge	Yellow	NA(Not Applicable)
12	Delayed Mode	Yellow	NA(Not Applicable)

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13	Pre Alarm	Yellow	When Device is in Pre – Fire state, ON
14	Common Fault	Yellow	When any Fault Occurs, ON
15	Supervisory	Yellow	NA(Not Applicable)
16	Twin Fire	Red	If any zone is in fire condition, ON
17	Zone Fire	Red	If any zone is in fire condition, ON
18	Zone Fault	Yellow	If any zone is in fault condition, ON

3. LCD Indication

The 128x64 Dots graphics LCD Display is used in this system. System shows different status like, Zone fire status, Fault status, Configuration menus, real time clock and so on. The LCD is mainly used for the programming of the panel listed below.

- Zone modes
- View history events
- RTC settings
- Fire/ fault indication
- Change password
- Communication setting
- Dialer setting
- Device info
- Information
- Panel ID
- In idle mode, it shows screen with date and time.

4. Buzzer Indication

A Buzzer provides separate and distinct sounds for Fire, Faults and Walk Test Fire.

- Fire : Continuous Buzzer on.
- Fault: 1 sec ON and 1 sec OFF.
- Walk Test Fire: 1 sec on and 1 sec OFF (only 5 times).

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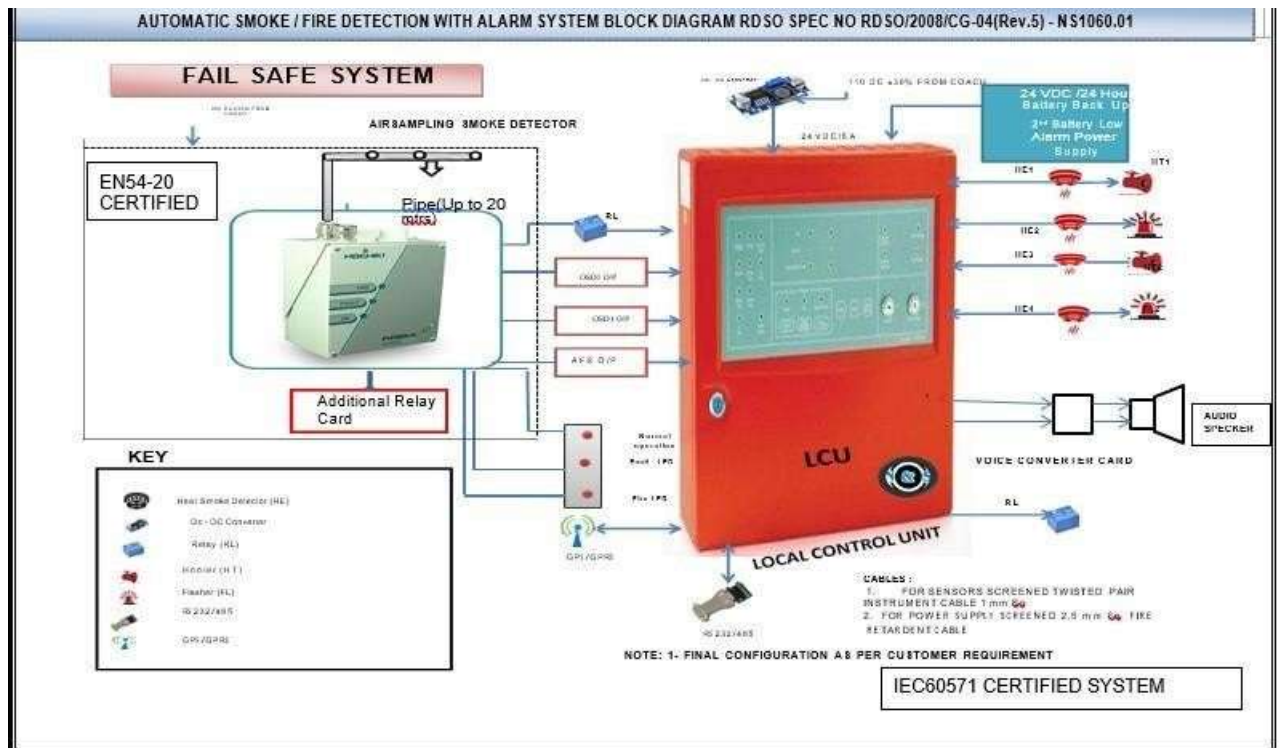
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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

2.3 Panel Wiring

The following diagram shows basic components of Conventional Fire Panel. It consists of various smoke and heat detectors, AC power source, Notification devices like Siren or sounder, GSM Dialer, all connected to control panel.



WARNING:

Several different sources of power can be connected to this panel. Disconnect all sources of power before servicing. The panel and associated equipment may be damaged by removing and / or inserting cards, modules or inter connecting while this unit is powered on.

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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Primary Power source (AC) and Earth Ground Connection :

AC Power connections are made inside the control panel cabinet. A separate Earth Ground connection must be made to ensure the proper panel operation and lightening and transient protection.

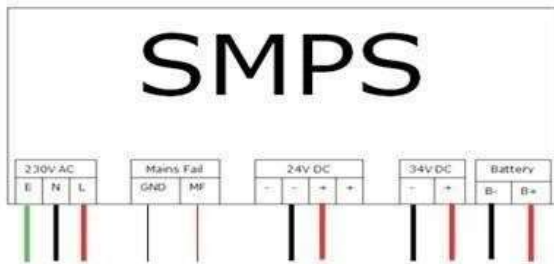
Standby Power Source (Batteries)(OPTIONAL)

Use Two 12V 7Ah or higher sealed lead acid type Battery. Observe polarity when connecting the battery. Connect the battery to the provided cable. The battery charger is capable of recharging sealed lead acid type batteries up to 9Ah.

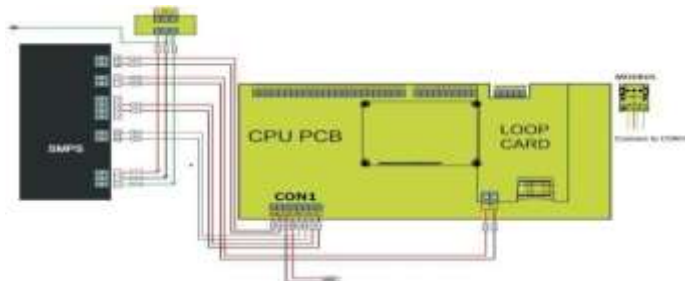
Cable Details:

- AFP Panel to AC Mains:- 3 Pin Power cord(3 core 2.5 sq mm)
- AFP Panel to Loop detectors:- Armoured Cable (2 core 1.5 sq mm)
- AFP Panel to Modbus communication:- Shielded twisted FRLS cable (2 core 1.5 sq mm)
- AFP Panel to Repeater Panel:- Shielded twisted FRLS cable (2 core 1.5 sqmm)

1. Power Supply Circuit Board



2. Internal Wiring Diagram



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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

2.3.3 Internal Connection Details

Power Supply System		
CON1.1	SMPS BATT+	SMPS BATTERY INPUT (+)
CON1.2	SMPS BATT –	SMPS BATTERY INPUT (-)
CON1.3	BAT -	BATTREY INPUT(-)
CON1.4	BAT +	BATTREY INPUT(+)
CON1.5	MF+	MAINS FALL INPUT (+)
CON1.6	MF -	MAINS FALL INPUT (-)
CON1.7	V+	DC INPUT SUPPLY FROM SMPS (+)
CON1.8	V -	GROUND(-)

CON NO.	DESCRIPTION
FIRE INPUT ZONES	
1	Zone1 : +ve
2	Zone1 : -ve
3	Zone2: +ve
4	Zone2 : -ve
5	Zone3 : +ve
6	Zone3: -ve
7	Zone4 : +ve

Resettable supply	
9	Resettable supply IN
10	Resettable supply OUT
11	GND
8	Zone4: -ve

SIREN OUTPUT 24VDC	
21	SIREN +VE
22	GND

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DETECTION WITH ALARM SYSTEM

2.3.3 Internal Connection Details

FIRE INPUT ZONES	
12	FIRE RELAY 1 NO
13	FIRE RELAY 1 C
14	FIRE RELAY 1 NC
15	FAULT RELAY 2 NO
16	FAULT RELAY 2 C
17	FAULT RELAY 2 NC
18	EXTRA RELAY 3 NO
19	EXTRA RELAY 3 C
20	EXTRA RELAY 3 NC

24VDC OUTPUT	
23	24 V O/P +VE
24	GND

MODBUS/ REPEATER	
27	RS485 D -
28	RS485 D -

DI (DIGITAL INPUT)	
29	AUX SENSE IN
30	GND
31	AUX I/P
32	GND

SPEAKER OUTPUT	
33	SPEAKER O/P +VE
34	SPEAKER O/P +VE

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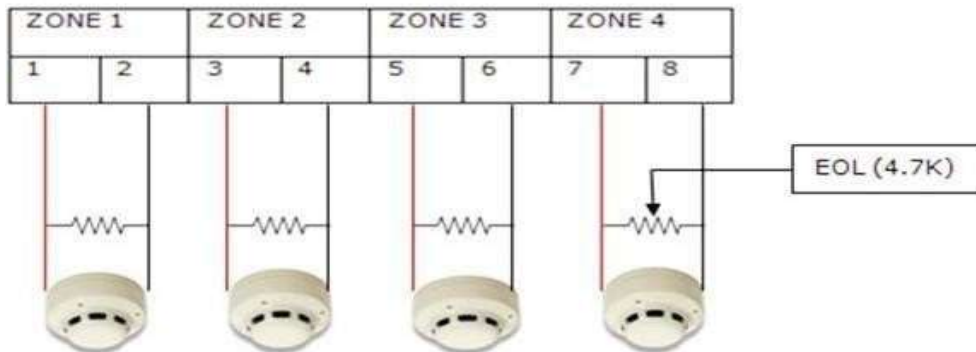
**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

LOOP1	
35	LOOP IN –VE
36	LOOP IN +VE
37	EARTH
38	LOOP OUT –VE
39	LOOP OUT +VE

4. Initiating Device Circuit (IDC)

- No. of Initiating circuit : 4 Zone
- Type : Class B
- Wire Size: 1.5 sq. mm max.
- Operating Voltage : 24 VDC nominal max
- Connector : CON 2
- Total No. of Devices : Maximum 20 smoke detectors per zone
- Monitoring Device : 4.7K Ohm, 1 W(EOL)

All zones may be configured for general fire alarm applications.



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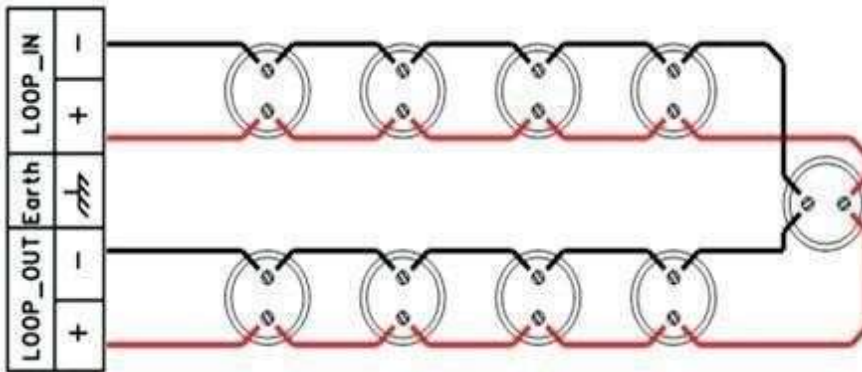
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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

5. Loop Wiring Installation

- No. of Loop : One
 - Type : Class A
 - Wire Size: 1.5 sq. mm Max.
 - Operating Voltage : 34 VDC Nominal
 - Terminal : CON 4 (Loop Card)
 - Total No. of Devices : 126/75/25 (Depending on Panel Variant)
- All devices may be configured for general fire alarm applications.



6. Installation Precautions for Fire Panel

Addresses 127 and 128 are not valid for fire Panel. For S90, XP95 and Discovery, addresses above 126 are invalid. So, for S90, XP95 and Discovery devices, the user can enter address less than 127. Address range from 1 to 126 is for all series i.e. S90/XP95/Discovery/Soteria but address range from 129 to 254 is only for Soteria.

If user adds S90/XP95/Discovery device on address 'X', (here $X < 127$), then $X+128$ address will not be available and no Soteria devices are added at $X+128$ address.

If S90 / Xp95 / Discovery devices are used in combinations, then consider the following examples while adding the devices.

For example1, if XP95 device is added at address 12 then at address 140($12+128$), no Soteria device can be added. Address 140 is not available. But if Soteria is added at address 12 then address 140 will be available.

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If a Discovery device is added at address 3 then at address 131(3+128), no Soteria device can be added. Address 131 is not available. But if Soteria is added at address 3 then address 131 will be available.

If a Soteria device is added at address 'Y', (here Y>128), then if user selects a S90/XP95/Discovery device, address Y-128 will not be available but if user selects Soteria device, address Y-128 will be available.

For example2, If a Soteria device is added at address 129, then if a S90/XP95/Discovery device is selected to add, address 129-128= 1 will not be available. But if a Soteria device is selected instead, address 1 will be available

7. Output Circuits

1. Output Circuit NAC

- No. of NAC: 1 Ckts.
- Type : Class B
- Output Voltage : 27.5V
- Current : 0.5 Amps maximum
- Terminals : CON 4
- Monitoring Devic : 4K7 (if siren is absent)
- Wire Size : 1.5 Sq. mm



FIRE RELAY			FAULT RELAY			PFC RELAY 1			SIREN	
NO	COM	NC	NO	COM	NC	NO	COM	NC	+	-

2. THREE PFC OUTPUTS

1. Fire status output (CON4.1 NO, CON4.2 C, and CON4.3-NC)
2. Fault status output (CON4.4 NO, CON4.5 C, and CON4.6-NC)
3. PFC1 status (CON4.7 NO, CON4.8 C, CON4.9-NC)

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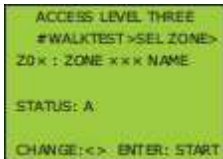


**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

4. Maintenance

1. Walk test (For conventional zones)

To go to **Walk Test**, Go to level 2 and press key 3.

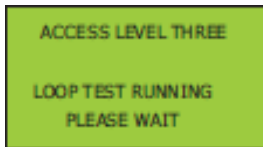


Walk Test Procedure:

Select zone (using left, right arrow) which is to be kept in walk test. Press “Enter” key on the keyboard. Give smoke to device which is under the walk test zone. Then the respective zone fire led turns ON & OFF five times with 1sec ON/OFF time. Event is logged. Buzzer will toggle & Siren will remain ON till zone auto resets. Press **ESC** to come back to previous screen.

2. Loop Test (For Addressable Zones)

To go to **Loop Test**, Go to level 3 and press key 7.



3. Servicing

Following are the servicing check list of AFP panel. Maintenance / servicing is required twice a year for each panel.

Sr. No.	Check point or maintenance point	ok / not ok	Remark
1	Clean each smoke detector using soft cloth		
2	Check panel operation on battery backup mode		
3	Check panel operation on mains supply		
4	Check all connection of panel		
5	Perform walk test/ loop test of panel		
6	Check smoke detector		
7	Check siren output		
8	Check battery supply		
9	Check panel mounting screw		

2.4.4 Periodic inspection and test of system

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For additional information on control panel faults, regular checking of the functionality of the control panel and fire detection system by a person responsible for fire prevention in the company must ensure the availability of the fire detection system. Perform the Walk test regularly.

Weekly Testing By the User

- Ensure that all indicators are showing correctly.
- Check that the internal buzzer are operating correctly
- LCD Display shows messages from the system.
- Each week, choose different manual check points so that the manual check points in the building are tested in rotation over a prolonged period.
- Check all detectors and ensure that none are obstructed in any way. Enter results of tests into the log book.

Quarterly Test

- Perform Walk / Loop Test to check the healthy condition of all Zones/Detectors. After every 3-4 months Walk/Loop test must be carried out.

Annual Test

- Additionally, test all detectors, check points and check for correct operation.

Every 2 - 3 Years

- Clean smoke detectors to ensure correct operation and freedom from false alarms.
- Special equipment is required for cleaning smoke detectors.

Every 4 years

- Replace sealed lead acid batteries. If the operating temperature exceeds 25o C continuously, then the battery may need to be replaced sooner.

Pre Check list for call:

- Check mains supply of system
- Check supply voltage of panel
- Check panel operation on battery backup mode
- Check all Indicators are showing results as per action are taking place in the Panel.
Mainly
check out for the system ON indicator is glowing
- LCD display shows messages, buzzer operates.
- Check all the cables are connected in proper manner
- Smoke detectors can detect the smoke
- Perform Walk/Loop test to ensure all zone are healthy

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

5. Do's and Don'ts

1. Do's

1. DO take responsibility for your fire systems

Taking responsibility means being proactive and intentional about managing the programme and knowing what it takes to maintain a high level of reliability your fire systems.

2. DO understand how your fire system works

Do you know the difference between the Trouble signals Fire Alarm system? What's the correct response to these different signals? What button should you press? It's important that you find ways to learn how the system operates so that you are prepared to interact with the equipment in the case of an emergency. We encourage you to make an effort to understand how your particular fire systems are designed to operate.

3. DO know the inspection, testing and maintenance requirements

Testing must be performed on a periodic basis to verify the functionality of the fire system including simulating the events and conditions that are to be expected during an emergency situation. One must also remember those maintenance tasks are necessary to keep the system in good operating condition. These tasks include both periodic preventative maintenance activities and making the required repairs revealed by the inspection or testing of the system components like siren.

4. DO train your people

Certain people must receive varying degrees of training depending upon their role. Some must understand how to operate the system so they can interact with the system when something happens. Others must simply be ready to react appropriately when an event happens. If you decide that more training is needed, don't forget to turn to your fire system service provider for help.

5. DO pay attention to record keeping

There are several different types of records that are important to maintain. Every Fire Alarm System should have what is called a "Record of Completion" document that is maintained up-to date with any and all system changes made over the life of the system. Other important records include built drawings, user manuals, written sequence of operation and servicing charts.

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DETECTION WITH ALARM SYSTEM**

2.5.2 Don'ts

1. DON'T ignore reoccurring problems

Some fire systems are plagued by reoccurring trouble conditions that just don't seem to go away on their own. Common intermittent troubles include ground faults, circuit problems, battery faults and device failures. An experienced fire system service technician can track down the root cause of the problem and know how to make the necessary repairs. Resist the temptation to ignore these problems because of their sporadic nature. You may have a bigger problem than you think and your system may be rendered ineffective because of it.

2. DON'T let building occupants become apathetic to fire alarms

May be you have noticed this, but most people hesitate to respond when they hear the fire alarm evacuation signals in a building. Unfortunately, most of us have experienced more than one “false alarm” from a fire system in our lifetime and this has led many to be apathetic about evacuating. Facility Managers must do what they can to avoid false alarms, but when they do happen take steps to make whatever changes are necessary to prevent them in the future. When possible, inform occupants about the source of each false alarm in hopes of maintaining their future confidence in the system.

3. DON'T cause an accidental discharge

Many facilities may have one or more spaces protected by an automatic fire extinguishing system. Unfortunately, too many system owners have had to deal with an accidental discharge of a system. Facility Managers must take steps to avoid this at all costs. Without question, the most common reason for a false discharge is human error. It's important to put in place and enforce procedures and policies that will minimize the chance for this sort of error. The single biggest contributor to the prevention of accidental discharges is training the personnel who work in and around these spaces.

4. DON'T allow unqualified personnel to service your fire system

Facilities Managers must ensure those who are performing these tasks are trained on the equipment they are servicing. The person working on Fire Panel unit, must have through knowledge of Fire Sprinkler, Fire Alarm and Special Hazard Fire Suppression. Facility Managers must not hesitate to ask not only the service provider, but also the specific technician about their level of experience in the type of work they are performing. The reliability of your life safety and business continuity depends upon this person.

5. DON'T forget to consider the fire system when your facility changes

One thing is for certain, your building will eventually change and each time it does the Facility Manager must not forget to evaluate the impact those changes will have on the fire systems protecting the building. Other types of fire systems and components will no doubt be impacted

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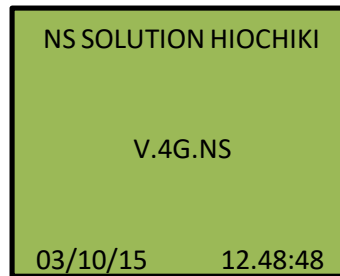


**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

including detector placement, notification appliance location, sprinkler coverage and obstructions to manual pull stations. When you realize your building will be undergoing a change, begin planning up-front for the necessary changes to the fire systems.

3. System Programming

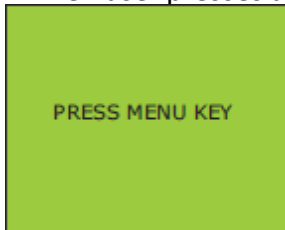
An addressable fire panel is completely programmable at site with the help of panel keypad and LCD. It does not require software skills. Programming Mode is level password protected. If we do not enter the password within 10 seconds, the panel display will automatically go back to main screen. When panel is in normal state, the screen displays as below. Normal state means no active alarms, troubles or under configuration / testing mode.



To enter the programming mode, panel must be in normal condition as above. If any fault or alarm condition exists, make sure that it is cleared and panel returns to normal condition. System can be programmed only by administrators i.e. users having administrator role passwords. Normal users can operate the system but they are not able to program the system.

1. Unit Configuration

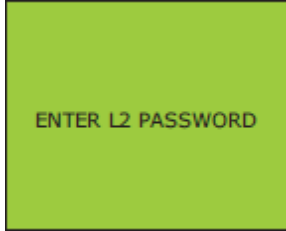
1. When user presses any key other than menu, the LCD appears as shown below.



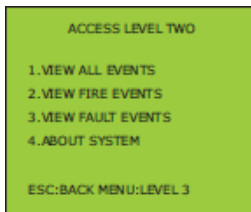
2. When Menu key is pressed, the LCD appears as shown below.



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DETECTION WITH ALARM SYSTEM

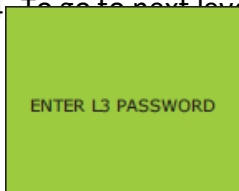


3. If you enter the Level 2 password correctly, the LCD appears as shown below.



- To view **All events**, press **1** key.
- To view **Fire events**, press **2** key.
- To view **Fault events**, press **3** key.
- To view **About System**, press **4** key.
- To view the events one by one, press < or > key.

4. To go to next level menu, press Menu key. LCD appears as shown below.



Enter **Level3** password. The default password is 3333.

5. If you enter the level 3 password correctly, the LCD appears as shown below.



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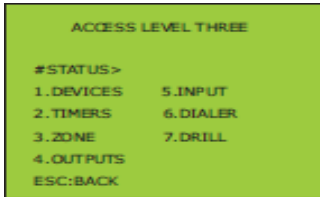
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DETECTION WITH ALARM SYSTEM

6. To go to Status, press 1 key.



Devices: Press 1 to see the status of all Devices. To view devices use left and right arrow Keys.

Timers: Press 2 to see the status of all timers.

Zone: Press 3 to see the status of all zones.

Output: Press 4 to see the status of Outputs.

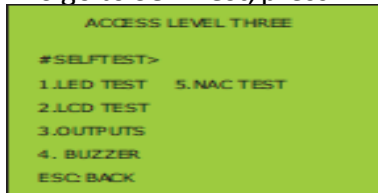
Input: Press 5 to see the status of Inputs.

Dialer: Press 6 to see the status of Dialer.

Drill: Press 7 to see Drill status

Press **ESC** to come back to previous screen.

7. To go to **Self-Test**, press 2 key.



1.LED TEST: After pressing 1, all LEDs of panel turn ON & then OFF, and display shows TESTING LEDS.....

2. LCD TEST: After pressing 2, all pixels of display are checked.

3.OUTPUTS: After pressing 3, all outputs of the relay (Fire, Fault, PFC1) turn ON & then OFF and display shows TESTING OUTPUTS.....

4.BUZZER: After pressing 4, buzzer turn ON & then OFF and display shows TESTING BUZZER.....

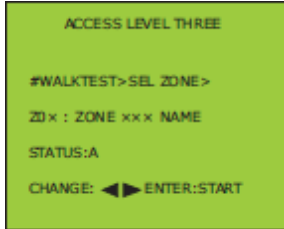
5.NAC TEST: After pressing 5, NAC (siren) turn ON & then OFF and display shows TESTING NAC.....

Press **ESC** to come back to previous screen.

8. To go to **Walk Test**, press 3 key.



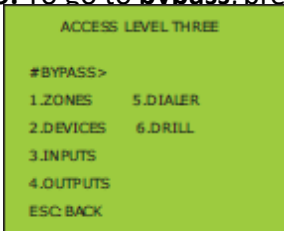
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DETECTION WITH ALARM SYSTEM



Select zone (using left, right arrow) which is to be kept in walk test. Press “Enter” key on the keyboard. Give smoke to device which is under the walk test zone. Then the respective zone fire led turns ON & OFF five times with 1sec ON/OFF time. Event is logged. Buzzer will toggle & Siren will remain ON till zone auto resets.

Press **ESC** to come back to previous screen.

9. To go to **bypass**, press **4** key.



1.Zones: After pressing 1, all zones can be viewed by using > and < arrow. Zones status can be changed as 'Active' or 'Bypassed' by using 'V' (Down) arrow key. The changed Status is saved only when 'Enter' key is pressed.

2.Devices: After pressing 2, all devices can be viewed by using > and < arrow. Device status can be changed as 'Active' or 'Bypassed' by using 'V' (Down) arrow key. The changed status is saved only when 'Enter' key is pressed.

4. Outputs: After pressing 4, 'NAC' & 'PFC RLY' options are displayed.

NAC: Press 1 to bypass NAC by using Down arrow. The changed status is saved only when 'Enter' key is pressed.

PFC RLY: After pressing 2, three options are displayed.

a.Fire Relay: Press 1 to bypass Fire relay by using Down arrow. The changed status is saved only when 'Enter' key is pressed.

b.Fault Relay: Press 2 to bypass Fault relay by using down arrow. The changed status is saved only when 'Enter' key is pressed.

PREPARED BY: M/S/Y/M

APPROVED BY: K.S.S.K

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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

C. PFC Relay: Press **1** to bypass PFC relay by using down arrow. The changed status is saved only when 'Enter' key is pressed.

Press **ESC** to come back to previous screen.

Note: If any of the above is bypassed then Common Bypass LED becomes ON.

Note: Not applicable For V2 or V4 model.

3. Inputs: After pressing 3, the status of the input will be displayed. Input status can be changed as 'Active' or 'Bypassed' by using 'V' (Down) arrow key. The changed status is saved only when 'Enter' key is pressed.

10. To go to **Device Info**, press **5** key.



After pressing **5**, you get above screen which contain device Address, Date, Analog value and Device Type. Next device can be accessed by using left and right arrow.

11. To go to **Find Me**, press **6** key.

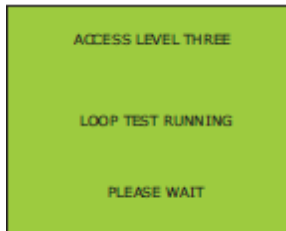


After pressing **6**, you get above screen which contains device Address and Name .Device Address is changed by using left and right arrow. According to selection of Address of Device that Device LED is ON. Press '0' key and user can directly jump on any device address.



ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

12. To go to **LOOP TEST**, press **7** key.



Note: Not applicable to V2 or V4 model.

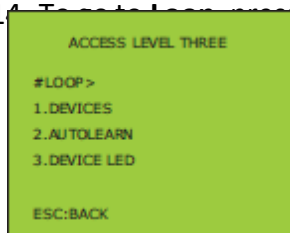
During this test, the LED indicator of each device connected in addressable loop turns ON & OFF sequentially for all devices connected in the loop. In case of output devices, the device turns ON & OFF momentarily.

13. To go to next level menu, press **8** key ('**CONFIG**'). LCD appears as shown below.



Press **ESC** to come back to previous screen.

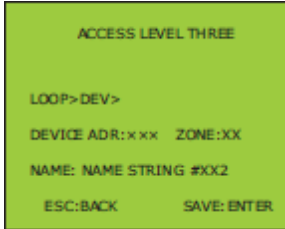
14. To go to next level menu, press **1** key. The LCD appears as shown below.



15. Press **1** key, the Device with Address is seen. The LCD appears as shown below.

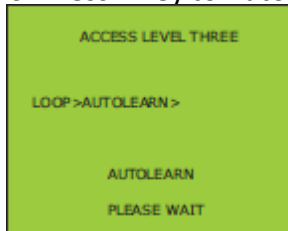


ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM



Press **ESC** to come back to previous screen.

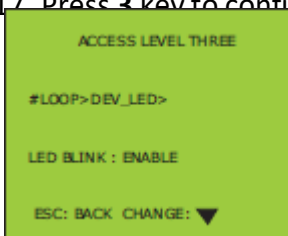
16. Press **2** key to Auto Learn. The LCD appears as shown below.



The System learns all devices connected on Loop and then displays device count after learning is completed.

Press **ESC** to come back to previous screen.

17. Press **3** key to configure Device LEDs. The LCD appears as shown below.



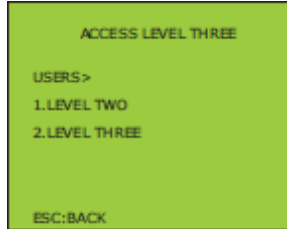
This option is used to Enable or Disable the LED indications of addressable devices while polling.
Press **ESC** to come back to previous screen.

18. To go to **Zones**, press **2** key.
This menu is under development.
Press **ESC** to come back to previous screen.

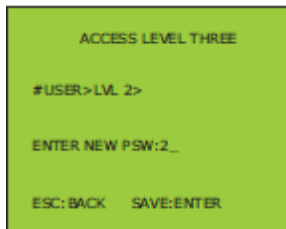
19. To go to **Users**, press **3** key. The LCD appears as shown below.



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DETECTION WITH ALARM SYSTEM

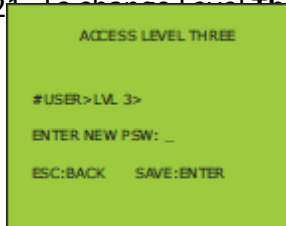


20. To change **Level Two** password press **1**, the LCD appears as shown below.



Enter new password and press **Enter** Key to save new password for Level 2. Numeric password of exactly 4 character length must be entered.
Press **ESC** to come back to previous screen.

21. To change **Level Three** password, press **3** key. The LCD appears as shown below.



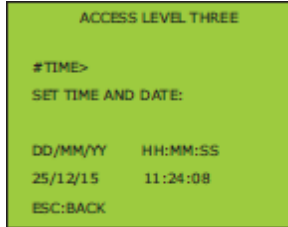
Enter new password and press **Enter** Key to save new password for Level 3. Numeric password of exactly 4 character length must be entered. Press **ESC** to come back to previous screen.

22. To go to **Output**, press **4** key.
This menu is under development.
Press **ESC** to come back to previous screen.

23. To go to **Time/Date**, press **5** key. The LCD appears as shown below.

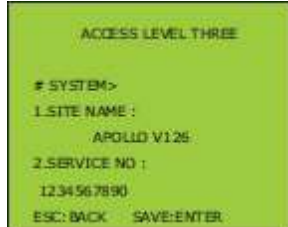


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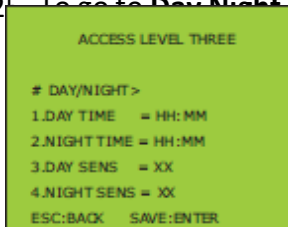
System date and time can be set in this menu. Press **Enter** key to save the date and time. Press **ESC** to come back to previous screen.

24. To go to **System**, press **6** key. The LCD appears as shown below.



Only service numbers are editable using keypad. Press **ESC** to come back to previous screen.

25. To go to **Day/Night** mode, press **7** key. The LCD appears as shown below.



Set day time, press **Enter**. Set night time, press **Enter**. Set day sensitivity from 01 to 05, press **Enter**. Set night sensitivity from 01 to 05, press **Enter**. Then press **Enter**, the LCD appears as shown below.

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APPROVED BY: K.S.S.K

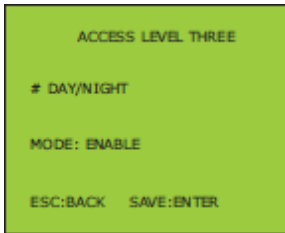
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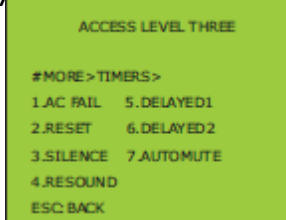


The down arrow key can be used to Enable or Disable the Day/Night mode.
Press **ESC** to come back to previous screen.

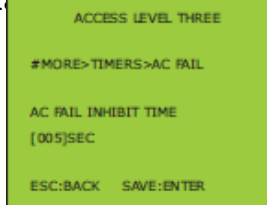
26. To go to **More**, press **8** key. The LCD appears as shown below.



27. To go to **Timers**, press **1** key. The LCD appears as shown below.



28. To change **AC FAIL** time press **1** key, The LCD appears as shown below.

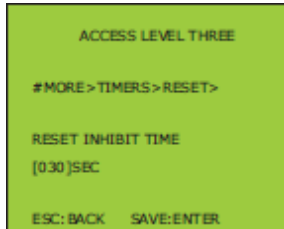


Change the AC Fail timer and press **Enter** key to save.
Press **ESC** to come back to previous screen.



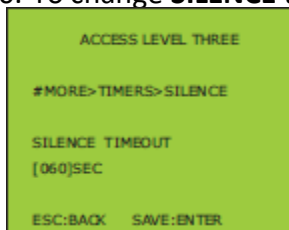
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DETECTION WITH ALARM SYSTEM

29. To change **RESET** time press **2** key, The LCD appears as shown below.



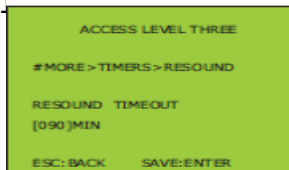
Change the RESET timer and press **Enter** key to save.
Press **ESC** to come back to previous screen.

30. To change **SILENCE** time press **3** key, The LCD appears as shown below.



Change the SILENCE timer and press **Enter** key to save.
Press **ESC** to come back to previous screen.

31. To change **RESOUND** time press **4** key. The LCD appears as shown below.

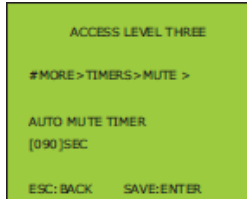


Change the RESOUND timer and press **Enter** key to save.
Press **ESC** to come back to previous screen.
The menus for Key **5** (Delayed 1) and key **6** (Delayed 2) are under development.

32. To change **AUTOMUTE** time press **7** key. The LCD appears as shown below.

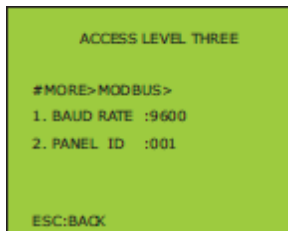


ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM



In this menu you can set the time after which the buzzer will become mute automatically. Press **ESC** to come back to previous screen.

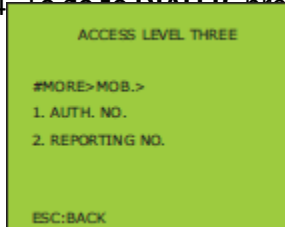
33. To go to **MODBUS**, press **2** key. The LCD appears as shown below



To change **BAUD RATE**, press **1** key then by using Down Arrow select Baud Rate and press **Enter** to save.

To change **PANEL ID**, press **2** key give Valid panel ID, press **Enter** to save. Press **ESC** to come back to previous screen.

34. To go to **DIALER**, press **3** key. The LCD appears as shown below.



Press **1** key to set Authentication Number. There are two authentication numbers that can be set by user using keypad.

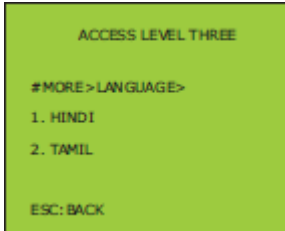
Press **2** key to set Reporting Number. There are ten reporting numbers that can be set by user using Keypad. On fire condition, all ten reporting numbers get SMS.

Press **ESC** to come back to previous screen.



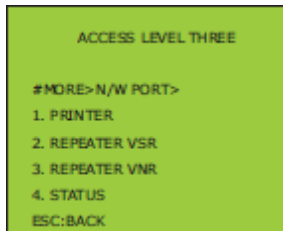
ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

35. To go to **LANGUAGE**, press **4** key. The LCD appears as shown below.



English will be always displayed. Additionally, messages can be viewed in Hindi or Tamil. Press key **1** to show the messages in **Hindi**. Press key **2** to show the messages in **Tamil**. Press **ESC** to come back to previous screen.

36. To go to **N/W Port** menu, press **5** key. The LCD appears as shown below.



Any one of the options 1, 2 or 3 can be assigned to the network port at a time. Press key **1** to configure the network port to Printer mode. (Under development) Press key **2** to establish communication with Repeater VSR. Press key **3** to establish communication with Repeater VNR. (Under development) Press key **4** to view the status of the network port. Press **ESC** to come back to previous screen.

3.2 Normal Mode Operation

This section explains the system behaviour under different conditions. The system continuously monitors for fire and system faults in all modes of operation.

When system is powered ON, **Power ON** LED is continuously ON and **Heart Beat** LED blinks (1Sec ON/OFF). LCD displays Brand Name, Product version, date and time.

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APPROVED BY: K.S.S.K

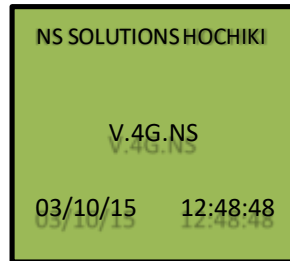
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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM



1. Fire Condition

If any zone detects (for example Z5) the fire, the system enters immediately into fire condition. The system operation and LCD display for this condition is shown below.



- First and Third lines Show Fire, Fifth line indicates the Name of Device and Device Address,
- Seventh line indicate Total Fire Event with Zone No and Device No and Eighth line indicates the
- time and date.
- The zone fire status is visually indicated by respective zone fire LED. The LED of the zone which
- detects the fire in panel will turn ON.
- Common Twin Fire LED turns ON.
- Internal buzzer produces steady sound until silenced by MUTE key.
- Respective NAC turns ON till system silence or reset action is carried out by user.
- The fixed Fire output of the relay (PFC Relay - O/P1) gets activated.
- All events are stored in memory.

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DETECTION WITH ALARM SYSTEM**

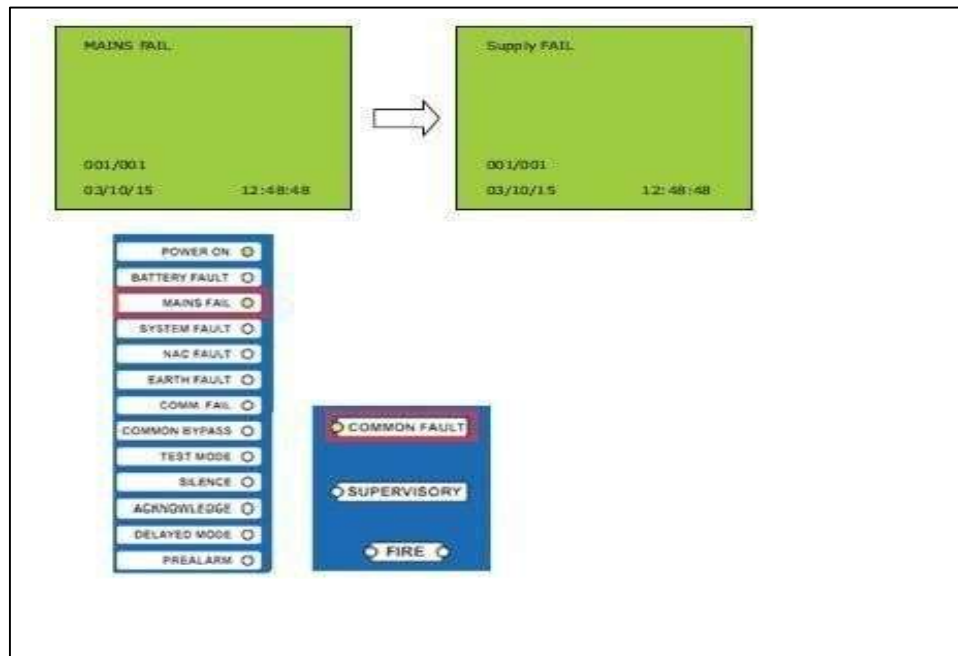
- Fire alarms are latched and are not allowed to clear automatically.
- Timer for NAC Silence, Reset starts.
- If any zone is in Walk test mode, it exits the Walk test mode.

2. Fault Condition

If system detects any fault, it immediately enters into fault condition. The system indicates fault visually and audibly with different indication than fire alarm. The fixed fault output relay (PFC relay) is activated. The system is able to recognize faults in Zone circuit, Loop circuit, NAC circuit, Mains fail, Battery Low and Earth fault. The system faults can also be shown in **Hindi** or **Tamil** language as shown on LCD as below.

For example

Fault Mains Fail



The System operation for the fault condition is given below.

- LCD shows fault message along with time & date.

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DETECTION WITH ALARM SYSTEM**

- Respective fault LED turns ON.
- Common fault LED turns ON.
- Fixed Fault output of the relay (PFC Relay - O/P2) gets activated.
- Internal buzzer toggles 1 second ON and 1 seconds OFF till all faults are recovered or till user
- Acknowledge (Mute).
- All events are stored in memory.
- If user acknowledges (Mute) the system, buzzer goes OFF.
- System stays in this condition till fault recovers or system is reset.

3. System Silence

Whenever the NAC is ON by means of fire or Drill operation or any other means, it can be turned OFF using long pressed SILENCE key.

The System operation for the System Silence condition is given below.

- Silence LED turns ON.
- NAC output turns OFF.
- All sounder turns OFF.
- All events are stored in memory.
- Other LED retains their status.

4. System Mute

Whenever the Buzzer is ON by means of fire or Fault, it can be turned OFF using long pressed MUTE key.

The System operation for the System Mute condition is given below.

- Internal Buzzer OFF.
- All events are stored in memory.

5. System Resound

Whenever the NAC & Sounder is OFF, it can be turned ON using long pressed RESOUND key.

The System operation for the System Resound condition is given below

- NAC output turns ON.
- Silence LED turns OFF.

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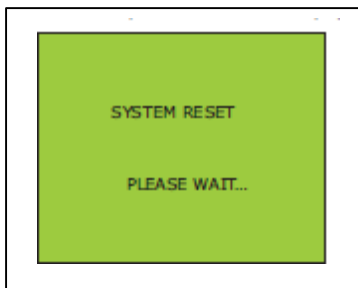


**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

- Sounders turn ON
- All events are stored in memory.

6. System Reset

To come out from fire latch condition or any other condition, long press RESET key. It takes 3-4 sec to complete reset action. LCD displays as shown below.

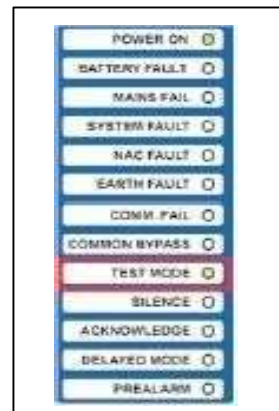


The System operation for the System Reset condition is given below.

- All LEDs are reset.
- NAC output and Buzzer output is also turns OFF.
- Resetting message displays on LCD.
- All events are stored in memory.
- All relay outputs are deactivated.

7. Walk Test Operation

To test Walk Test mode, keep zone in Walk Test configuration. Then apply smoke to the zone. For example, Zone 1: Walk Test mode, for this select Walk test menu in level 3 and select zone using arrow and press Enter to start walk test. The System operation and LCD display for this condition is shown below.



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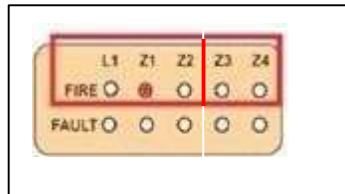
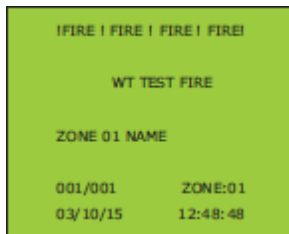
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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

- Apply smoke to the zone
- The System operation and LCD display for this condition is shown below.



The system operates as given below.

- Respective zone Fire LED turns ON and blinks five times with 1sec ON/OFF time.
- NAC Siren is ON till walk test running.
- Internal Buzzer is also ON/OFF with period of 1sec for five times.
- LCD shows the walk test fire message.
- All events are stored in memory.
- Other LEDs retain their status.

3.2.8 Bypass Operation

Bypass operation gives user the option to bypass following parameters:

1. Zones Bypass
2. Device Bypass
3. Inputs Bypass
4. Outputs Bypass
5. Dialer

When any of the above parameters are bypassed, that particular parameter ignores any input or output passed to or from that parameter.

For example, when Zone5 is bypassed from the menu, the LED indicates as shown below.

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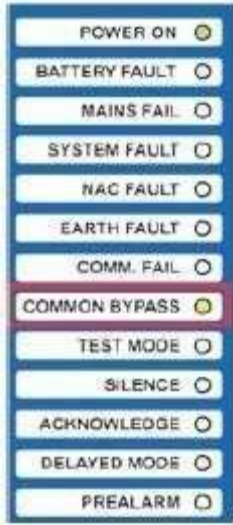
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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM



The system operates as given below.

- Common Bypass LED turns ON.
- Respective zone does not give any input to the system regarding fire or fault.
- Other LEDs retain their status.
- All events are stored in memory.

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

ASPIRATING SMOKE DETECTOR – FIRELINK-25



1 Introduction

FIRElink-25 is a highly sophisticated ‘next generation ‘of High Sensitivity Aspirating Smoke Detection product that has been designed to ensure that installation and commissioning is as simple as possible, while optimising performance.

A unique sensing technology ensures that the detector operates at optimum sensitivity for protected environment, without the need for complex setup. This means the product will configure itself to provide high sensitivity in a computer room or reduced sensitivity in a smoky area. The detector is designed to fit into a Docking station which accepts all sampling pipes and cables leaving the detector to be fitted during the final commissioning phase. This ensures that the detector is less likely to be damaged during installation.



This symbol appears on the main board of the unit and indicates that the board contains static sensitive components. Suitable anti-static precautions must be taken when handling the board.



This label is located on the laser chamber and signifies that the unit is a Class 1 Laser product as specified in IEC 60825-1. The unit incorporates a Class 3B embedded laser which must not be removed from the detector as retinal damage may result if the laser beam enters the eye.

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**



This symbol appears on the main board of the unit and indicates that the board contains static sensitive components. Suitable anti-static precautions must be taken when handling the board.

1.1 Indicators



Fire indicator illuminates when the alarm level has been reached and the appropriate time delays have expired.

Fault. Illuminates when the unit has a fault and a fault signal is being sent to the fire alarm panel.

OK. Illuminates to show normal operation when there are no faults. The OK lamp will flash during the 15 minute Fastlearn™ period when the detector is first learning about its environment.

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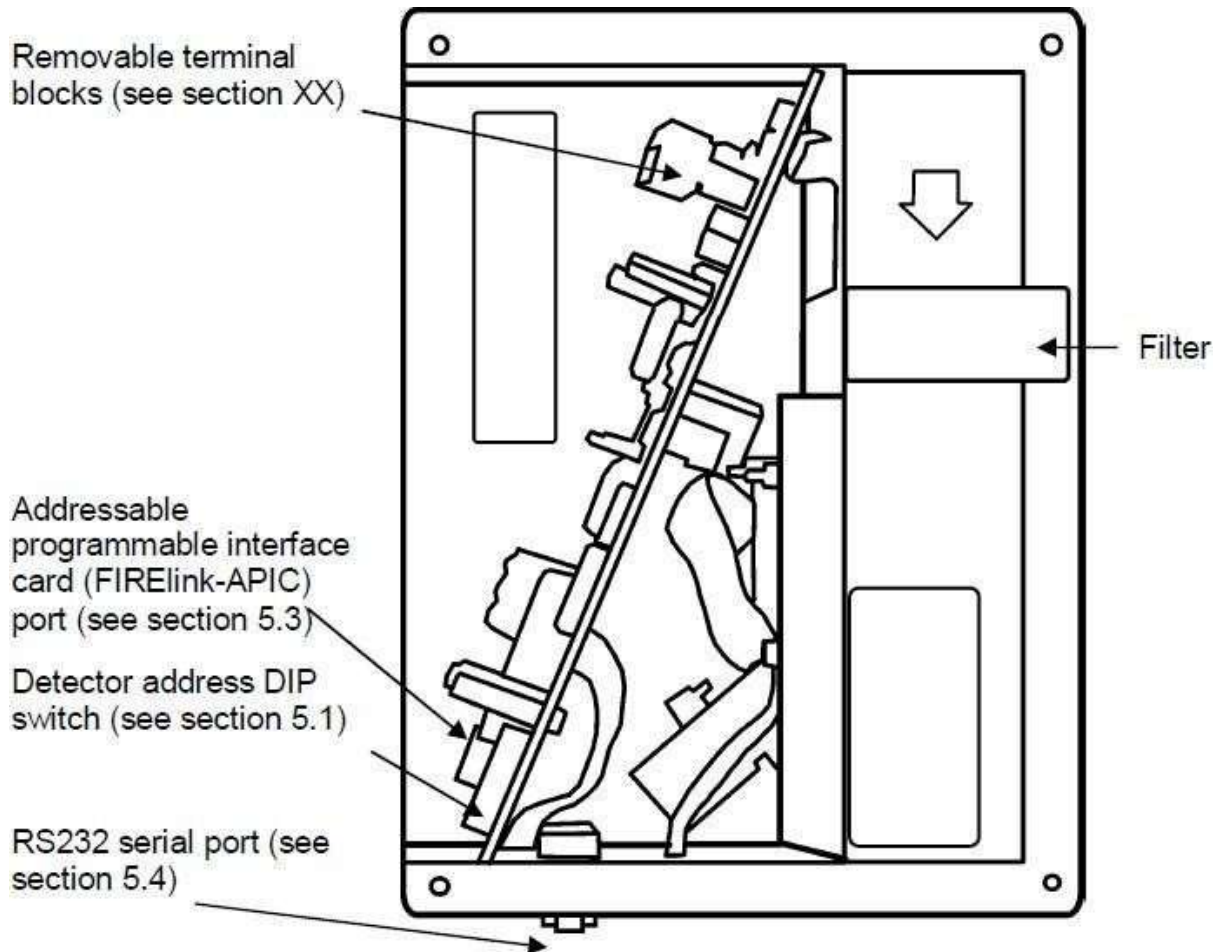
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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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1.2 Inside the Detector



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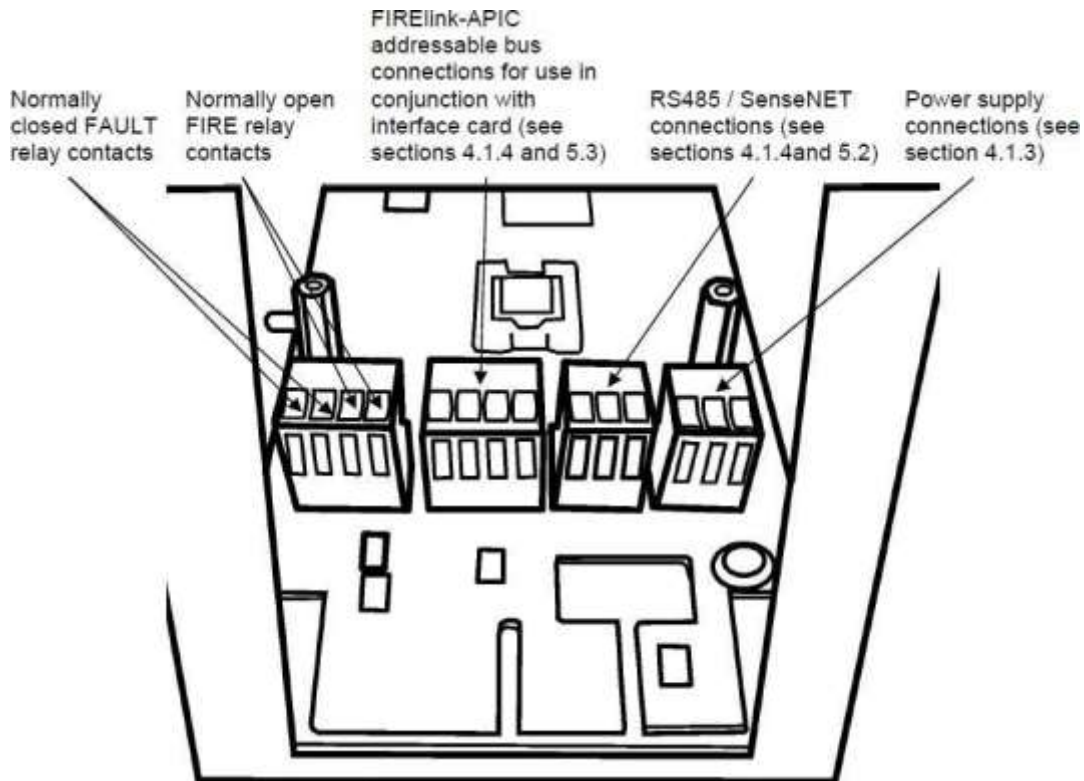
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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

1.3 Detector Terminal Block Connections



2. Programming the Detector

The FIRElink-25 may be programmed from a PC when connected to the detector via a standard 9-pin serial lead connected to the serial port of the computer and the 9 way socket at the base of the detector (see section 7.4, 'Connecting to a PC'). In order to do this, it is necessary to install the remote control software onto the computer. A copy of the remote control software is contained on a CD-ROM supplied with each detector. Install the software in accordance with the on-screen instructions. To open the software, select **Start > Programs > Hochiki > Remote 3.0**

The programmable functions are all accessed through the **Options > Detector** settings submenu or by clicking on the detector button on remote software toolbar as indicated below:

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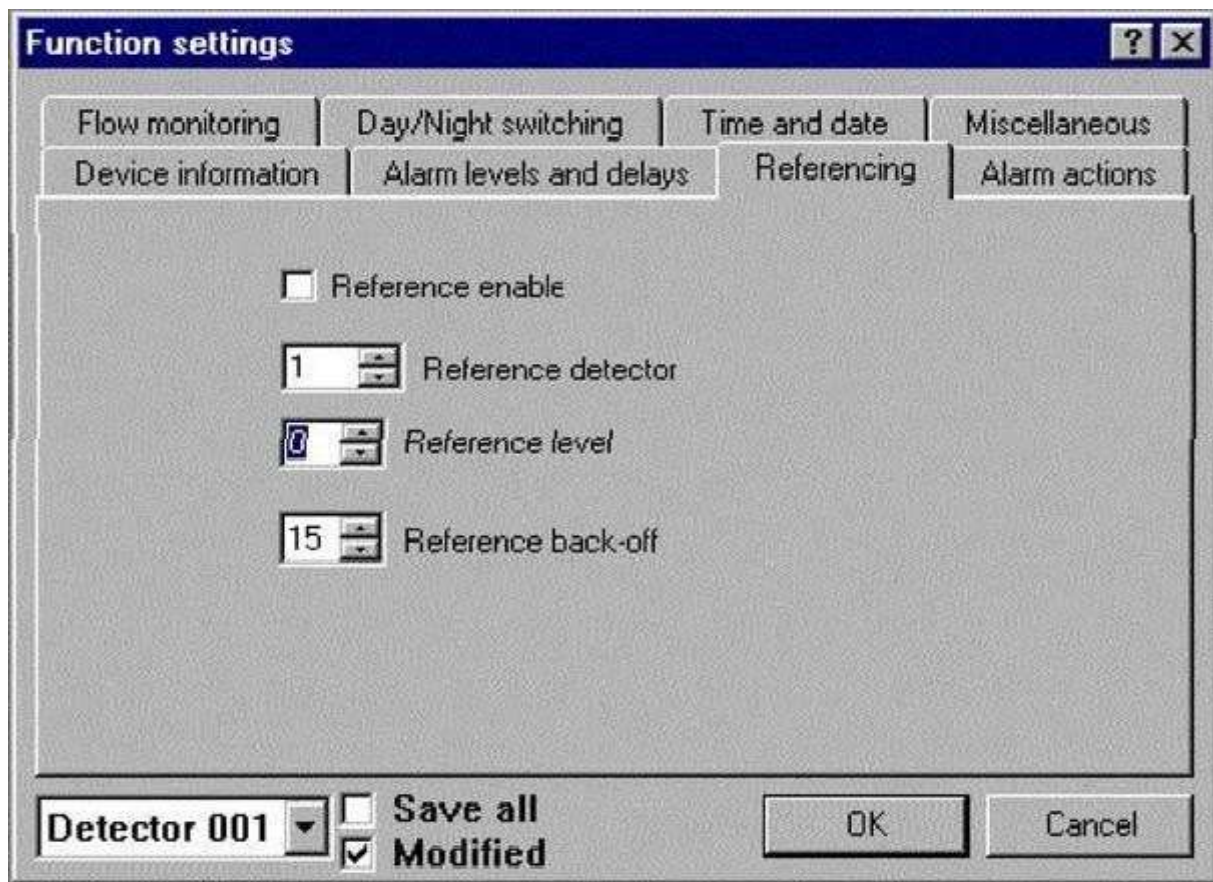
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The following screen is displayed:



This window contains all the programmable functions for the FIRElink-25. To amend one of the programmable functions, go to the relevant tab, make the change and then click **OK**. This will save the change to the detector's internal firmware.



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A list and explanation of the various functions is given below, with the functions grouped by the tab under which they appear.

1. Time and Date tab

It is important that the time and date be set up correctly on the controller's internal calendar/clock because it uses this information to store events in the event log. See section 8, "Event log" for more details. Unless specially ordered, units are supplied with the correct setting for UK time. This is backed up with a rechargeable battery. Later adjustments to the clock setting should not exceed ± 70 minutes unless a FastLearn is initiated.

2. Alarm Levels and Delays Tab

1. Alarm Levels - (Level subgroup)

The value set in the Fire, Pre-Alarm and Aux functions in the Level subgroup is the relatively scaled bargraph level at which the appropriate alarm is initiated on the detector. The Fire 2 level assigns an absolutely scaled alarm level in % obs/m.

The Aux level is set by factory default at level 10 which means that this alarm will occur after the Fire alarm. The default level settings for Pre-Alarm and Fire 1 are 6 and 8 respectively. The default setting for Fire 2 is 20% obs/m.

2. Alarm Delays - (Delay subgroup)

The alarm delay is the number of seconds that an alarm level has to be continuously sensed before the alarm is initiated. Each alarm level has a programmable delay of between 0 and 90 seconds. The default delay for each alarm level is 5 seconds.

3. ClassiFire® Override

This function has no current use on the FIRElink-25 but is reserved for future expansion purposes.

4. Alarm Factor

The detector sensitivity is set with this entry, which will also affect the probability of nuisance alarms. 0 = high sensitivity, higher probability, 8 = low sensitivity, lower probability. The default alarm factor is 4.

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Note: The highest sensitivity setting is suitable for clean, environmentally controlled environments, e.g. Semiconductor manufacturing clean rooms where airborne pollutants are kept to an absolute minimum and the least contamination is cause for alarm.

Use of this setting in a busy machine shop would lead to relatively frequent nuisance alarms due to the normal variation of atmospheric contamination and a lower sensitivity setting is recommended. It is therefore important that the alarm factor chosen is suitable for the area to be protected. When the appropriate alarm factor for the protected area has been set, nuisance alarms will be reduced to an absolute minimum.

The following table gives suggested settings of ClassiFire alarm setting for different locations:

Alarm Factor	Sensitivity	Probability of Nuisance Alarm	Suggested Protected Area
0	Extremely High	Once per year	Semiconductor manufacturing clean room
1		Once per 5 years	Computer room
2		Once per 10 years	Non-smoking office
3		Once per 50 years	Clean factory
4	Medium	Once per 1000 years	Warehouse
5	Medium	Once per 5000 years	Warehouse with diesel trucks operating
6	Medium	Once per 10000 years	Warehouse with diesel trucks operating
7	Low	Once per 20000 years	Warehouse with diesel trucks operating
8	Low	Once per 100000 years	Warehouse with diesel trucks operating

2.2.5 LDD Enable

When this function is ticked, Laser Dust Discrimination (LDD™) increases the response time of the detector slightly, whilst greatly reducing the likelihood of nuisance alarms due to dust ingress. LDD may be disabled in very clean rooms for a slightly faster response to smoke by setting this function to unticking the box. This function is enabled by default.

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NOTE: Disabling LDD is not recommended for areas other than manufacturing clean rooms, due to the increased probability of nuisance alarms in most other operating environments.

6. FastLearn Enable

If the detector is in FastLearn mode, unticking this box will stop the FastLearn process. Using the function in this way is neither recommended nor supported by Hochiki Europe (UK) Limited. Ticking the box will start a FastLearn at any time. The green “OK” LED on the front of the detector will flash for the fifteen minutes that it takes for the FastLearn process, and will then change to constant illumination to indicate that the FastLearn is complete.

Note: It will take a further 24 hours after the FastLearn for full sensitivity to be reached, unless Demonstration Mode has been initiated (See section 3.10, “Demo mode”). It is essential for proper functioning that the detector not be left in Demonstration mode, and that it be allowed to complete the 24-hour learning period. To cancel demo mode, tick this box or power down and restart the detector to initiate FastLearn mode.

7. Auto FastLearn Enable

When enabled, this function ensures that if the detector is powered off for any reason (e.g. for maintenance or to be moved to a new area), a FastLearn is commenced automatically on power-up. There may be occasions when it is desirable to power down the detector for short periods of time, and it is highly likely that ambient contaminant levels will be the same on power-up. Under these circumstances it may not be desirable that the detector should go through the whole learning process again. To this end, this function can be unticked before power-down, whereupon it will return to the original settings on power-up. This function is enabled by default.

8. ClassiFire 3D

If this function is ticked, then the detector will ignore any pre-set time delays in the event of an unacceptably rapid increase in smoke density, thereby minimising response time to 'rapid growth' fires. This function would normally only be used where there were long time delays programmed on the alarm levels. This function is disabled by default.

9. Demo Mode

Demonstration mode is an operating mode whereby the normal 24-hour learning period is bypassed, so that the detector can reach high sensitivity after only the 15 minute FastLearn

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period. This can be used so that initial smoke testing and other commissioning can be carried out.

However, it must be understood that, since the alarm levels will be based solely upon the sparse data gathered during the FastLearn period, there is a risk of nuisance alarms due to normal variations in ambient smoke levels. For this reason, the detector should not be left in Demo mode for normal use when connected to a fire panel.

3. Day/Night Switching Tab

1. Day Start / Night Start –

These values are the times to the nearest hour at which the day/night switching is desired to take place on the detector. Entries are made in 24-hour format, e.g. 19 for 7pm. Day and night switching is intended so that the detector may automatically select a different sensitivity when the protected area is unoccupied and fewer contaminants are being produced. ClassiFire automatically detects the change in smoke level after the protected area is left, and if the time at which this happens is within + 70 minutes of the programmed switchover time it selects the night-time histogram. This means that changes in time setting, for example changing to summer time, may be ignored as the detector will take this into account. The default times for day and night start are 08:00 and 19:00 respectively.

NOTE: That if the environment actually becomes more contaminated during the night period for any reason then ClassiFire will adapt to that too, reducing the night-time sensitivity.

2. Disable Day / Night Switching

If day/night switching is not desirable, the Disable day/night switching box may be ticked to leave the detector permanently in day mode.

4. Alarm Actions Tab

1. Remote Functions (Remote Input subgroup)

These functions have no current use on the FIRElink-25 but are reserved for future expansion purposes.

2. Programmed Isolate

When this function is ticked the controller will not generate alarms and will not indicate a fault condition on any fire panel which is connected, e.g. for use during detector maintenance. The

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“Fault” light will be illuminated on the detector front panel. The isolated condition will be disabled automatically after 7 days if not manually disabled. This function is disabled by default.

3. Latching Alarms

When this function box is ticked it requires a reset from the controlling computer to clear an alarm condition. If unticked, the alarm signal is extinguished as soon as the alarm condition ends. This is the factory default setting.

4. Latching Faults

When this function box is ticked it requires a reset from the controlling computer to clear a fault condition. If unticked, the fault signal is extinguished as soon as the fault condition ends. This is the factory default setting.

5. Cascading Alarms

Ticking this function box means that only when the detector’s controller has gone into Pre-Alarm does the controller start counting down the main Fire delay i.e. the time delays on Pre-Alarm and Fire 1 are cumulative. The Aux alarm is not included in the cumulative delay since it may be set to a higher level than either the Pre-Alarm or Fire 1 levels. This function is enabled by default.

5. Device Information Tab

1. Device Type

This function is for display purposes only. It shows any special designation for the unit, which will normally be FIRElink-25.

2. Firmware Version

This function is for display purposes only. It shows the version number of the fitted firmware chip.

3. Run-time Hours

This function is for display purposes only. It shows the cumulative total number of hours that the device has run (this is not the time that has elapsed since last power-up, but the sum total of run time since the detector memory was last reset).

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4. Watchdog Count

The watchdog is a circuit built into the controller that restarts the controller in the event of a failure to function properly. This could be as a result of electrical spikes. This count shows the number of interruptions found. The details of each problem can be found in the event log. See section 6, “Event Log” for further details.

5. Device Text

This function has no current use on the FIRElink-25 but is reserved for future expansion purposes.

6. Referencing Tab

1. Reference Detector

A FIRElink detector may use another detector as a fresh air reference. This function is the address of the detector which will be used as the reference. To set a detector as a reference detector, enter its address as set by its internal DIP switch into this function. This function is disabled by default.

2. Reference Enable

Ticking this box enables the reference for the detector, if one has previously been allocated in Reference detector (see section 2.6.1). This function is disabled by default.

3. Reference Level

The value set with this function is the percentage reference signal subtracted from the detector’s signal, if a reference device has been allocated. The default value is 0.

4. Reference Back-off

This value is the delay time between a build up of pollution being seen by the reference (if used) and the pollution being seen by the detector. The default value is 15.

7. Flow Monitoring Tab

1. Flow Rate

This function is for display purposes only, and shows a value corresponding to the current airflow through the detector.

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2. Flow High Limit

This value is the level above which airflow needs to increase to trigger a fault indication (which may indicate a loose or damaged inlet pipe). Flow low limit and Flow high limit parameters are automatically set up on initial power-up.

3. Flow Low Limit

This value is the level below which airflow needs to be reduced to trigger a fault reading (which may indicate a blocked pipe). Flow low limit and Flow high limit parameters are automatically set up on initial power-up

This feature requires the Remote Control Software version 3.2 or later, available from the Hochiki Europe

8. Miscellaneous Tab

1. Access Code

This is the access code required to amend programmable parameters. The default code is **0102**. Once the appropriate code is entered it may be changed here to any four digit number to limit unauthorised access.

2. Chart Recording Rate

This function controls how frequently the detector and alarm level or flow rates are stored in the FIRElink- 25's internal chart recorder log. (See section 2.10, 'Chart Recording').

In the above table the shaded cells indicate flow rate recording whilst the white cells indicate detector and alarm level recording. At the slowest recording rate, one month of data can be recorded. The factory default setting is 8.

3. Separator Condition

The value given at this function is the efficiency rating of the dust separator element in the detector as a percentage of the efficiency of a clean separator. A new element will give a reading of 99 in this function. When the efficiency has decreased to 80%, the Fault indicator LED will illuminate and the event log will show "Separator renew".

NOTE: Fitting a new element will reset this figure to 99

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4. Separator Change Date

This function defaults to "--", which means that a separator fault will only appear when the efficiency decreases to 80% (see 2.8.3, "Separator Condition"). However, a date may be entered into this function to allow for a scheduled maintenance period. The detector will then generate a separator fault at the planned time regardless of the condition of the separator, although degradation of the separator to below 80% efficiency before this date will override this. See section 8, "Maintenance" for further details.

5. Factory Default

Enabling this function will reset each programmable function to the default value indicated in the text, where a default setting is specified. It will also put the detector into FastLearn mode, regardless of whether or not Auto Fastlearn is enabled (see section 2.2.7). This ensures that the flow setups and alarm thresholds are optimised to the detector's working environment after resetting. It should be noted that where a ClassiFire alarm factor other than the default is required for the protected area, this will need to be re-entered. Section 2.2.4 gives details of the ClassiFire alarm factors.

9. Other Remote Software Features

1. Reset

If latching alarms (see section 2.4.3) or latching faults (see section 2.4.4) are enabled, the relevant alarm or fault warnings will remain on the detector front panel LEDs and controlling unit until a reset is performed. If using SenseNET software, individual detectors can be reset (refer to the SenseNET User Guide for details). In the remote software, a global reset is available which resets all detectors on the SenseNET loop, or a single stand-alone detector.

To perform a reset, either select the menu options **Options > Global Reset** or click the button on the toolbar as indicated below:



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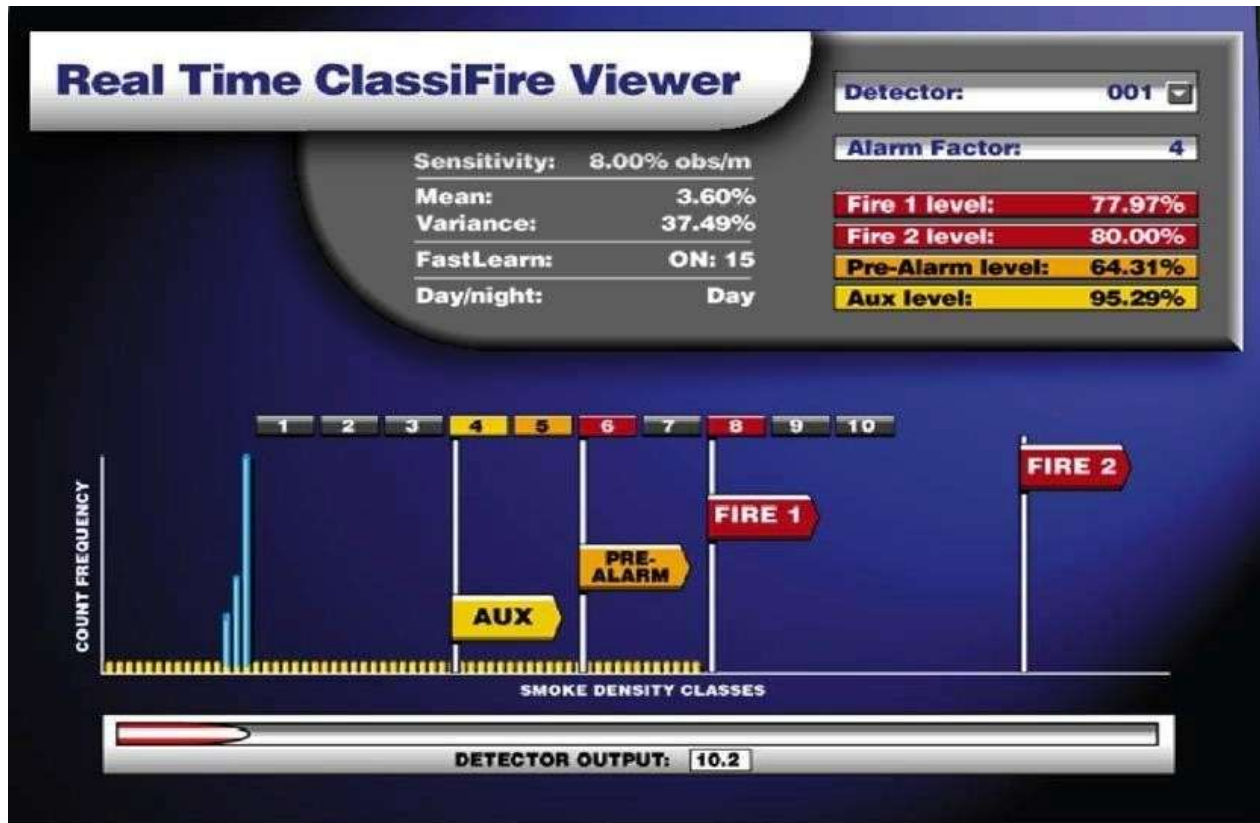
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2.9.2 Histogram Screen

The histogram screen shows various aspects of the detector function. To enter the histogram screen, either select the menu options **View > Histogram Viewer**, or click the button on the toolbar as indicated below:



The following screen is displayed:



There are two types of smoke density histogram; one shown in blue (the “fast” histogram) which updates every 15 minutes, feeding information to the long-term “slow” histograms

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(which appear in yellow). These set the detector sensitivity based on the ambient smoke conditions and it takes 24 hours for the two slow histograms (the “day” and the “night” histograms) to complete their learning phase (see section 2.2.6). Detector sensitivity is based on the fast histogram during FastLearn and is thereafter based on the currently active slow histogram. However, although the positions of the alarm flags are based on the slow histogram, sudden changes in smoke density are picked up by the fast histogram so that early warning is given.

Sensitivity: The current absolute sensitivity of the detector in percentage obscuration per metre (% obs/m)

Mean: The current mean value of smoke density, taken from the currently “active” histogram and given as a percentage of full scale deflection.

Variance: The “spread” of data in the currently “active” histogram and given as a percentage of full scale deflection.

FastLearn: If the detector is currently in FastLearn mode, this will show the number of minutes remaining in the FastLearn period. When this period has elapsed it will read “OFF”.

Alarm factor: This is the ClassiFire alarm factor (see section 3.5, “Alarm factor”)

Day/night: This indicates the currently active slow histogram

Alarm levels: These figures give the position of the various alarm flags in terms of a percentage of full scale deflection.

Detector output: This shows the real-time variation in background smoke levels in terms of a percentage of full scale deflection.

2.10 Chart Recording

The chart recording function shows how smoke density in the protected area has varied over time. The chart may be downloaded to disk or printed out from a connected printer.

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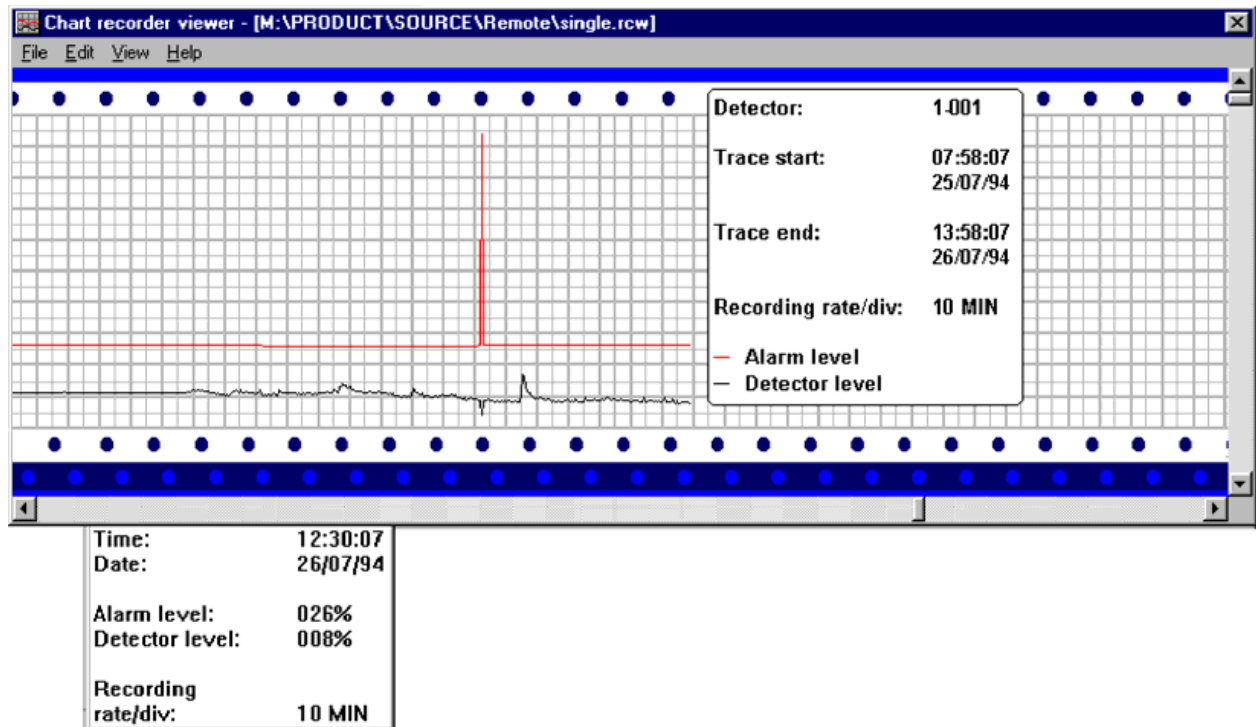


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To access the chart log, select the menu options **View > Chart Recording** or click the button on the toolbar as indicated below:



The following screen is displayed:



The red trace is the current alarm level and the black trace is the detector output. By moving the cursor along the chart, the “Chart information” window (shown at the bottom left) updates to show the date and time, detector level and alarm level of the relevant period. The **File** menu option in the chart recording window allows the chart recording to be saved to disk or printed

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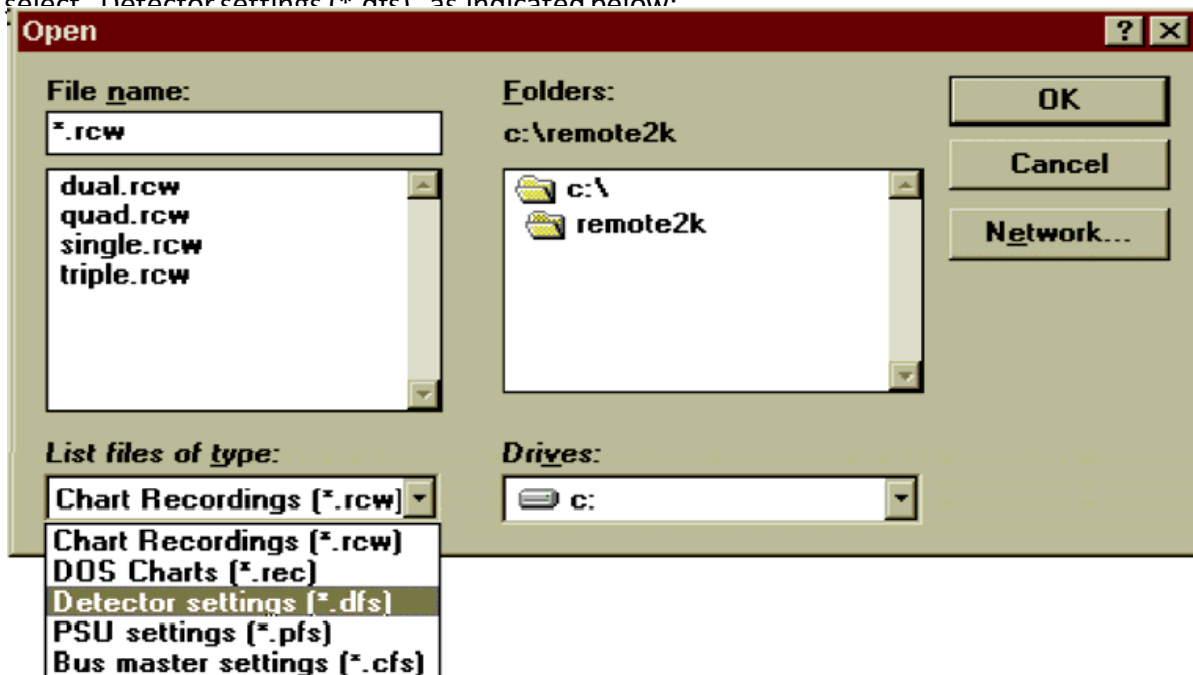
to a connected printer, and allows a previously saved chart recording to be loaded. Chart recording files have the extension “.rcw”.

2.11 Load / Save Function Settings

Where a custom set of programmable function settings is commonly used, these may conveniently be saved to or loaded from disk. To open a detector function settings (.dfs) file, select the menu options File > Open or click on the button on the toolbar as indicated below:



A file browser window will be displayed, click on the “List files of type” drop-down box and select “Detector settings (*.dfs)” as indicated below:





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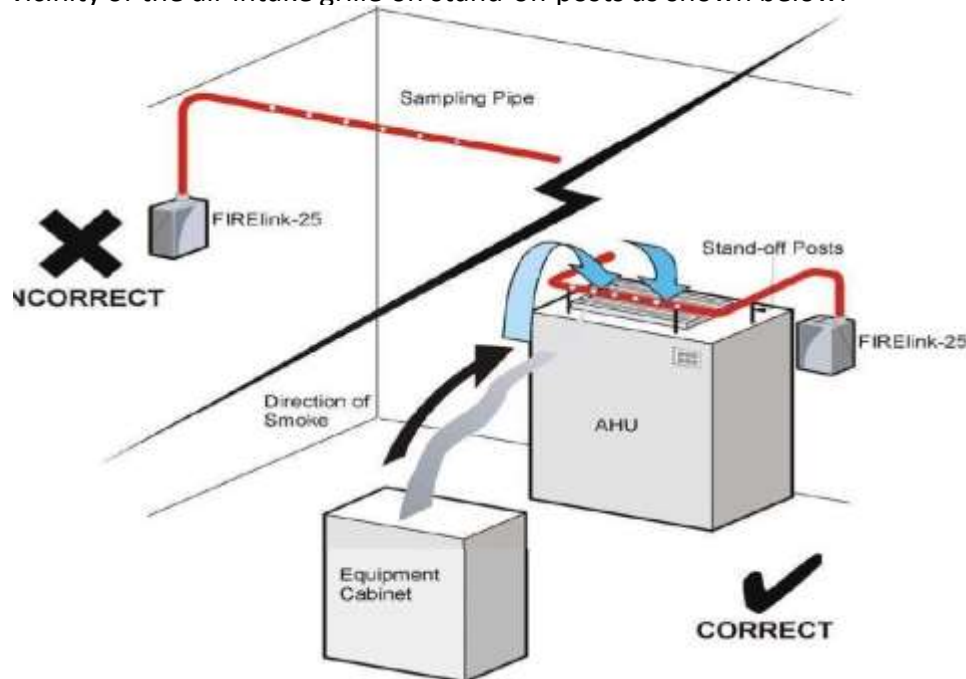
3.1 System Design

Simple designs with short sampling pipes produce the best results. Complex sampling pipe runs should be avoided with the FIRElink-25 detector. To assist in design and to verify system performance, it is advisable to use the FIRElink PipeCAD[®] sampling pipe modelling software.

Always locate the sampling points in positions to which smoke may reasonably be expected to travel. Do not expect ceiling mounted sampling points to operate satisfactorily if air flow from air-conditioning systems keeps the cool smoke from an incipient fire reaching from reaching ceiling level. In this instance it is usually better to locate the sampling pipe directly in the airflow (for example across the return air register of an air conditioning unit).

There is no substitute for carrying out smoke tests prior to installation of pipe work to indicate suitable sampling point location.

No more than ONE Air Handling Unit may be protected with one FIRElink-25 detector. In this application, ensure that the sampling pipe is raised clear of high velocity air in the immediate vicinity of the air intake grille on stand-off posts as shown below:



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3.2 EN54-20 Compliance

The installation must be designed using PipeCAD software, which is provided free on the CD shipped with each detector. After designing the installation including pipes, endcaps and sampling holes, enter the detector type in the “Type” drop-down list in “Options” “Calculation options”.

Select “Options” “Calculate” or click on the calculator icon. The software will prompt you to choose from “Use set hole sizes” “Best flow balance” and “Max. permissible transit time”. Select the appropriate option and click “OK”. The results for each pipe (“View” “Results”) show calculations for each sampling hole on the pipe with the nearest to the detector at the top of the screen, and the endcap hole at the bottom.

“Transit time” shows the smoke transit time to the detector from each sampling hole. For EN54-20, this must be below 60 seconds from every hole. The column headed “Hole sensitivity % obs/m” shows the predicted sensitivity for each hole. For the installation to comply with EN54-20, each sampling hole must be no less sensitive than 0.31% obs/m.*

The calculation can be further refined by leaving a working detector in the protected area for at least 24hrs at the intended alarm factor for the installation (this could be done before or after installation). The detector sensitivity can be read from the “Sensitivity” figure on the histogram screen of the Remote software supplied with each detector. Enter this figure into the PipeCAD calculation under “Options” “Calculation options”, “Detector sensitivity”. Clicking on “OK” will update the hole sensitivities to the figure expected for the actual layout.

Commissioning and periodic system tests must involve smoke tests to verify that the system performs as expected and enters Fire 1 alarm within 60 seconds from the farthest hole. The detector sensitivity must also be inspected to ensure it has not radically fallen from the installed figure. If it has changed for any reason. the new figure must be re-entered into PipeCAD and the recalculated hole sensitivities must be confirmed to be within the class limits shown above. The settings of a compliant system should be recorded, as it is possible by changing certain programmable functions to make the system non compliant. If functions are changed, it is recommended that the system is retested if continuing compliance is in any doubt.

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**The results should be verified at installation by entering the installed detector's Fire 1 sensitivity (as indicated in the remote software histogram screen) into the PipeCAD "Options/Calculation options/Detector sensitivity" field and recalculating the layout results.*

4 Installations

Before installing the detector the local standards for installation of aspirating detection systems must be consulted as these standards differ throughout the world. Specific advice for one country may not be applicable to another. The following is a brief set of guidelines on installing detectors:

- The detector will normally be mounted at a level where there is easy access to the unit for configuration and programming.
- The exhaust air from the unit must not be impeded in any way. If the unit is mounted in a different air pressure from where the air is being sampled (for example an air duct), then a pipe must be taken from the exhaust port back to the same air pressure zone as the sampling holes.
- Sampling holes should be free from burrs and swarf.
- All signal cables must be screened and must be of a suitable type. The specific type of cable will normally depend upon the local fire regulations.
- The unit must not be placed in areas where either the temperature or humidity is outside the specified operating range.
- The unit should not be placed in close proximity to any equipment expected to generate high Radio Frequency levels (such as radio alarms) or units generating high levels of electrical energy (such as large electric motors or generators).

4.1 Docking Station

The basic principle behind installation of the FIRElink-25 is that all wiring and pipe-work is installed using a docking station. This is a convenient feature which means that the detector can be dismantled or replaced without disturbing any wiring or installed pipe-work.

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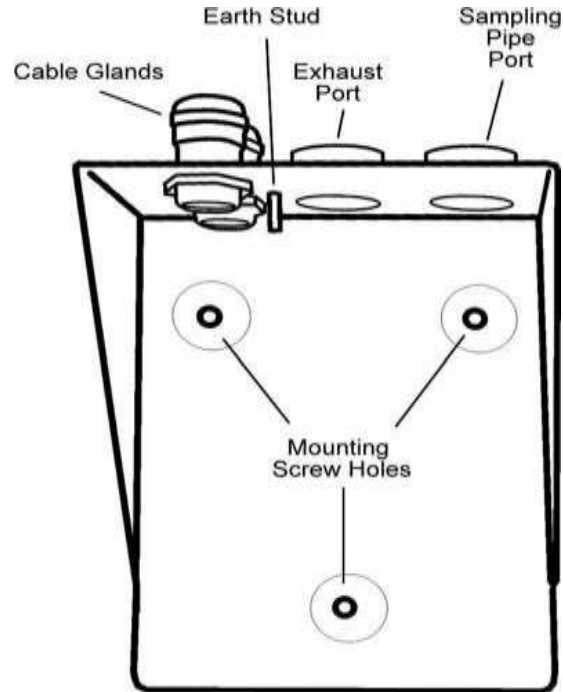
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DETECTION WITH ALARM SYSTEM**



1. Mechanical Installation

The docking station is connected to the installed sampling pipe-work and fixed to the wall or mounting surface using 3 off screws of a type appropriate to the mounting surface. Ensure that the sampling and/or exhaust pipes are securely seated in the pipe ports before fixing. If using a piped exhaust docking station be sure that the sampling and exhaust pipes are fitted into the relevant ports as shown in section 4.1.

2. Electrical Installation

The FIRElink-25 detector is supplied with removable terminal blocks (See illustrations in Section 0). These are simply removed from their sockets by lifting them up at right angles to the circuit board. Take note of the orientation of each terminal block and its function before removing it. It may also be beneficial to mark the connection wires with suitable identification labels or coloured rings to aid in the connection process.

NOTE: All connections should be made with the power turned off.

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4.1.3 Power Supply Connections

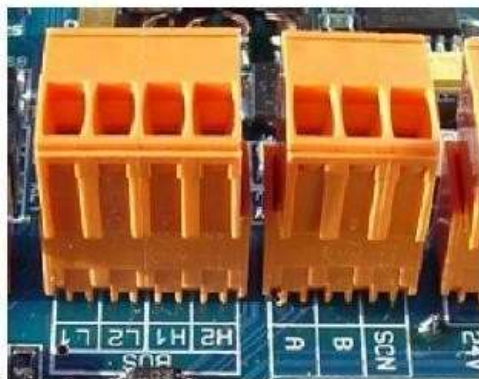
The power supply cable should be of screened type and should be led through the metal cable gland provided, leaving about 35mm of the cable extending from the bottom of the cable gland. Depending on the type of cable used, it may be necessary to increase the diameter of the cable with sleeving or insulating tape to ensure that the cable is firmly held when the cable gland is fully tightened.

Remove the detector cover by unfastening the four screws at the front of the unit and detach the power supply terminal block. This is at the top left with the detector held with the serial port at the bottom of the unit.

NOTE: Be aware of the orientation of the terminal block.

Connect 0V and +24VDC to the “0V” and “24V” screw terminals respectively. Connect the screen wire to the earth stud on the docking station and connect a second wire from the “Earth” terminal to the docking station earth stud. The picture in Section 4.1 shows the location of the earth stud. Fix the earth wires in place with the nuts provided.

4.1.4 Signal Connections



FIRElink-APIC Address Terminals
RS485/SenseNET Terminals

To connect the signal wire, lead a suitable wire type (RS485 cable 9841, 120 ohm screened twisted pair or equivalent) through the second cable gland and tighten it into position with about 35mm of cable from the bottom of the cable gland.

Remove either the three-way terminal block next to the power supply socket if connecting the detector to a SenseNET system, or the four-way “Bus” terminal block if connecting the detector to an alarm panel in conjunction with the FIRElink- APIC addressable programmable interface card (see section 5.3). For example, in a SenseNET system using screened cable connects the screen wire(s) to the “SCN” terminal, Bus A wire(s) to the “A” terminal and Bus B wire(s) to

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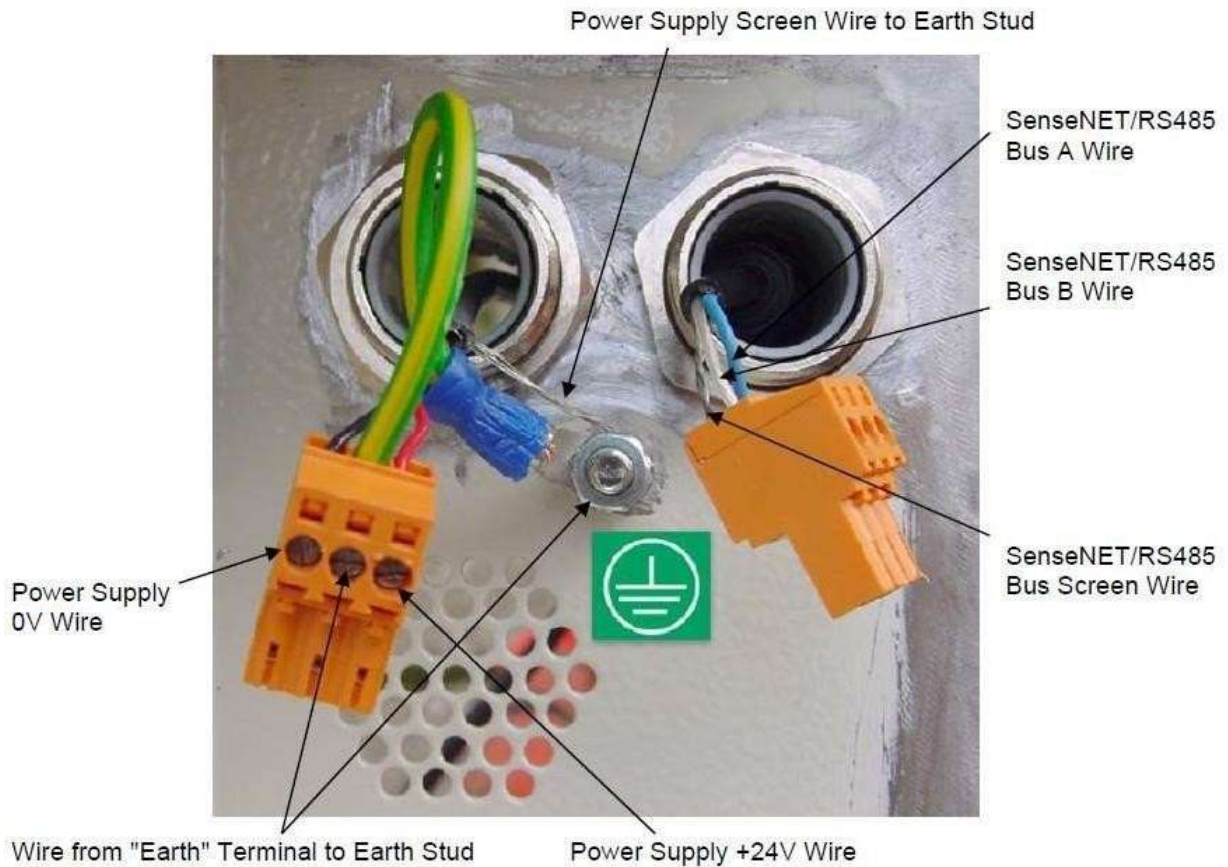
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the “B” terminal. If the detector is in the middle of a SenseNET chain, with input and output connections, it may be more convenient to link the common Bus A, Bus B and screen wires to single A, B and screen wires for linking to the terminal block.

The Following illustration shows the power and signal connection to the docking station for connecting to a single senseNET cable.



4.2 Final installation

Once the power and signal connections are made slide the detector body up into the docking station and fasten it into position using the M4 pan head screws provided. Slot the power and

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signal terminal blocks into the relevant sockets on the detector PCB (they will only click fully home in the correct orientation) and replace the detector cover using the four M3 pan head screws provided.

NOTE: The detector is designed solely for operation with the front cover securely fitted using all four fixing screws.

Removing the detector is simply the reverse of this process, leaving the pipe-work and wiring connections installed in the docking station.



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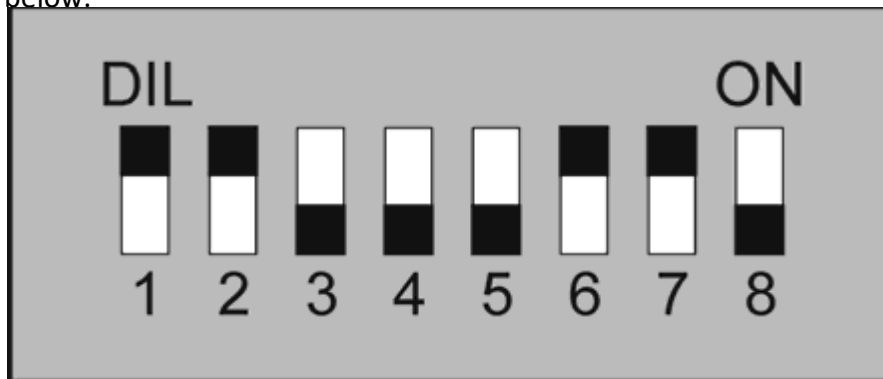
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5 Interfacing

Because of the flexible nature of the FIRElink-25 detector and the many possible configurations, there are many options for interfacing the detectors to the Fire Panel. These include many third party interfaces available from various manufacturers. Because of this, it is not possible to give a complete list of all interfacing methods but the following pages will give details of the most common methods that are likely to be used.

1. Setting the Detector Address

In order to identify itself to the PC Command Module or fire panel, each detector needs to have a unique address ranging from 1 to 127. The detector address is simply set on the red DIP switch SW1 at the top left of the opened detector on the main circuit board. The switch settings are on for 1 and off for 0, and the detector address is set as a 7-bit binary code (switch 8 equates to a value of 128 and so is outside the usable address range). An example is shown below.



The address equates to 01100011 in binary, or $(1 \times 1) + (1 \times 2) + (0 \times 4) + (0 \times 8) + (0 \times 16) + (1 \times 32) + (1 \times 64) + (0 \times 128) = 99$.

The full range of available addresses and their relevant switch settings are shown below:

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Switch								Switch								Switch							
1	2	3	4	5	6	7	Addr	1	2	3	4	5	6	7	Addr	1	2	3	4	5	6	7	Addr
●	○	○	○	○	○	○	1	●	●	○	●	○	○	○	43	●	○	○	○	○	○	○	85
○	○	○	○	○	○	○	2	○	○	○	○	○	○	○	44	○	○	○	○	○	○	○	86
●	○	○	○	○	○	○	3	○	○	○	○	○	○	○	45	○	○	○	○	○	○	○	87
○	○	○	○	○	○	○	4	○	○	○	○	○	○	○	46	○	○	○	○	○	○	○	88
○	○	○	○	○	○	○	5	○	○	○	○	○	○	○	47	○	○	○	○	○	○	○	89
○	○	○	○	○	○	○	6	○	○	○	○	○	○	○	48	○	○	○	○	○	○	○	90
○	○	○	○	○	○	○	7	○	○	○	○	○	○	○	49	○	○	○	○	○	○	○	91
○	○	○	○	○	○	○	8	○	○	○	○	○	○	○	50	○	○	○	○	○	○	○	92
○	○	○	○	○	○	○	9	○	○	○	○	○	○	○	51	○	○	○	○	○	○	○	93
○	○	○	○	○	○	○	10	○	○	○	○	○	○	○	52	○	○	○	○	○	○	○	94
○	○	○	○	○	○	○	11	○	○	○	○	○	○	○	53	○	○	○	○	○	○	○	95
○	○	○	○	○	○	○	12	○	○	○	○	○	○	○	54	○	○	○	○	○	○	○	96
○	○	○	○	○	○	○	13	○	○	○	○	○	○	○	55	○	○	○	○	○	○	○	97
○	○	○	○	○	○	○	14	○	○	○	○	○	○	○	56	○	○	○	○	○	○	○	98
○	○	○	○	○	○	○	15	○	○	○	○	○	○	○	57	○	○	○	○	○	○	○	99
○	○	○	○	○	○	○	16	○	○	○	○	○	○	○	58	○	○	○	○	○	○	○	100
○	○	○	○	○	○	○	17	○	○	○	○	○	○	○	59	○	○	○	○	○	○	○	101
○	○	○	○	○	○	○	18	○	○	○	○	○	○	○	60	○	○	○	○	○	○	○	102
○	○	○	○	○	○	○	19	○	○	○	○	○	○	○	61	○	○	○	○	○	○	○	103
○	○	○	○	○	○	○	20	○	○	○	○	○	○	○	62	○	○	○	○	○	○	○	104
○	○	○	○	○	○	○	21	○	○	○	○	○	○	○	63	○	○	○	○	○	○	○	105
○	○	○	○	○	○	○	22	○	○	○	○	○	○	○	64	○	○	○	○	○	○	○	106
○	○	○	○	○	○	○	23	○	○	○	○	○	○	○	65	○	○	○	○	○	○	○	107
○	○	○	○	○	○	○	24	○	○	○	○	○	○	○	66	○	○	○	○	○	○	○	108
○	○	○	○	○	○	○	25	○	○	○	○	○	○	○	67	○	○	○	○	○	○	○	109
○	○	○	○	○	○	○	26	○	○	○	○	○	○	○	68	○	○	○	○	○	○	○	110
○	○	○	○	○	○	○	27	○	○	○	○	○	○	○	69	○	○	○	○	○	○	○	111
○	○	○	○	○	○	○	28	○	○	○	○	○	○	○	70	○	○	○	○	○	○	○	112
○	○	○	○	○	○	○	29	○	○	○	○	○	○	○	71	○	○	○	○	○	○	○	113
○	○	○	○	○	○	○	30	○	○	○	○	○	○	○	72	○	○	○	○	○	○	○	114
○	○	○	○	○	○	○	31	○	○	○	○	○	○	○	73	○	○	○	○	○	○	○	115
○	○	○	○	○	○	○	32	○	○	○	○	○	○	○	74	○	○	○	○	○	○	○	116
○	○	○	○	○	○	○	33	○	○	○	○	○	○	○	75	○	○	○	○	○	○	○	117
○	○	○	○	○	○	○	34	○	○	○	○	○	○	○	76	○	○	○	○	○	○	○	118
○	○	○	○	○	○	○	35	○	○	○	○	○	○	○	77	○	○	○	○	○	○	○	119
○	○	○	○	○	○	○	36	○	○	○	○	○	○	○	78	○	○	○	○	○	○	○	120
○	○	○	○	○	○	○	37	○	○	○	○	○	○	○	79	○	○	○	○	○	○	○	121
○	○	○	○	○	○	○	38	○	○	○	○	○	○	○	80	○	○	○	○	○	○	○	122
○	○	○	○	○	○	○	39	○	○	○	○	○	○	○	81	○	○	○	○	○	○	○	123
○	○	○	○	○	○	○	40	○	○	○	○	○	○	○	82	○	○	○	○	○	○	○	124
○	○	○	○	○	○	○	41	○	○	○	○	○	○	○	83	○	○	○	○	○	○	○	125
○	○	○	○	○	○	○	42	○	○	○	○	○	○	○	84	○	○	○	○	○	○	○	126
																○	○	○	○	○	○	○	127

● = ON ○ = OFF

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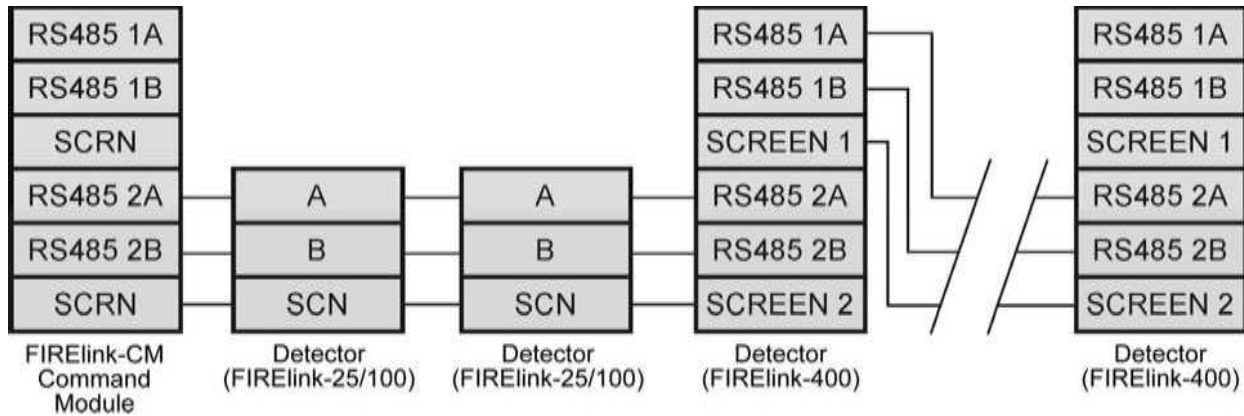
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5.2 Connecting a FIRElink-25 to a SenseNET/RS485 Detector Network



Up to 127 detectors may be linked in a single SenseNET bus, supporting a total length of wire between adjacent detectors of up to 1.2km.

In the above example, two FIRElink-25 detectors are linked into a 127-detector bus with a Command Module and a number of other FIRElink detectors. It will be noted that whereas the FIRElink-400 units have two input / output buses (1A / 1B and 2A / 2B), the FIRElink-25 has only a single such bus (A / B) and therefore each bus terminal has an input and an output wire, compared with a single wire in each terminal in the FIRElink-400.

For this reason, it may be easier to join the input and output wires for each bus and screen connections together and to solder or crimp a single wire or connecting ferrule to each wire pair so that they are easier to fit into the screw terminals. If this is done it is recommended that bare wire joints be insulated to prevent possible shorting of the data bus, which will cause a drop-out of data on the SenseNET bus.

In the above example, there could be a total length of RS485 cable of up to 1.2km between the Command Module and Detector 3, since these are all on a single bus. However, Detector 3 is a FIRElink-400 which has a second communications bus (RS485 bus 2) and an RS485 repeater. This allows a further total of 1.2km of cable until the next FIRElink-400 in the RS485 loop.

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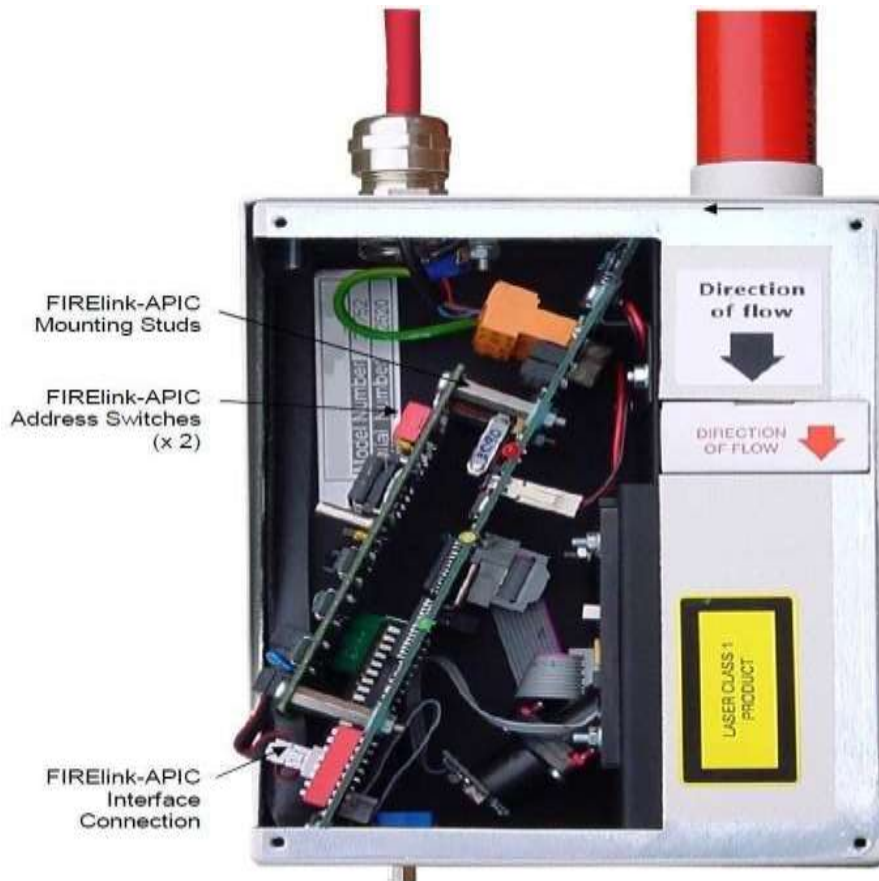


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In the above example, if detectors 4-126 (not shown) were all of the FIRElink-25 type then the total length of wiring between detectors 3 and 127 would be limited to 1.2km. However, each additional FIRElink-400 detector wired up using both RS485 buses would allow an additional 1.2km of cabling to be added to the RS485 loop.

5.3 Connecting a FIRElink-25 to an addressable Fire Panel

An Addressable Programmable Interface Card (FIRElink-APIC) may be used to decode detector information and to relay this to a Fire Panel. The FIRElink-APIC is fitted to the four mounting studs on the FIRElink-25 PCB using the supplied screws as shown below:



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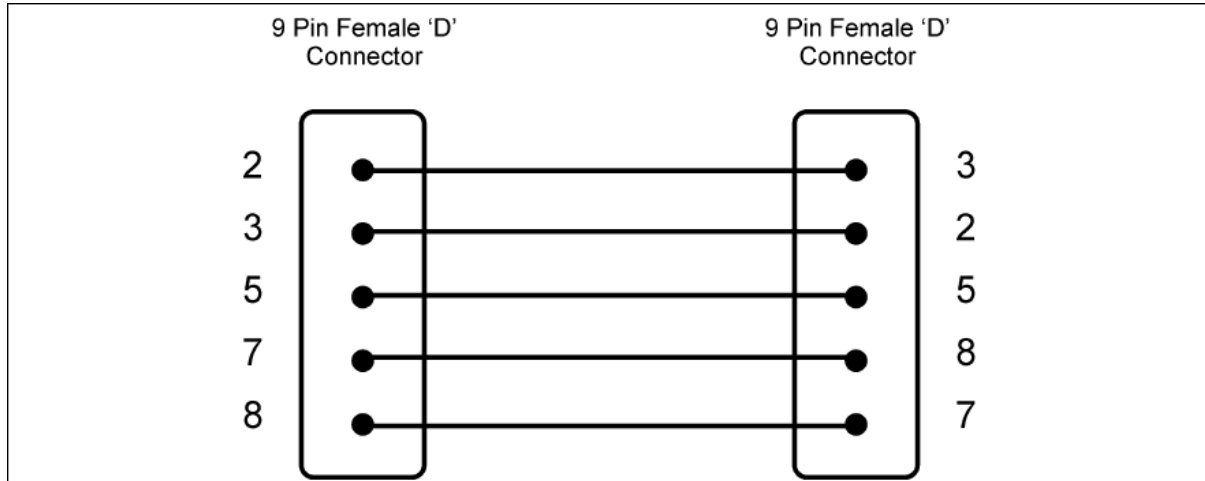
The connections to the Fire Panel are made using the BUS L1 and H1 (bus 1 input and output) and the BUS L2 and H2 (bus 1 input and output) terminal connectors shown in Section 4.1.4.

The only settings that need to be made are on the FIRElink-APIC address DIP switches. The start loop address is entered on SW1 and the end loop address on SW2. In the case of a single FIRElink-25 the start and end addresses will be the same.

NOTE: The detector address on the SenseNET loop and the Fire Panel addressable protocol address are the same, in other words, no address translation is performed. Some protocols may not support all the available alarm levels and fault reporting is usually a general fault with no detailed fault information. Please consult the specific FIRElink-APIC documentation for more information.

5.4 Connecting to a PC

To connect a single stand-alone detector to a PC, connect the PC's serial port directly to the detector's 9-way RS232 port, which is situated on the bottom surface of the detector case. Connections for this cable are shown below:



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6 Event Log

An event is defined as

- a change to any programmed function
- a signal received from an external controller such as the remote software, FIRElink-APIC or SenseNET
- a detector output level meeting or exceeding the Pre-Alarm, Aux, Fire 1 or Fire 2 alarm thresholds
- a fault condition such as a flow or separator fault
- start of day / night operation
- demonstration mode start / stop
- FastLearn start / stop
- Power on or off

The detector stores an internal log of the last 200 events, and this can either be viewed on a PC screen or downloaded to disk by use of the remote control software.

When the event log is full (200 events are stored) and a new event occurs, the oldest event in the log is Transferred to local control panel where 10,000 events are recorded (First-In, First-Out).

To download the event log, connect a PC to the detector serial port and run the remote software. Either

select the menu options View > Event Log or click on the event log symbol as indicated below:



The following screen will be displayed:

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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
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Date	Time	Device	Event
23/11/2001	10:54	001	Pre-Alarm
23/11/2001	10:50	001	Pre-Alarm
23/11/2001	10:05	001	Fire 1
23/11/2001	10:04	001	Aux
23/11/2001	10:04	001	Pre-Alarm
23/11/2001	10:03	001	Flow setup end
23/11/2001	10:03	001	FastLearn end
23/11/2001	10:03	001	Functions downloaded
23/11/2001	10:02	001	Demo mode
23/11/2001	10:02	001	Functions downloaded
23/11/2001	10:01	001	Flow setup
23/11/2001	10:00	001	FastLearn start
23/11/2001	10:00	001	Power-up
23/11/2001	09:11	001	IDetector Flow
23/11/2001	09:11	001	Day start
23/11/2001	09:01	001	Fire 1
23/11/2001	09:01	001	Aux

This shows the time and date of each event stored in the log along with its general description. The buttons at the bottom of the screen allow control over the input and output of the log.

Open: opens a previously saved event log. Event logs have the file extension “.evl”.

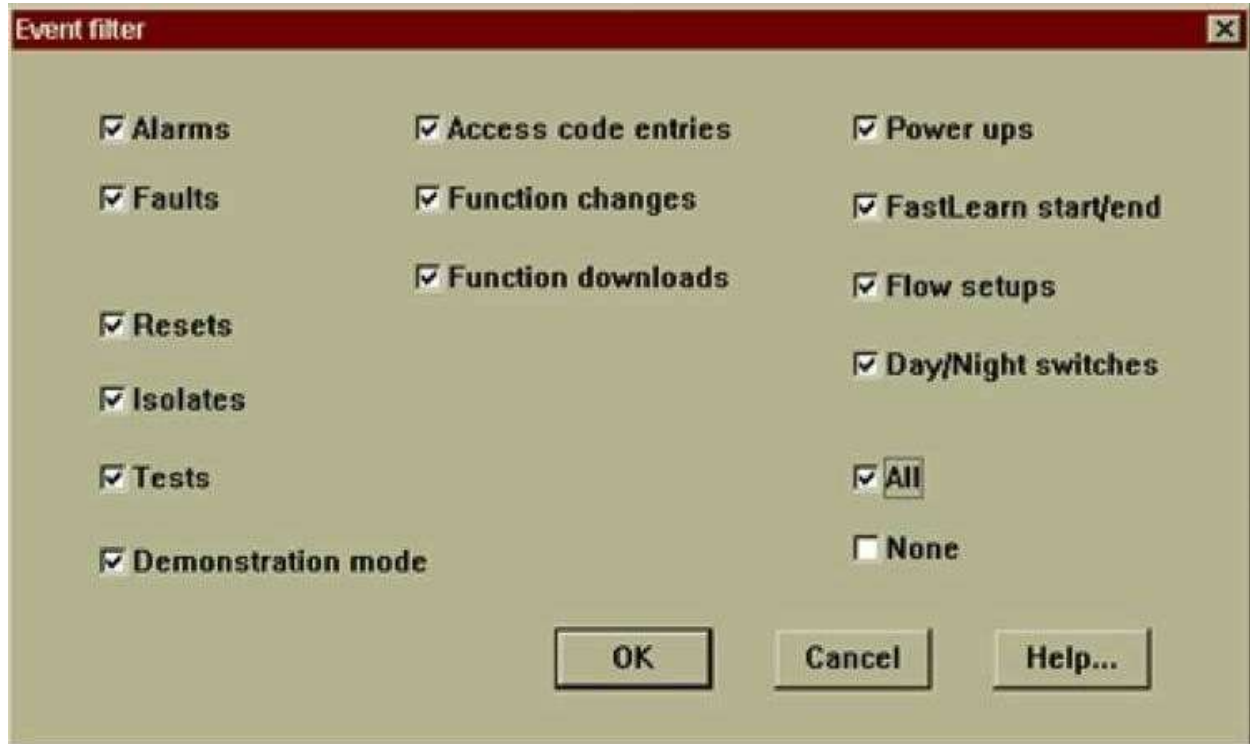
Save As: saves the current event log as a .evl file with a user defined name.

Print: prints the event log to a connected printer.

Filter: clicking on this option displays the following screen



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This allows the user to limit the information printed or viewed on the PC screen. For example the user might wish to concentrate on alarm events only. To do this, click on “None”, which unticks all boxes, and then click on “Alarms”. To tick all the boxes, tick “All”. Any or all of the event categories may be selected or deselected as desired.

7 Commissioning

Before commissioning the detector the local standards of aspirating detection systems must be consulted.

These standards differ widely throughout the world and specific advice for the market in one country may not be applicable to another.

Commissioning strategy will initially depend upon the environment in which the detector is installed. For instance, the test for a computer room (which should be a relatively clean environment) would be very different from, say, a flour mill, which would probably have a high level of airborne particulate content.

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

A widely accepted standard for computer rooms/EDP areas is British Standard BS6266, equipment overheating at a stage well before combustion. To perform the test electrically overload a 1 metre length of PVC insulated wire of 10/0.1mm gauge for one minute using an appropriate power supply. The detector has two minutes from the end of the wire burn to give an alarm indication.

For areas with higher levels of background particulate matter testing methodology would be similar to that of standard point detectors.

7.1 Commissioning Checklist

The following brief checklist allows quick setup of the detector. This procedure will be adequate for most standard installations.

1. Before powering up the detector, visually check all cabling to ensure correct connection. If wire identification is not immediately clear (for example, by use of different colored wires or wire identification sleeves) an electrical check should be made. Any damage caused by misconnection of the detector is not covered by warranty.
2. Power up the unit and connect to a PC and set the address switches on the detector board (see section 5.1) and FIRElink-APIC board if applicable (see section 5.3).
3. Verify that the time and date are correct (see section 2.1)
4. Set an appropriate alarm factor for the protected environment. The detector will perform a Fast Learn for the new alarm factor. (see section 2.2.6)
5. Whilst the detector is still in FastLearn mode set the detector into demonstration mode (see section 3.10).

NOTE: Aerosol-type synthetic smoke sources should not be used to test the response of the detector as these may leave acidic residues which could cause damage to the unit.

6. Wait for the FastLearn to finish and the flashing OK LED indicator will finish and perform any necessary smoke tests, ensuring that the detector reacts appropriately (within 120 seconds for LPCB compliance), and let the smoke fully dissipate.

7. Perform another FastLearn, this time not putting the detector into demonstration mode. The detector will generate no alarms during the 15 minute FastLearn period, and after this the detector will operate at a reduced sensitivity for 24 hours whilst ClassiFire acclimatises to the protected environment and sets up appropriate day and night sensitivity settings.

PREPARED BY: M/S/Y/M

APPROVED BY: K.S.S.K

REV: 02

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DATE:06-04-2022



ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

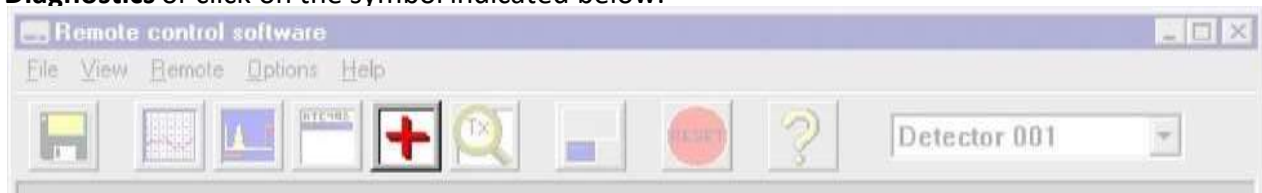
8 Maintenance

FIRElink-25 is a very low maintenance detection system. If required, external cleaning of the unit should be performed using a damp (not wet) cloth. Do not use solvents as these may mar the front panel label. The only part that may require field replacement during servicing is the dust separator assembly. The dust separator condition can be checked using the Dust Separator test in the Miscellaneous tab of the remote software 'Detector settings' screen (see section 2.8.3) which gives a percentage reading of dust separator efficiency. When this level drops to 80% the detector will signal a fault and the dust separator will need replacing. To replace the filter, simply remove the front cover and pull the filter out from the main unit. Slide the replacement filter in so that the 'Direction of flow' arrow printed on the carton duplicates that on the 'Direction of flow' label beside the filter slot.

As dust contained in the dust separators may expose maintenance personnel to a 'Nuisance Dust' hazard as defined by the 'Control of Substances Hazardous to Health' (COSHH), it is strongly recommended that suitable masks and protective clothing be worn when changing filters. **Used separators are not intended for re-use and should be disposed of.**

1. Diagnostics

The remote control software includes a diagnostic function which carries out a number of checks to verify the correct functioning of the detector. A good time to run these tests is as a part of planned maintenance. To call up diagnostic mode, select the menu options **View > Diagnostics** or click on the symbol indicated below:



The following message will be displayed:

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DATE:06-04-2022

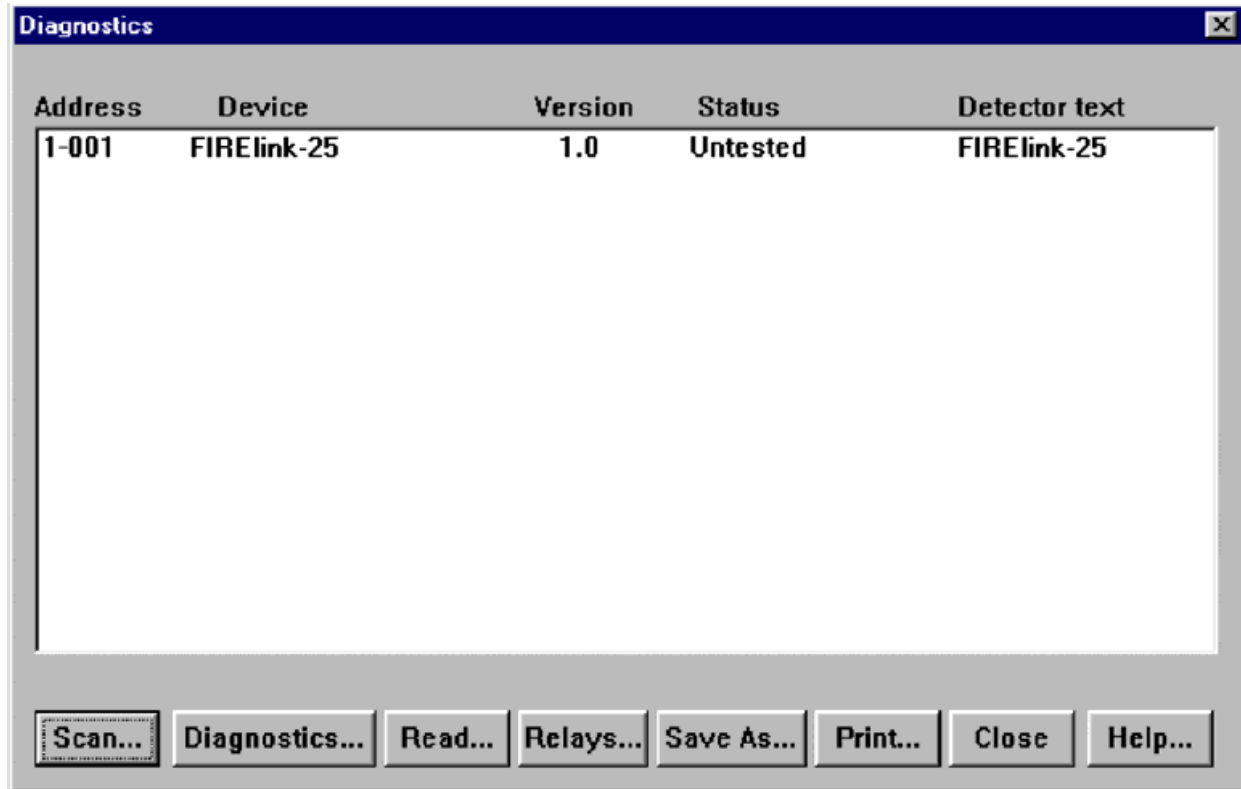


ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM



The software will then scan the loop for up to 127 detectors. For a single detector, wait until the first detector has been identified and the window indicates that it is scanning for Detector 2, then press the Cancel button.

The following window is displayed:



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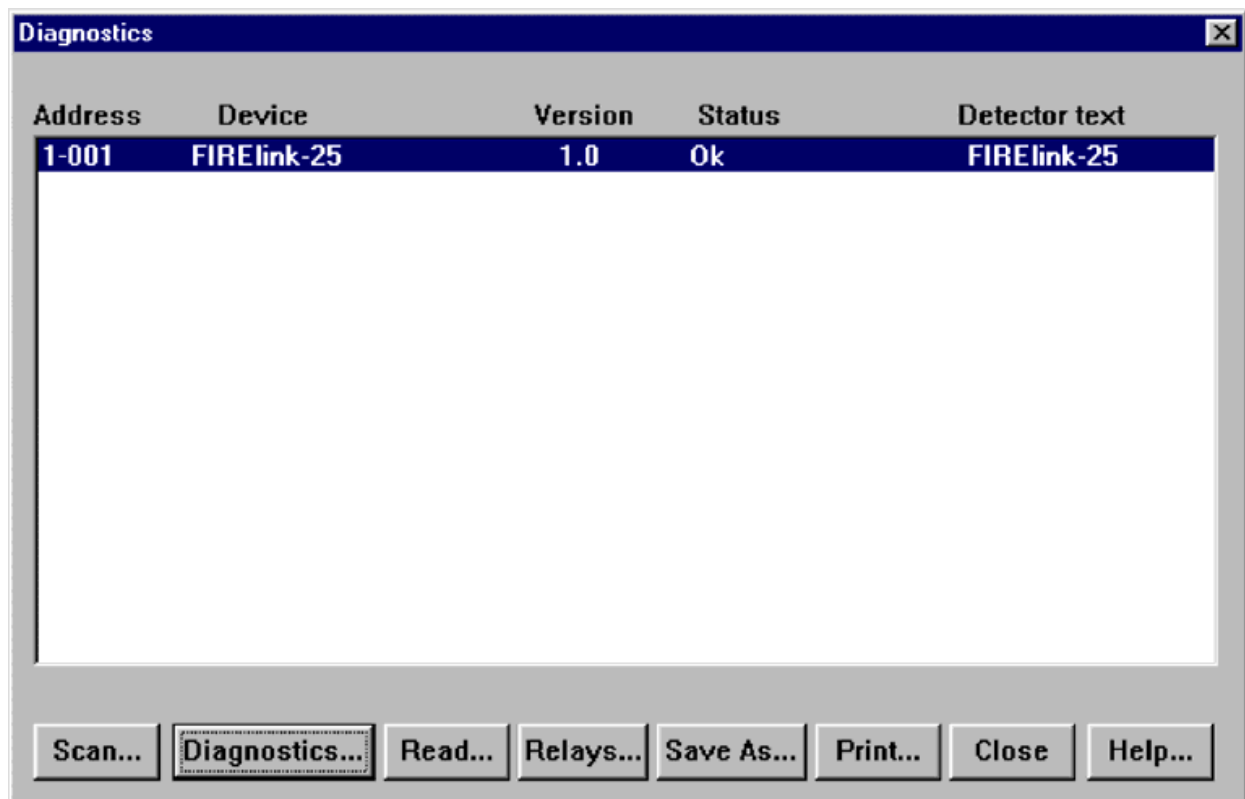
DATE:06-04-2022



ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

Click on the list entry to highlight it and click on the **Diagnostics** button. The software will then commence the system tests. During the “Aspirator and flow” test, the detector fan will suddenly slow down, but this is a normal part of the test.

When the test has finished and no problems have been found, the following screen is displayed:



If any problems were found during the diagnostic tests, the nature of the fault will be indicated in the “Status” column.

Scan: Reads in the status of all connected detectors.



**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

Read Button: This brings up a display of the detector output and flow rate which updates in real time.

Relays: Brings up a screen allowing the function of the volt-free 'Fire' and Fault LEDs to be tested with the aid of a continuity meter or other tester. The Fire relay contacts are open in normal operation and will close on test. The Fault relay contacts operate on a 'Fail-safe' basis and are held closed in normal operation. They will therefore open on test.

Save As: Saves the summary list of scanned detectors and their status as a text (.txt) file.

Print: Prints the summary list to a connected printer.

9 Troubleshooting

1. Nuisance Alarms Occur Too Often

- Check that the ClassiFire alarm factor setting is appropriate for the normal working environment of the protected area. See section 2.2.4
- Check that the detector is not in Demonstration mode. This can be ascertained by viewing the event log (see section 2) and checking that the entry **Demo mode** has a higher log entry number than the most recent **FastLearn start** and **FastLearn end** entries. Remember that the log entries are in reverse order, with the most recent entries appearing first. If the log shows that Demonstration mode was invoked during the last FastLearn period, start a new FastLearn and allow it to complete its 24-hour cycle (see section 2.2.6).
- From the event log (see section 6), check that 24 hours have elapsed since the last FastLearn end entry.
- Check that day-night switchover times are appropriately set to reflect active and non-active periods (see section 2.3.1).

2. Elevated Smoke Levels Do Not Generate Alarms

- Check that detector is not Isolated or in FastLearn (if Isolated, the Fault light will be lit)
- Check that the detector sampling points are in the smoke stream
- Check that the correct ClassiFire alarm setting has been set (see section 2.2.4)

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

- Check that the detector has either had a 24 hour learning period or that it has been placed in demonstration mode.

3. Low Mean Output

- Check that the filter does not require changing (see section 2.8.3) and that the air plenum chamber is clean. The chamber may become clogged when, for example, heavy building activity has occurred near the sampling pipes. If so, the chamber may require factory service. The detector is not designed to handle large quantities of coarse debris and dust.

4. Detector Sensitivity Varies Over Time

- There are many reasons why particle densities may vary, and the ClassiFire system automatically compensates for this in order to replace the likelihood of nuisance alarms due to normal variations in background smoke density. Within limits set by the ClassiFire alarm factor, this is a normal part of the detector's working.

5. Flow Fault Errors

- These occur when the airflow rate into the detector is outside the pre-programmed limits. As the detector 'learns' the flow setup from the initial installation, this usually means that there has been some change in conditions. A Flow high fault may indicate that a sampling pipe is damaged, and a Flow low fault may indicate that the pipe has been blocked, for example, by nearby building operations.
- If the detector input is sampled from one area and the exhaust is in another area with different pressure (for example the detector is in a roof space and sampling from an enclosed room), this may lead to flow faults. In this case it would be necessary to lead a pipe from the exhaust to the protected area to ensure normal flow. This will require the detector to be installed using the pipedexhaust docking station (see section 4.1).

1. "Low Flow" Error Messages.

- Check that the pipe giving the error is not blocked
- Check that the low flow fault threshold is not set too high (see section 2.7.3)

2. "High Flow" Error Messages

- Check that the pipe is pushed home into the inlet and is not broken or cracked

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

- Check that installed pipe-work is fitted with an end-cap. The FIRElink PipeCAD® pipe modelling software prompts the use of appropriate end-caps. **Open bore pipes are not recommended.**
- Check that the high flow fault threshold is not set too low (see section 2.7.2)

10 Do's and Don'ts

DO

- Ensure that the ClassiFire alarm factor is appropriately set.
- Ensure that cables are correctly connected before powering up by use of cable identifiers or electrical continuity checks. Incorrect connection could damage the detector.
- Ensure that cable of an appropriate approved type is used for interconnection.
- Place sampling points so that the detector will be able to detect smoke at the earliest opportunity.
- Ensure that the detector exhaust is in an area with the same atmospheric pressure as the sampling
- pipes, either by placing the detector physically in the protected area or by leading a pipe from the detector exhaust to the protected area.
- Ensure that the environment of the protected area is within the environmental operating parameters of the detector (temperature -10 to +60°C, (humidity 0-90%, non-condensing).

DON'T

- Forget to set the appropriate ClassiFire alarm factor for the area to be detected.
- Forget to set the Detector Address Switches correctly when used in a network.
- Site detectors in damp or exposed areas.
- Remove or connect boards when the detector is powered up.
- Connect internal 0 volt terminals to local earth.
- Attempt to re-use dust separator cartridges once removed.
- Attempt to adjust or alter detector settings other than via the user programmable functions. In particular, the setting up of the laser is a precision task, and once set up the potentiometers should be left alone. If it is suspected that the laser alignment has shifted (e.g. after dropping the detector), it should be returned to Hochiki Europe (UK) Ltd for recalibration.

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**ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM**

- Place the detector near high power RF sources.
- Operate the detector with the front cover removed, or with one or more of the cover fixing screws loose or missing.
- Test the response of the detector using aerosol synthetic smoke.

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ASPIRATION TYPE AUTOMATIC FIRE/SMOKE
DETECTION WITH ALARM SYSTEM

11 FIRElink-25 Specification

SELV Rating (EN 60950)	Class III
Supply Voltage	21.6Vd.c. - 26.4Vd.c. PSU Type: conforming to EN 54-4 Electrical safety complies with BS EN 610190-1
Size (mm)	138W x 205H x 84D
Weight	1.7kg with docking station
Operating Temperature Range	-10 to +38°C (UL268) -10 to +60°C (CEA4022)
Operating Humidity Range	0 - 90% Non Condensing BS EN 61010-1 Pollution degree 1 BS EN 61010-1 Installation Cat. II
Measurement Range (%Obs/m)	0.03% to 25% (Full Scale Detection)
Maximum Sensitivity Resolution	0.0015% obs/m
Detection Principle	Laser light scattering mass detection
Particle Sensitivity Range	0.0003µm to 10µm
Current Consumption	250mA
Relay Contact Rating	500mA @ 30Vd.c.
Maximum Sampling Pipe Length	50 metres total (see section 3 "Design Limitations" on page 20)
Sampling Pipe Inlets	1
Sampling Pipe Internal Diameter	15-25mm
Alarm levels	2 – "FIRE" and "FAULT" (2 additional levels available with optional Relay Card or FIRElink- APIC fitted)
Chamber Service Intervals	Greater than 8 years (depending on environment)
Dust Separator Replacement Intervals	Greater than 5 years (depending on environment)
Laser Lifetime (MTTF)	Greater than 1000 years
Programming	PC via RS232/RS485
Data Bus Cable	RS485 data cable
Data Bus Length	1.2 km
IP Rating	IP50

NOTE: This equipment is only to be used in accordance with this specification. Failure to operate the equipment as specified may cause damage to the unit.

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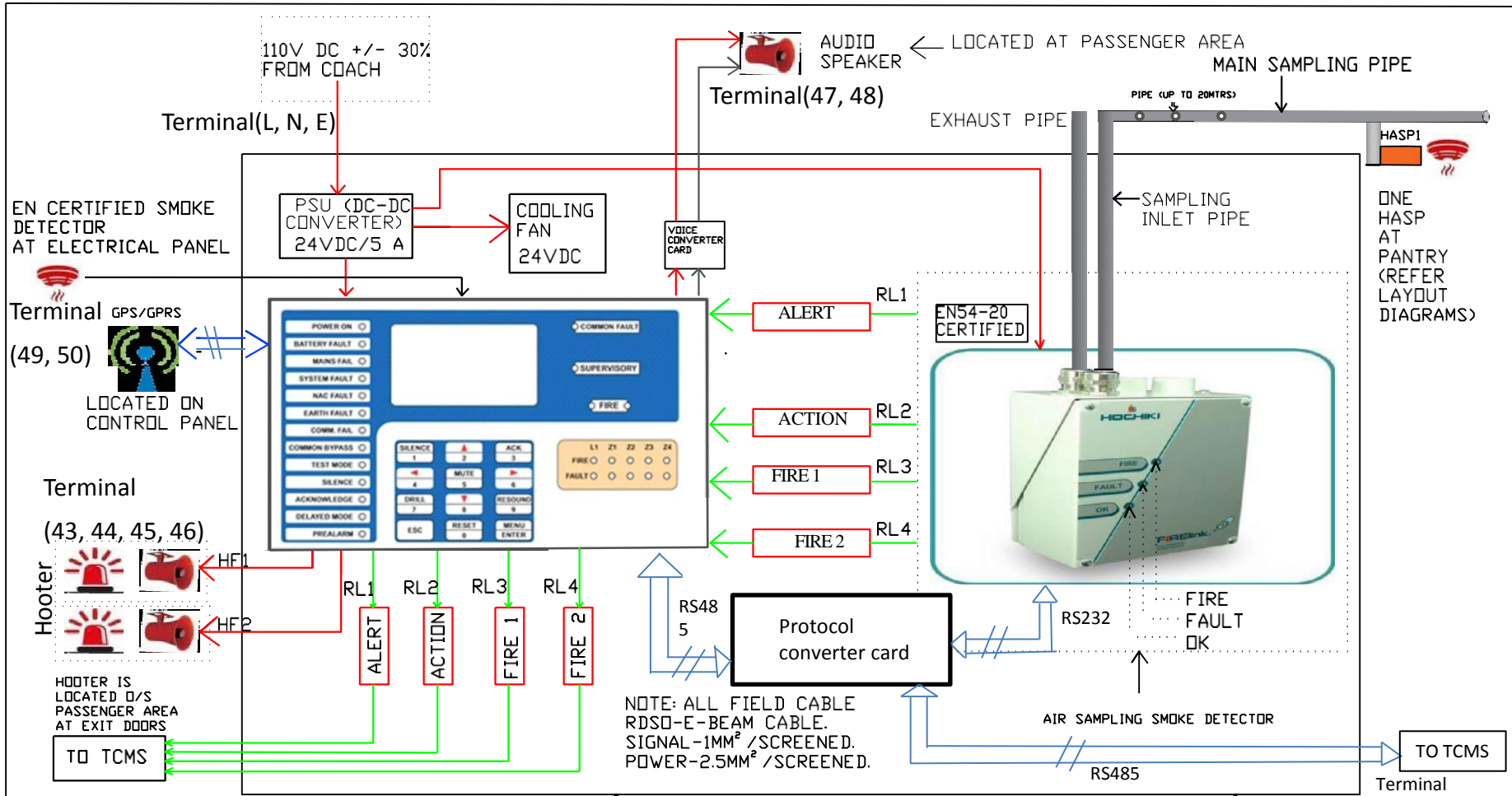
DATE:06-04-2022

PART- B

**ASPIRATION TYPE AUTOMATIC SMOKE/
FIRE DETECTION WITH ALARM SYSTEM
FOR INDIAN RAILWAYS AC COACHES TO
RDSO SPECN No. RDSO/2008/CG-04,
Rev-05 (SYSTEM FOR STAND
ALONE/RAKE FORMATION COACH
CLAUSE-2.4 OF SECTION-A AND WITH
TCMS FOR TRAIN 18 APPLICATION
SYSTEM)**

**BLOCK DIAGRAM MAINTENANCE MANUAL FOR
TRAIN 18- FDS SYSTEM –DRAWINGS AND
BOMS**

**NSSPT PART NO. : NS1060.01 FIRELINK-25 RDSO
SPEC. NO. : RDSO/2008/CG-04(REV5)**



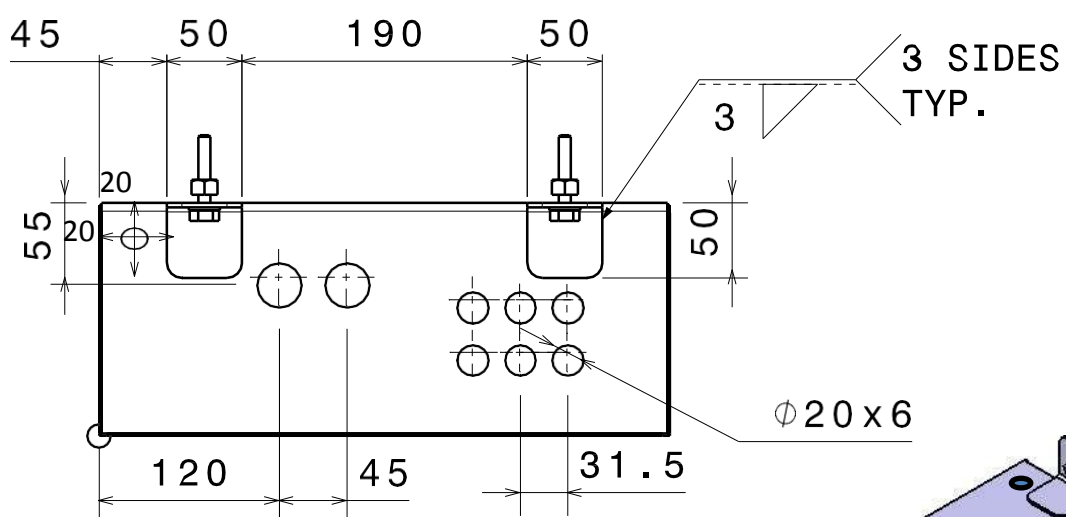
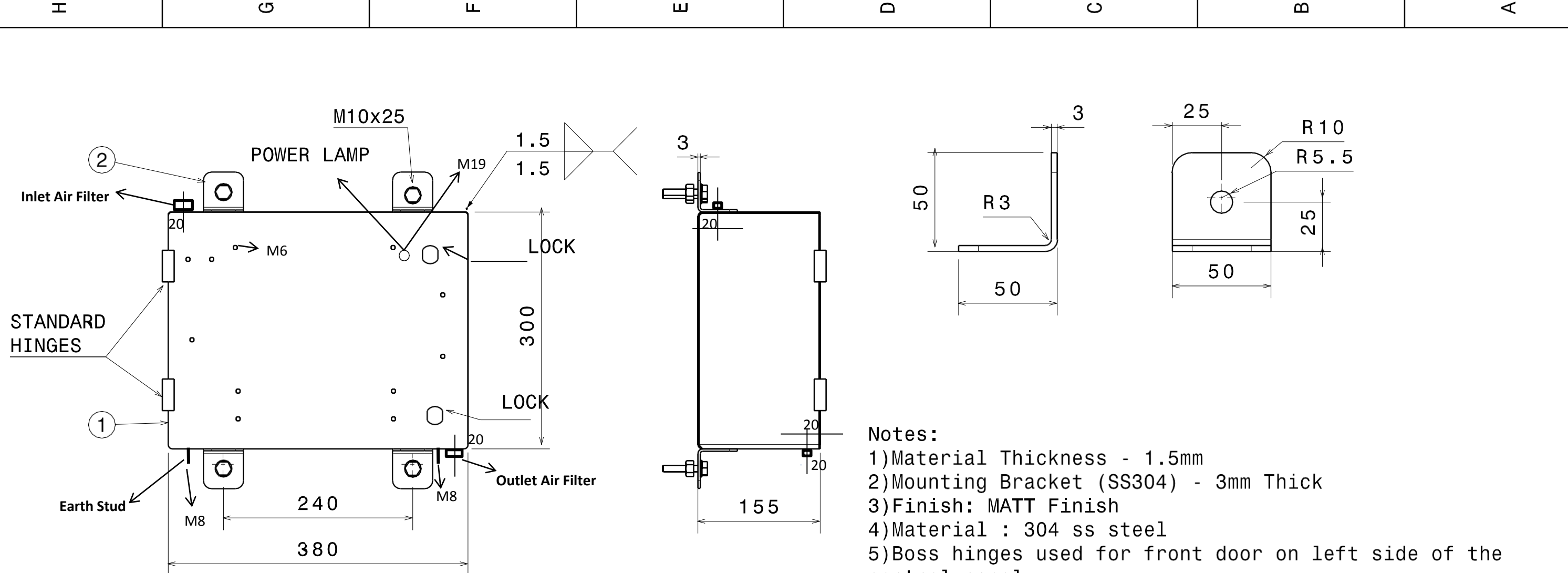
CABLES:
 1.FOR SENSORS SCREENED TWISTED PAIR INSTRUMENT CABLE:1MM SQ.
 2.FOR POWER SUPPLY SCREENED 2.5MM SQ FIRE RETARDENT CABLE.

LOCAL CONTROL UNIT (LCU)
 (LOCATED IN ECC)

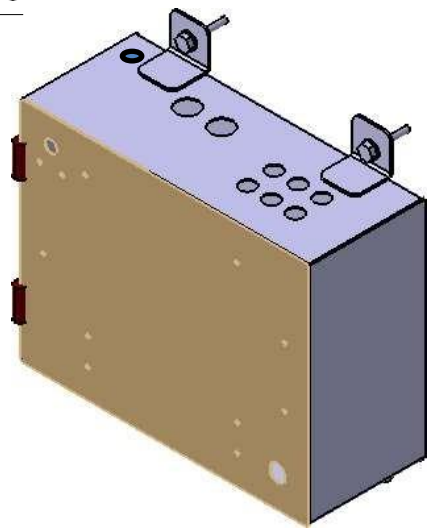
IEC60571 CERTIFIED

COMPANY NAME	CRITICAL DIMENSIONS		PREPARED BY	VERIFIED BY	APPROVED BY	PRODUCT DETAILS		
	DIMENSIONS	TOLERANCES				DIMENS IN MTS	SCALE NTS	ASPIRATING TYPE SMOKE/FIRE DETECTION SYSTEM AS PER RDSO/2008 CG-04(REV-5)/V/D EBV
N&S SOLUTIONS PVT LTD			ASSISTANT MANAGER DELIVERY SYSTEMS ACAD ENGINEER SELVENDRI Y	PROJECTS& DOCUMENTATION ENGINEER YASHASVI	DIRECTOR DELIVERY SYSTEMS K.S SHAILESH KUMAR			
CUSTOMER APPROVAL	IN MTS	-	MATERIAL	THICKNESS	FINISH	QUANTITY	PRODUCT NO :	REV SIZE
TRAIN 18	-	-					NS/ASD/BLOCKDIAGRAM-002	05 A4
DATE : 26/12/2021	-	-					NS1060.012.FR	SHEET: 1 OF 1
			DRAWING NO: NS/ASD/BLOCK DIAGRAM-002 IEC60571 CERIFIED SYSTEM					

KEYS	
	HEAT ACTIVATED SAMPLING POINT
	HOOTER CUM FLASHER (HF1,2)
	GPS/GPRS
	SAMPLING PIPE



- Notes:**
- 1)Material Thickness - 1.5mm
 - 2)Mounting Bracket (SS304) - 3mm Thick
 - 3)Finish: MATT Finish
 - 4)Material : 304 ss steel
 - 5)Boss hinges used for front door on left side of the control panel
 - 6)PG 29 Stainless steel gland used for inlet and outlet of the sampling pipe (sampling pipe Ø27mm)
 - 7)Cam lock is used for locking front door
 - 8)Legend lables refer drawing number NSSPT/ASD/CONTROL PANEL/006-LABLES
 - 9)PG 13.5 STAINLESS STEEL GLANDS AS FOLLOWS
 - 1) 1x2.5sqmm and 8x1.5sqmm
 - 2) 1x2.5sqmm
 - 3) 2x0.75 SCR
 - 4) 2X1.5sqmm
 - 5) 2x1.5sqmm
 - 6) SPARE



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DRAWING TITLE		NS-HOCHIKI-CONTROL PANEL - TRAIN18		
DRAWN BY JAGADISH	DATE 23/11/2021	SIZE A3	DRAWING NUMBER NSSPT/ASD/CONTROL PANEL/006	REV 06
CHECKED BY SELVI	DATE 23/11/2021	SCALE 1:5	WEIGHT(kg) -	SHEET 1/4
APPROVED BY KSSK	DATE 23/11/2021			



N&S SOLUTIONS PVT LTD No:37-38 Reliable Residency ,HSR Layout,Harlur,Bangalore-560102

TITLE-ASPIRATING TYPE FIRE/SMOKE DETECTION WITH ALARM SYSTEM TO RDSO SPEC-RDSO/2008/CG-04/REV-05

DOC NO :NSSPT/PDE/ASD/Material composition

REV-04

INDEX

Sl.no	Description	Qty/PerCoach	Part No.	MAKE/OEM	COMPONENTS	MATERIAL COMPOSITION	Material being used as per Clause No:8.1.2
1	NS Make Aspiration smoke/fire Detectors with Alarm System for Indian Railways AC coaches along with accessories as per RDSO Spec no :RDSO/2008/CG-04 [REV 5] -NS PART NO NS1060.01 along with FIRELINK-25 ASD (% obscuration Better than 0.05%) With Multi Level Alarm setting & additional Relay Facilities.	01no.		FIRE LINK-25 , HOCHIKI ,UK / JAPAN (NS1060.01 FR-NS INTERNAL PART NUMBER)	1(a) Fire link external box 1(b)PCB 1(c)Sensor assembly. 1(d)Sub -D connector 1(e)Fasteners	1(a)Metal 1(b) FR 4 GRADE 1(c)Metal 1(d) Will confirm 1(e)Metal	a) FIRELINK 25 is EN54-20 certified to BRE Global Certificate No : 0832- CPR-F1279 b) Test Reports, Guarantee Certificate, WTC / Certificate of conformance from OEM c) Purchase Invoice / Delivery challan
2	Local Control Unit/ Fire Panel with LCD ,Programming ,configuration Keypad WithHindi , English display , GSM MODULE ,GPS MODULE , SMS FEATURE with data storage capacity of 10000 readings. (user settable upto 200 -20000 reading) .RS232-RS485 coms port.Battery Back up - 12v, 7Ah(Optional) Electronic voice message sounder (Optional)	01 no.		NS1060.01 ,NS MAKE , INDIA	3(a)Control Panel ,Metal Enclosure 3(b)PCB 3(c)Fan 3(d)Back Plate 3(e)Power Supply 3(f)Cable Tray 3(g)Name plates 3(h)PG Cable Gland	3(a)SS304 3(b) FR4 GRADE 3(c)Metal (Di cast Aluminium) 3(d)Metal 3(e)Metal enclosure 3(f) Polyimide material , Will confirm 3(e)Stainless Steel/Brass 3(h)Metal PG Cable Gland	a) Enclosed Control Panel Drawing . no: (1)NSSPT/ASD/CONTROL PANEL-006
3	AUDIO VISIUAL ALARAM	02 no.		EMX- 7T05SP , HOCHIKI, UK / JAPAN OR EQUIVALENT	4(a)External Enclosure 4(b)PCB	4(a) FR Polymer ABS 4(b) FR 4 Grade	a) Refer Enclosed certificate no:7324 b) Test Reports, Guarantee Certificate, WTC / Certificate of conformance from OEM c) Purchase Invoice / Delivery
4	Fire Retardant Main Sampling Pipe Specification Diameter : 3/4 inch nominal bore(27mm O/D) . Material: CPVC with capillary pipe, T reducer joints and fixtures as per coach requirement.	25 Mts		NSSPT/1060.01/CONPIPE, -(NS INTERNAL PART NUMBER) APPROVED MAKE	6(a)Sampling Pipe 6(b)Capillary Pipe 6(c)Sampling Nipple/Nozzle 6(d)T Reducer Joints	CPVC, UL certified Aluminium Powder coated RAL 1009005	a) Enclosed Supreme datasheet certified to UL listed (UL 1821). b) Invoice of a local Dealer
5	Female 9 pin SUB-D Connector for data download	02 no's		APPROVED LOCAL MAKE , INDIA	NA	NA	a) Metal Enclosure b) Invoice of a local Dealer
6	Clamps & Brackets for pipe Mounting : 3/4 size	LUMPSUM as required		NSSPT/1060.01/CLR-BRC,NS MAKE , INDIA(NSINTERNAL PART NUMBER)	Metal Parts	METAL PARTS Finish Powder coated to RAL 1009005	a)Metal Zinc or chromium Passivated. b) Invoice of a local Dealer
7	User manual - NSSPT/PDE/NS1060.01/USER-MANUAL	06 set		NA , NS MAKE LOCAL, INDIA	NA	NA	NOT Used in Coach
8	Smoke /Heat detector SIL-2 Certified	01Nos		Hochiki Make	SIL-2 Certified	Drawing No: SLR-E-(IS) & base YBN-R/4(IS)	SIL-2 Certified
9	Heat Activated Sampling point	01Nos		NS Make	SS304 Housing	Drawing No:NS/ASD/HASP-001	SS304 Hochiki

B-Scope of Services

1	Installation and commissioning per coach
2	Commissioning Spares/coach
3	Guaranteed spares for 3 years /coach

PREPARED BY : K S S K	CHECKED BY:	Date : 14-12-2021
		APPROVED BY : Director Delivery Systems K S S K



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Signature:



N&S SOLUTIONS PVT LTD No:37-38 Reliable Residency ,HSR Layout,Harlur,Bangalore-560102

TITLE-ASPIRATING TYPE FIRE/SMOKE DETECTION WITH ALARM SYSTEM TO RDSO SPEC-RDSO/2008/CG-04/REV-05

DOC NO :DOC NO:NSSPT/PDE/ASD-PIPE

REV-04

INDEX

MAIN BOM DOC NO:NSSPT/PDE/ASD- QAP, SL NO:05 SAMPLING PIPE DETAILS

Sl.no	Description	Qty/PerCoach	Part No.	MAKE/OEM	Material being used as per Clause No:8.1.2
5	Fire Retardant Main Sampling Pipe Specification Diameter : 3/4 inch nominal bore(27mm O/D),. Material: CPVC with capillary pipe, T reducer joints and fixtures as per coach requirement.	25 Mts	SUPREME SAP NO:PCPZSW3M002E (NSSPT/1060.01/ PIPE-MAIN -NS INTERNAL PART NUMBER) .		Enclosed Supreme datasheet certified to UL listed (UL 1821). a) Test Reports, Guarantee Certificate, WTC / Certificate of conformance from OEM. b) Purchase Invoice / Delivery challan
5(a)	Inline Trunk Adapter for capillary Aspirating CPVC pipes	As per number of sampling points	SUPREM PRODUCT CODE:4206-007 NSSPT/1060.01/ PIPE-TA (NS INTERNAL PART NUMBER) .		Enclosed Supreme datasheet certified to UL listed (UL 1821). a) Test Reports, Guarantee Certificate, WTC /Certificate of conformance from OEM. b) Purchase Invoice / Delivery challan
5(b)	CPVC Capillary sampling Tubes (8mm TO 11mm)- 1.5 mts Length	As per number of sampling points	NSSPT/1060.01/ PIPE-ST (NS INTERNAL PART NUMBER)		a) Test Reports, Guarantee Certificate, WTC /Certificate of conformance from OEM. b) Purchase Invoice / Delivery Challan
5(c)	AL Capillary sampling points Nozzels (Concealed)	As per number of sampling points	NSSPT/1060.01/ PIPE-SN (NS INTERNAL		NS Make a)To Suit Sampling Pipe OD diameter. b)Dimensions to Meet Drawing No: NSSPT/ASD/NS/008. c)Refer Layout Drawing no.: b)Refer Layout Drawing no.: NSSPT/ASD/SAMPLING/LAYOUT/TC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/MC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/DTC .Rev.05 for TC/DTC/MC
5(d)	Safety Mesh cover for capillary sampling points Nozzels	3 nos	NSSPT/1060.01/ PIPE-MC (NS INTERNAL PART NUMBER)		METAL PART Enclosed Drawing no: NSSPT/ASD/SN NETTED COVER/04 a) Invoice of a local Dealer b)Refer Layout Drawing no.: NSSPT/ASD/SAMPLING/LAYOUT/TC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/MC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/DTC .Rev.05 for TC/DTC/MC
5(e)	Solvent Cement - Size Pint (473.17ml)	One pint box.	SUPREM PRODUCT CODE:FS5-020 NSSPT/1060.01/ PIPE-SC (NS INTERNAL PART NUMBER)		CONSUMABLE a) Invoice of a local Dealer
5(f)	Clamps & Brackets for pipe Mounting : 3/4 size	LUMPSUM as required	NSSPT/1060.01/CLR- BRC,NS MAKE , INDIA(NSINTERNAL PART NUMBER)		Ms Zinc or chromium Passivated. b) NS Make
	Coupler - Size 3/4" (20mm)	5 nos	SUPREM PRODUCT CODE:4229-007 (NSSPT/1060.01/PIPE-C NS INTERNAL PART NUMBER)		Enclosed Supreme datasheet certified to UL listed (UL 1821). a) Test Reports, Guarantee Certificate, WTC /Certificate of conformance from OEM. b) Purchase Invoice / Delivery challan
5(g)	CPVC Elbow Joints - 45° Elbow - Size 3/4" (20mm)	4 nos	SUPREM PRODUCT CODE:4206-007 (NSSPT/1060.01/PIPE-EJ NS INTERNAL PAR- NUMBER)		Enclosed Supreme datasheet certified to UL listed (UL 1821). a) Test Reports, Guarantee Certificate, WTC /Certificate of conformance from OEM. b)Purchase Invoice / Delivery challan
5(h)	CPVC EndCap	1 nos	SUPREM PRODUCT CODE:4206-007 (NSSPT/1060.01/PIPE-EJ NS INTERNAL PAR- NUMBER)		Enclosed Supreme datasheet certified to UL listed (UL 1821). a) Test Reports, Guarantee Certificate, WTC /Certificate of conformance from OEM. b)Purchase Invoice / Delivery challan
5(i)	AL Capillary sampling points Nozzels (Visible)	3 no.	NSSPT/1060.01/ PIPE-SN (NS INTERNAL		NS Make a)To Suit Sampling Pipe OD diameter. b)Dimensions to Meet Drawing No: NSSPT/ASD/NS/008. c)Refer Layout Drawing no.:b)Refer Layout Drawing no.: NSSPT/ASD/SAMPLING/LAYOUT/TC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/MC .Rev.05 NSSPT/ASD/SAMPLING/LAYOUT/DTC .Rev.05 for TC/DTC/MC



DOC NO :NSSPT/PDE/20-21/QAP

PREPARED BY : KSSK

CHECKED BY:

Date :14-12-2021

APPROVED BY : Director Delivery Systems K S S K

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SIGNATURE :

PLANING ACTIVITY WORKSHEET FOR ASD I & C For ICF/LHB Coaches

1	Tender Number /Date	Tender number: 06211506 Closing Date/Time: 28/10/2021 14:15
2	Consignee	M/S ICF/Chennai
3	Paying Authority	M/S ICF/Chennai
4	Latest M.A.No. & Date	Not Applicable

STAR T DATE	END DATE	SL NO	PROCESS ACTIVITY	DRAWING DOCUMENTS
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Required Documents for Reference

		1	General schematic diagram of sampling pipe layout for 3 coaches (DTC, TC and MC) with dimensions in reference to main sampling pipe line.	1) TC onboard equipment 2) DTC onboard equipment 3) MC onboard equipment
		2	Sampling Nozzle	NSSPT/ASD/SN/008
		3	Sampling Nozzle cover	NSSPT/ASD/SN NETTED COVER/004
		4	Heat activated sampling point.	NS/AASD/HASP-001 (IEC60571 CERTIFIED SYSTEMS)
		5	control pannel	NSSPT/ASD/CONTROL PANEL/006
		6	Bend pipe for main sampling point to avoid infringement	NSSPT/1060.01/CON-PIPE
		7	sample 3D pictures of sampling pipe layout and sampling nozzle capillary pipe	ENCLOSED 3D PICTURES
		8	Approved Bill of Material for sampling pipe layout.	BOM SL. NO. 6 (SAMPLING PIPE DETAIL)

ROUTING OF SAMPLING PIPE INSIDE ROOF OF COACH

		1	Required material for coach(Upvc pipe,elbow, T joint, approved cabels , clamps & Brackets, Buzzer, cappillary tube,Nipple, Sealeant, as per BOM).	Refer BOM NO 2
		2	The approved UPVC pipe to be laid through the false ceiling from ASD outlet to the termination on the other end for the coach as per the layout drawing .	Refer respectice 2D/3D layout drawing
		3	Main sampling pipe will be laid as per coach layout diagram, for specific coach and T-joint or capillary point offtake will be as per layout diagram.(enclosedd Sample 3D pictures)	Refer 3D pictures
		4	Capillary pipe 10mm dia of 2.5mts and 1.5mts (Or as per customer requirement) with additional slack of 0.5mts to be provided from each capillary point offtake.	Refer Diamentional layout drawing for respective coaches
		5	The terminal end of each capillary pipe will be tied with 1.0 mmsquare flexible steel wire of 2mts length.	Refer Diamentional layout drawing for respective coaches
		6	As the ceiling panel is mounted with pre drilled sampling holes of 16mm dia. The corresponding sampling capillary pipe steel guide wire is inserted into the ceiling sampling holes and gently pulled from below.	Refer Diamentional layout drawing for respective coaches

		7	As the ceiling panel is locked in the place the guide wires are fully pulled till the sampling capillary pipe protrudes out from the respective sampling hole.	Refer Diamentional layout drawing for respective coaches
		8	The steel guide wire is is removed from the capillary pipe the terminal end of the capillary pipe is dressed.	Refer Diamentional layout drawing for respective coaches
		9	Now the capillary pipe is inserted into the sampling nozzle after a coat of adhesive compound[Refer BOM SL. No. 6(e)] simaltaneously the sampling nozzle is press fitted on to the ceiling through the 16mm hole so as to lock both mechanically and adhesively .	Refer Diamentional layout drawing for respective coaches
		10	In reference to the sampling nozzle cover drawing is fitted concentric to the sampling nozzle by means of 2 self threading screws to protect the samplig nozzle.	Refer Sampling Nozzle cover drawing number.: NSSPT/ASD/SN NETTED COVER/004
		11	The above same process is repeated is repeated for all the sampling nozzle holes as per the the sampling layout diagram for the respective coach.	
		12	Control Cabinet as per drawing number NSSPT/ASD/CONTROL PANEL/006 is mounted at far end of 4no. M10 bolting system.	
		13	precaution to be taken care of mounting the control panel along with the anti vibrating rubber with the control panel kit.	
		14	After the control panel is fitted the inlet point on the control panel for the sampling pipe is connected to main main sampling pipe line to ensure an air tight fit through the control pannel provided on the inlet pipe mounted on control panel.	
		15	A half meter to 1meter sampling pipe is fit into the outlet exhaust pipe fitted on the control panel and left open to the same pressure area .	
		16	power supply cable 110volt DC is drawn from the coach control panel through the coach cable tray and terminate through 110volts PG 16 glands inside the control panel.	
		17	The TCMS data cable from the control panel is drawn through PG16 gland on the control panel to the TCMS termination points provided near the control panel installation.	
		18	The 4 relay output NC/NO contact cabling is drawn from the control panel PCB termianion (Refer wiring chart drawing number: NSSPT/PDE/WIRING -CHART/001) through the PG16 gland and provide to the TCMS systems.	
		19	please refer to the routine test procedure for the full system to RDSO clause no. 6.4 to test the system.	

		20	Refer test plane for sensors to RDSO Specification no. RDSO/2008/CG-04/REV-05	
		21	Refer to test plan result tabulation for recording the various parameters once commissioning of the system is done.	

ROUTING OF FIELD CABLES INSIDE COACH

		1	From Buzzer audio visual at mounted on ceiling outside both end A .C Coach door visible to passenger.	Refer to the fitment chart for the individual parts
		2	Drawing 110 v DC, A.C Coach or supply from electrical panel through false ceiling via cabel tray with 2.5 mm square fire retardent.	I & C User Manual
		3	Continuity checking end for each cable to ensure signal transmission.	I & C User Manual
		4	To connect data download cabel from Hochiki ASD box with sub -d cabels to TCMS point from control pannel.	I & C User Manual

Powering on and calibration

		1	Check continuty of every cabel.	
		2	Check power supply from electric panel 110v DC.	
		3	Power on fire panel.	
		4	verify fire panel an ASD Instalization.	
		5	Now follow N & S Solution document for user setup procedure.	

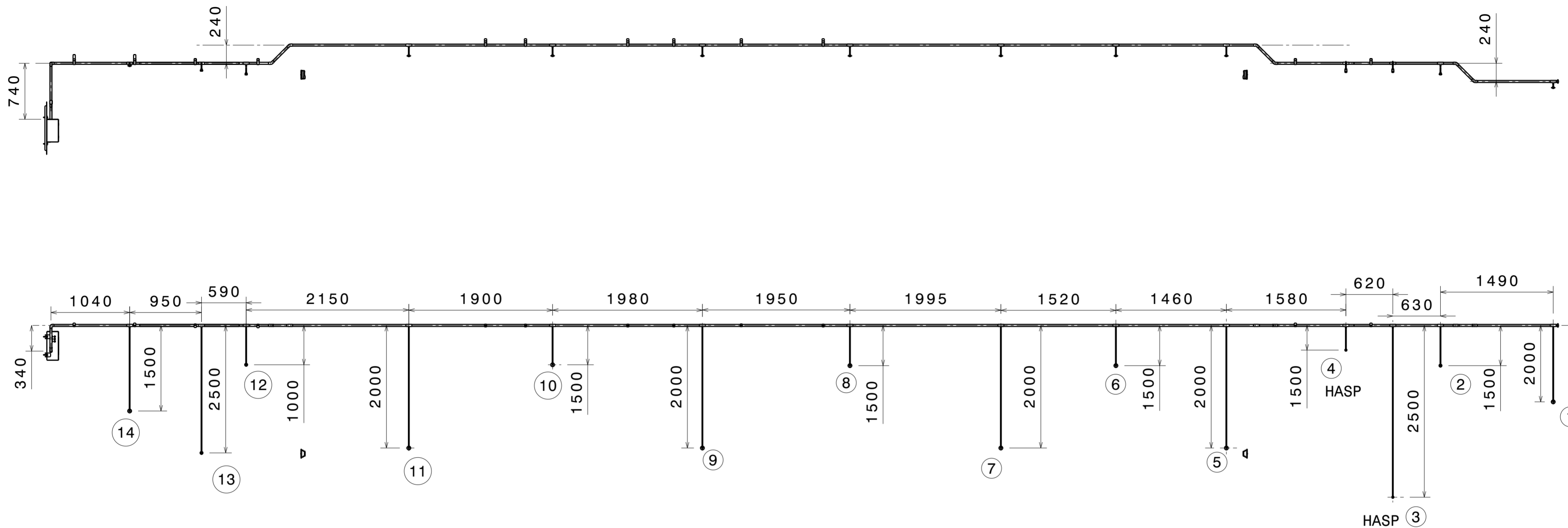
Precautions

1	Use always approved adhesive compound (as per BOM) for all pipe joints to ensure no leakage.
2	Ensure thin film of adhesive compound is applied specifically for capillary pipe inserted to sampling nozzles to avoid or prevent excessive adhesive compound accumulating in sampling nozzles.
3	as every lenth of pipe is being layed, ensure that there is no dust, greese, oil and foreign material in the pipes being laid.
4	All the sampline pipe line to be layed and harnessed as per the layout diagram for the specific coaches with mounting brackets as shown.

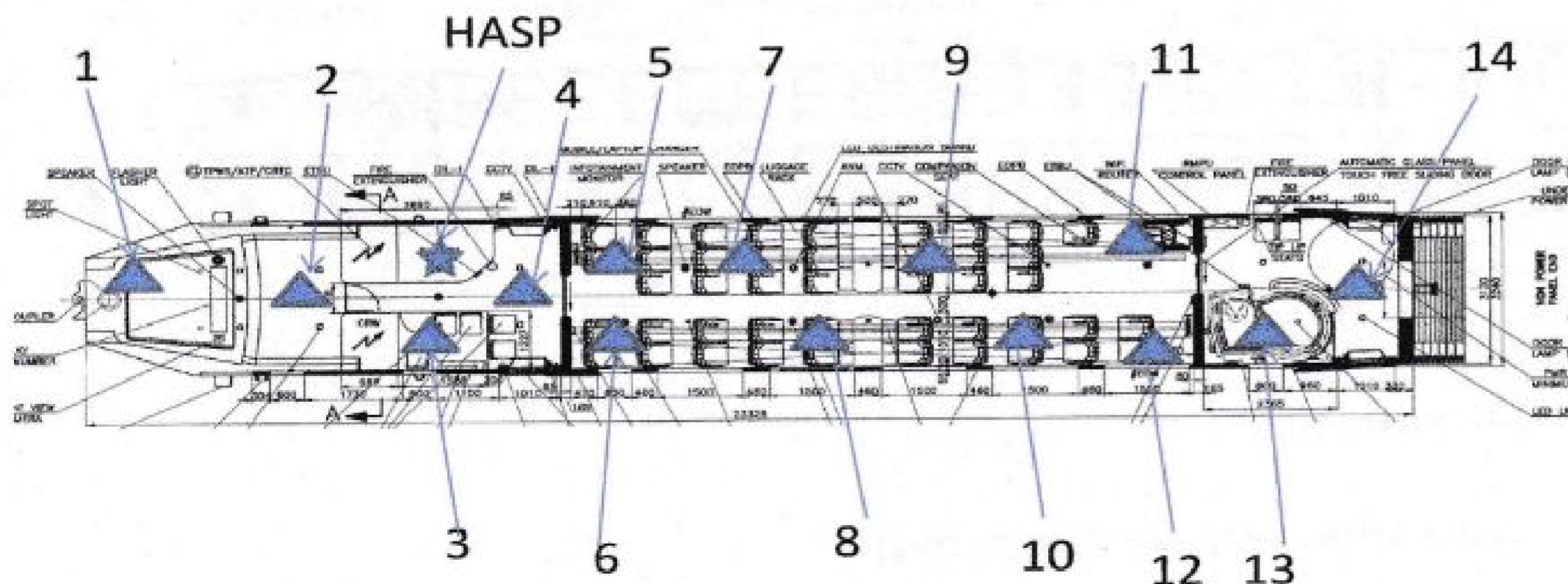
Note:1. For each coach 2 manpower is required, 1 person is electrical and another person is mechanical technicians and one Supervisor or manager.

Note: 2. Supervisor from Bangalore office should remain.

Prepared :Ramya (Customer Contract Management)	Checked : I & C Team	Approved: K. S. Shailesh Kumar (Director)
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TS/DTC REQUIREMENTS :



SAMPLING POINTS AND TYPES :

- 1) IN PASSENGER AREA : 6 SAMPLING POINTS (CONSEALED) - FROM 6 TO 11
- 2) SAMPLING POINTS IN DOOR WAY : 3 CONSEALED - (1 ,5, 14)
- 3) 2 HASP IN PANTRY: (VISIBLE)
- 4) NO OF SAMPLING IN ELECTRICAL PANEL: 1(VISIBLE) - 2
- 5) 2 SAMPLING POINTS IN TOILETS (VISIBLE TO PASSENGER) - 12 AND 13

MEASUREMENT OF MAIN SAMPLING PIPE AND TEE JOINTS ARE AS MEASURED FROM THE PHYSICAL COACH.

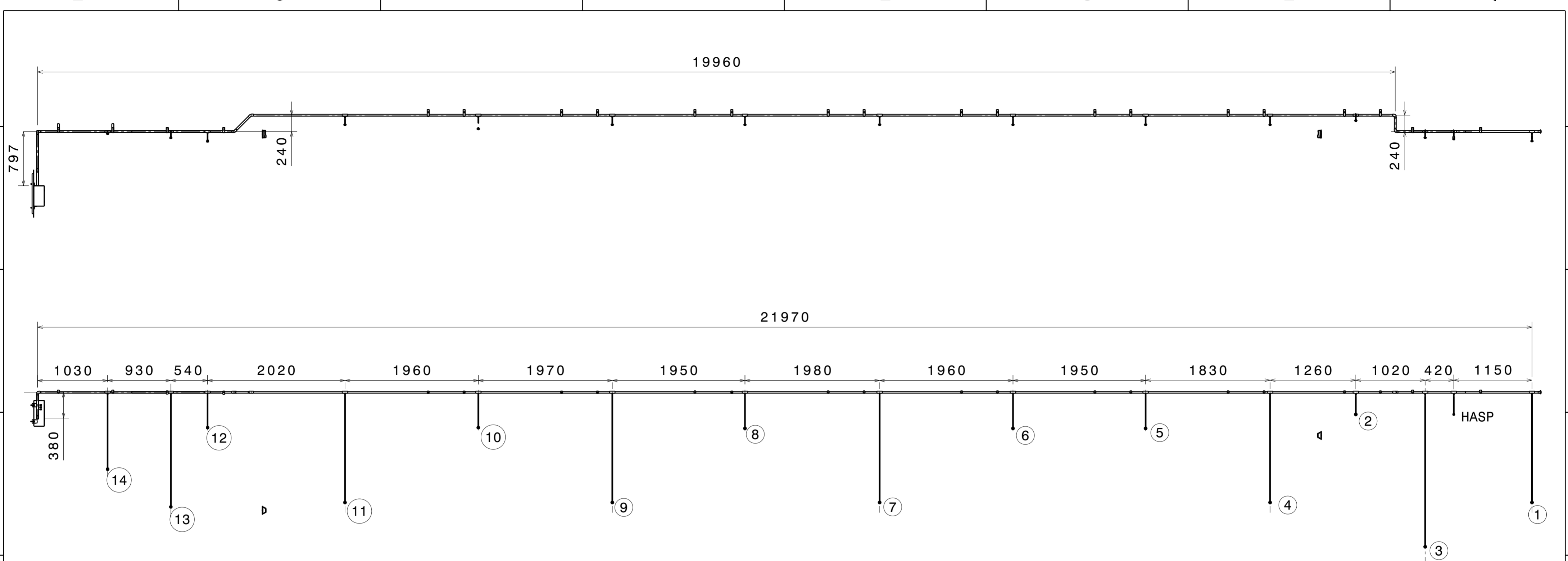
NOTE: REFER DRW NO NSSPT/ASD/SN/008 (REVISION 04) FOR CONSEALED SAMPLING POINT ASSEMBLY

NOTE: REFER DRW NO NSSPT/ASD/SN/008 (REVISION 03) FOR VISIBLE SAMPLING ASSY

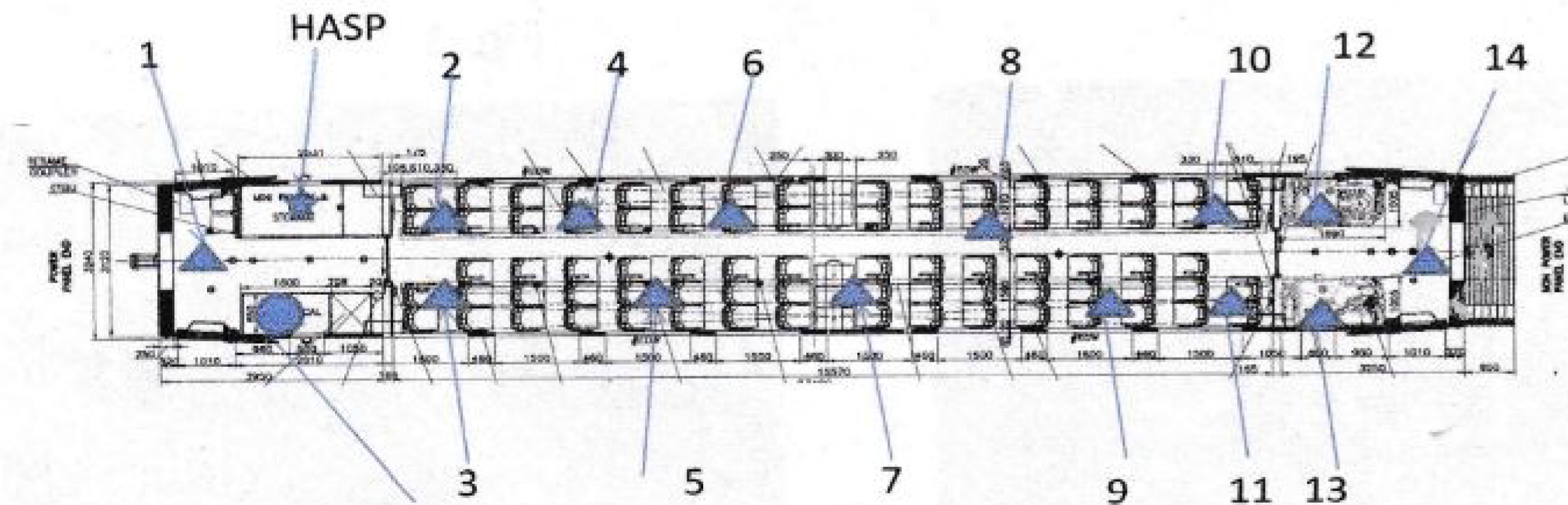
- ASPIRATION TYPE SAMPLING POINT
- HASP (HEAT ACTIVATED SAMPLING POINT)

NOTES:
 1.10MM DIA PIPE IS FLEXIBLE PIPE, KEEP +15CM TOLERANCE (EXTRA LENGTH) FOR ADJUSTMENTS
 2.REFER DETAILED BOM FOR SAMPLING PIPE SYSTEM.




This drawing is our property. It can't be reproduced or communicated without our written agreement.		N&S SOLUTIONS PVT LTD		
DRAWING TITLE		MAIN SAMPLING PIPELAYOUT ALONG WITH CAPILLARY PIPES - DTC		
DRAWN BY	DATE	SIZE	DRAWING NUMBER	REV
JAGADISH	22/02/2022	A2	NSSPT/ASD/SAMPLING/LAYOUT/DTC	06
CHECKED BY	DATE	SCALE 1:40		WEIGHT(kg)
SHIV KUMAR	22/02/2022			
APPROVED BY	DATE	SHEET 1/1		
KSSK	22/02/2022			



TS/MC REQUIREMENTS :



SAMPLING HOLE

-  ASPIRATION TYPE SAMPLING POINT
-  HASP (HEAT ACTIVATED SAMPLING POINT)
-  SAMPLING HOLE

NOTES:
 1. 1.10MM DIA PIPE IS FLEXIBLE PIPE, KEEP +15CM TOLERANCE (EXTRA LENGTH) FOR ADJUSTMENTS
 2. REFER DETAILED BOM FOR SAMPLING PIPE SYSTEM.

SAMPLING POINTS AND TYPES :

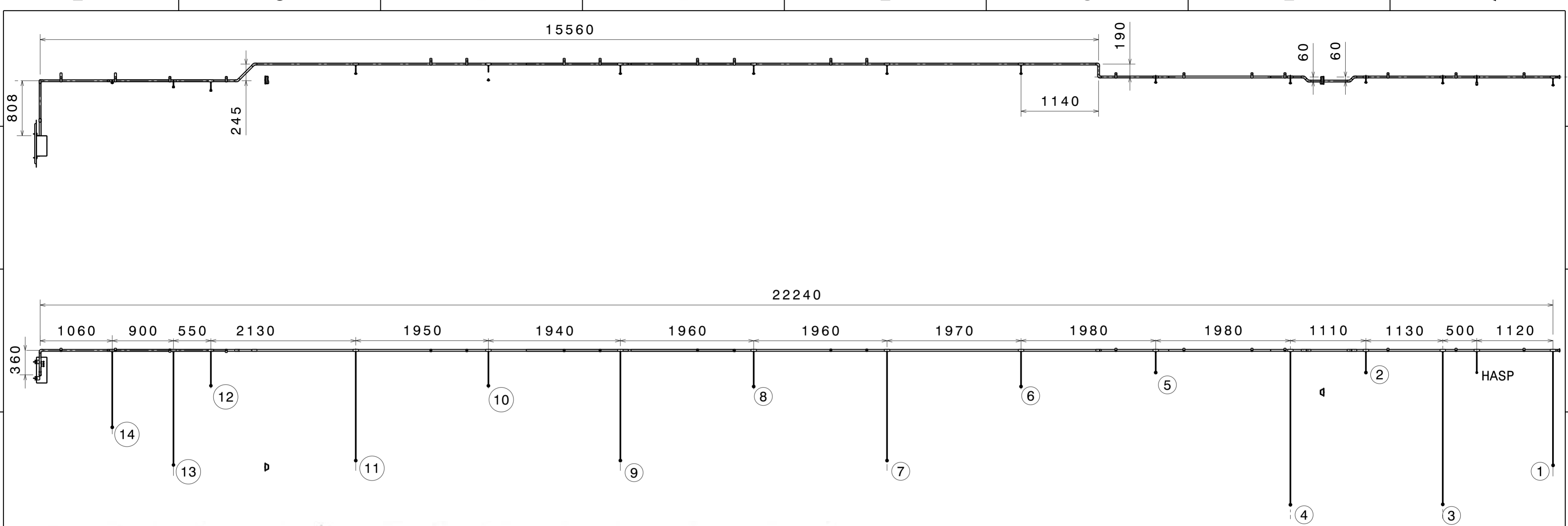
- 1) IN PASSENGER AREA : 10 SAMPLING POINTS (CONSEALED) - FROM 2 TO 11
- 2) SAMPLING POINTS IN DOOR WAY : 2 CONSEALED - (1 AND 14)
- 3) 1 HASP IN PANTRY: (VISIBLE)
- 4) NO OF SAMPLING IN ELECTRICAL PANEL: 1(VISIBLE)
- 5) 2 SAMPLING POINTS IN TOILETS (VISIBLE TO PASSENGER) - 12 AND 13

MEASUREMENT OF MAIN SAMPLING PIPE AND TEE JOINTS ARE AS MEASURED FROM THE PHYSICAL COACH.

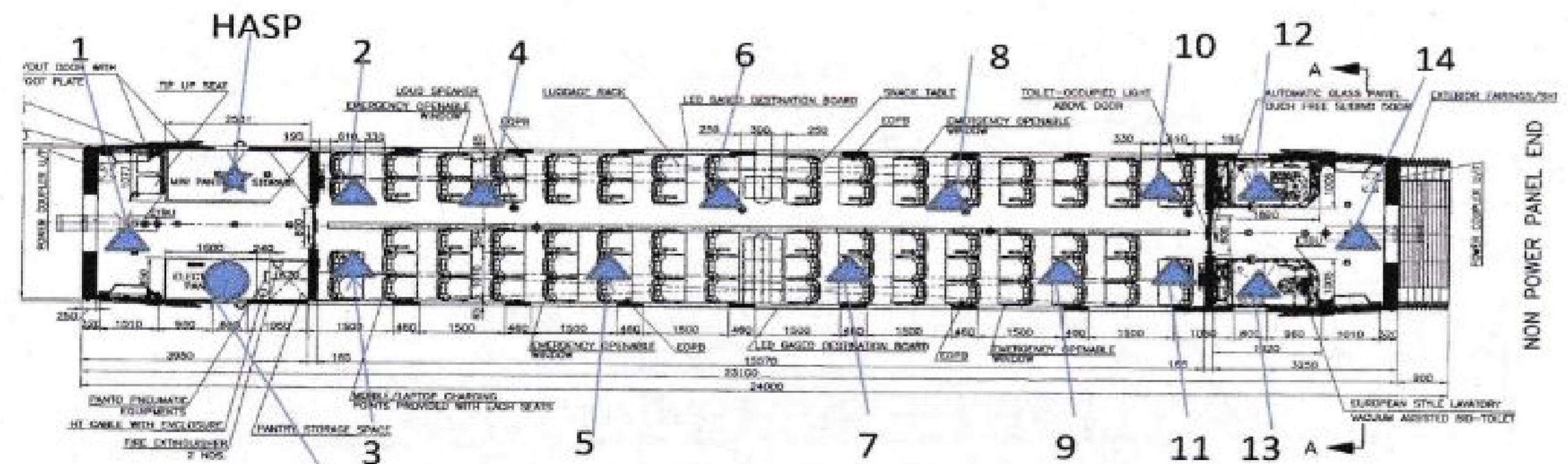
NOTE: REFER DRW NO NSSPT/ASD/SN/008 (REVISION 04) FOR CONSEALED SAMPLING POINT ASSEMBLY

NOTE: REFER DRW NO NSSPT/ASD/SN/008 (REVISION 03) FOR VISIBLE SAMPLING ASSY

This drawing is our property. It can't be reproduced or communicated without our written agreement.		N&S SOLUTIONS PVT LTD		
DRAWING TITLE		MAIN SAMPLING PIPELAYOUT ALONG WITH CAPILLARY PIPES - MC		
DRAWN BY	DATE	SIZE	DRAWING NUMBER	REV
JAGADISH	25/12/2021	A2	NSSPT/ASD/SAMPLING/LAYOUT/MC	05
CHECKED BY	DATE	SCALE	WEIGHT(kg)	SHEET
SHIV KUMAR	25/12/2021	1:40		1/1
APPROVED BY	DATE			
KSSK	25/12/2021			



TS/TC REQUIREMENTS :



SAMPLING POINTS AND TYPES :

- 1) IN PASSENGER AREA : 10 SAMPLING POINTS (CONSEALED) - FROM 2 TO 11
- 2) SAMPLING POINTS IN DOOR WAY : 2 CONSEALED - (1 AND 14)
- 3) 1 HASP IS PANTRY: (VISIBLE)
- 4) NO OF SAMPLING IN ELECTRICAL PANEL: 1(VISIBLE)
- 5) 2 SAMPLING POINTS IN TOILETS (VISIBLE TO PASSENGER) - 12 AND 13

MEASUREMENT OF MAIN SAMPLING PIPE AND TEE JOINTS ARE AS MEASURED FROM THE PHYSICAL COACH.


NOTE: REFER DRAWING NO NSSPT/ASD/SN/008 (REVISION 04) FOR CONSEALED SAMPLING POINT ASSEMBLY

NOTE: REFER DRAWING NO NSSPT/ASD/SN/008 (REVISION 03) FOR VISIBLE SAMPLING ASSY

- ASPIRATION TYPE SAMPLING POINT
- HASP (HEAT ACTIVATED SAMPLING POINT)
- SAMPLING HOLE

NOTES:
 1.10MM DIA PIPE IS FLEXIBLE PIPE, KEEP +15CM TOLERANCE (EXTRA LENGTH) FOR ADJUSTMENTS
 2.REFER DETAILED BOM FOR SAMPLING PIPE SYSTEM.

This drawing is our property. It can't be reproduced or communicated without our written agreement.		N&S SOLUTIONS PVT LTD		
DRAWN BY JAGADISH		DRAWING TITLE MAIN SAMPLING PIPELAYOUT ALONG WITH CAPILLARY PIPES - TC		
CHECKED BY SHIV KUMAR		DATE 25/12/2021	SIZE A2	DRAWING NUMBER NSSPT/ASD/SAMPLING/LAYOUT/TC
APPROVED BY KSSK		DATE 25/12/2021	SCALE 1:40	REV 05
WEIGHT(kg)			SHEET 1/1	

		N&S SOLUTIONS PVT LTD No:37-38 Reliable Residency ,HSR Layout,Harlur,Banglore-560102				Document number: NSSPT/PDE/21-22/QAP/IO/002		Date: 18-12-2021	
		TITLE-ASPIRATING TYPE FIRE/SMOKE DETECTION WITH ALARM SYSTEM TO RDSO SPEC-RDSO/2008/CG-04/REV-05						Rev.03	
External Terminal Connection and Wiring Details Outside The Control Panel									
SL NO	ASD External Interface	Source				Destination			Wiring Details
		Terminal Connection/Components	Terminal /Pin No	Signal Name	Terminal Connection/Components	Number on terminals	Signal Name		
1	Control Panel To Flasher Hooter 1	Control Panel wago Terminal	21	FH1(+)(RED)	Direct Termination through lugs	43	FH1(+)(RED)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
			22	FH1(-)(BLACK)		44	FH1(-)(BLACK)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
2	Control Panel To Flasher Hooter2	Control Panel wago Terminal	21	FH2(+)(RED)	Direct Termination through lugs	45	FH2(+)(RED)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
			22	FH2(-)(BLACK)		46	FH2(-)(BLACK)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
3	Control Panel To Audio Announcement	Control Panel wago Terminal	3	SP(+)(Red)	Direct Termination through lugs	47	SP(+)(Red)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
			4	SP(-)(Yellow)		48	SP(-)(Yellow)	2C X 1.0 mm 2 Twisted Pair EBEAM Cable Length As Required	
4	Inlet power Supply from Coach	LNE OF COACH	LNE		LNE of Panel	L	L(RED)	2.5mm2 2C+1 Twisted Pair EBEAM Cable	
						N	N(BLACK)	2.5mm2 2C+1 Twisted Pair EBEAM Cable	
						E	E(GREEN)	2.5mm2 2C+1 Twisted Pair EBEAM Cable	
5	RS485 MODBUS	Control Panel wago Terminal	D+	RS1	TCMS				
			D-	RS2					
			GND	RS3					
6	Control Panel Relay to TCMS								
6A	RL1	Control Panel wago Terminal	35	ALT 1				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
			36	ALT2				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
6B	RL2	Control Panel wago Terminal	37	ACT1				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
			38	ACT2				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
6C	RL3	Control Panel wago Terminal	39	FR1				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
			40	FR2				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
6D	RL4	Control Panel wago Terminal	41	FR3				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
			42	FR4				2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
7	Smoke Sensor	Control Panel wago Terminal	29	SS1	Direct Termination through lugs	49	SS1(RED)	2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
			30	SS2		50	SS2(BLACK)	2C X 1.0 mm2 Twisted Pair EBEAM Cable Length As Required	
PREPARED BY : Projects & Design Engineer-		CHECKED BY : K S S K							
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