Bespoke Intelligent Damper Control & Monitoring System
Introduction

Consultants in the field of fire engineering have long recognised the damage and danger to human life that can be caused by smoke spreading through buildings, even when the fire is confined to a small area.

Smoke/fire protection can save human lives as well as keeping damage to property and contents to an absolute minimum.

Control measures for smoke/fire protection, in old and new buildings, comprise a wide variety of systems and items of equipment that must be carefully integrated in order to ensure maximum safety.

One of the most important tasks is performed by the automatic smoke and fire dampers that are incorporated into HVAC systems. In an emergency they must close immediately to contain the smoke and fire and prevent their spread through the ducting or open immediately to allow smoke extraction to take place.

The Actionpac LNS4 system represents the latest evolution of damper control. The system has been designed with the user in mind, providing an advanced tool that simplifies installation and commissioning of dampers and peripheral devices. The embedded panel PC operates on an embedded platform and utilises solid state technology for optimum reliability.

It’s server architecture delivers benefits such as reduced commissioning time, simplified operation and scope for future growth and flexibility.

The Actionpac LNS4 Bespoke Intelligent Damper Control and Monitoring System.

Denotes SmokeShield CE Marked ‘ES’ Rated Fire Damper in smoke containing mode on the first floor whilst offering pressurisation to other floors including the stairwell.

Positive Pressure.

The Actionpac LNS4 system is designed to protect life and property from damage caused by smoke and fire, by providing the means to:

- Compartmentalise fire zones.
- Reduce the spread of smoke and fire.
- Keep escape routes and fire-fighting access open.

Allow pressurisation and smoke extract by combined operation of dampers and fans.

Allows complex strategies (cause and effect).
Other Addressable Panel Options

Actionpac Lite 80-standard

The Actionair Actionpac Lite 80 System consists of an 8.4 inch monitor, embedded PC, UPS and pre-loaded software. This standard system communicates with damper interfaces to provide intelligent control and monitoring of motorised dampers. The data network cabling enables substantial reduction in costs when compared with conventional systems. The digital input and output device (DI804-M) is accommodated within the panel enclosure.

The embedded PC is supplied with Actionair Actionpac Lite 80 software and operates on an embedded platform, which is extremely user friendly. The server architecture delivers new benefits such as reduced commissioning time, ease of configuration, simplified operation, full diagnostics for system and device integration along with optional automatic scheduled damper testing.

Actionpac Electro Mechanical Smoke and Fire Damper Hard

EMS – Standard

Control and monitoring system.
Actionpac Electro Mechanical Smoke and fire damper control system.
Automatic damper operation utilising relay logic and LED indication of damper status.
Standard Modular Construction.
LED indication of damper status.
Mains isolator.
Test/Normal/Override Keypswitch.
Lamp test facility.
2 Versions (Mode 5 and Mode 6), available in 3 sizes, from Stock.

EMB – Bespoke

Control and monitoring system.
Actionpac Electro Mechanical Smoke and fire damper control system.
Automatic damper operation utilising relay logic and LED indication of damper status.
Features
Customised central Control Panel.
Individual, or collectively controlled and continually monitored.
Wall mounted enclosure to IP55.
Custom Engraved Traffolyte fascia.
LED indication of damper status.

Zonal inputs.
Door interlocking isolator.
Miniature circuit breaker protection.
Options
Lockable glazed door.
Special paint finish to BS standard colour reference numbers.
Flush mounting flanges.
Latching push buttons.
Fireman’s override key switches.
Test Switch.
Lamp Test.
Audible alarm with mute facility.
B.M.S. common fault relay interface.
B.M.S. output.
Delay timers.
Battery backup.

Specialist Panels available

Fan Control Panel.
Fireman’s control panel.
Mimic (Repeater) Panel
Fire damper monitor (Indication) panel.
Benefits

• Actionair experience and know-how in the damper market
• Actionair SmokeShield CE Marked ‘ES’ Rated Fire Dampers and LPCB approved
• Allows for phased commissioning and future expansion
• Backward compatible
• CE marked, EMC and LVD compliant
• Customer testimonials available
• Hundreds of prestigious reference sites
• Meets EM harmonised standard for railway environments and London Underground
• Powerful and very flexible functionality accommodates any last minute changes to strategy, zones, damper quantities, references and descriptions etc and enables standardisation of software (no bespoke site specific versions required)
• Off site system cause and effect witnessing can be arranged

• Open and interoperable protocol allows possible support by others and future proof lifecycle preventative maintenance costs
• Optional networking of panels to a central control and monitoring panel - up to 32 networked panels to meet practically any building’s damper requirements
• Optional automatic scheduled damper testing, including omit option for critical dampers
• Optional remote access via internet
• System designed to cater for environmental occupancy (energy saving) as well as the building’s smoke/fire strategy
• We offer preventative maintenance contracts Telephone 01227 276100.

System Commissioning

Actionair offers a comprehensive after sales service to include pre-commissioning checks and a complete commissioning service for all our products.

Our Standard Commissioning service includes the following:-

• Attendance at all necessary induction courses and site familiarisation.
• Final connections of inputs to system from fire alarms, override switches, BMS etc.
• Final connections of each damper interface unit, electrical contractor to have ensured all necessary cables are entered into enclosure glands.
• Establishing communication to each damper interface unit.
• Viewing of damper blade movement to check operation.
• Configuring of the relevant cause and effect.
• Demonstration / witnessing of 10% of dampers installed. Full witnessing available by special request.
• Client Training on the system.

Customer Service

Actionair provides quality products backed by a dedicated team committed to providing the very best in customer service.

We offer experienced technical backup, comprehensive sales, administrative customer support, and product commissioning. Telephone 01227 276100.

Enclosure Specifications

Standard enclosure sizes and weights are dependent on the number of networks and digital input/output devices required.

<table>
<thead>
<tr>
<th>Enclosure Size (mm) W x H x D</th>
<th>Max Load (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 x 500 x 210</td>
<td>500</td>
</tr>
<tr>
<td>800 x 800 x 210</td>
<td>500</td>
</tr>
<tr>
<td>800 x 1000 x 300</td>
<td>500</td>
</tr>
<tr>
<td>800 x 1200 x 300</td>
<td>500</td>
</tr>
</tbody>
</table>

Colour

RAL 7035

Hinged

Left

Power cables

Bottom of right hand side

Network cables

Top entry

I/O cables

Top entry

Protection

IP 20 (230 Volt terminals shrouded)

Max ambient temperature

30 °C (Panel must be in a ventilated environment)
The Actionair Actionpac LNS4 System consists of a 12 inch embedded panel PC, UPS and pre-loaded software. The system communicates with damper interfaces to provide intelligent control and monitoring of motorised dampers and monitoring of manual fire dampers. The data network cabling enables substantial reduction in costs when compared with conventional systems. Digital input/output devices can be accommodated on the network cable or located within the panel enclosure.

The embedded panel PC is supplied with Actionair Actionpac LNS4 software and operates on an embedded platform, which is extremely user friendly. The server architecture delivers benefits such as flexibility, reduced commissioning time, ease of configuration, simplified operation, future system growth, full diagnostics for system and device integration along with optional automatic scheduled damper testing.

**Control Panel**

**Digital Input / Output Device (DI804)**

This device accepts eight volt free contact inputs into the Actionpac LNS4 System. Typical inputs would be from fire alarm panels, fireman’s override switches, manual call points and smoke detectors.

This device also provides four relay outputs to be driven from the Actionpac LNS4 System. Typical outputs would be to fans and BMS systems.

Complex strategy (cause and effect) lists, included priorities can be driven from this input / output device which is located within the embedded panel PC enclosure. Other I/O devices are available for panel or field location.

**Mimic Panels**

Bespoke LED mimic panels are available to clients’ specification.

**Firefighter’s Override Panels (FOP)**

Bespoke key switch or push button firefighter’s override panels are available to clients’ specification.

**Damper Interfaces**

The damper interfaces, except for the 3 PSFDI, accept local auxiliary inputs (normally duct smoke detectors) which can drive cause and effect schedules.

**SmokeShield CE Marked ‘ES’ Rated Fire Damper Interface (SFDI)**

This device, is required for each smoke fire damper used with the Actionpac LNS4 System.

The SFDI controls and monitors motorised smoke/fire dampers. The device ensures correct operation and status of the damper and provides an alarm at the PC Panel in the event of local power supply failure.

**3 Position SmokeShield CE Marked ‘ES’ Rated Fire Damper Interface (3PSFDI)**

Actuator can be set to a balanced position or driven one way and fail safes the other via spring return. Actuator can alternatively be modulated via 2 – 10V signal from BMS.

**FireShield CE Marked ‘E’ Rated Fire Damper Interface (FDI)**

Monitors damper position and provides facility for energising an electromagnet. Damper fail safes closed via its spring mechanism and must be manually reset.

**Hot Damper Interface (HDI)**

The HDI with a unique thermal enclosure (HDI) offers protection of the various interfaces to control and monitor HotShield dampers up to 300°C for 2 hours.

The HDI enclosure consists of two separate materials, enabling the HDI to function at the extreme temperature specified. The outer casing has endothermic properties that significantly slow down the internal temperature rise in a high temperature emergency condition. The inner casing is a special thermal insulating material. The unit has been tested and independently witnessed by IFC.
SFDI Wiring Detail

Control Options
System will control and monitor most motorised dampers and offers monitoring of any dampers that are manually reset.

Typical Operation
- Power On → Damper resets
- Power Off → Spring release
- Release Time ≈ 22 secs.
- Reset Time ≈ 60 secs.

24V AC or DC
Connect 24V via a safety isolating transformer.

230V AC 50 / 60Hz
1 amp fused spur to be provided. EN wiring regulations to be observed.

Power Consumption
- 24V AC or DC
- 230V AC
Maximum power consumption for combined SFDI plus 24V or 230V actuator is <15W.

SFDI Wiring Detail

LED Behaviour

<table>
<thead>
<tr>
<th>Function</th>
<th>Green</th>
<th>Red</th>
<th>Yellow</th>
<th>Blue</th>
<th>Service (Yellow)</th>
<th>Power (Green)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>On</td>
<td>Off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed</td>
<td>Off</td>
<td>On</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travelling</td>
<td>Flashing</td>
<td>On</td>
<td>Flashing</td>
<td></td>
<td></td>
<td>On</td>
</tr>
<tr>
<td>Fault</td>
<td>Flashing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>On</td>
</tr>
<tr>
<td>Ping</td>
<td>One-shot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>On</td>
</tr>
<tr>
<td>Offline</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>Flashes for 5 secs</td>
<td>On</td>
</tr>
</tbody>
</table>

1. Maximum number of devices* per network channel is 64. If >64 and / or >500m a network extender is required.
2. If wired as a loop, the network is polarity sensitive. In all other instances, the network is polarity insensitive.

These cable specifications are fundamental to the stable and reliable operation of your smoke/fire control and monitoring system.

Failure to adhere to these specifications will result in unstable and unreliable network communications and will void all warranties.

N.B. A multiple damper requires one Damper Interface or Hot Damper Interface per damper/section.

* A device is one of the following: Damper Interface, NDI404, Network Extender or a Panel Router.

Cable Type | Fire Rated | Max Length Between Devices | Max Length of Network Channel | Conductor Size |
-----------|------------|----------------------------|-------------------------------|----------------|
Belden 8471 NH 2 core | | 400m | 500m | 1.3mm² |
Prysmian (Pirelli) FP 200 Gold 2 core | | 400m | 500m | 1.5mm² |
Prysmian (Pirelli) FP Plus 2 core | | 400m | 500m | 1.5mm² |
Firetuf FT30 2 core | | 400m | 500m | 1.5mm² |
Firetuf FT120 2 core | | 400m | 500m | 1.5mm² |
Typical Network Schematic

Note: Each damper interface controls/monitors a damper.
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Due to policy of continuous product development the specification and details contained herein are subject to alteration without prior notice.