



DCS-100

intelligent damper control & monitoring system

Introduction

The Disys Technologies DCS-100 is a revolutionary new control system designed specifically for the fire/smoke damper controls market. Through a program of sustained investment in research and development, utilising the latest micro-controller technology and high reliability communications system, Distributed Intelligence is now available for fire/smoke damper control.

Every aspect of damper control applications has been carefully considered. The Human Interface Panel has been designed to grace any entrance foyer whilst being robust enough for plant room installations. The digital communications system provides high integrity signalling over 4 Km of cable and instantaneous real time monitoring and control of the dampers. Flexibility was a key design requirement and the DCS-100 allows dampers to be added, deleted or re-allocated to different fire zones quickly, simply and at any time. All system configuration parameters are stored in non-volatile 'Flash' memory¹ in the panel and in the nodes themselves. Additional panels may be fitted to a system anywhere in the building providing either a simple mimic panel or a full duplicate control station.

The advantage of utilising distributed intelligence is that the system is fault tolerant. For example if the power to the panel fails the nodes themselves are intelligent enough to continue operating and avoid the total shutdown of the ventilation system.

The features mentioned above are standard on the entry level systems whilst still offering an extremely cost effective solution that provides a real alternative to hard wired systems. Options available include networked systems for installations exceeding 100 dampers, automated damper testing, fault logs, alarm logs and cold smoke clearance mode.

Distributed Intelligence & Digital Communications

Distributed intelligence means that there is no central computer controlling the system. Each element within the system has a dedicated processor which monitors its own environment and communicates with the other elements of the system.

The significance of this is that in a true distributed intelligence system no single point of failure is able to disable the whole system. The digital communications protocol employed by the DISYS control system is an open standard; licence free; high reliability communications system.

Already proven in life safety applications it has been utilised in fields as diverse as the automotive industry and factory automation. DISYS Technologies have now introduced this technology for fire/smoke damper control applications.

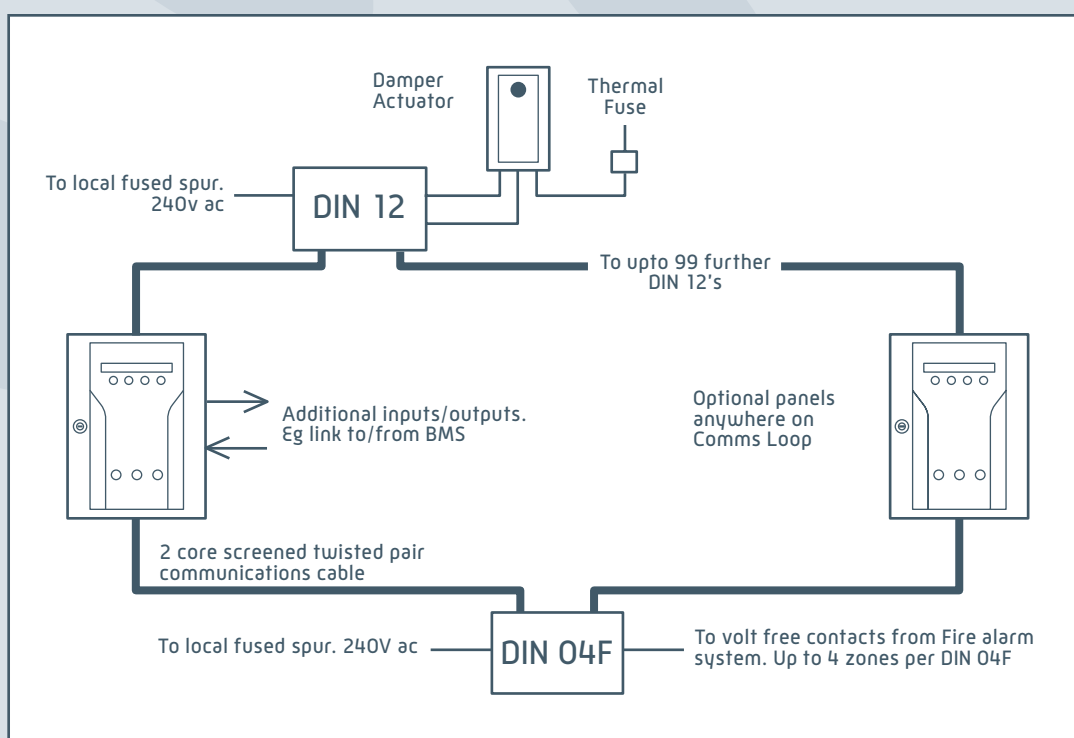
1. Flash memory retains the information when power is removed

System Overview

A system is comprised of a number of Distributed Intelligent Nodes (DINs) and one or more Human Interface Panels (HIPs). Nodes are available to perform a variety of functions, for example damper actuator control and monitoring, fire alarm interfacing and AHU control. During system configuration the nodes are loaded with their criteria for operation which are held in 'Flash' memory. The nodes then monitor their inputs and outputs together with status messages from other nodes in the system and compare this status information with the configured criteria in order to determine whether any action is necessary. Each node immediately broadcasts any change in status to the system ensuring true real time control and indication. A watchdog function ensures that individual nodes detect the absence or failure of any other node in the system. The communications cable linking the DIN cards may be any screened twisted pair cable, wired in either a loop or radial topology according to the application, with cable runs of up to 4 Km permitted without requiring signal boosters or repeaters.

Due to the intelligence of the individual nodes the Human Interface Panel (HIP) is not a 'control' panel in the conventional sense, it acts purely as a display for system status information and as an input device for manual intervention. The status of each of up to 100 dampers is displayed via a matrix of tri-colour LEDs. Additional information is accessed via the two line forty character display. The easy to follow menu structure guides the user/operator to the more detailed information that may be required. A unique feature of the system is that if the power to the HIP fails then the system will continue to operate. The HIP allows password protected access to the system configuration. An authorised user may change the number of dampers controlled within a system, the number of Fire Alarm zones and which dampers respond to which alarm signals. Additional HIPs may be added to the system providing indication and/or control from multiple locations within a building.

Typical System Installation



System Elements

A complete control system comprises one or more Human Interface Panels and up to 150 Disys Intelligent Nodes connected together via a twisted pair communications cable.

A total of 100 dampers may be controlled with additional nodes acting as interfaces to the fire alarm system, BMS and AHU's. Larger installations with more than 100 dampers may be accommodated by either separate systems of 100 or multiple systems networked together.

All versions of the Disys Intelligent Nodes are available in 240V ac and 24V ac or dc versions. For smaller 24V systems of up to 30 nodes it is possible to supply all the damper units from a power supply fitted in the Human Interface Panel providing a fully integrated stand alone system.



Changes are easily accommodated at any time.

The Human Interface Panel

The Human Interface Panel (HIP) has been designed to provide an elegant solution to the problem of providing damper indication and control to the fire fighters at the entrance to buildings, whilst remaining practical and easy to use. All the controls are protected behind a tough, lockable polycarbonate glazed door. The fire fighters over ride buttons illuminate during a fire condition and are large enough to be operated whilst wearing protective gloves. The number and function of the over ride switches are customised to user requirements.

The operator controls provide a simple to use, password protected method of amending the fire strategy, adding or deleting dampers and alarms. The address of each node (DIN) may be set or altered from the HIP, together with its assignment to an alarm zone. This information is then stored in the 'Flash' memory on board each node.

Distributed Intelligent Nodes - Overview

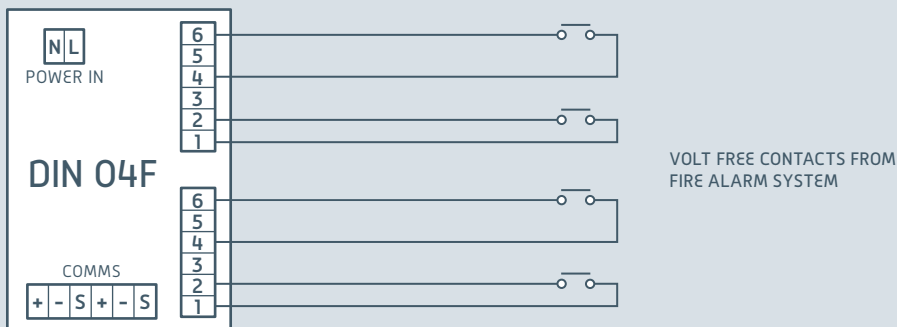
The technology employed in the Distributed Intelligent Nodes (DINs) allows the processing power required in the system to be shared amongst the nodes. Consequently the HIP is a much lower cost panel than in traditional control systems, whilst the DINs benefit from being designed specifically for damper control applications and are very competitively priced. A range of DINs are available for specific functions, the most commonly used are listed here. For further information on the full range please visit our website.



Distributing the intelligence reduces the costs.

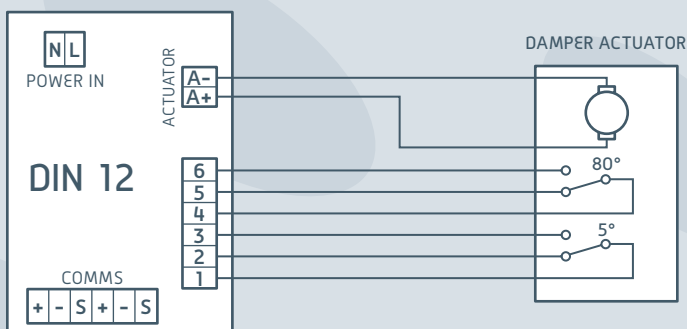
DIN 04F

The DIN 04F which is dedicated to monitoring contacts from the main building fire alarm system. These units provide four inputs for zone or general alarms contacts and may be situated anywhere on the communications line.



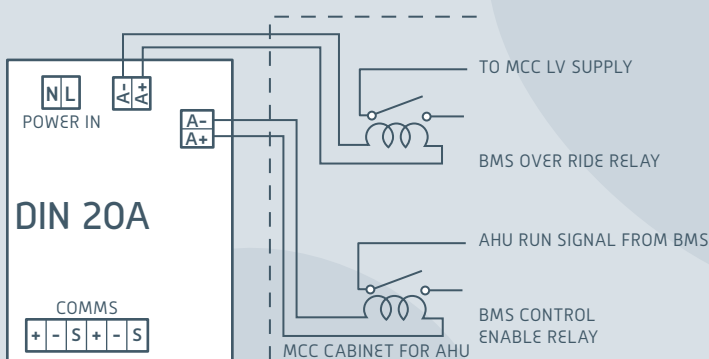
DIN 12

The standard DIN for damper control, the DIN 12, controls the operation of the damper actuator and monitors the limit switches for open/closed status. The DIN 12 periodically reports this status to the network and instantaneously reports any change in status. The DIN 12 monitors incoming messages from other nodes and will energise or de-energise the damper actuator according to the criteria selected during system configuration. The damper reference number within an installation is programmed into the DIN from the Human Interface Panel (HIP). This is performed during commissioning, but may be updated at any time. All the reconfigurable parameters are stored onboard the DIN in 'Flash' memory. Also available is the DIN 02 which is the monitoring only version of the DIN 12.



DIN 20A

The DIN 20A is a dedicated AHU interface. During normal operation it allows the AHU to run under BMS control but during a fire condition BMS control is disabled and the DCS-100 assumes control.



System Specifications

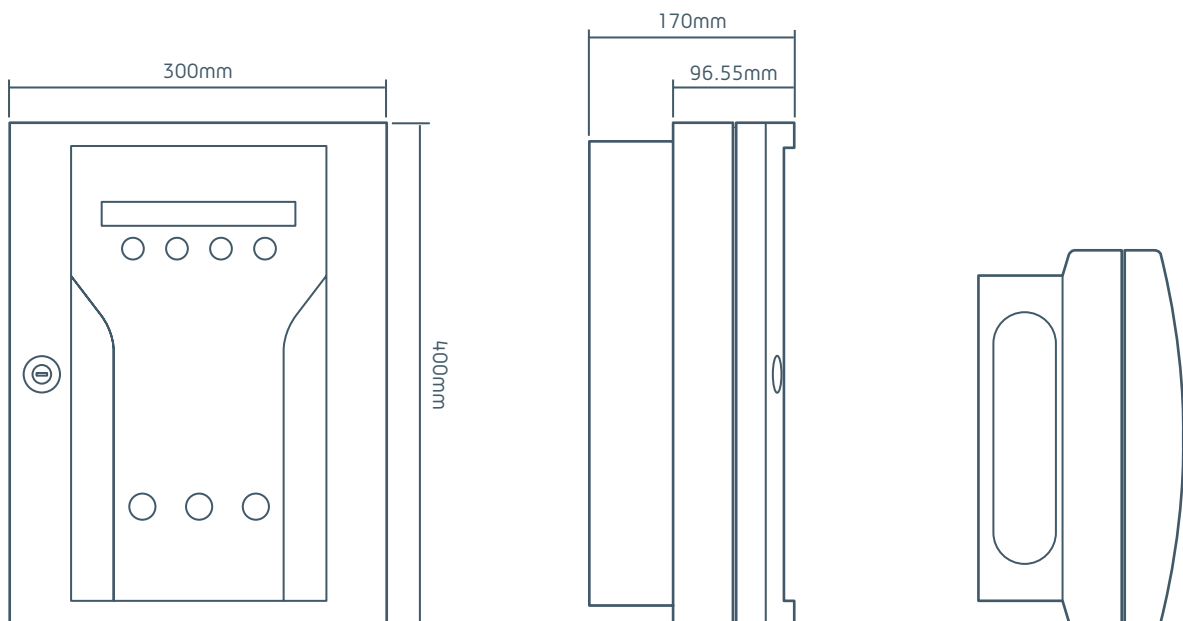
Communications Cable Specification

Maximum cable length:	4Km
Topology:	Loop or radial
Cable type:	Screened twisted pair
Approved cables:	Belden 9841 FireTuf Data 1 pair 910234

Please phone for approval before using other cables.

HIP Specification

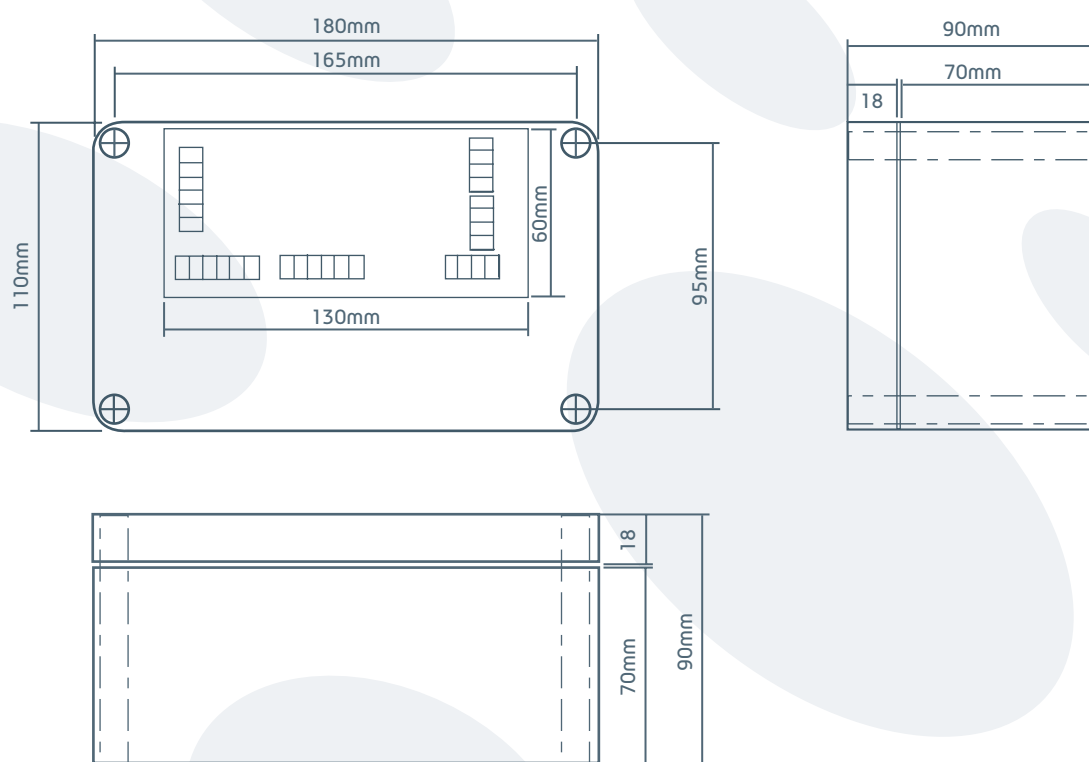
Enclosure size:	300 x 400 x 170mm
Colours:	Black and grey (other colours optional)
Materials:	Powder coated mild steel Polycarbonate control cover
Hinged:	Left or right
Cable entry:	Gland plate top and bottom
Protection:	IP44
Ambient temp range:	0° to 70°C
Power requirement:	220-240V 50Hz Max. 3A Battery backup optional
Damper indication:	100 tricolour LEDs as standard
Digital inputs:	12 as standard (fire alarm contacts, override switches)
Digital outputs:	4 relay outputs 240V 1A rated 8 opto isolated 24V 100mA rated Alarm sounder



DIN Specification

DIN Specification

Enclosure dimensions	180 x 110 x 90mm
Material	Polycarbonate
Colour	Light grey with blue tinted lid
Protection	IP55
Environment	0° – 70°C
Cable entry	Cable glands factory fitted as required
Power requirement	220-240V AC 50Hz 250mA max 24V AC 50Hz 2.5A max 24V DC 2.5A max
Max. power consumption	60W (Inputs and outputs fully loaded)
Fuse	Built in re-settable thermal fuse
Comms protection	3KV ESD protection Thermal shutdown Short circuit proof
Inputs	24V DC 10 mA to volt free contacts
Monitors	Optional thermal fuse monitor
Outputs (240V supply)	240V AC 50Hz 0.1A
(24V AC/DC supply)	24V DC 1A



- Wide choice of cables including low cost twisted pair
- Tri colour LED status indication for each damper
- Cascade panels for infinite systems
- 4km comms cable loop length
- Add/Address nodes from panel
- Mimic any sub-panel on master
- 100 dampers per panel
- Lockable glazed door
- IP44 rated
- BMS link
- Lamp test
- Audible alarm
- Small attractive panels
- Real time status indications
- Instant network wide control
- Remote fireman's over rides
- Surface or semi recessed mounting
- Power fail at damper detect/indication



Agents contact details:

DISYS technologies Ltd
 24-25 Cross Hands Business Centre
 Heol Parc Mawr, Cross Hands
 Llanelli SA14 6RE

T +44 (0)1269 842496
F +44 (0)1269 844708
E sales@disystechnologies.com
W www.disystechnologies.com