

Universal Field Controller to individually control up to 2 motorized fire or smoke extraction dampers. It is the perfect solution for bus (Modbus and BACnet) or conventional integration into a superior system.



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## Technical Data

<b>Electrical Data</b>	Nominal Voltage	24 V AC / DC
	Nominal Voltage Range	-20%... + 20%
	Dimensioning	2 VA + damper actuators (max 24 VA)
	Power Consumption	2 W + damper actuators
	Connections	AMP plug-in connections and quick connections (terminals)

### Communication / Modbus



Protocol	Modbus RTU
Medium	RS-485, not electrically isolated
Transmission Formats	Specified by Modbus RTU Standards
Number of Devices per Line	100 (without repeater)
Baud Rates	9'600, 19'200, 38'400, 76'800 bps
Address	1..127 (1-10 reserved for FSC-M200) (0 reserved for broadcast)
Termination	120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if FSC-UFC24-2 is last Modbus device in line, see electrical installation, page 7
Typical Response Time	<200 ms

## Communication / BACnet



Protocol	BACnet MS/TP
Medium	RS-485, not electrically isolated
Number of Devices per Line	65 (without repeater)
Baud Rates	9'600, 19'200, 38'400, 76'800 (auto detect)
Address	1..127 (1-10 reserved for FSC-M200) (0 reserved for broadcast)
Termination	120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if FSC-UFC24-2 is last BACnet device in line, see electrical installation, page 7
Typical Response Time Device Instant	<100 ms Automatically assigned by physical address, writable

## Safety

Protection Class	III (safety extra low voltage)
Protection Degree	IP42, housing of non-flammable polycarbonate
Electromagnetic Tolerance	CE in accordance with 2004/108/EC
Low Voltage Directive	CE in accordance with 2006/95/EC
Mode of Operation	Type 1 (EN 60730-1)
Rated Impulse Voltage	2.5 kV (EN 60730-1)
Degree of Pollution of Environment	2 (EN 60730-1)
Ambient Temperature	-20 °C to + 50 °C
Storage Temperature	-20 °C to + 80 °C
Humidity Test	95% RH, non-condensing (EN 60730-1)
Maintenance	Maintenance free

## Mechanical Data (Dimensions / Weight)

Width	120 mm
Length	153 mm
Height	57 mm (with bracket)
Weight	ca. 415 g (with bracket)
See drawings page 5.	

**Installation** The FSC-UFC24-2 is directly installed at or close to the fire or smoke extraction damper. The bracket can be pre-installed. The FSC-UFC24-2 can be snapped onto the bracket any time (at the damper manufacturer or at the job site).

**Electrical Installation** See details page 7.

**Safety Notes** The FSC-UFC24-2 is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.  
 The company buying and / or mounting the FSC-UFC24-2 on site bears full responsibility for the proper functioning of the whole system. Only authorized specialists may carry out the installation. All applicable legal or institutional installation regulations must be complied with during installation.  
 The device contains electrical and electronic components and is not allowed to be disposed of as domestic refuse. All locally valid regulations and requirements must be observed.

**Product Features / Application** The FSC-UFC24-2 is used together with one or two fire or smoke extraction damper actuators to individually control and monitor one or two fire or smoke extraction dampers. This Universal Field Controller has one bus address which offers individual control and status messages for each of the two connected actuators. It provides Modbus, BACnet or conventional connection and is normally mounted at or close to the damper.  
 Following control modes can be chosen through dip switch terminal:

- Fire or smoke extraction application
- Bus protocols: Modbus or BACnet

Conventional: Digital input per damper for conventional application.

*This digital input in the FSC-UFC24-2 always overrides the bus commands.*

Universal System Link between one or two fire or smoke extraction dampers and any Modbus or BACnet system or conventional control.

**Power Supply** The FSC-UFC24-2 needs to be powered up with 24 V AC / DC. It provides the power supply to the actuators. For more details see page 8.

**Control** *Conventional*

The FSC-UFC24-2 offers the option to work without bus communication (Modbus / BACnet) and can be controlled in a conventional way. There is one input to open or close the dampers. It is also possible to monitor the damper position conventional through a digital output signal.

**Communication** *Serial Communication – RS-485*

Through Modbus RTU (RS-485) or BACnet MS/TP (RS-485).

**Actuator Connection**

3-pole AMP plug and terminal connections for 2 standard 24 V AC/DC fire or smoke extraction actuators.

6-pole AMP plug and terminal connections for 2 internal actuator end switches. Identification of the end position switches of the actuators.

**Additional Connections**

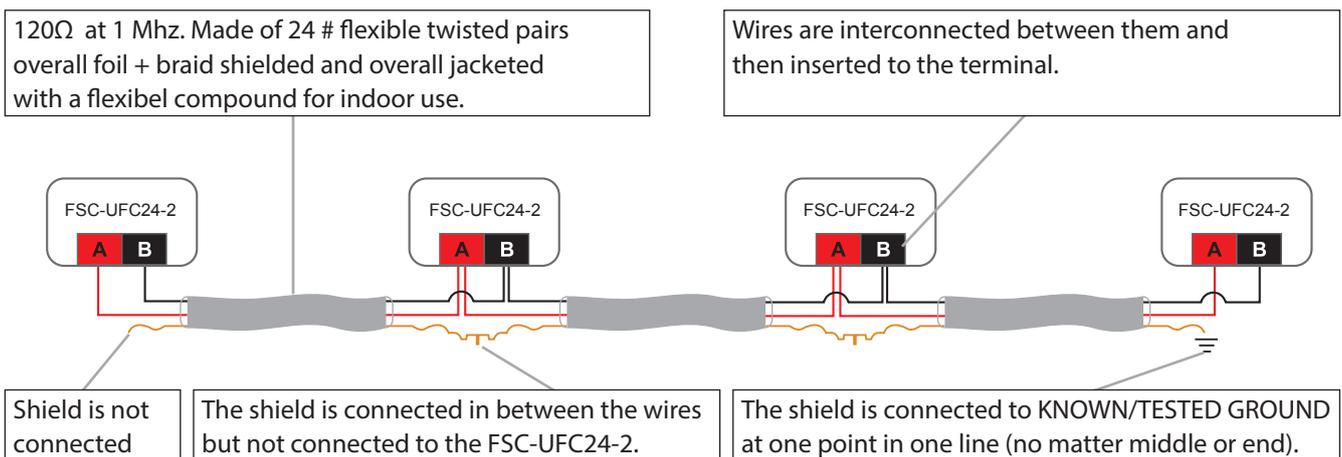
Digital input for conventional application.



**Cable Specification**

120 Ω with 1 Mhz. Made of 24# flexible twisted pairs overall foil + braid shielded and overall jacketed with a flexible compound for indoor use, or similar. Cable type: Belden 3105a or equivalent.

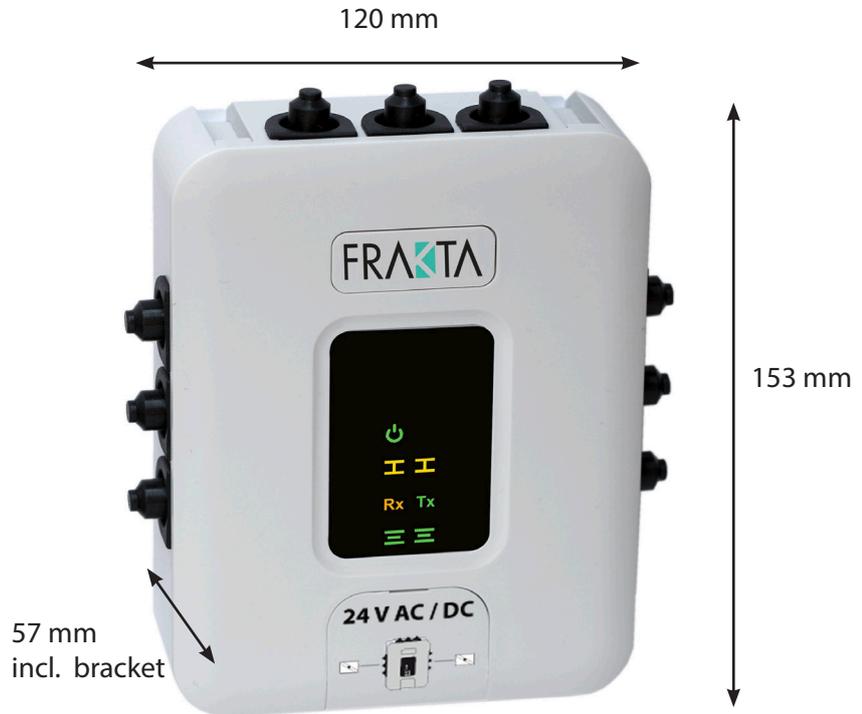
**IMPORTANT:** SMT takes no responsibility of the functionality of the units/ network if a different cable is used to the one specified here.



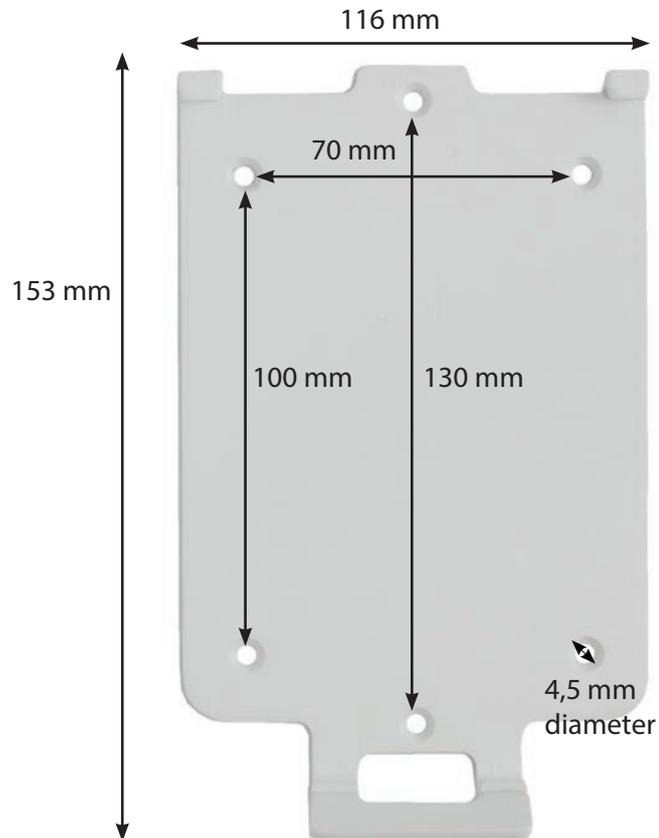
← Up to 1'200 meters and max. 100 FSC-UFC24-2 with Modbus RTU and 65 FSC-UFC24-2 with BACnet MS/TP →

**Dimensions**

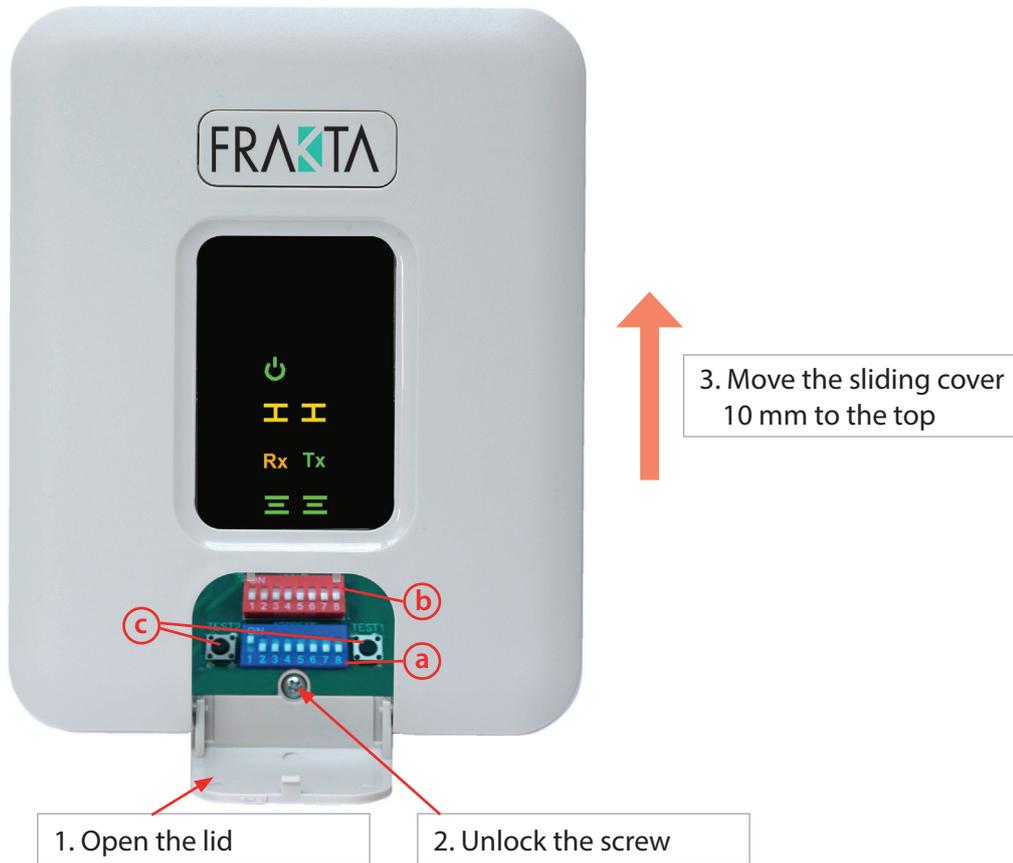
**FSC-UFC24-2**



**Mounting Bracket**



**Removing the Cover of the Housing**



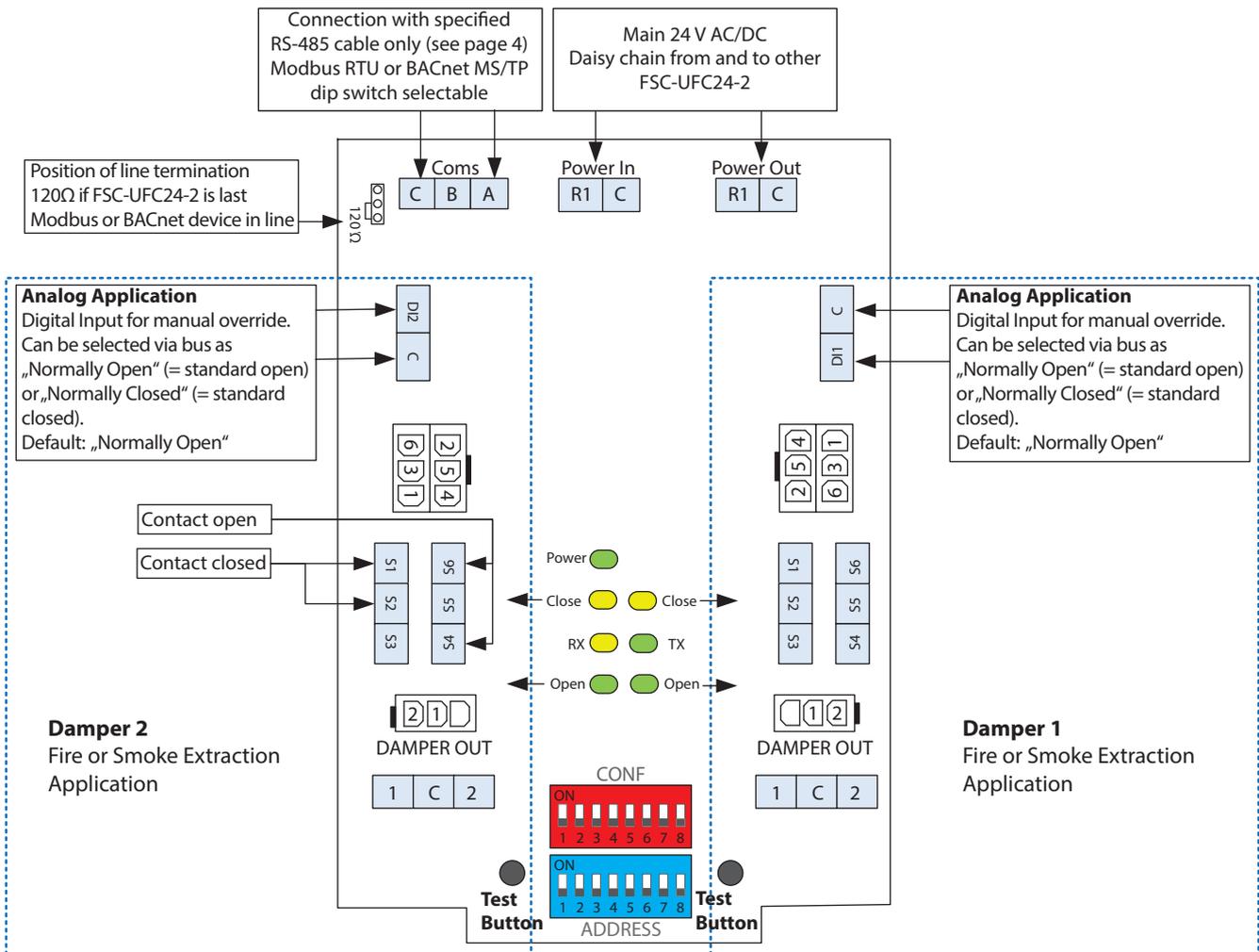
1. Open the small lid on the lower end of the housing by flapping up the cover
2. Unlock the screw which is placed on the lower end in the middle
3. Move the sliding cover 10 mm to the top
4. Remove the cover

**Lid for Easy Access to Dip Switch Terminals (Configuration / Addressing) and Test Button**

- (a) The blue coloured dip switch terminal is for the Modbus or BACnet addressing.
- (b) The red one for the configuration.
- (c) **Test buttons: For detailed explanation of the function of the test button see page 14.**

## Electrical Installation

### General Information



Hybrid forms (fire and smoke extraction actuator) are possible.

#### IMPORTANT:

If only one actuator is connected to the FSC-UFC24-2 the LEDs of the side where no actuator is connected indicate an alarm. A jumper has to be installed between S4 and S6 in the terminal where there is no actuator connected, to indicate an "opened" position in the LED. If the second connection is not activated via bus, there will be no alarm signal on the bus system.

## Power Supply

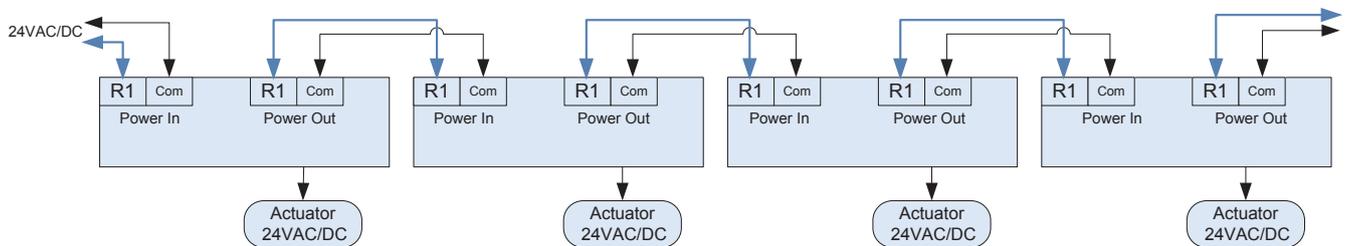
### Main Power – FSC-UFC24-2

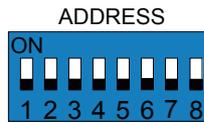
The FSC-UFC24-2 is dual power 24V AC/DC.

The actuator has to be 24V AC and/or DC. Meaning it has to operate with the same voltage (AC or DC) as the FSC-UFC24-2. There are 2 terminals for the power, in order to make the daisy chain connection for the installer easier.



**The polarity must be respected when connecting multiple FSC-UFC24-2 to one power source (phase to phase, com to com)!**





## Modbus and BACnet Addressing

\*Attention: If the FSC-UFC24-2 is used in combination with the FSC-M200 controller\*\*, Modbus addresses 1 - 10 are reserved for the FSC-M200. That means that the Modbus addressing of the FSC-UFC24-2 starts with Modbus address 11. Furthermore, the Baud Rate needs to be changed to 38'400 (PIN 5 to ON).

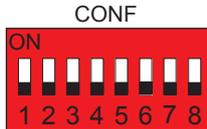
If the FSC-UFC24-2 is used in combination with the FSC-M60, the addressing needs to be done in consecutive order. \*\*Integration planned, not yet available

Address	Switches On	Address	Switches On	Address	Switches On	Address	Switches On
0*	Broadcast-not in use	33	1+6	66	2+7	99	1+2+6+7
1*	1	34	2+6	67	1+2+7	100	3+6+7
2*	2	35	1+2+6	68	3+7	101	1+3+6+7
3*	1+2	36	3+6	69	1+3+7	102	2+3+6+7
4*	3	37	1+3+6	70	2+3+7	103	1+2+3+6+7
5*	1+3	38	2+3+6	71	1+2+3+7	104	4+6+7
6*	2+3	39	1+2+3+6	72	4+7	105	1+4+6+7
7*	1+2+3	40	4+6	73	1+4+7	106	2+4+6+7
8*	4	41	1+4+6	74	2+4+7	107	1+2+4+6+7
9*	1+4	42	2+4+6	75	1+2+4+7	108	3+4+6+7
10*	2+4	43	1+2+4+6	76	3+4+7	109	1+3+4+6+7
11	1+2+4	44	3+4+6	77	1+3+4+7	110	2+3+4+6+7
12	3+4	45	1+3+4+6	78	2+3+4+7	111	1+2+3+4+6+7
13	1+3+4	46	2+3+4+6	79	1+2+3+4+7	112	5+6+7
14	2+3+4	47	1+2+3+4+6	80	5+7	113	1+5+6+7
15	1+2+3+4	48	5+6	81	1+5+7	114	2+5+6+7
16	5	49	1+5+6	82	2+5+7	115	1+2+5+6+7
17	1+5	50	2+5+6	83	1+2+5+7	116	3+5+6+7
18	2+5	51	1+2+5+6	84	3+5+7	117	1+3+5+6+7
19	1+2+5	52	3+5+6	85	1+3+5+7	118	2+3+5+6+7
20	3+5	53	1+3+5+6	86	2+3+5+7	119	1+2+3+5+6+7
21	1+3+5	54	2+3+5+6	87	1+2+3+5+7	120	4+5+6+7
22	2+3+5	55	1+2+3+5+6	88	4+5+7	121	1+4+5+6+7
23	1+2+3+5	56	4+5+6	89	1+4+5+7	122	2+4+5+6+7
24	4+5	57	1+4+5+6	90	2+4+5+7	123	1+2+4+5+6+7
25	1+4+5	58	2+4+5+6	91	1+2+4+5+7	124	3+4+5+6+7
26	2+4+5	59	1+2+4+5+6	92	3+4+5+7	125	1+3+4+5+6+7
27	1+2+4+5	60	3+4+5+6	93	1+3+4+5+7	126	2+3+4+5+6+7
28	3+4+5	61	1+3+4+5+6	94	2+3+4+5+7	127	Reserved factory defaults
29	1+3+4+5	62	2+3+4+5+6	95	1+2+3+4+5+7		
30	2+3+4+5	63	1+2+3+4+5+6	96	6+7		
31	1+2+3+4+5	64	7	97	1+6+7		
32	6	65	1+7	98	2+6+7		

**Via each, per dip switch allocated Modbus or BACnet address, the second actuator can be individually controlled through the software (see Modbus Register or BACnet Object List).**

## Configuration through Dip Switch

### Default Dip Switch Position



### Configuration Possibilities

Pin	Off (Default)	On
1	Fire Damper 1	Smoke Extraction Damper 1
2	Fire Damper 2	Smoke Extraction Damper 2
3	Modbus RTU	BACnet MS/TP
4	Baud Rate (Off-Default)	
5	Baud Rate (Off-Default)	
6	Not In Use=Off	
7	Not In Use=Off	
8	Not In Use=Off	

#### Information Pin 3:

If the FSC-UFC24-2 is used in connection with the FSC-M60, Pin 3 has to be on ON (BACnet).

#### Information Pin 5:

If the FSC-UFC24-2 is used in connection with the FSC-M200\*, Pin 5 has to be on ON (Baud Rate 38400).

\*Integration planned.

#### Baud Rate Selection Modbus

This has to be done when choosing Modbus only.

	9 600 (Default)	19 200	38 400	76 800
4	Off	On	Off	On
5	Off	Off	On	On

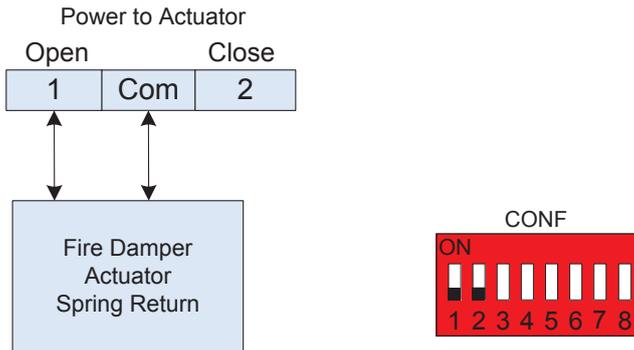
#### Baud Rate Selection BACnet

Baud rate in BACnet is automatically detected.

## Connection Details

### Fire Damper Actuator – Connections

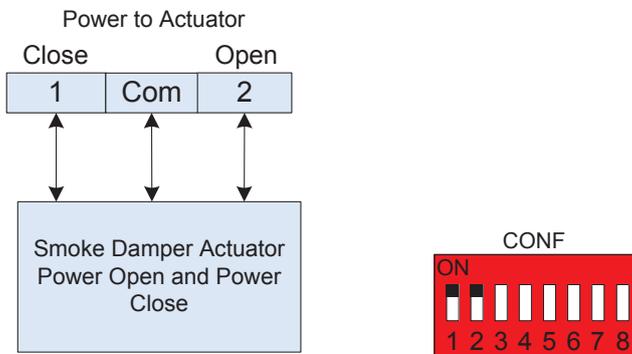
Fire damper actuator (spring return). When the actuator has power it is open, when there is no power the actuator is closed with the spring.



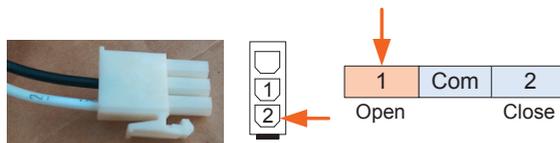
### Smoke Extraction Damper Actuator – Connection

If the actuator is powered up the smoke extraction damper is either open or closed.

If the FSC-UFC24-2 sends the smoke extraction damper actuator the open signal, pin OPEN is powered. If the FSC-UFC24-2 sends the smoke extraction damper actuator the close signal, pin CLOSE is powered.

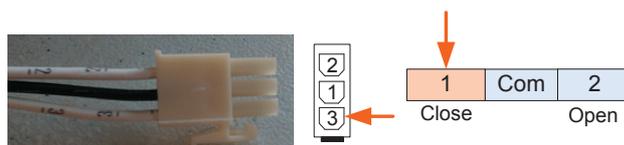


### Fire Damper



When the FSC-UFC24-2 is powered up, the power to the actuator is on output 'open' (pin nr 1).

### Smoke Extraction Damper



On power up the CLOSE output will be ON. During normal operation the FSC-UFC24-2 in this application ONLY, will hold the last command on memory.

### After Connection - Power Reset:

- **Fire Damper Application** will always go to OPEN.
- **Smoke Extraction Damper Application** will hold last command on memory.

## Conventional Application

Conventional connection is the application when the FSC-UFC24-2 is not connected to a bus network. No configuration settings are required. One digital input for conventional application is available for each of the two dampers. This is to open and close the damper. Digital output signals indicating the damper positions are available .

Digital Input: volt free, normally open as default (can be changed on bus).  
The digital input allows to control the damper position through an external contact/device.

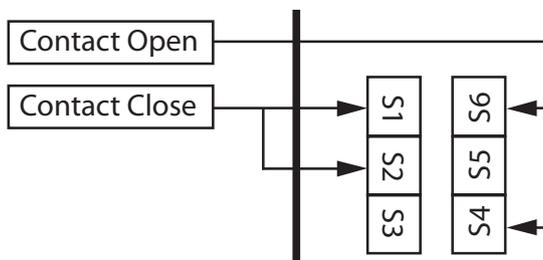
***This digital input in the FSC-UFC24-2 always overrides the bus commands.***

Digital Output: the feedback signals (on/off) of the actuator can be forwarded via the connections S1 and S2 (actuator/damper closed) and / or S4 and S6 (actuator/damper open) to any control or monitoring device.

These outputs can be connected in parallel between the different FSC-UFC24-2 to monitor their status.

Current output max is 5mA.

## Electrical Installation for Conventional Application

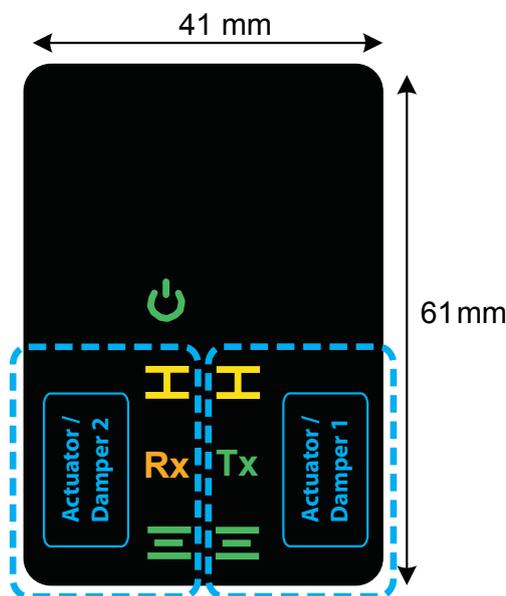


## Explanation of LEDs

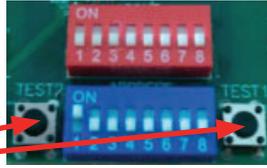
The LEDs are only visible if they are active. If not active the symbols will not appear.

### IMPORTANT:

If only one actuator is connected to the FSC-UFC24-2 the LEDs of the side where no actuator is connected indicate an alarm. A jumper has to be installed between S4 and S6 in the terminal where there is no actuator connected, to indicate an "opened" position in the LED. If the second connection is not activated via bus, there will be no alarm signal on the bus system.



Led	Color	Action	Description
Power	Green	On	Power is connected
Alarm	Yellow or green per actuator / Dampers blinking alternately	Flash Interval 1 sec	Actuator did not reach end switch position within set time
Alarm	Both LED green (damper open) blinking alternately. Yellow (damper closed) = static	Flash Interval 3 sec	Alarm on 1 or more devices active (minimum 1 actuator in closed position). Bus-Command = open; Alarm = close all actuators
Rx	Yellow	Flash	Receive data
Tx	Green	Flash	Transmit data
Close	Yellow	On	Damper close
Open	Green	On	Damper open
Close + open	Yellow / Green	Flashing in parallel	Damper is moving



## Functionality of Test Buttons

Two test buttons are available in the FSC-UFC24-2 (damper 1 and damper 2). Depending on the application (fire or smoke extraction) the test buttons create different test scenarios.

### **Fire Application:**

- Power on the FSC-UFC24-2: actuator (damper) opening until end position is reached
- Pushing test button will interrupt the power supply to the actuator. Spring is closing the actuator
- As soon as the test button is released the power comes back to the actuator and the damper will open again

### **Smoke Extraction Application:**

- Power on: actuator makes self-test and remains in position defined by controls
- Pushing test button changes command of the actuator – actuator (damper) runs into opposite direction
- Release test button: actuator (damper) runs back into last defined position

## **Run Time Monitoring of Actuator**

The FSC-UFC24-2 is equipped with an actuator run time monitoring function for both actuators independently. This function monitors the time required by the actuator from leaving of the one and reaching of the other end switch. If the actuator does not reach the other end switch in the specified time an error message is sent.

The default value for the actuator run time is 90 seconds. This can be adapted via Modbus or BACnet from 0...360 seconds.

## **Full Auto Test**

The FSC-UFC24-2 offers a 'Full Auto Test' function. This can be controlled through the Modbus or BACnet controller.

### ***Function***

Base for this function is the run time monitoring of the actuator.

### ***Fire Damper***

To start the full auto test functionality, the corresponding bus-register has to be activated via bus. By starting the full auto test, the timer of the run time monitoring starts to count the time and the fire damper actuator is closing (spring) and remains in the closed position until the timer of the set running time has reached the set time. Then the actuator will open again automatically until the end switch has been reached. The timer of the run time monitoring starts to count again as soon as the command 'open' has been sent. Once the timer of the set running time has reached the set time, the FSC-UFC24-2 will go back into normal operation mode and a feedback "full auto test ok" is activated. If one of the end switches is not reached within the defined running time, an error message is activated.

### ***Smoke Extraction Damper***

To start the full auto test functionality, the corresponding bus-register has to be activated via bus. By starting the full auto test, the timer of the run time monitoring starts to count the time and the smoke extraction damper actuator is moving to the opposite direction and remains in that position until the timer of the set running time has reached the set time. Then the actuator will automatically move back to the original position until the end switch has been reached. The timer of the run time monitoring starts to count again as soon as the command 'opposite direction' has been sent. Once the timer of the set running time has reached the set time, the FSC-UFC24-2 will go back into normal operation mode and a feedback "full auto test ok" is activated. If one of the end switches is not reached within the defined running time, an error message is activated.

## Bus Monitoring Application

The FSC-UFC24-2 is equipped with a Bus Monitoring Function. If the bus signal to the unit is interrupted the dampers will move to the safety position after the defined period of time and remain there until the bus functionality is back to normal operation.

### Objects

There are 2 objects which can be activated by Modbus or BACnet:

- Logic Alarm Communication
- Delay Alarm Communication

### Default settings:

Logic Alarm Communication not active

### Activation (via Bus):

- Logic Alarm Communication 1 (on)
- Delay Alarm Communication is activated, default delay time is 120 sec. Option to set the delay time via bus between 0...360 sec

## Functionality

### Fire Damper

After the defined period of time the fire damper will move to the closed position and remains closed until the bus functionality is back to normal operation.

### Smoke Extraction Damper

If damper is closed:

After the defined period of time the fire damper will move to the open position and remains open until the bus functionality is back to normal operation.

If damper is open:

Damper remains in open position



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