

# Technical Data Sheet QSLAVE® SMART-UFC24-2

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)
<b>Communication / Modbus</b>	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 M200*) (0 reserved for broadcast)
	Termination	120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if UFC24-2 is last Modbus device in line, see electrical installation, page 7
	Typical Response Time	<200 ms

\*Integration planned

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**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 bps (auto detect)  
 Address 1..127 (0 reserved for broadcast)  
 Termination 120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if -UFC24-2 is last BACnet device in line, see electrical installation, page 7  
 Typical Response Time <100 ms  
 Device Instant 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 UFC24-2 is directly installed at or close to the fire or smoke extraction damper. The bracket can be pre-installed. The 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 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 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 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.

*These digital inputs in the UFC24-2 always override 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 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 UFC24-2 offers the option to work without bus communication (Modbus / BACnet) and can be controlled in a conventional way. There is one input for each damper to open or close the dampers. The home position is depending on the fire or smoke extraction application. 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 each. Identification of the end position switches of the actuators.

**Additional Connections**

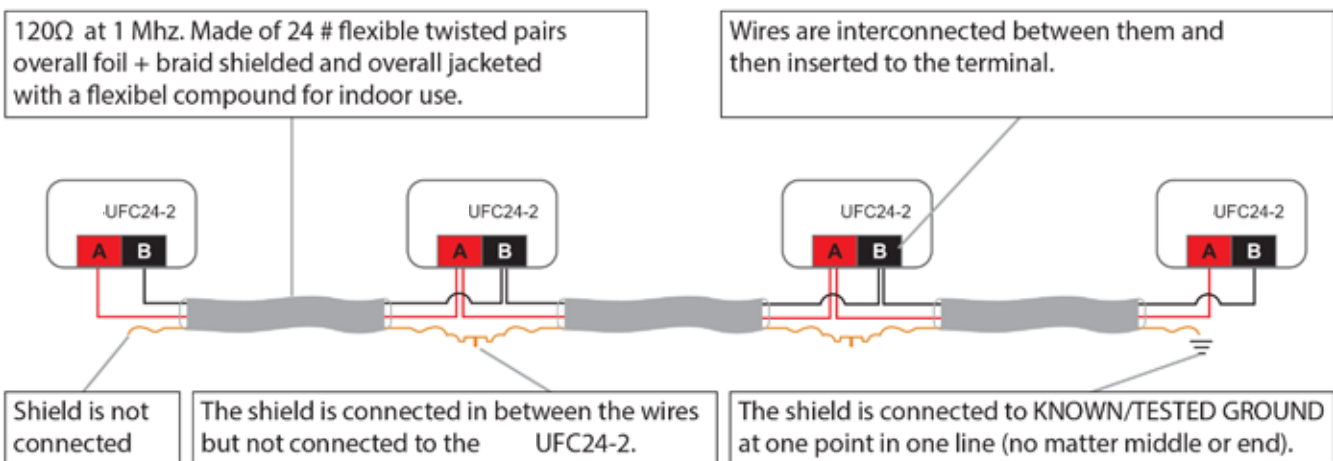
Digital input for conventional application.

## 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:** ESSECI has no responsibility of the functionality of the units / network if a different cable is used to the one specified here.



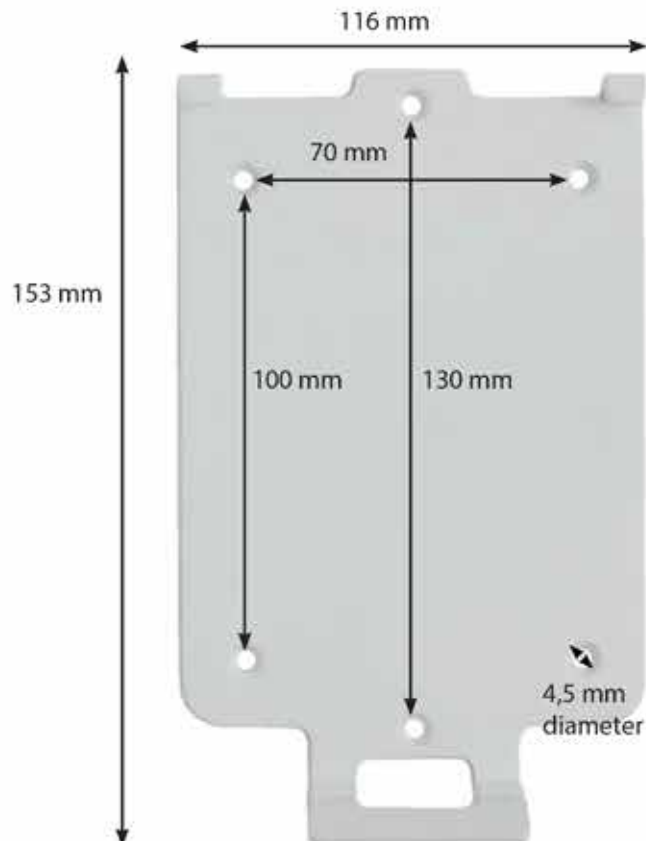
← Up to 1'200 meters and max. 100 UFC24-2 with Modbus RTU and 65 UFC24-2 with BACnet MS/TP →

Dimensions

UFC24-2



Mounting Bracket



Removing the Cover of the Housing



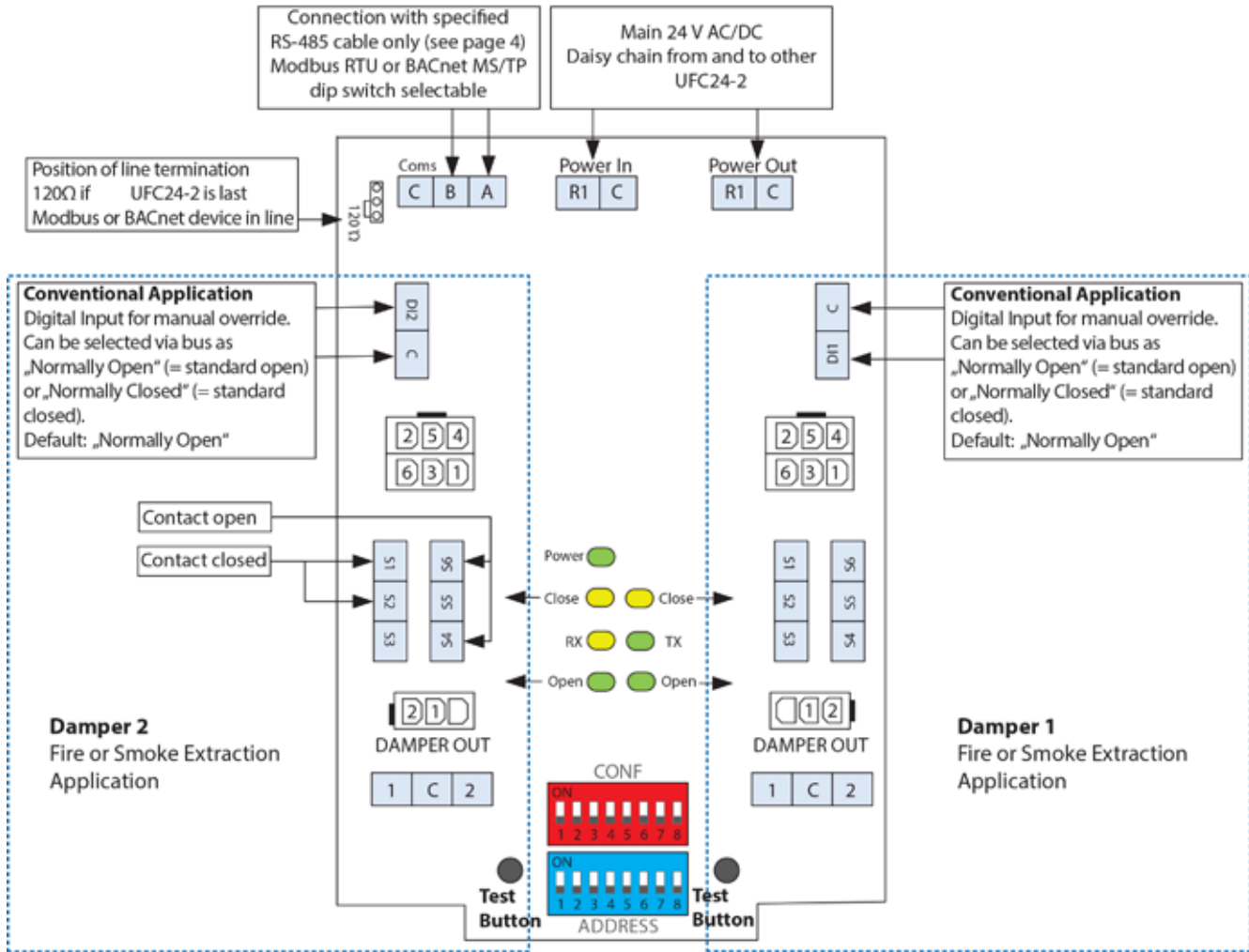
1. Open the small lid on the lower end of the housing by flapping up the cover
2. Unlock the screw which is placed on the lower end in the middle
3. Move the sliding cover 10 mm to the top
4. Remove the cover

**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 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

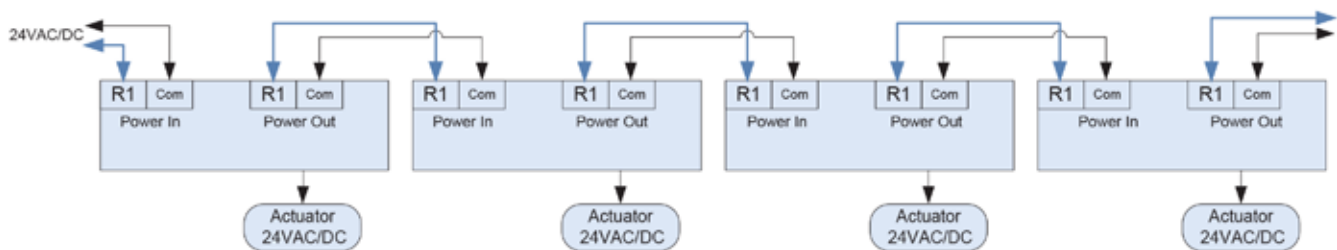
### Main Power – UFC24-2

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

The fire damper or smoke extraction actuator has to be 24V AC and/or DC. Meaning it has to operate with the same voltage (AC or DC) as the 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 UFC24-2 to one power source (phase to phase, com to com)!**

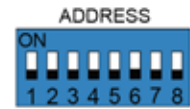




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## Modbus and BACnet Addressing

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



If the UFC24-2 is used in combination with the 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 1 and 2:

If Pin 1 or 2 are changed from fire to smoke extraction application or from smoke extraction to fire application, the UFC24-2 needs to be taken off the power supply and put back again to activate the new mode.

#### Information Pin 3:

When a UFC24-2 has been connected and operated in one bus protocol first (Modbus or BACnet) and then will be operated by the other (BACnet or Modbus) the factory reset functionality in the UFC24-2 MUST be activated by bus communication as soon as it is connected to the other protocol (Modbus register 27, BACnet Object List BV 18). **If the UFC24-2 is used in connection with the M60, Pin 3 has to be on ON (BACnet).**

#### Information Pin 5:

If the UFC24-2 is used in connection with the 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.

	9600 (Default)	19200	38400	76800
4	Off	On	Off	On
5	Off	Off	On	On

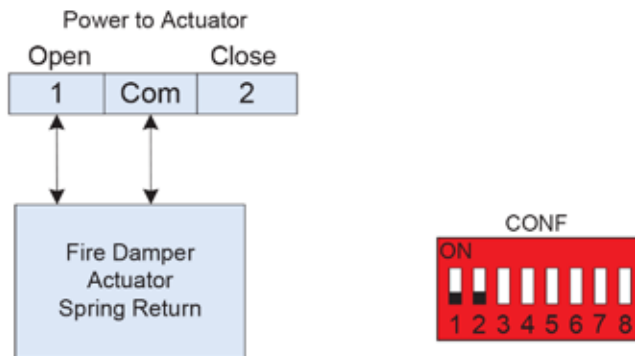
#### Baud Rate Selection BACnet

Baud rate in BACnet is automatically detected.

## Connection Details

### Fire Damper Actuator – Connections

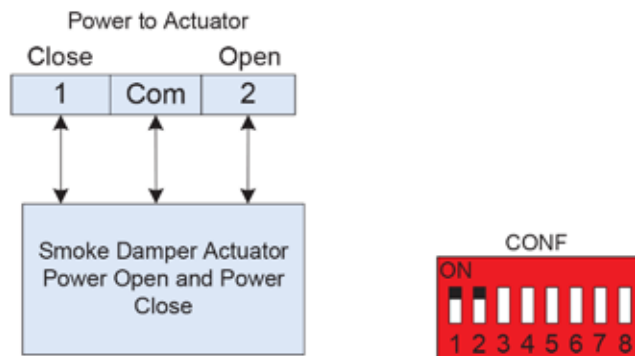
Fire damper actuator (spring return). When the actuator has power it is open, when there is no power the actuator is closed with the spring.



### Smoke Extraction Damper Actuator – Connection

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

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

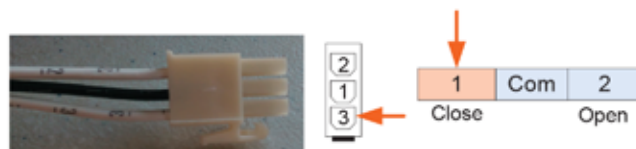


### Fire Damper



When the 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 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 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.

***These digital inputs in the UFC24-2 always override the bus commands.***

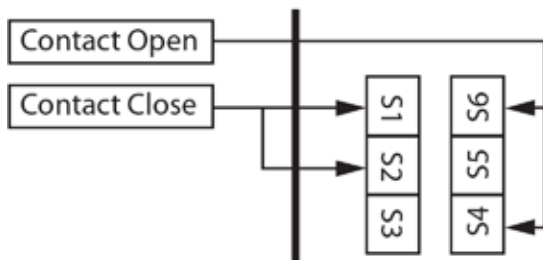
Digital Output: the feedback signals (on/off) of the actuator can be forwarded via the connections S1 and S2 (actuator/damper closed) and / or S4 and S6 (actuator/damper open) to any control or monitoring device.

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

Current output max is 5mA.

## Electrical Installation for Conventional Application

Feedback signals from the UFC24-2:

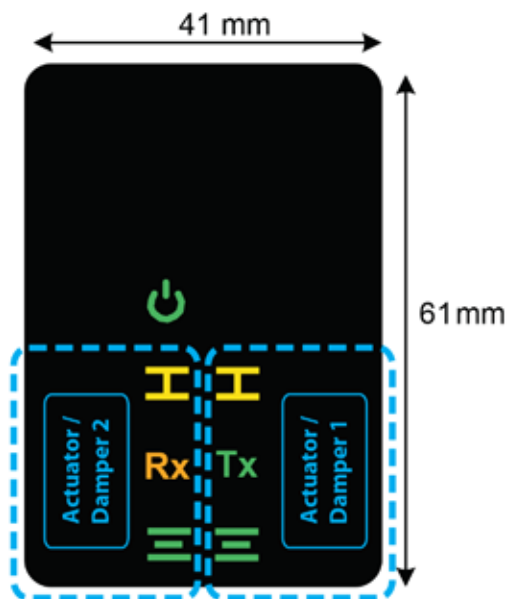


## Explanation of LEDs

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 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 and green per actuator / dampers blinking alternately	Flash Interval 0.5 sec	Actuator did not reach end switch position within set time
Alarm	Yellow and green per actuator / dampers blinking alternately	Flash Interval 3 sec	Alarm active at damper(s); bus command = actuator open, actuator = in closed position
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 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 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 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 UFC24-2 offers a 'Full Auto Test' function. This can be controlled through the Modbus or BACnet controller.

#### **Basis of the Functionality**

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 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 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 UFC24-2 is equipped with a Bus Monitoring Function. If the bus signal to the UFC24-2 is interrupted the dampers will move to the safety position after the defined delay 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 / Bus Monitoring Function
- Logic Alarm Delay / Set Delay (time in sec)

#### *Default settings:*

Logic Alarm / Bus Monitoring Function not active

#### *Activation (via Bus):*

- Logic Alarm / Bus Monitoring Function 1 (on)
- Logic Alarm Delay is activated, default delay time is 120 sec. Option to set the delay time via bus between 30...360 sec

## Functionality

### **Fire Damper**

After the defined delay 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 the smoke extraction damper is closed:

After the defined delay the smoke extraction damper will move to the open position and remains open until the bus functionality is back to normal operation.

If the smoke extraction damper is open:

The smoke extraction damper remains in the open position even if the bus signal is interrupted.