

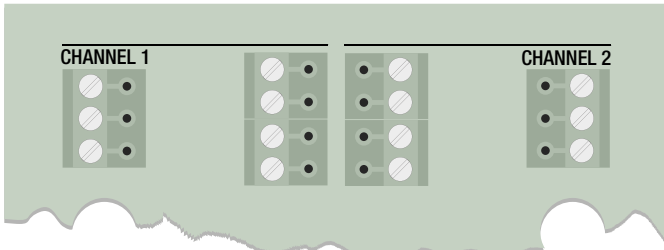
SX:UNO / DUO

PRODUCT SHEET FOR OPTION 004



INTRODUCTION

The SX:UNO/DUO is our standard module for fire damper control and is available in two versions. The SX:UNO provides channel 1 for connecting one damper, whereas the SX:DUO allows you to connect two dampers in separate channels.



FUNCTIONS

- Handles one (UNO) or two (DUO) fire/smoke dampers
- Smoke detector input
- Temperature sensor input (10 kohm NTC)
- Able to control regulating fire/smoke dampers

The module is connected to a bus system that is controlled and supervised by a central unit (SX:ACCESS) or another system such as PLC via a gateway (SX:NETLINK). The SX:ACCESS central unit is able to receive other fire alarms and to switch the module to fire alarm mode.

DFF FORM

Open the DFF form for a comprehensive overview of the status, settings and configuration of the local module. Use our SIOX Smoke Manager software for PC. Press the CONNECT option to connect to the SIOX bus. Then press the SEARCH AND MANAGE option to search. Double-click on the module when you can see it in the list.



FUNCTION TESTING

There are several ways to start a function test:

- Via the central unit (SX:ACCESS)
- Via Modbus
- By pressing the button on the module
- Via a local schedule defined in the module (default 48h)

NOTE

The module has a local timer for the function test, and it is set to 48 hours on delivery. Note that it is reset if there is a power failure. In a system with an SX:ACCESS central unit, the timer is deactivated automatically as this function is handled by the central unit instead.

P marked dampers must be function tested every 48 hours. The function test verifies that the damper closes and opens within a defined time. Otherwise a damper error is indicated and the module attempts to open the damper. The defined time is 40 seconds to close and 180 seconds to open.

A damper error is reset after a successful function test cycle. The module normally starts with a function test when power is applied (may be changed via the DFF form).

ALARMS

If there is an alarm, the power to the actuator is cut. The alarm relay switches from closed to open.

The module switches to fire alarm mode when one of the following happens:

- The central unit reports a fire
- The higher-level system reports a fire (via Modbus)
- A connected smoke detector is triggered
- A connected temperature sensor exceeds the set limit
- The watchdog triggers on lost communication

A module can be included in multiple fire cells so it can be affected by different smoke detectors. The module always switches to fire alarm mode locally if a connected smoke detector or temperature sensor is triggered.

When the module returns from fire alarm mode to normal mode, a function test is carried out. In alarm mode, function testing is blocked.

If the module does not exercise, has no fire alarm and Force Open is not active, then the module is in standby mode.

ALARM RELAY

The potential free alarm relay is closed unless the module is in fire alarm mode. For fan control, the function can be changed so that when the module is in standby mode the relay is only closed when the dampers are indicated as open. Use the DFF form to change the function. Note that Force Open prevents standby mode and hence the relay will open. The alarm relay is specified for maximum 1 A 30 V AC/DC resistive load.

SMOKE DETECTOR

The smoke detector is connected between terminals 4 (+) and 5 (-). The module identifies levels for service alarm, fire alarm and interrupted smoke detector loop. If a fire alarm is detected or the smoke detector loop is interrupted, the module enters fire mode and closes the connected dampers. Smoke detectors designed for a 24 V DC power supply and a 2.2 k Ω termination resistor usually work with predefined alarm levels. The smoke detector alarm levels can be changed from the DFF form. The smoke detector is reset with the button on the module or central unit, or via the communication system. When the product is delivered, the termination resistor is installed between terminals 4 and 5 and must be moved if a detector is installed.

TEMPERATURE SENSOR

An NTC temperature sensor (10 k Ω) is connected between terminals 6 and 7. The value can be obtained from the DFF form or via Modbus. If a temperature alarm level is set to a value other than 0 °C, a local fire alarm is indicated when the temperature is high or when the sensor is interrupted or short-circuited.

REGULATING DAMPERS

The module can control regulating dampers with spring return with the 0-10 V output at terminal 13 (and/or 23 for SX:DUO). If there is no need for the regulating function, this terminal is always at 10 V (fully open). The function is controlled by writing to parameter 6 (and/or 7 for SX:DUO). Values of 0-4096 set the damper outputs to 0-10V (2-10V may be selected via the DFF form).

DAMPER ERROR/DAMPER IN WRONG POSITION

A damper error is indicated after a failed function test or if a 2-position damper in the normal position drops its open indication. If a regulating damper is being used, the position indications are only monitored during the function test. A reset is only possible with a successful function test.

FORCE OPEN

Forced opening is a function that enables the dampers to open even if the module is in fire mode. In a fire scenario, it can be used to open specific dampers for selective smoke extraction. The function is activated from the command register. See the flag for "Forced damper open" on the last page. Predefined scenarios are normally developed, indicating which dampers can be opened. Firefighters are then able to activate openings by activating the corresponding switch. It is extremely important to reset them when the firefighting operation ends.

ADDRESSING

Each of the modules on the bus must have a unique address. The default address of the module on delivery is 00:62. Addressing takes place using SIOX Smoke Manager or SX:ACCESS menu options. During the addressing process, you press the physical button on the module. You normally only press once, but if you hold down the button for slightly longer before releasing it (more than 2 seconds), the module also starts a function test after it receives its address.

Once they have been addressed, you will be able to identify the modules by sending an identification flash by using the SIOX Smoke Manager.

All the PC software you need can be downloaded from siox.se. [Click here to go to our download package.](#)

WATCHDOG

The watchdog is an important function. It activates fire mode and closes the dampers in the event that communication with the module is interrupted. Use SIOX Smoke Manager to activate the function and set the time. Double-click on the module after a search, or configure all units at the same time with the "Set watchdogs" command at the top of the search window.

NOTE

When the product is delivered, the watchdog is deactivated (0 seconds) to prevent the dampers closing during the installation phase. In a working system, the watchdog must be activated at all times. The Swedish Fire Protection Association (SBF) recommends a maximum setting of 40 seconds.

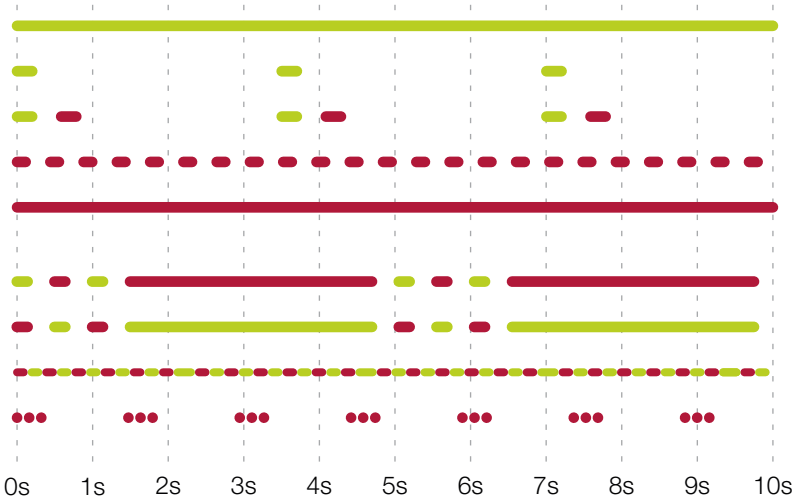
UNUSED DAMPER OUTPUT

If only one of the damper outputs is used, you can jumper the unused channel to prevent damper error alarms. I.e. if terminals 24-27 and 21-23 are unused, 24-25 and 26-27 should be jumpered. You can also permanently disable the fire damper function in the DFF form.



OPERATING MODE INDICATOR

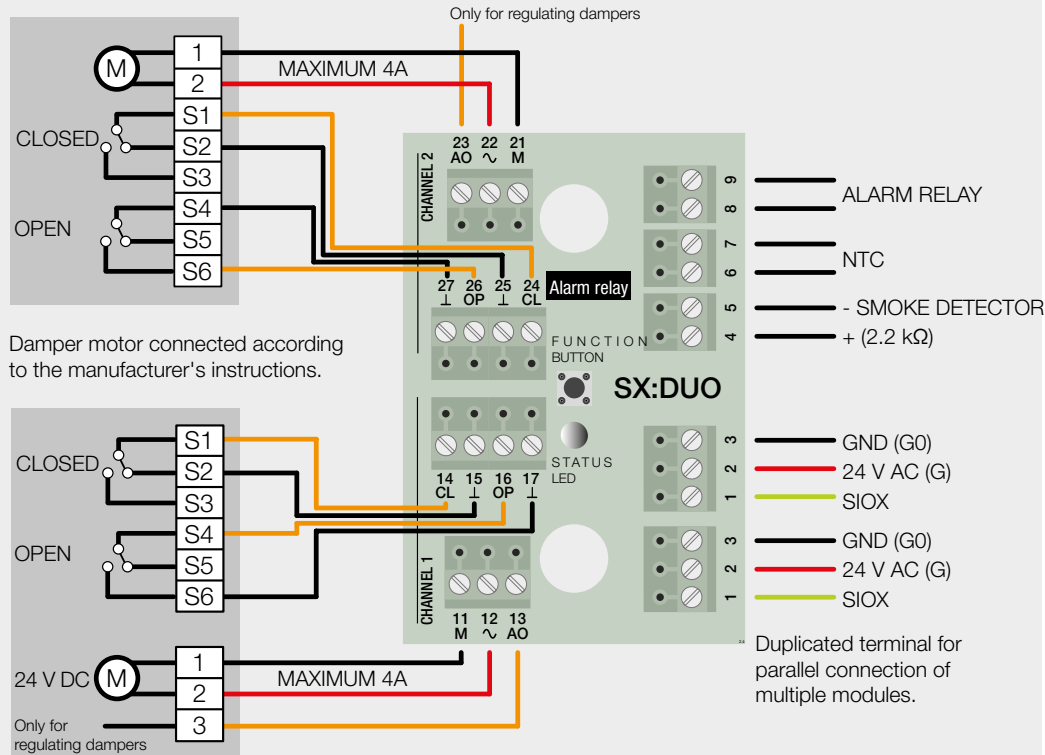
A bicolour LED (red/green) indicates the operating mode of the damper module.



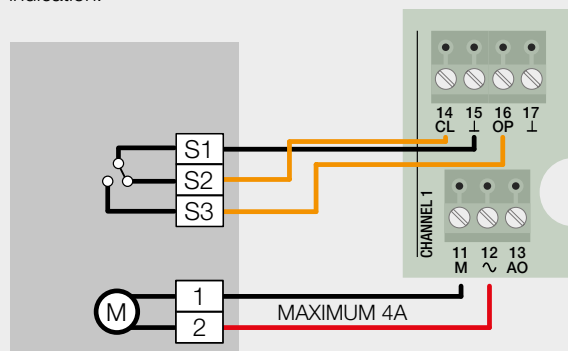
- Standby
- Standby with communication
- Standby with communication, watchdog not set
- Fire
- Damper fault / Motor short circuit / Service alarm in smoke detector / Button pressed
- Function test - Damper opening
- Function test - Damper closing
- Flashing for identification
- Sequential addressing taking place

CONNECTIONS

Connection of damper motors with S1-S6 as position indication.



Connection of 2-position damper motor with S1-S3 as position indication.



The connections above are only examples.
Variations may occur.

LIST OF PARAMETERS FOR SMOKE CONTROL OPTIONS

Each damper module has a 16-bit status register and a 16-bit command register (and some other registers which do not normally need to be changed). Each register can be read/written with a message according to the SIOX protocol. Settings can also be changed more permanently in EEPROM using similar protocol messages. If an SX:ACCESS or SX:NETLINK module is used, settings can also be changed via Modbus TCP. See also siox.se/modbus

The prefix "\$" denotes a hexadecimal number.

STATUS FLAGS	SIOX		MODBUS			
	Param.	Bit	Obase	1base	Bit	
Standby mode	\$20	\$0001	32.0	33.1	513	
Fire alarm mode	\$20	\$0002	32.1	33.2	514	Damper closed due to external/internal alarm
Smoke detector loop error	\$20	\$0004	32.2	33.3	515	Loop/temperature error
Error, damper 1	\$20	\$0008	32.3	33.4	516	
Function test mode	\$20	\$0010	32.4	33.5	517	
Error, damper 2	\$20	\$0020	32.5	33.6	518	For SX:DUO only
Sum error, damper 1 or 2	\$20	\$0040	32.6	33.7	519	
High temperature (NTC)	\$20	\$0080	32.7	33.8	520	Local alarm due to high temperature
Damper 1 closed	\$20	\$0100	32.8	33.9	521	
Damper 1 open	\$20	\$0200	32.9	33.10	522	
Damper 2 closed	\$20	\$0400	32.10	33.11	523	For SX:DUO only
Damper 2 open	\$20	\$0800	32.11	33.12	524	For SX:DUO only
Smoke detector normal mode	\$20	\$1000	32.12	33.13	525	
Fire, alarm point	\$20	\$2000	32.13	33.14	526	Local fire/temperature alarm
Smoke detector, service required	\$20	\$4000	32.14	33.15	527	
Smoke detector loop interrupted	\$20	\$8000	32.15	33.16	528	A broken loop will also set local fire

The status flags are read as individual bits via Modbus function code 1 or 2. The status flags can also be read as register 32/33 via function code 3 or 4. Writing always takes place to the status flags.

COMMAND	SIOX		MODBUS			
	Param.	Bit	Obase	1base	Bit	
Force damper open	\$2C	\$0001	44.0	45.1	705	Selective smoke extraction, dampers will be open
External fire alarm	\$2C	\$0002	44.1	45.2	706	External fire closing order
Smoke detector reset	\$2C	\$0004	44.2	45.3	707	Reset automatically
Close damper	\$2C	\$0008	44.3	45.4	708	For example night closing
Function test	\$2C	\$0010	44.4	45.5	709	Reset automatically

Note: To reset the smoke detector and start the function test, writing should only take place once. If the SX:ACCESS module is used then it is not possible to request Force open, Close damper or External fire by writing to the register. These functions are controlled by the configuration in the SX:ACCESS module.

SETUP	SIOX		MODBUS		
	Param.	Default settings	Obase	1base	
Watchdog time no comm.	\$03	25	32771	32772	7705 = 30 seconds*. 25 = 0 seconds (default value)
Smoke detector, error level	\$0C	400	32780	32781	Under this level, loop error=fire. 400=4mA
Smoke detector, service level	\$0D	1600	32781	32782	Above this level, a service alarm is indicated. 1600=16mA
Smoke detector, fire level	\$0E	3000	32782	32783	Above this level, a fire alarm is set. 3000=30mA
High temperature level	\$0F	0	32783	32784	(0.1°C) 0=no alarm, e.g. 720 = 72°C
Temperature sensor, actual value	\$38		56	57	(0.1°C). Only for reading RAM
Smoke detector, actual value	\$39		57	58	(µA * 10). Only for reading RAM
Time until function test	\$29		41	42	Hours RAM
Function test interval	\$23	48	32803	32804	Hours 0=no local function testing
Closing time, damper	\$24	640	32804	32805	Max damper closing time (unit 1/16s) in function test
Opening time, damper	\$2A	2880	32810	32811	Max damper opening time (unit 1/16s) in function test

Note: Modbus registers 32xxx are saved in EEPROM (non-volatile memory). Do not constantly write to them because each register is guaranteed for a maximum of 1 million write operations. The time unit for the closing time and opening time is 1/16 second. For example, the actual parameter value for 40 seconds is 640.

* Formula: Seconds x 256 + 25. (Example: 30 seconds x 256 + 25 = 7705)

ANALOGUE OUTPUT	SIOX		MODBUS		
	Param.	Default settings	Obase	1base	
Analogue out, damper 1	\$06	\$1000	6	7	\$1000=4096 means 100% open= 10 V
Analogue out, damper 2	\$07	\$1000	7	8	\$1000=4096 means 100% open= 10 V