



## Outdoor Controller and Sensor SOC2

The SOC2 is a programmable controller and sensor with communication capabilities. It is for outdoor sensing with rain protection (IP63). Each control loop may use 2 PI sequences and 2 binary stages. The SOC2 comes with a built in RS485 communication interface that allows peer-to-peer communication with an operation terminal such as OPT1-(2TH)-VC. Complete parameter sets may be copied by use of an accessory called AEC-PM2 or exchanged with a PC using an RS485-USB converter and the Easyset program. The SOC2 uses the universal X2 operating system.

### Applications

- Ventilation control
- Air measurement
- Zone control
- VAV control

### Functions

- Two universally configurable control loops:
  - Functions for dehumidifying, set point shift and cascade control
  - Multiple auxiliary functions: heat-cool auto changeover, automatic enable, set point compensation
  - Free heating and cooling with economizer function based on enthalpy or temperature
  - Differential, averaging, min and max functions, enthalpy and dew point calculations
  - Transmitter function for sensors and set points
- Universal analog outputs (VDC, mA) and one relay with a normally open and a normally closed contact (SPDT)
- 8 freely assigned alarm conditions, selectable state of outputs on alarm condition
- Password protected programmable user and control parameters
- Measures temperature and humidity

### Ordering

Model	Item	Loop	UI	DO	AO	Functions	AO1	AO2
SOC2-TH-210.102U-1	40-300181	2	1	1	2	Temperature- and humidity sensor	Temp.	RH
SOC2-TH-210.102U-OP-1	40-300184	2	1	1	2		Temp.	RH

AO1 and AO2 are the analog outputs of the controller/sensor. The device is pre-programmed ex works as a transmitter. The sensors are assigned to the analog outputs according to the table.

Model	Item	Description
OPC2-S	40-500109	Display option for SDC2 and SOC2 devices
AEC-PM2	40-500130	Plug-In memory module

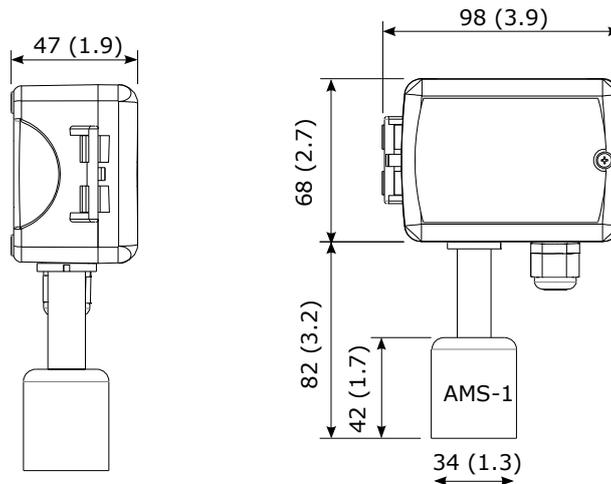
A large range of remote operation terminals may be found on our website. All -VC operation terminals work with this controller.

## Technical specifications

### Important notice and safety advice

This device is for use as an operating controller or sensor. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

<b>Power supply</b>	Power requirements	24 VAC $\pm$ 10%, 50/60 Hz, 15..34 VDC SELV to HD 384, Class II, 48VA max	
	Power consumption	Max. 5 VA	
	Electrical connection	Screw terminal connectors for wire 0.75...1.5 mm <sup>2</sup> (AWG 20...16)	
<b>Signal inputs</b>	Temperature sensor	Bandgap sensor	
	Range	-40...70 °C (-40...158 °F)	
	Measuring accuracy	See Figure 1	
	Repeatability	$\pm$ 0.1 °C, $\pm$ 0.2 °F	
	Humidity sensor	Capacity sensor element	
	Range	0...100% RH	
	Measuring accuracy	See Figure 2	
	Hysteresis	$\pm$ 1%	
	Repeatability	$\pm$ 0.1%	
	Stability	< 0.5% / year	
	Passive input	UI6, Passive Temperature NTC or open contact	
	Type:	NTC (Sxx-Tn10) 10k $\Omega$ @25°C	
<b>Signal outputs</b>	Range	-40...100 °C (-40...212 °F)	
	Analog outputs	AO1 to AO2	
	Output signal	DC 0...10 V or 0...20 mA	
	Resolution	9.76 mV or 0.019 mA (10 bit)	
	Maximum load	Voltage: $\geq$ 1k $\Omega$ Current: $\leq$ 250 $\mu$ A	
	Relay outputs:	AC Voltage	0...48 VAC, full-load current 2A.
		DC Voltage	0...30 VDC, full-load current 2A
	Insulation strength between relays contacts and system electronics:	between neighbouring contacts:	1500V AC to EN 60 730-1 800V AC to EN 60 730-1
	<b>Connection to remote terminal</b>	Hardware interface	RS485 in accordance with EIA/TIA 485
Cabling		Twisted pair (STP) cable	
<b>Environment</b>	Operation	To IEC 721-3-3	
	Climatic conditions	class 3K5	
	Temperature	0...50 °C (32...122 °F)	
	Humidity	<85 % RH non-condensing	
	Transport & storage	To IEC 721-3-2 and IEC 721-3-1	
	Climatic conditions	class 3K3 and class 1K3	
	Temperature	-25...70 °C (-13...158 °F)	
	Humidity	<95 % RH non-condensing	
	Mechanical conditions	class 2M2	
<b>Standards</b>		conformity	
		EMC directive	2014/30/EU
		Low voltage directive	2014/35/EU
	Product standards: Automatic electrical controls for household and similar use		EN 60 730 -1
	Electromagnetic compatibility for industrial and domestic sector	Emissions:	EN 60 730-1
		Immunity:	EN 60 730-1
	Degree of protection		IP63 to EN 60 529
	Pollution class		II (EN 60 730-1)
	Safety class:		III (IEC 60536)
	Overvoltage category		II (EN 60 730-1)
	<b>General</b>	Material	Fire proof ABS plastic (UL94 class V-0)
		Dimensions: (H x W x D)	150 x 98 x 47 mm (5.9 x 3.9 x 1.9 in)
Weight (including package)		380g (13.4 oz)	

**Dimensions, mm (inch)****Selection of actuators and sensors****Temperature sensors**

Use Vector Controls NTC sensors to achieve maximum accuracy: SDB-Tn10-20 (duct), SRA-Tn10 (room), SDB-Tn10-20 + AMI-S10 as immersion sensor.

**Actuators**

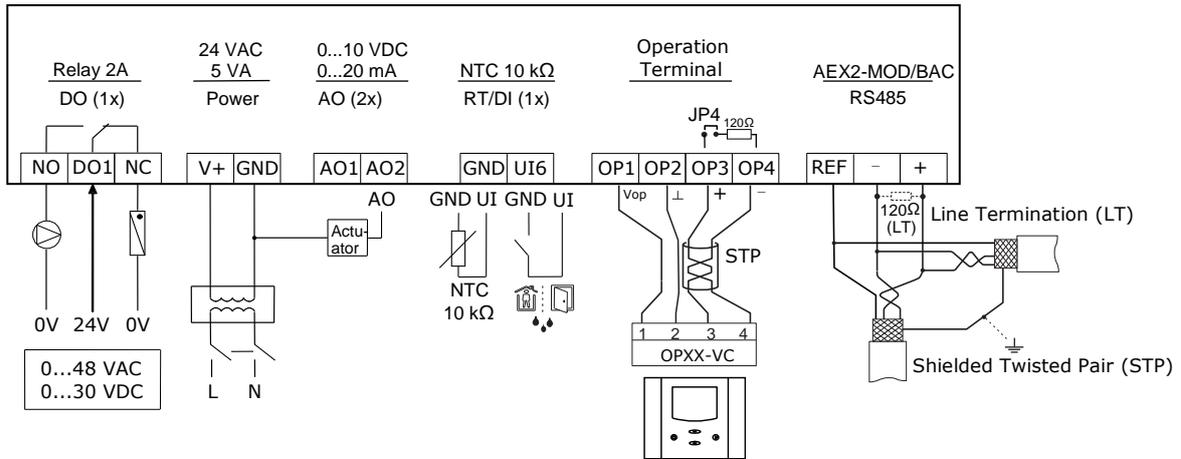
Choose modulating actuators with an input signal type of 0/2-10 VDC.

3-point actuators with constant running time are recommended.

**Binary auxiliary devices** (e.g. pumps, fans, on/off valves, humidifiers, etc.)

Do not directly connect devices that exceed specified limits in technical specifications – observe startup current on inductive loads.

**Connection diagram**



**LED-indicators**

A status LED is located in the controller housing. During normal operation the LED blinks briefly once every 5 seconds. If there is an alarm or fault condition it will blink every second. See installation sheet point D.

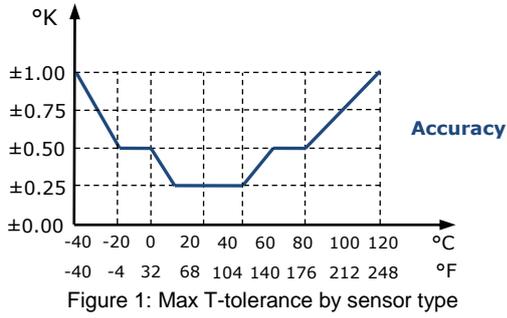
**Installation**

See installation sheet no:

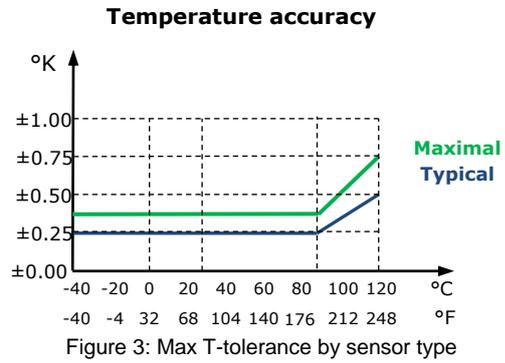
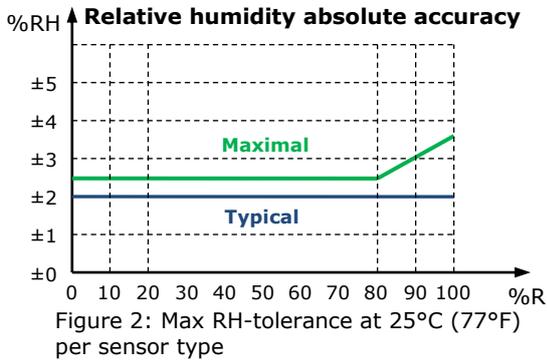
- SOC2-TH-210 70-000687 ( [www.vectorcontrols.com](http://www.vectorcontrols.com) )

**Sensors**

**Temperature sensors on -T- types**



**Temperature & Humidity from RH sensor on -HT- type**



## X2 Functional Scope

The controller has the following X2 functions and elements:

Group	Modules	QTY	Description
UP			User and display parameters
UI	01U to 05U	5	Sensor inputs for temperature and humidity
	06U	1	Universal input for RT/DI
	07U to 10U	4	Virtual inputs for operation terminals, bus modules or special functions
AL	1AL to 8AL	8	Alarm conditions
LP	1L to 2L	2	Control loops
Ao	1A to 2A	2	Analog outputs for mA, VDC
FAN	1F	1	Fan or lead lag modules, 1 to 3 fan speeds, up to 3 switching lead-lag stages each
do	1d	1	Binary output with a normally open and a normally closed (SPDT) relays contact
FU	1FU	1	<b>Remote Enable:</b> Activation of the controller based on signal and alarm conditions
	2FU	1	<b>Change Operation Mode:</b> Switching occupied and unoccupied with control signals
	3FU	1	<b>Heat/Cool Change:</b> Switching heating and cooling based on a control signal
	4FU	1	<b>Setpoint Compensation:</b> Summer/winter compensation of setpoint
	5FU	1	<b>Economizer</b> (free heating or cooling due to the condition of outside and room air)
Co			Communication (if a communication module is available)
COPY			Copying complete parameter sets between run, default and external memory with up to 4 memory locations (AEC-PM2)

### Operation manual and configuration

This controller uses the latest generation X2 operating system. Detailed operating instructions for all devices equipped with this operating system can be downloaded here

<http://www.vectorcontrols.com/products/x2>

Also available are programming instructions for technicians and an application database.

**The device can be fully configured using EasySet.**

**EasySet may be downloaded free of charge from [www.vectorcontrols.com](http://www.vectorcontrols.com).**

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