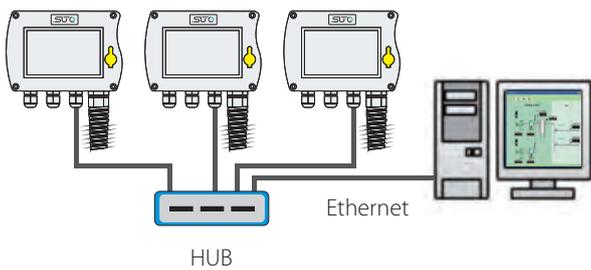
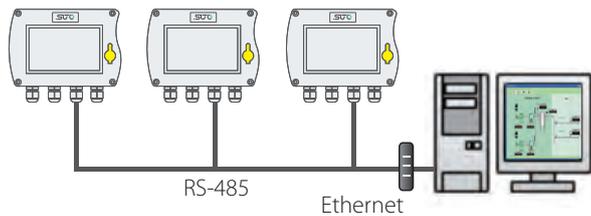
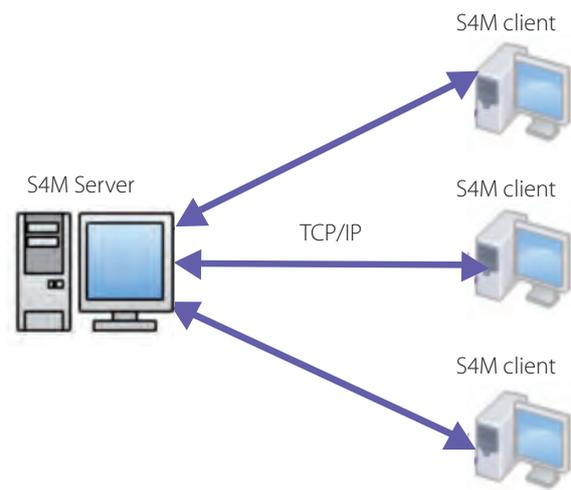


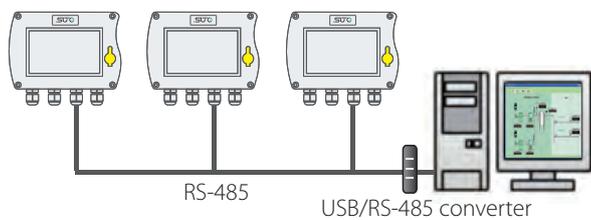
In times where energy conservation is a top priority for all progressive enterprises, the measurement of flow rates and consumption is becoming more and more important. However, measurement is just one step forward. In order to have a complete picture of the gas and compressed air consumption in a factory a permanent monitoring, graphical/statistical analyzes and convenient reporting is required.



S4M acquiring measurement data through Ethernet from several remote units



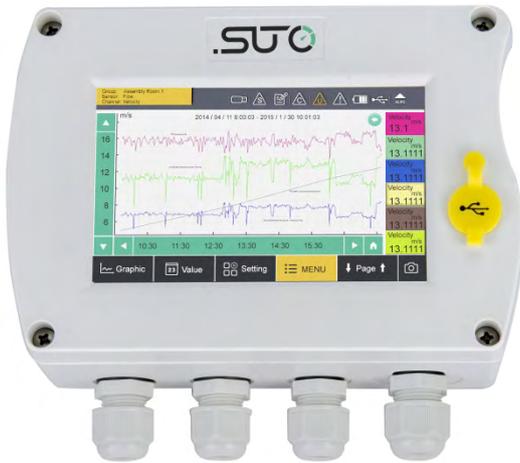
S4M acquiring measurement data through Ethernet / RS-485 gateway



S4M acquiring measurement data through RS-485 from several remote units



The universal display and data logger can measure, display and record all relevant parameters (Flow, consumption, dew point, pressure, temperature, power consumption, compressor status etc.) in a compressed air system.



## Features

- High resolution 5" colour touch screen interface
- All SUTO sensors and compatible third party sensors are connectable
- 16 x Modbus inputs (58 standard or optional 108 Channels)
- 2 x SDI inputs (12 channels)
- 2 x Analog and pulse input (4 channels)
- Plus 10 virtual channels for calculations like kW/m<sup>3</sup>/min or Differential pressure
- 2 wall casings available: 4 cable glands or 7 cable glands
- USB interface for data transfer to data stick or PC
- RS-485 (Modbus RTU) and Ethernet (Modbus TCP) interface to factory automation system
- 10 W sensor power supply (24 VDC)
- Data logger (S 331 only): 100 million values
- Alarm monitoring with 2 relay outputs
- Integrated web server for remote monitoring
- Quick set up
- Various options for system extension

The SUTO S 330/331 is a powerful yet cost effective local display, sensor interface and data logging (S 331 only) solution for virtually any application. Up to 20 sensors can be connected to a single device allowing local nodes to be setup throughout the factory. With it's easy to use, high resolution 5" touch screen, information from all the connected sensors can be accessed locally making readings easy to access for those on the ground.

Modbus RTU or Modbus TCP output data can be transmitted into the site's ethernet network allowing information to be viewed in real time via an existing SCADA system or with the simple and easy to use SUTO S4M software. Alternately locally logged data can be downloaded onto a USB memory card or directly to a computer through the USB port.

The S 330/331 can display virtually any parameter from the connected sensors and with it's virtual channels can make calculations to help you measure and monitor efficiency or productivity, simplifying often complex tasks. Alarms can be set on each signal to your preselected parameters helping keep an eye on performance and indicating when there is a problem.

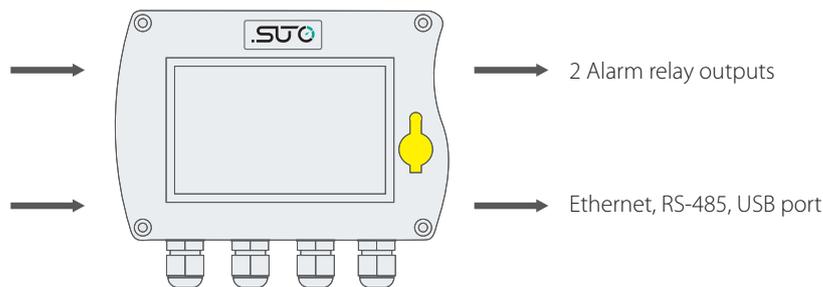
## System overview

2 digital inputs:

- SDI Sensors (up to 2 SDI sensors)
- Modbus Sensors (up to 16 Modbus sensors)

2 analog inputs (option):

- 0 ... 20 mA, 4 ... 20 mA
- 0 ... 10 V
- Pulse



SUTO sensors are equipped with SDI and / or Modbus interface



S 330/331 is available as panel version or in 2 different size wall mountable casings

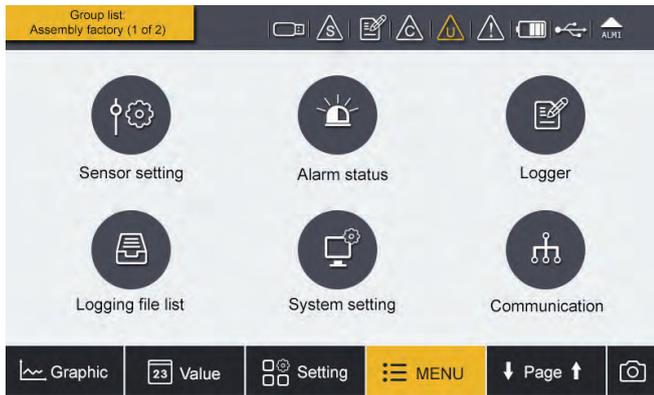
Hat rail option

Back view with connection terminals

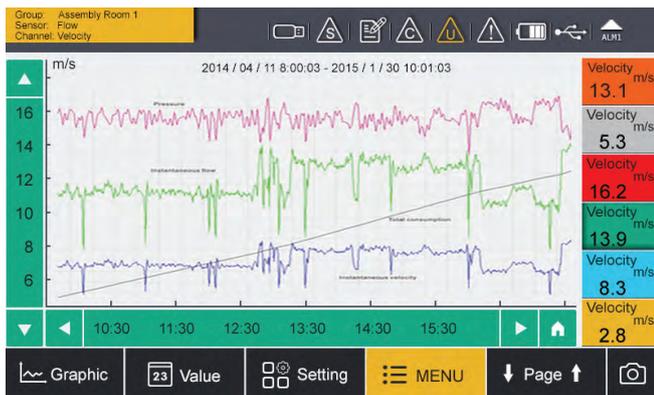
# S 330/331 DISPLAY AND DATA LOGGER



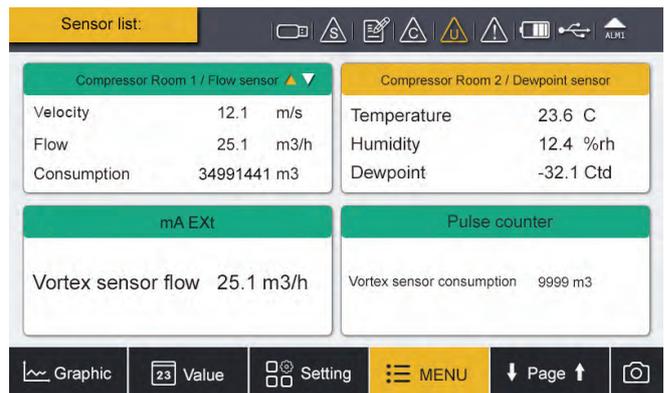
## Touch screen operation



Up to 4 sensors can be viewed on one page and through page scrolling further sensors can be displayed.



The S 330/331 comes with a high resolution 5" colour touch screen interface making the operation as simple as possible.



Select which channels you want to view or analyze and the built in graphic analyzer will help you identify problems immediately.

For detailed analysis we recommend using SUTO S4M software.

### Technical data S 330/331

Casing size	Size: 120 x 173 x 67 mm
Power supply	A: 100 ... 240 VAC, 20 W B: 18 ... 30 VDC, 20 W
Interface	USB RS-485 Ethernet
Alarm output	2 relay, 230 VAC, 3 A, changer
Sensor inputs	2 x SDI inputs or 1 x SDI and 1 x Modbus input (Modbus input for up to 16 sensors) 2 x analog (option)
Data logger	100 million values (option)

Accuracy	SDI, Modbus: see sensor specs Analog: 0 ... 20 mA: 0.01 mA 0 ... 10 V: 0.01V Pulse: ±1 digit
Display	size: 5" Resolution: 800 x 480 px
Operating temperature	0°C ... +50°C
Storage temperature	-20°C ... +70°C
Protection	IP65

## Sensors connectable to S 330/331

The S 330/331 has 2 digital inputs, 2 analogue inputs and can connect up to 16 Modbus sensors.

### Flow / Consumption sensors



S 330/331 can power maximum one S 450/452. If more than one S 450/452 is connected a separate power supply has to be added. (see accessories for S 330/331)

### Dew point sensors



Please refer to the detailed sensor data sheet for further information and options.

### Inputs for analog sensors (2 channels)

#### SUTO analog sensors



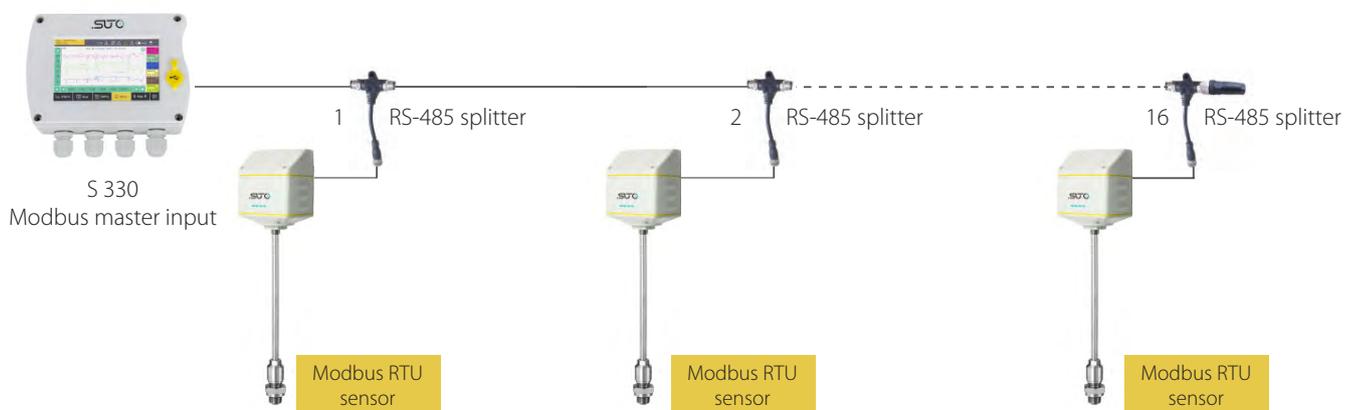
#### Third party sensors

Following third party sensors are connectable to S 330/331:

- 0 ... 20 mA, 4 ... 20 mA, 0 ... 1V, 0 ... 10V signals
- Pulse
- Modbus RTU

### Modbus-Master input for Modbus RTU sensors

The S 330/331 includes digital inputs for SUTO sensors or Modbus RTU sensors. In order to connect the Modbus RTU sensors properly on a RS-485 bus system it's recommended to daisy-chain the sensors to one of the inputs. For this purpose we offer a RS-485 splitter to simplify the connection. Through this method you can add up to 16 sensors to the master input. (In this case additional power supply is required.)



## Order form

Order No.	Option	Power supply	Casing	Description
D500 0333				S 330, panel version, 2 digital inputs, Ethernet, RS-485, USB
D500 0331				S 331, panel version, 2 digital inputs, Ethernet, RS-485, USB, data logger, S4A software
	A			None
A1662	B			2 analogue inputs 0 ... 20 mA + 2 pulse inputs
A1663		A		Power supply 100 ... 240 VAC, 20 VA, 2 relay outputs for alarm
A1664		B		Power supply 18 ... 30 VDC, 20 W, 2 relay outputs for alarm
			A	None
A1665			B	Wall mountable casing with 4 cable glands
A1666			C	Wall mountable casing with 7 cable glands
A1667			D	Wall mountable casing with 3 cable glands + Ethernet
A1668			E	Wall mountable casing with 6 cable glands + Ethernet
			A	None
A1669			B	Hat rail holder (only in connection with wall mountable casing)

## Further accessories

Order No.	Description
<b>Cables</b>	
C219 0055	M12 connector with RS-485 termination resistor, 120 Ω, for Modbus daisy chain termination
A554 3310	M12 RS-485 (Modbus) splitter
A553 0130	USB cable for S 330/331
A553 0104	Sensor cable 5 m, with M12 connector, open wires, AWG24 (0.2 mm <sup>2</sup> )
A553 0105	Sensor cable 10 m, with M12 connector, open wires, AWG24 (0.2 mm <sup>2</sup> )
A553 0106	Power cable with mains plug, 1.8 m
A553 0120	Ethernet cable 5 m, RJ45 plug at both ends
A553 0123	RS-485 cable, 3 pole, AWG 24 (per meter)
<b>Converters and gateways (Please contact our customer service for further converter/gateway options)</b>	
A554 0010	RS-485 / Ethernet gateway
A554 0012	RS-485 / Profibus gateway
A554 0013	Modbus RTU / Modbus TCP gateway
A554 0011	RS-485 repeater
A554 0331	RS-485 / USB converter
<b>Software</b>	
M599 2030	S4M, data acquisition and analyzes software, 20 measuring channels
M599 2033	S4M, data acquisition and analyzes software, unlimited measuring channels
A1102	Consumption report generator for S4M
<b>Others</b>	
D554 0030	Power meter S 110, hat rail mountable, Modbus RTU
D554 0031	Current meter, 0-20 mA, 8 channels, Modbus RTU
D554 0032	Pulse meter, 7 channels, Modbus RTU
A1661	S 330/331 with 108 Modbus-Sensor-channels [standard is 58]
A554 0007	Power supply wall mountable
A554 0009	Power supply for hat rail
A554 3311	Line filter for EMC protection
A554 3313	Connection board for looping 4-20 mA and pulse signals to PLC, mountable in wall casing A1666 or A1668

The S 320 local display provides a simple, cost effective solution where information from a single difficult to access sensor is required.

### Sensor inputs

1 input for SUTO flow/ dew point sensors

1 input for analog sensor (0 ... 20 mA, 0 ... 10V)



### Communication Interfaces

USB port

### Other Signals / Features

2 Alarm relay outputs



### Technical data S 320

Casing	Size: 118 x115 x 93 mm Panel size: 92 x 92 Protection class: IP65	
Power supply	100 ... 240 VAC, 50-60 Hz, 15 VA	
Interface	USB	
Alarm output	2 relay, 230 VAC, 3 A	
Ambient conditions	0°C ... +50°C	
Sensor input 1	1 sensor: S 401, S 421, S 430, S 450, S 452, S 220, S 201, S 212, S 215	
Sensor input 2	1 analog sensor: pressure sensors, temperature sensor, 0 ... 20 mA, 0 ... 10 V	
Accuracy 1)	Dew point:	See sensor specs.
	Flow:	See sensor specs.
	0-20 mA:	0.01 mA
	0-10 V:	0.01 V
Operation temperature	0°C ... +50°C	
Storage temperature	-20°C ... +70°C	
Protection	IP65	

## Order Information

S 320	Power supply	Casing	Description
D500 0320			S 320 base unit, panel version, 1 input for SUTO sensor, 1 analog input.
A1640	A		Power supply 100 ... 240 VAC, 15 VA, 2 relay outputs
A1641	B		Power supply 18 ... 30 VDC, 15 VA, 2 relay outputs
		A	None
A1645		B	Wall mountable casing with 4 cable glands

### Accessories

A553 0104	Sensor cable 5 m, with M12 connector, open wires, AWG24 (0.2 mm <sup>2</sup> )		
A553 0105	Sensor cable 10 m, with M12 connector, open wires, AWG24 (0.2 mm <sup>2</sup> )		
A553 0106	Power cable with mains plug, 1.8 m		

1) Accuracy of sensor not included

# S 551 COMPRESSED AIR ANALYZER



The S 551 is the ideal data logger for energy analysis (ISO 50001) and air audits (ISO 11011).

## Features

### Easy to use

- Just connect the sensor and start the recording, no configuration and programming required
- Easy operation through color-touch display

### Flexible

- Connectable sensors for all required measurement tasks (air flow, air consumption, power consumption, pressure, temperature and many more)
- Up to 24 inputs through extension boxes and Modbus
- Several loggers can be combined: no need to have long cables from the sensor to the logger
- Third party sensors can be easily connected

### Safe

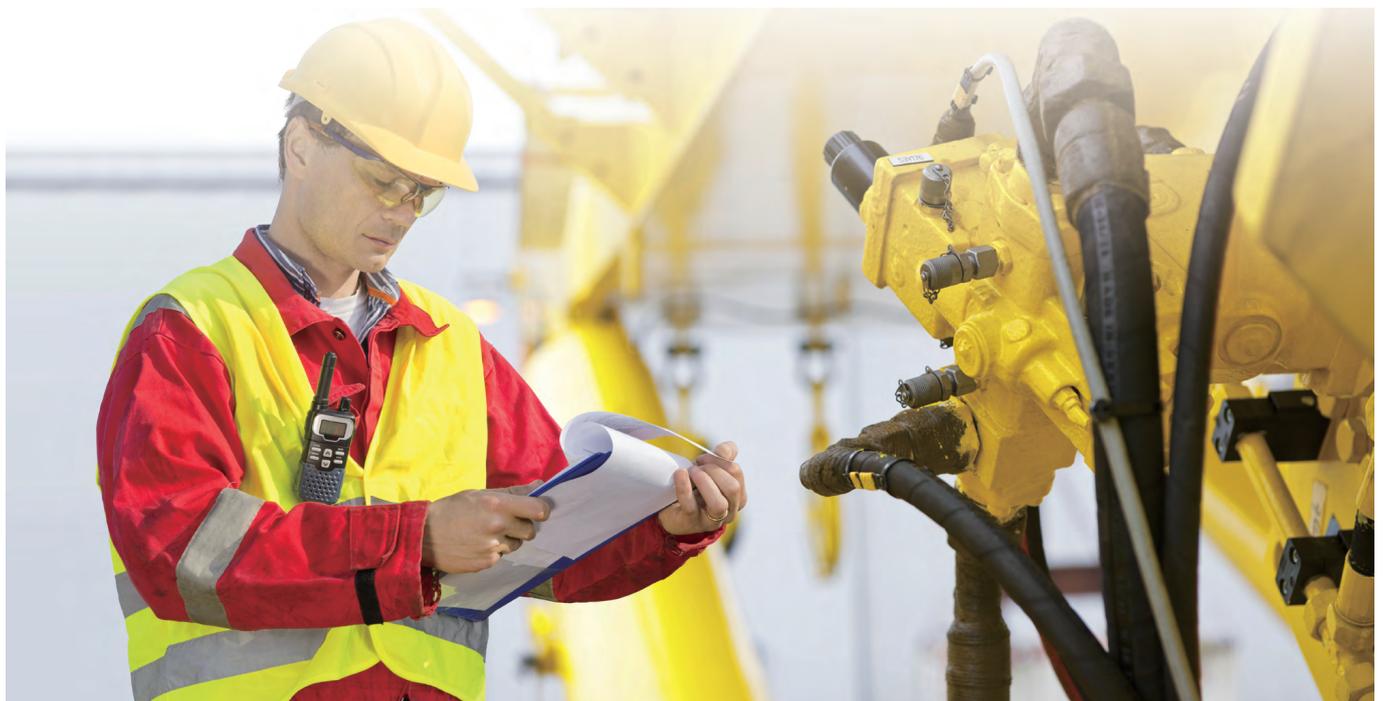
- Power glitches and cuts won't affect performance: battery backup power

### Efficient

- S 551 logs data on site
- Data is analyzed in the office
- Cost effective solution
- Full software package includes:
  - S4A for basic analyzes
  - CAA for compressed air audit analyzes

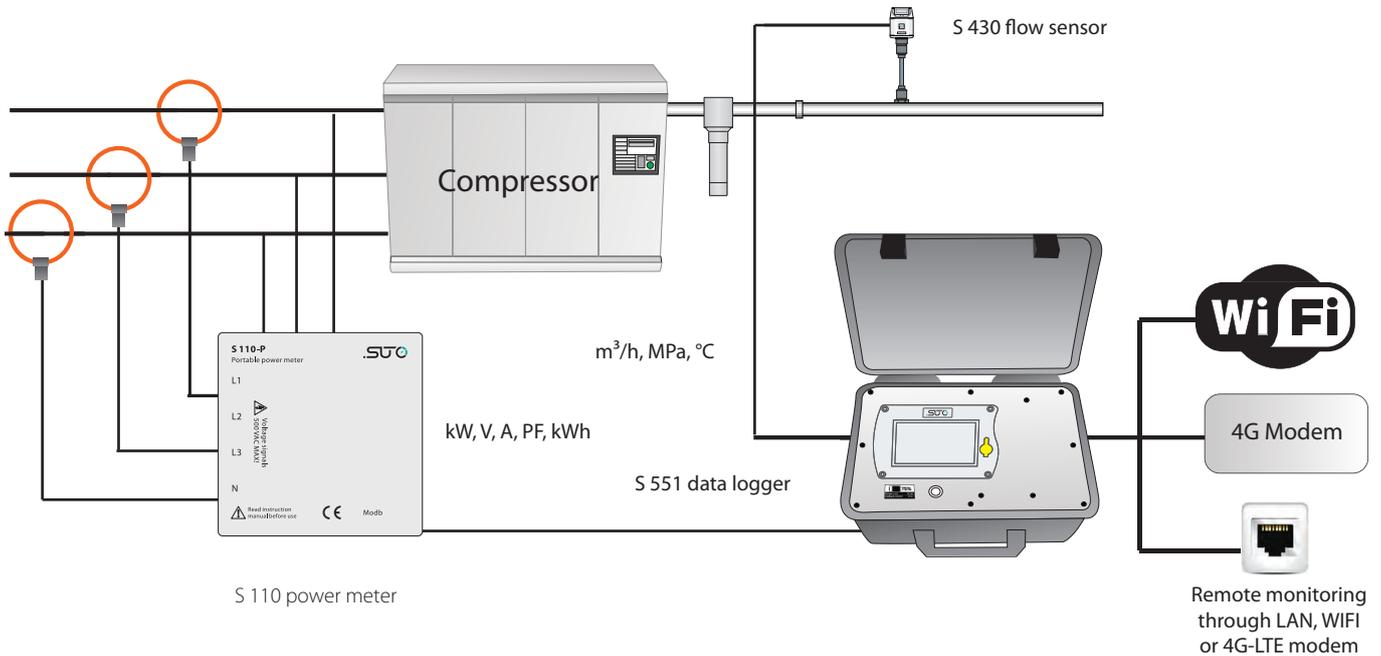


Includes SUTO Compressed Air Analyzer Software

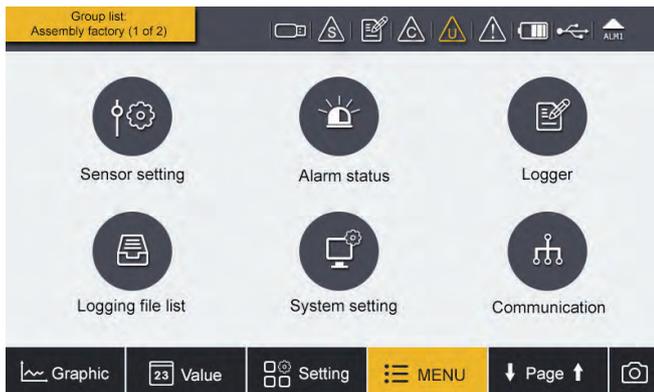


## Application

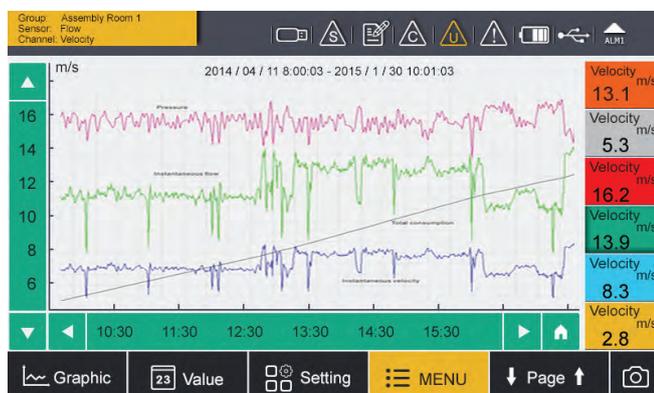
Measurement setup for data logging on the supply side



## Touch screen operation



Up to 4 sensors can be viewed on one page and through page scrolling further sensors can be displayed.



The S 551 comes with a high resolution 5" colour touch screen interface making the operation as simple as possible.

SUTO intelligent sensors are detected automatically on power-up. With a few settings the data logger is ready for operations with virtually unlimited memory size.

Sensor list:	
Compressor Room 1 / Flow sensor ▲▼	
Velocity	12.1 m/s
Flow	25.1 m <sup>3</sup> /h
Consumption	34991441 m <sup>3</sup>
Compressor Room 2 / Dewpoint sensor	
Temperature	23.6 C
Humidity	12.4 %rh
Dewpoint	-32.1 Ctd
mA EXT	
Vortex sensor flow	25.1 m <sup>3</sup> /h
Pulse counter	
Vortex sensor consumption	9999 m <sup>3</sup>

Select which channels you want to view or analyze and the built in graphic analyzer will help you identify problems immediately.

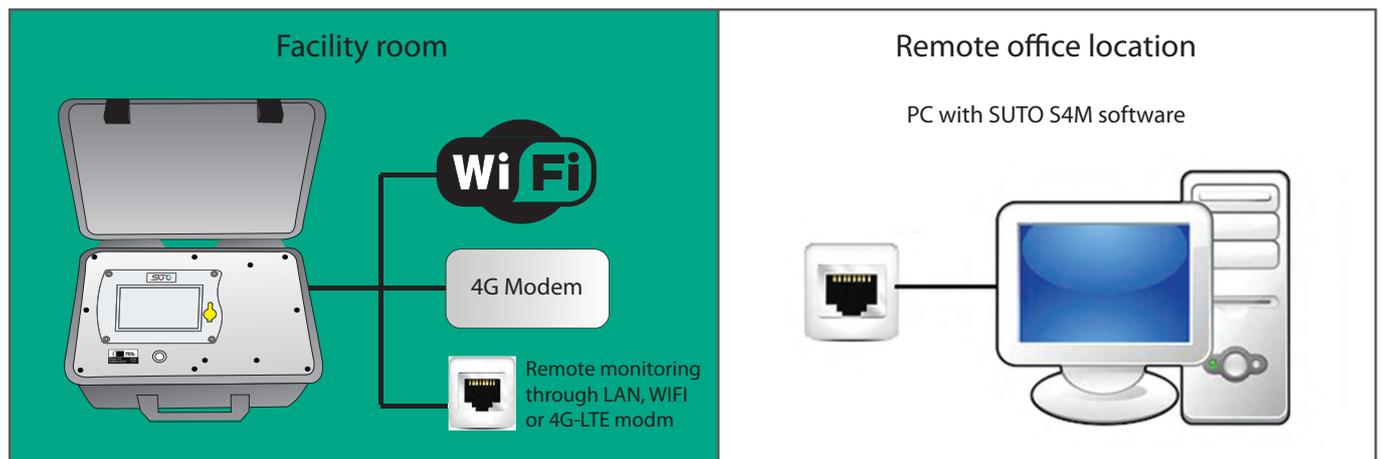
For detailed analysis we recommend using SUTO software S4A, CAA or S4M.

# S 551 COMPRESSED AIR ANALYZER

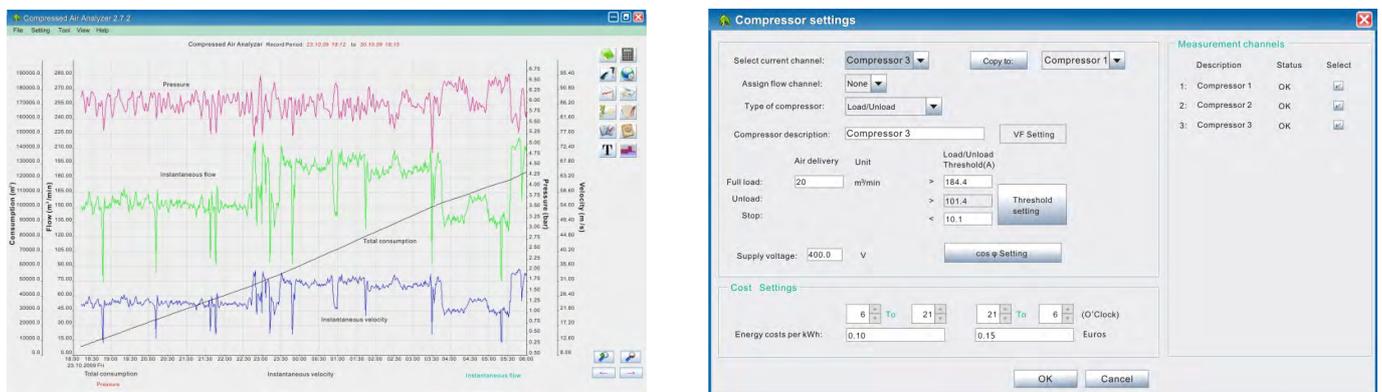


## Touch screen operation

The S 551 is capable of sending measurement data and status information to a remote server through the internet. This allows users to monitor the system remotely. The illustration below shows the principle setup.



## Data Analysis with the Compressed Air Analyzer



Through SUTO software S4A recordings are downloaded to the PC via USB or Ethernet port. The basic analysis can be done in S4A.

For more sophisticated compressor analysis the SUTO CAA software offers many advanced features such as: performance statistics of compressors (efficiency, air delivery, load/unload cycles), leakage analysis, report generation and more. Comparisons with base line measurements from last year or last month help to identify system changes.

## Order information



### Data logger

- P560 5100 S 551-P4, portable data recorder, 4 digital input channels, power cord, USB cable, S4A software, CAA software
- P560 5101 S 551-P6, portable data recorder, 4 digital input channels and 2 analog, power cord, USB cable, S4A software, CAA software



### Flow sensors

- S601 0401 S 401-M, insertion type flow sensor, DN15 ... DN300, Modbus RTU, 5 m cable with connector
- S601 0430 S 430 pitot tube flow sensor, DN25 ... DN250, 220 mm shaft, SDI, Modbus RTU, 5 m cable with connector



### Dew point sensor

- S601 0215 S 215 dew point sensor, -20°Ctd ... +50°Ctd, measuring chamber, 5 m cable with connector
- S601 0212 S 212 dew point sensor, -50°Ctd ... +20°Ctd, measuring chamber, 5 m cable with connector
- S601 0220 S 220 dew point sensor, -100°Ctd ... 0°Ctd, measuring chamber, 5 m cable with connector



### Pressure sensors

- S694 1886 Pressure sensor, 0 ... 1.6 MPa(g), 5 m cable with connector for S 551
- S694 0356 Pressure sensor, 0 ... 4.0 MPa(g), 5 m cable with connector for S 551



### Amp sensor

- S554 0156 SUTO current clamp sensor, 1000A, 100 mm diameter, including connector to S 551
- S554 0157 SUTO current clamp sensor, 3000A, 150 mm diameter, including connector to S 551



### Temperature sensor

- S693 0005 Temperature transmitter, -50°C ... +200°C, 4 ... 20 mA loop powered, 6 x 150 mm sensor tube, 5 m cable with connector
- A554 6003 Compression fitting, 6 mm, G 1/2" thread, 0.6 MPa
- A554 6004 Compression fitting, 6 mm, G 1/2" thread, 1.6 MPa



### Power meter (for 3 phase and single phase measurement)

- P554 0134 Portable power meter S 110-P, Modbus RTU, including 4 test leads, 4 test clips, 5 m cable with connector to S 551
- S554 0160 Rogowski coil for S 110-P, 1000 A, 100 mm diameter, 1.8 m cable, connector to S 110-P
- S554 0161 Rogowski coil for S 110-P, 3000 A, 150 mm diameter, 1.8 m cable, connector to S 110-P
- S554 0162 Rogowski coil for S 110-P, 100 A, 160 mm diameter, 1.8 m cable, connector to S 110-P



**Note:** For 3 phases power supply 3 Rogowski coils are needed.

# S 551 COMPRESSED AIR ANALYZER



## Liquid flow meter (clamp on ultra sound)

P554 0070 Ultrasonic controller for liquid flow sensor, connectable to S 551, including 5 m connection cable to S 551 and to the sensors



S694 4603 Ultra sound sensor pair, DN32 ... DN100, socket terminals

S694 4604 Ultra sound sensor pair, DN100 ... DN700, socket terminals

S694 4605 Ultra sound sensor pair, DN300 ... DN6000, socket terminals



## Other sensors / extensions

P554 0080 8 channel analog input extension, connectable to S 551, including 5 m cable with connector



A554 3314 Portable Modbus splitter box, with M12 connector



## Accessories

A553 0103 Extension cable, 5 m, male-female connectors



A553 0110 Open wires cable, 5 m cable with connector



A553 0111 Sensor cable, M12, 5 m with connector to S 551

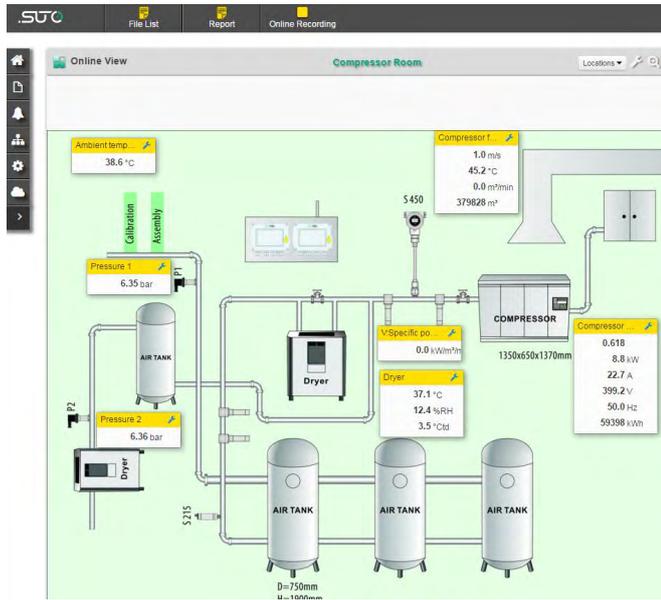


A554 0035 Transport case S 551 for sensors and cables, L560 x W450 x H160 mm (internal compartment can be arranged according to your individual sensor requirements)



A554 0036 Transport case, customized for 1 x S 110-P, 3 Rogowski coils, 4 x test leads, 4 x test clips, 1 x S 430

\* Please contact us for further accessories and details.



## Features

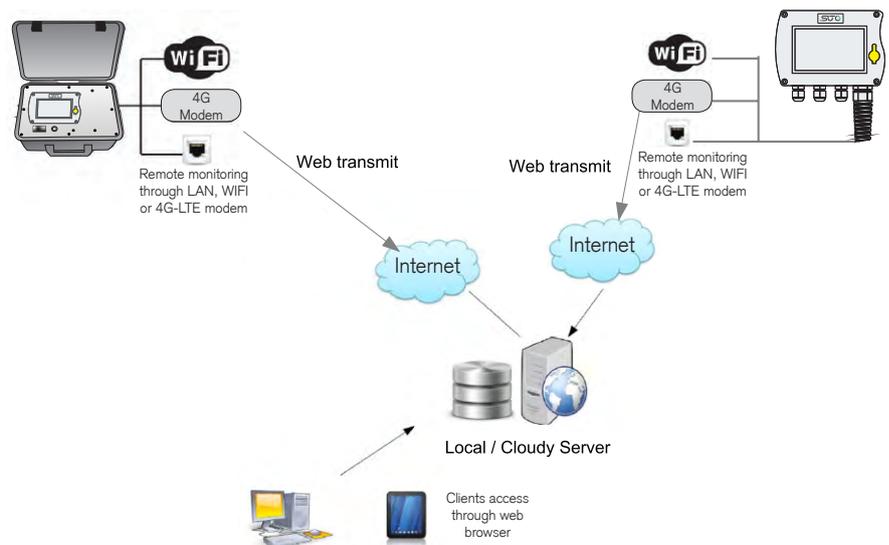
- Data acquisition of from an unlimited number of sensors from locations all over the world
- Alarm monitoring and indications on screen, relay and SMS
- Secure data storage on local hard drive in a SQL database
- Server / client architecture
- Application software installed on Windows PC
- Client access through web browser (PC, tablet, HMI terminal)
- Remote access through the Internet is possible
- Scalable customizable solution
- Communication with field devices through Modbus TCP or Modbus RTU or via web
- Multi language support
- E-mail feature for sending alarms and reports
- Consumption report (optional)

The S4M is a new generation of monitoring software designed to monitor factory or building systems of all scales. For example in a compressed air system it records and analyzes air consumption, system pressure, dew point, oil vapor contents, compressor status, particles basically everything required for a safe operation. Rich alarm monitoring with indications on screen, relay outputs and e-mail puts the user in control of the system. The S4M is not limited to compressed air systems. What can be measured and is available through a Modbus communication can be recorded and analyzed by the S4M.

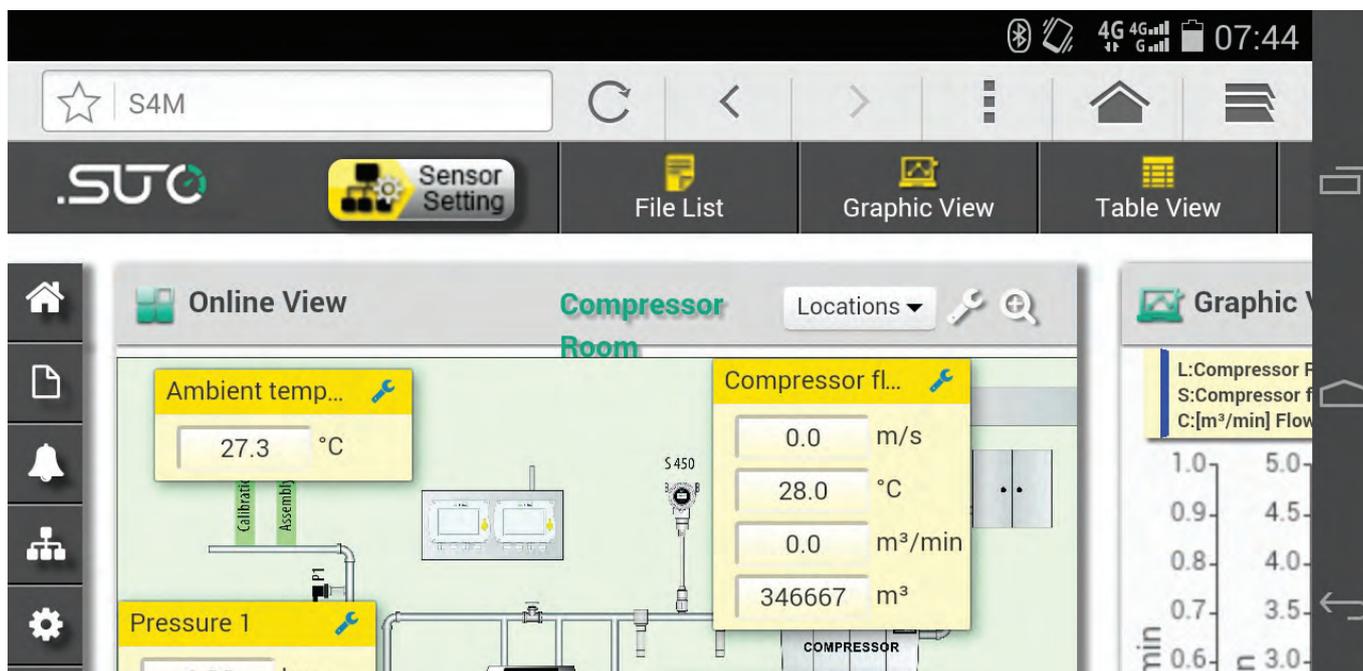
The S4M software is installed on a Windows PC (server installation). Clients operate the software through a web server and web browser. This allows hardware to be independent of client installations on a PC, tablet computers and HMI terminal

## Applications

- Compressed air system monitoring
- Building monitoring
- Compressor analysis and optimization
- Monitoring of process gas consumptions
- Energy consumption monitoring (ISO 50001)
- Provide timely and thoughtful facility maintenance service for your customers
- EPC (Energy Performance Contracting) projects for energy saving in compressed air systems



# SMART COMPRESSED AIR SYSTEM MONITORING WITH S4M



Above is an example show monitoring of a typical compressed air system with all relevant online parameters displayed on the screen.

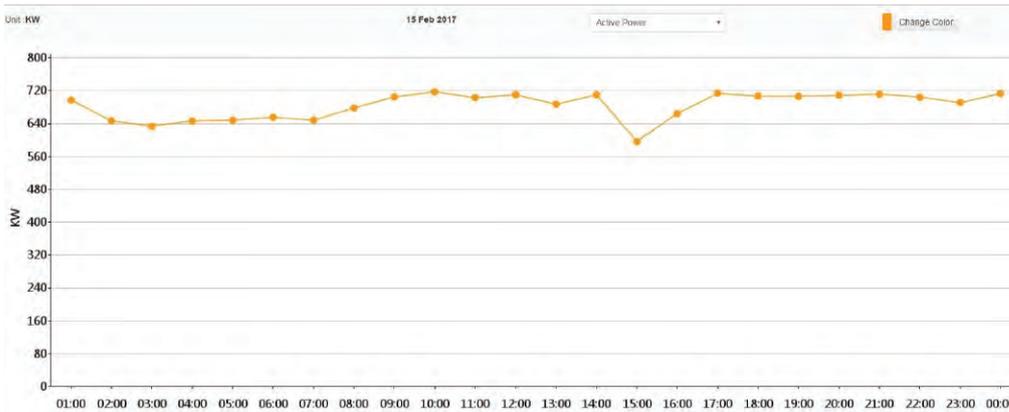
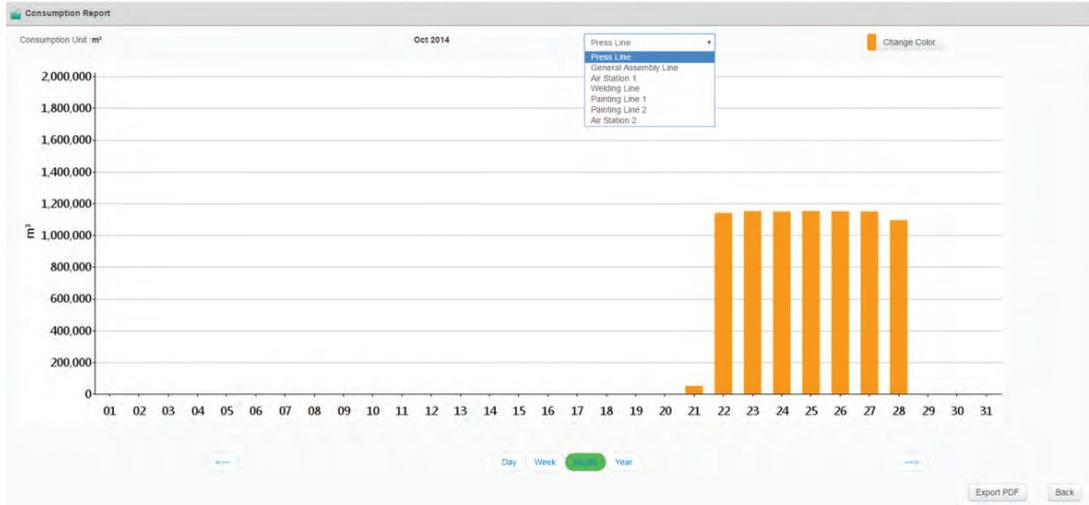
Order no.	Description
A554 0027	GSM modem for SMS notifications, connectable to PC server
M599 2030	S4M, data acquisition and analyzes software, 20 measuring channels
M598 2030	Update S4M, 20 measuring channels
M599 2031	S4M, data acquisition and analyzes software, 50 measuring channels
M598 2031	Update S4M, 50 measuring channels
M599 2032	S4M, data acquisition and analyzes software, 100 measuring channels
M598 2032	Update S4M, 100 measuring channels
M599 2033	S4M, data acquisition and analyzes software, unlimited measuring channels
M598 2033	Update S4M, unlimited measuring channels
M599 9000	Software setup, configuration and training
A1102	Add-on Consumption Report

## Features

- Add-on for S4M
- Report in the form of graphic or table
- Report export to PDF as well as Excel
- Programmable company information like name, logo, etc.

## Applications

- Track how much energy (electricity, compressed air, water, etc.) is used during a period such as a day, week, month and year
- Cost allocation for production lines
- Comparison between main line and summary of several branch lines
- Trend analysis for any recorded data



**Consumption Report  
Monthly Report Feb 2018**

Day	Group 1				Group 2				
	S 401	S 401	S 401	S 401	S 401	S 401	S 401	S 401	
	Painting Line 2 (m³)	Welding Line (m³)	Sum (m³)	Air Station 1 (m³)	Assembly Line (m³)	Press Line (m³)	Painting Line 1 (m³)	Sum (m³)	Air Station 2 (m³)
20	121232	57080	178312	178315	108591	54300	501298	664189	664188
21	303344	146031	449375	449376	159157	1142570	337325	1639052	1639050
22	304530	143803	448333	448333	157807	1154418	330088	1642313	1642315
23	302131	144269	446400	446400	159183	1151219	330554	1640956	1640956
24	301715	143766	445481	445477	158929	1154402	331627	1644958	1644957
25	300830	143647	444477	444480	158664	1153614	330999	1643277	1643277
26	302993	144611	447604	447605	158664	1151612	329347	1639623	1639626
27	315222	144767	459989	461438	156927	1155085	340579	1652591	1654042
28	547200	172800	720000	748800	144000	1152000	518400	1814400	1843200
<b>Max</b>	547200	172800	720000	748800	159183	1155085	518400	1814400	1843200
<b>Min</b>	121232	57080	178312	178315	108591	54300	329347	664189	664188
<b>Total</b>	2799197	1240774	4039971	4070224	1361922	9269220	3350217	13981359	14011611
<b>Average</b>	311021	137863	448885	452247	151324	1029913	372246	1553484	1556845
<b>Cost(\$)</b>	55,983.94	24,815.48	80,799.42	81,404.48	27,238.44	185,384.4	67,004.34	279,627.18	280,232.22