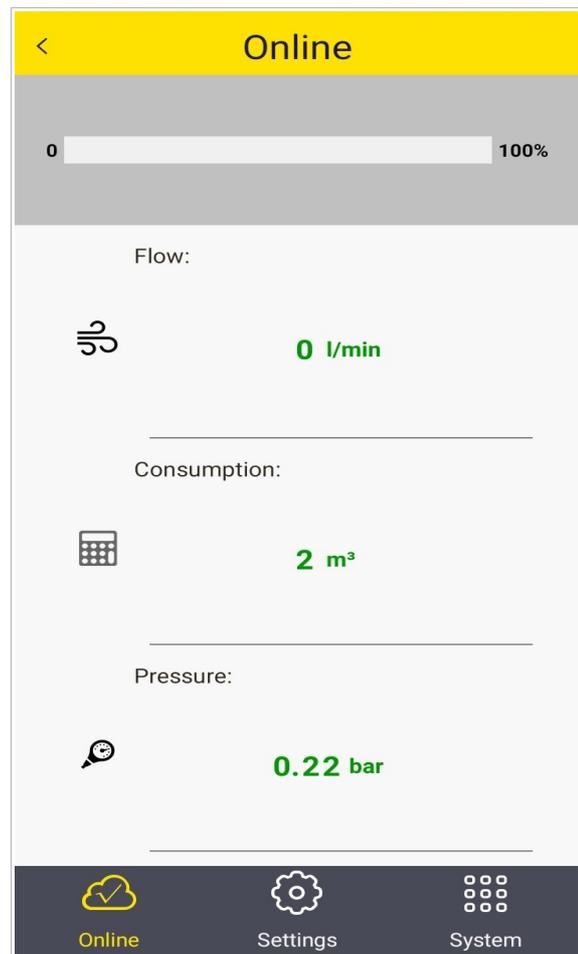
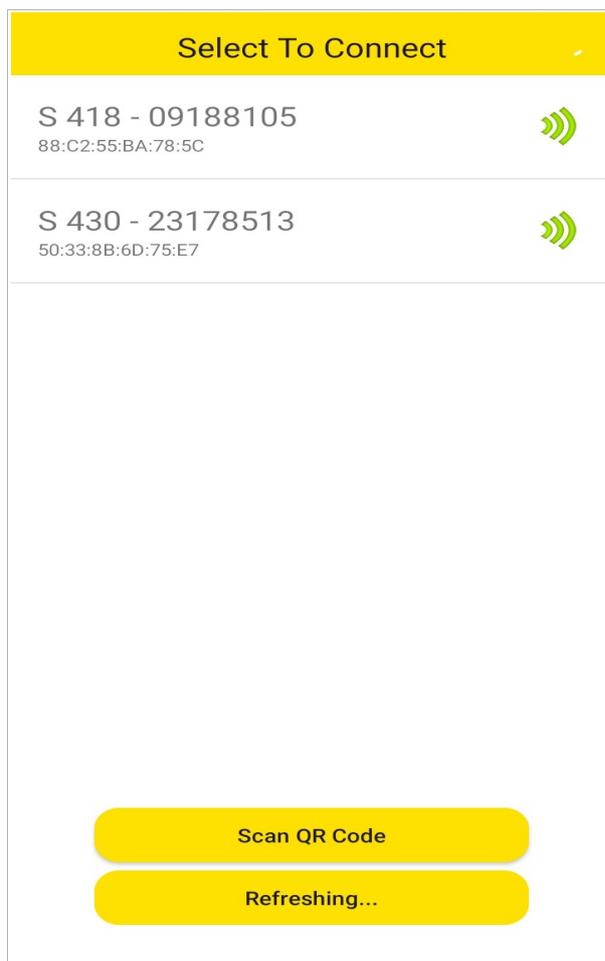


Instruction and operation manual

S4C-FS

Software for Configuring Flow Sensor



Dear Customer,

Thank you for choosing our product.

Please read the manual in full before you start up the device and carefully observe the instructions stated. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in the manual, the warranty is cancelled and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

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1 Registered trademarks

SUTO®

Registered trademark of SUTO iTEC

MODBUS®

Registered trademark of the Modbus Organization, Hopkinton, USA

HART®

Registered trademark of the HART Communication Foundation, Austin, USA

PROFIBUS®

Registered trademark of the PROFIBUS User Organization, Karlsruhe, Germany

2 Application

S4C-FS is an app that enables you to view measurement readings and change settings for SUTO flow sensors through Android devices.

S4C-FS supports the following SUTO flow sensors:

S415	S401
S418	S421
S418-V	S430

2.1 System requirements

Ensure that your Android devices meet the following requirements:

- Android 7.0 or above versions installed
- BLE4.0 and above supported (You can check the information with the device vendor.)

Ensure that you have allowed the app to access the following information:

- Location (Network-based approximate location and GPS- and Network-based precise location)
- Camera (Scan the QR code)
- Pair with Bluetooth devices
- Device ID and call information (Read phone status and identity)
- Others (View network connections, View Wi-Fi connections, Access Bluetooth settings, Change network connectivity, full network access)

2.2 Operating requirements

S4C-FS can automatically detect a SUTO flow sensor when both of the following requirements are satisfied:

- The SUTO flow sensor is powered on.
- The Android device is no more than 10-meter away from the flow sensor (within sight). Walls and metal enclosures will reduce the effective distance!

3 Features

- Android smart phones and tablets applicable.
- Designed for service people to check sensor readings and change sensor settings using Android devices.
- Bluetooth integrated as the interface to communicate with the sensor.
- Multiple languages supported: English, German, Chinese, and French.

4 Installation and registration

4.1 Installation

The S4C-FS app file (*.APK) is available for download on Google Play Store (play.google.com) and the SUTO Website. (www.suto-itec.com).

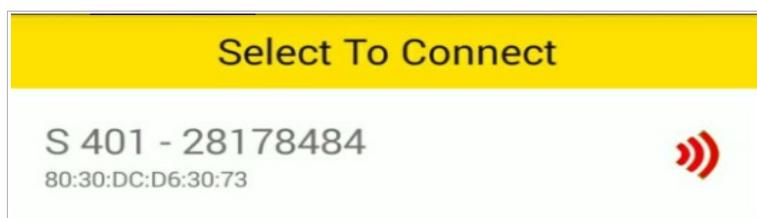
Use your Android phone or tablet to download and install the application, same as you do for any other apps.

4.2 Connection

After S4C-FS is installed, it automatically detects powered sensors within its reach.

When S4C-FS detects a sensor for the first time, S4C-FS has the Read-only access to the sensor and can only view sensor readings and settings.

As shown in the following figure, a sensor is detected with the sensor name and serial number displayed, and the signal icon is shown in **RED** indicating that the sensor is Read-only. By clicking the sensor name, you trigger the S4C-FS to connect with the sensor. After the connection is built, you are directed to the online view of the sensor where you can view its measurement data.



Later when the Android device is placed within the valid distance of the sensor, the sensor remains Read-only unless you register the S4C-FS to the sensor.

Note: S4C-FS can detect and connect to multiple sensors. A sensor can connect to only one Android device at a time.

4.3 Registration

To change settings of a sensor, you must register S4C-FS to the sensor by scanning the QR code of the sensor. If the registration is successfully completed, the sensor is configurable to the S4C-FS which means that you can change sensor settings and perform calibration for the sensor using the S4C-FS.

Preparation:

- Power on the sensor.
- Obtain the certificate of the sensor. The certificate comes together with the sensor and have the QR code provided. Following is an example of the QR code.

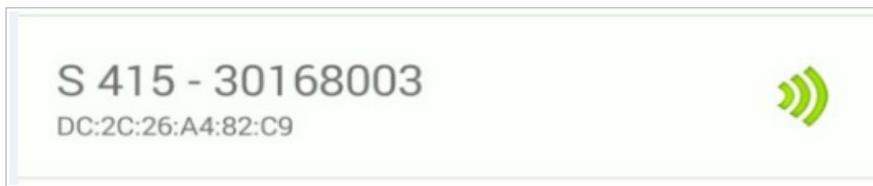


S 401 S/N: 4717 9420

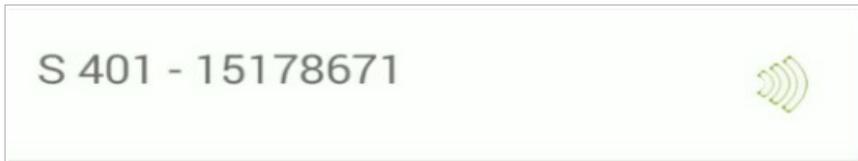
Steps:

1. Launch the **S4C-FS**.
The sensor within the reach of S4C-FS is displayed with a red signal icon.
2. Click the **Scan QR Code** button.
3. Scan the QR code on the sensor's certificate.

After scanning the QR code, S4C-FS saves the sensor information to the Android device, and the signal icon changes from **RED** to **GREEN** indicating that the sensor is configurable to the S4C-FS.

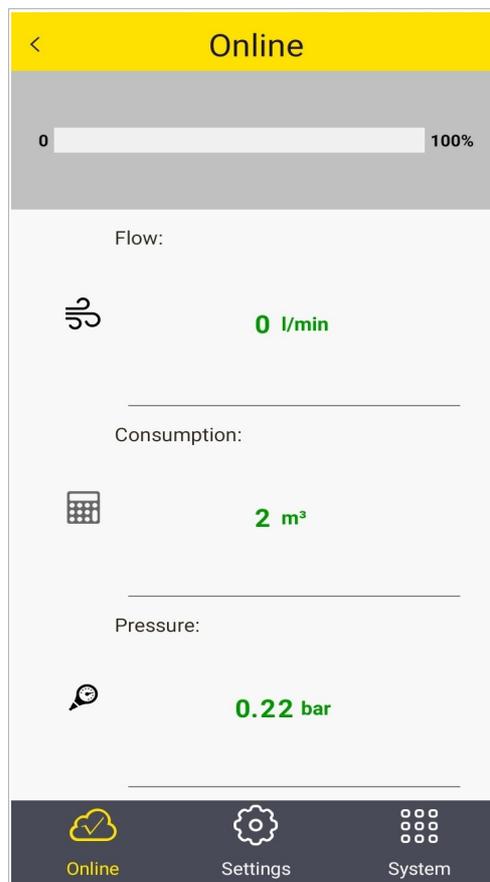


Note: A **GREEN** hollow signal icon as shown in the following figure indicates that the Bluetooth signal is weak. You can place your device closer to the sensor.



5 Menus

On the main screen of S4C-FS, click on a sensor record to enter the sensor screen. The screen provides three menus at the bottom for you to operate: Online, Settings, and System.



5.1 Online

The Online menu enables you to view the online measurement values which are updated twice per second. Different sensors have slightly different measurement parameters as shown in the following table.

S401	S421	S430	S415	S418	S418-V
Flow Consumption Consumption[R]	Flow Consumption	Flow Consumption Consumption[R] Temperature Velocity Pressure	Flow Consumption	Flow Consumption Pressure	Flow Consumption Pressure

Remarks:

S418 shows the pressure only if the optional pressure sensor is integrated.

5.2 Settings

The Settings menu enables you to change sensor settings and calibrate a sensor if you have successfully registered the S4C-FS to the sensor. Otherwise, you can only view these settings.

SUTO flow sensors provide various settings which influence the performance and the features of the sensors. Be careful when you change the settings because they might affect the accuracy or the overall performance. Please contact our service team for information.

The following settings are available on SUTO flow sensors:

- Flow Settings
- Gas Type
- Units Settings
- Reference Conditions
- Factory Settings
- Counter Settings
- Output Settings
- Calibrations
- Logger settings

For more information about the setting descriptions, see chapter 6 on page 10.

5.3 System

The **System** menu enables you to view or configure information of the sensor and S4C-FS:

- Sensor Info
- Language
- Version

For more information, see chapter 7 on page 15.

6 Settings

This chapter describes parameters in the Settings menu.

6.1 Flow settings

To configure settings related to flow measurement.

Parameter	Remarks	
Pipe diameter	For all insertion type flow sensors, enter the correct inner diameter of the pipe at the installation point. For in-line flow meters, the diameter can not be changed.	
Gas type	Select a gas from the list of available gas types. Some sensors have up to two real gas calibrations stored (for example, CO ₂ , CH ₄) which is indicated by the word CAL behind the gas type.	
Gas constant, Gas factor Max flow, Min flow	These parameters are for information only and can not be changed.	
Flow type (for S430 only)	S430 supports various flow types:	
	Flow:	Standard flow based on the reference conditions that you set. This is the most commonly used flow type, which corresponds to the standard flow measured with thermal mass flow meters.
	Dry air flow:	Flow rate of dry air that is calculated based on the relative inside-pipe humidity that you set. 90% is the default. S430 is mainly used in wet air flow behind compressors. This selection enables you to view the dry flow after the compressed air goes through a dryer.
	FAD:	Free Air Delivered referred back to the intake air conditions that you set (temperature, humidity, absolute pressure, and altitude).

Parameter	Remarks
	Actual flow: Actual volumetric flow rate at the system pressure.
Installation (for S430 only)	Select an installation type for S430: <ul style="list-style-type: none"> Center installation--The sensor tip is inserted to the center of the pipe. 100 mm insert depth--The sensor is only inserted 100 mm into the pipe. This installation type is used in big pipe diameters where a center installation is not feasible.
Cutoff Flow Threshold (for S401, S421 only)	The cutoff flow threshold is a lower limit of the flow. All measured flow that is lower than the threshold are set to zero.

6.2 Gas type

To select the gas type to be measured.

S415	S418	S418-V	S401	S421	S430
Air N2	Air CO2 O2 N2 N2O Ar Natural gas CH4 Propane Butane Others	Air	Air CO2 O2 N2 N2O Ar Natural gas CH4 Propane Butane Others	Air CO2 O2 N2 N2O Ar Natural gas CH4 Propane Butane Others	Air CO2 O2 N2 N2O Ar Natural gas CH4 Propane Butane Others

6.3 Units settings

To set units for flow, pressure, temperature, and consumption.

Available units are listed as follows based on the sensor types.

6.3.1 Flow units

S415	S418	S418-V	S401	S421	S430
l/min	l/min	l/min	m ³ /h	m ³ /h	m ³ /h
cfm	cfm	cfm	m ³ /min	m ³ /min	m ³ /min
kg/h	kg/h	kg/h	cfm	cfm	cfm
m ³ /h	m ³ /h	m ³ /h	l/min	l/min	l/min
Nm ³ /h	Nm ³ /h	Nm ³ /h	l/s	l/s	l/s
NI/min	NI/min	NI/min	kg/h	kg/h	kg/h
Ncfm	Ncfm	Ncfm	kg/min	kg/min	kg/min
			kg/s	kg/s	kg/s
			Nm ³ /min	Nm ³ /min	t/h
			NI/min	NI/min	lb/h
			Nm ³ /h	Nm ³ /h	Nm ³ /h
			NI/s	NI/s	Nm ³ /min
			Ncfm	Ncfm	Ncfm
					NI/min
					NI/s

6.3.2 Pressure units

S415	S418	S418-V	S401	S421	S430
N/A	bar PSI	bar PSI	N/A	N/A	bar PSI MPa

6.3.3 Temperature units

S415	S418	S418-V	S401	S421	S430
N/A	N/A	N/A	N/A	N/A	°C °F

6.3.4 Consumption units

S415	S418	S418-V	S401	S421	S430
m ³					
l	l	l	l	l	l
cf	cf	cf	kg	kg	kg
kg	kg	kg	cf	cf	cf
Nm ³	t				
NI	NI	NI	NI	NI	lb
Ncf	Ncf	Ncf	Ncf	Ncf	NI
					Nm ³
					Ncf

6.4 Reference conditions

To configure "Standard" or "Norm" conditions.

Reference conditions are used to calculate volumetric flow to so-called "Standard" or "Norm" conditions. This setting is important for gases because the volume of a gas varies with pressure and temperature.

Parameter	Values
Standard	1000 hPa, 20 °C
Norm	1013.25 hPa, 0 °C
Customer	

6.5 Factory settings

These settings are ex-factory and not changeable by users.

Parameter	Remarks
Filter grade	Enter a value between 0 ... 127 as the filter grade. It's a damping of the flow value which is used to stabilize the flow rate in systems where the flow is very unstable. A high value means a very high damping (slow response).
Profile factor	The profile factor is the ration between average flow in the pipe and the centre flow.
Over pressure	Used to surpress the small velocity values (< 1 m/s) and has no impact on readings above this value.

6.6 Counter settings

To set the consumption counter to a new start value. Some flow sensors work bi-directionally and therefore have a standard counter and a reverse counter.

6.7 Output settings

There are various output options available depending on the flow sensor type and the ordered options. Here is an overview of available outputs:

Output Option	Flow sensor
4 ... 20 mA + pulse	S401, S421, S430, S415, S418, S418-V
Modbus	S401, S421, S430, S415, S418, S418-V
MBUS	S401, S421, S430, S415, S418, S418-V
MBUS + Analog	S401, S421
Analog compatible	S401, S421
S400	

4 ... 20 mA + pulse	Description
Scaling: 4 mA 20 mA	Usually set to 0 flow Usually set to maximum flow
Pulse per unit	Drop list with the following three items: - 1 pulse per consumption unit (default) - 1 pulse per 10 consumption unit - 1 pulse per 100 consumption unit

Modbus	Description
Device address	Each device must have a unique device address within (1 ... 247) with the ex-factory value of 1.
Baudrate (All devices on the bus must have the same communication parameters: baudrate, parity, start and stop bits)	Select a baud rate from: 1200, 2400, 4800, 9600, 19200 (default), 38400, 57600, 115200
Parity	- None (default) - Even - Odd
Stop bit	- 1 (default) - 2

MBUS	Description
Primary Address	Settable from (1 ... 250)
Secondary Address	Settable and default is the product serial number.
Manufacturer Code	Read only
M-BUS Version	Read only
Baudrate	Settable from (300, 600, 1200, 2400, 4800, 9600)
Fabrication Number	Read only
Response Delay (ms)	Read only
Response Timeout (ms)	Read only
Receive Timeout (ms)	Settable from (0 ... 65535)

6.8 Calibration

To perform calibration on a sensor.

	S401	S421	S430	S415	S418	S418-V
Zero Flow Calibration	Y	Y	Y	Y	Y	Y
Zero Pressure calibration	N/A	N/A	Y	N/A	N/A	N/A

6.9 Logger settings

When a sensor comes with the data logger, you can use S4C-FS to change logger-related settings of the sensor.

Parameter	Remarks
Logger Status	To enable or disable the logger function.
Start Date & Time	To view the start date and time for sampling.
Stop Date & Time	To view the stop date and time for sampling.
Number of Samples	To view number of the data samples that the sensor has logged.
Sampling Rate(mm:ss)	To configure the sampling interval.

7 System

This chapter lists information that you can view in the System menu based on sensor types.

7.1 Sensor information

To view the sensor information.

	S401	S421	S430	S415	S418	S418-V
Device name	Y	Y	Y	Y	Y	Y
Item number	Y	Y	Y	Y	Y	Y
Serial number	Y	Y	Y	Y	Y	Y
Production date	Y	Y	Y	Y	Y	Y
Calibration date	Y	Y	Y	Y	Y	Y
Option name	Y	Y	Y	Y	Y	Y
Bi-directional measurement	Y	N/A	Y	N/A	N/A	N/A

	S401	S421	S430	S415	S418	S418-V
Hardware version	Y	Y	Y	Y	Y	Y
Firmware version	Y	Y	Y	Y	Y	Y

7.2 Language

To set the language for S4C-FS.

Language	语言	Sprache	Langue
English	中文	Deutsch	Francais

7.3 App version

To view the current version of S4C-FS.

8 Maintenance

Make sure that Bluetooth always works well on your Android device.

Please check whether the latest version is installed on your device. You can download the latest version from Google Play Store or the SUTO Website.

