Amendment to the operating instructions:
Selection of the operating mode via
IO-Link interface

SAxxxx
1 Preliminary note

⚠ Please read the supplied operating instructions for all articles described below prior to set-up.

These instructions are an amendment to the supplied operating instructions of the SAxxxx flow sensors in which all setting options via the pushbuttons on the sensor are described.

These present instructions also give alternative options for parameter setting via the IO-Link interface.
2 Operating modes
With regard to the software the SAxxxx flow sensor behaves like 3 sensors on a hardware platform: The following three operating modes can be selected for flow measurement.

<table>
<thead>
<tr>
<th>Operating mode</th>
<th>Medium</th>
<th>Process value display</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL</td>
<td>liquids, air</td>
<td>% of the taught range</td>
</tr>
<tr>
<td>LIQU</td>
<td>liquids</td>
<td>m/s, l/min, m3/h (fps, gpm, cfm)</td>
</tr>
<tr>
<td>GAS</td>
<td>air</td>
<td>m/s, l/min, m3/h (fps, gpm, cfm)</td>
</tr>
</tbody>
</table>

The operating modes can be set via the pushbuttons on the sensor. As an alternative the operating mode can be changed as follows:

- By means of the memory plug E30398 (→ 3)
- Via the LR SENSOR software (→ )
- Via the LR DEVICE software (→ 4.3)
- By setting the vendor ID and device ID at the IO-Link master port (→ 5).

3 Operating mode selection via memory plug E30398
By means of the memory plug E30398 it is possible to duplicate the parameter set and therefore the operating mode of a sensor to several sensors of the same type.

Detailed function description
3.1 Approach

1. Set the operating mode on the sensor:

- Change from the RUN mode to the initialisation menu [INI]
- Select [ModE] and define the operating mode: REL, GAS, LIQU.

**Information**
A medium and an internal pipe diameter must be entered for the operating modes LIQU and GAS.

When the factory setting is changed (ModE = REL), the unit displays [≡≡≡≡] to force these entries:
- Press [●].
  > [MEdI] is displayed.
- Define the medium.
  > [diA] is displayed.
- Define the internal pipe diameter in mm or inch.

**Information**
The operating mode REL requires a flow adjustment.

**Information**
A change of the operating mode leads to a restart of the unit.
The settings are saved in the respective operating mode, i.e. after a change of the operating mode the settings are not lost.

2. Save the parameter set of the sensor on the memory plug:

**Requirement:**
The memory plug is used as delivered (empty / [Write protected])

- Connect the memory plug to the supply voltage.

- Connect memory plug and sensor.
  > The memory plug reads the parameter set of the sensor and saves it.
3. Transfer a parameter set to other sensors:

- Connect the memory plug to the supply voltage.

- Connect the memory plug with a sensor of the same type.
  > The memory plug writes its parameter set to the sensor.

- Repeat the process with sensors of the same type as often as you wish.
Operating mode selection via a parameter setting software

4.1 System requirements

4.1.1 IO-Link interface E30390

Required version: from firmware 2.1.5 – 1.2.5 (production after 17/02/2016, see label on the unit).

If the firmware is older, the following error message is displayed. In this case, an update of the firmware is necessary.

The latest firmware is available for download at www.ifm.com.

- Download firmware and overwrite firmware on the IO-Link interface.


4.1.2 IODD (IO Device Description) for SAxxxx flow sensors

There is a separate IODD for each operating mode which is available for download via ifm's homepage:

SA5030, SA5040, SA2000, SA5000, SA4100, SA4300

IODD Release V1.3.25.555560 supports IODD1.0.1 and IODD1.1 - Standard

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dec 2016</td>
<td>zip</td>
<td>894.4 kB</td>
</tr>
</tbody>
</table>

SA5030_GAS, SA5040_GAS, SA2000_GAS, SA5000_GAS, SA4100_GAS, SA4300_GAS

IODD Release V1.3.23.543158 supports IODD1.0.1 and IODD1.1 - Standard

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</table>
- SAxxx Operating mode REL for flow measurement in liquids and air
- SAxxx_GAS Operating mode GAS for flow measurement in air
- SAxxx LIQU Operating mode LIQU for flow measurement in liquids

For ifm units a number of IODDs is stored in the LR SENSOR / LR DEVICE software. If the required IODD is missing, it can be loaded into the software via the marked cloud symbol:

If the symbol is pink, new IODD files are available for download.
4.2 LR SENSOR
Required version: from 4.1.0.43.


4.2.1 Approach
Example: SA5000 flow sensor.

1. Connect sensor to PC via IO-Link interface and read parameter settings via the LR SENSOR.

The parameter for the operating mode [ModE] is displayed but cannot be changed.

The factory setting for SAxxxx is the operating mode [ModE] = REL.

2. Change to the offline mode.
3. ► Select IODD for the required operating mode.

If the required IODD is not available in the unit catalogue, it has to be downloaded in the online mode (→ 4.1.2).

4. ► Change parameter settings of the sensor.
5. ► Save changed parameter set as lrp file.

In the offline mode, reading or writing to a connected device is not possible. The saved file with the parameter set can only be accessed in the online mode and then be written to the device.

6. ► Change to the online mode.
7. ► Load parameter set as file.

► Open the Lrp file stored in step 5.

The Lrp file contains the operating mode selected in step 3 with the parameter settings adapted in step 4.

The setting of the medium [MED] is not stored in the Lrp file. It has to be set manually under the menu item [MED].

8. ► Write the parameter set to the sensor.

> The sensor carries out a reset and restarts:

> The sensor is now in the GAS operating mode:

In case of a new parameter setting via the LR SENSOR the software detects the newly set operating mode automatically.
4.3 LR DEVICE


4.3.1 Approach

Example: SA5000 flow sensor.

1. ► Connect sensor to PC via IO-Link interface and read parameter settings via the LR DEVICE.

   ![LR DEVICE](image1)

   The parameter for the operating mode [ModE] is displayed but cannot be changed.

   ![Sensor Parameter](image2)

   The factory setting for SAxxxx is the operating mode [ModE] = REL.

2. ► Select IODD for the required operating mode.

   ![Device Parameter](image3)

   If the required IODD is not available in the unit catalogue, it has to be downloaded in the online mode (→ 4.1.2).
3. ► Change parameter settings of the sensor.

4. ► Write the parameter set to the sensor.

> The sensor carries out a reset and restarts:

> The sensor is now in the GAS operating mode:
5 Selection of the operating mode at the IO-Link master port

The SA sensors have a process data width of 4 bytes:
5.1 Determine vendor ID and device ID

► Vendor ID and device ID for the respective sensor and the requested operating mode can be found on our website at www.ifm.com.

5.1.1 Example for SA5000

► Enter the article number under Search.

> The article is displayed:
► Select the tab "Documents & downloads".
► Open PDF for the requested operating mode and language.

- PDF Operating mode REL for flow measurement in liquids and air
- PDF GAS Operating mode GAS for flow measurement in air
- PDF LIQUID Operating mode LIQU for flow measurement in liquids

► Note down vendor ID and device ID:

Version V1.3.25.555560 Release date 2016-10-25
Copyright 2016, Builder: 3.1.2.1, Time: 09:09:39

SA
Vendor ID 310 / 0x0136 - Bytes: 01 54 / 0x01 0x36
Device ID 533 / 0x000215 - Bytes: 00 02 21 / 0x00 0x02 0x15
Vendor name ifm electronic gmbh
Vendor text www.ifm.com
Vendor URL http://www.ifm.com/ifmgb/web/io-link-download.htm
5.2 Set vendor ID and device ID at the master port

In this example the software Siemens Step7 and the ifm IO-Link master AL1100 are used. The procedure may be slightly different with other control systems and other IO-Link masters.

- Select the module IO-Link 4 Byte Input in the device catalogue and drag and drop it to the respective port.
► Double-click the module to open the Properties window.

► Select the tab "Parameters".

► Enter vendor ID and device ID (→ 5.1):
  - Operating mode REL:
- Operating mode GAS:

![Image of parameters for Operating mode GAS]

- Operating mode LIQU:

![Image of parameters for Operating mode LIQU]

> When communication is initiated the master calls up the selected operating mode, the connected SA sensor adjusts automatically.