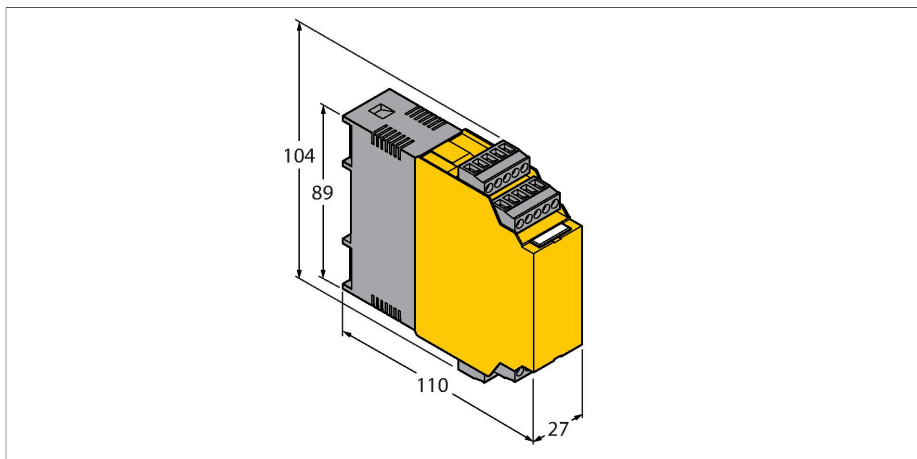# FM-IM-2UPLI63X
# Flow Monitoring  –   For the Connection of FCS and FCI Product Series Flow Sensors
# IO-Link Device with Current and Transistor Outputs



## Technical data

| Type | FM-IM-2UPLI63X |
|---|---|
| ID | 7525104 |
| **Electrical data** | |
| Operating voltage | 20…30  VDC |
| Power consumption | < 4.5 W |
| No-load current $I_0$ | ≤ 63 mA |
| Teach modes | Min/max adjustment. Teach modes incl. DeltaFlow monitoring (teach modes are automatically released with the change of flow speed). |
| Flow speed | [%] after min/max adjustment (permanent) |
| Medium temperature | [°C] with the SET button temporarily pressed |
| Repeatability flow rate | typical ± 1 % (of full scale) |
| Repeatability media temperature | typical ± 1 K |
| Measuring accuracy media temperature | typical ± 7 K |
| Switchpoint hysteresis media temperature | 2 K |
| Input function | Connection of flow sensors (non-Ex sensors of the FCS/FCI product series only!) |
| Sensor voltage | ≤ 15 VDC |
| Sensor current | ≤ 35 mA |

## Features

- Analog output for flow
- Transistor switching outputs for temperature and faults
- Teaching upper and lower flow limit
- LED band for indication of flow rate and media temperature
- Monitoring of operating and display range
- Detection of wire-break and short-circuit on the sensor side
- Standard IO or IO-Link operating mode
- Parametrized via pushbutton or software-supported via IO-Link

## Functional principle

All non-Ex flow sensors from the FCS series (immersion sensors) and FCI series (inline series) can be operated with the FM-IM external processing unit.

The flow module features four status LEDs as well as a 10-segment LED band for local monitoring. Software-based diagnostic options are also available to the user, such as wire-break and short-circuit on the sensor side.

## Technical data

| | |
|---|---|
| Sensor current limitation | approx. 110 mA |
| Measuring frequency | 5 Hz (every 200 ms with software filter) |
| **Output functions** | |
| Flow monitoring | Analog output |
| Temperature monitoring | transistor output |
| Error monitoring | transistor output |
| Current range | 4…20 mA / 20…4 mA parametrizable |
| Load | < 600 Ω |
| Characteristic | Output of probe signal, no linearization |
| Error recognition | NAMUR error limits |
| Switching characteristic | PNP |
| Switching state | active high / active low parametrizable (transistor output error monitoring only active low) |
| Switching voltage | 20…30 VDC |
| Switching current | 100  mA |
| Electrical connections | 5-pole removable reverse polarity protected terminal blocks |
| Connection mode | screw connection |
| Terminal cross-section | ≥ 1.5…≤ 2.5  mm² |
| **IO-Link** | |
| IO-Link specification | V 1.0 |
| Transmission rate | 38.4 kBit/s (COM 2) |
| Transmission physics | Transmission physics 3-wire physics (PHY 2) |
| Communication channel | Clamp 12 and via front panel jack COM (PC) |
| Communication modes | Tool based engineering via FDT / DTM, IODD. Acyclic communication via On-Request Data Objects |
| Included in the SIDI GSDML | Yes |
| **Tests/approvals** | |
| Approvals | CE, C-UL U.S. submitted |
| Electromagnetic compatibility (EMC) | Acc. to NE21 |
| Relative humidity | EN 60068-2-38 |
| **Mechanical data** | |
| Design | Signal processor |
| Dimensions | 89 x 110 x 27  mm |
| Housing material | Polycarbonate/ABS |
| Ambient temperature | -25…+70  °C |

Furthermore, monitoring of flow rates and media temperatures within a predefined operating and display range.

The upper and lower limit are determined in relation to the analog output signal and taught in using the implemented teach mode. Working on the calorimetric principle, the connectible sensors not only detect the flow rate but also the media temperature.

The flow module can be operated either in IO-Link (IOL) or in standard IO (SIO) mode via the integrated IO-Link interface. In SIO mode, the switching outputs are operated in the standard way. In IOL mode the current process signal is transmitted cyclically as a 10 bit-serial value.

Parametrization is initiated either via pushbutton or software-supported via IO-Link interface. The actual parametrization is then implemented via the tool-based DTM or IODD within the FDT frame PACTware™ or acyclically near the control via On-Request Data Objects (ORDO).

## Technical data

| | |
|---|---|
| Mounting type | DIN rail mounting and mounting panel |
| Protection class | IP20 |
| MTBF | 117  Years |

LED display

| LED | Color | Status | Description |
|---|---|---|---|
| Pwr | green | on | Operating voltage applied<br>Device ready for operation |
| | | flashing | Operating voltage applied<br>IO-Link communication active<br>(inverted flash with T on 900 ms and T off 100 ms) |
| Flow | yellow | on | Active current output |
| | | flashing | Teach mode / display of diagnostic data<br>for specification see manual |
| Temp | yellow | off | Switching output media temperature [low] |
| | | on | Switching output media temperature [high] |
| | | flashing | Teach mode / display of diagnostic data<br>for specification see manual |
| Fault | Red | Off | Switching output fault [high] |
| | | On | Switching output flow [low]<br>(for error pattern in combination with LEDs see manual) |

For detailed description of the display patterns and flashing codes see instruction manual FM-IM/FMX-IM

IO-Link (Process Data Objects)

| Bit | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow Value 10 Bit (Bit 15 = MSB, Bit 6 = LSB) | | | | | | | | | | not assigned | | | Out 3 (Fault) | Out 2 (Temp) | Out1 (Flow) |