

lix.one solo

User Manual

English

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Revisions

Version	Date	Author	Changes
1.0	17.05.2023	ASP	Initial release
1.1	01.06.2023	ASP	Added 7.2.2 Extended Events Added "Special mode" to 7.3.3 Memory Bank 2
1.2	22.11.2023	ASP	Renamed lix.solo to lix.one solo Added 6.5 Advanced Settings

1 General Information

The sensor is supplied with 24 VDC via the Zhaga connector and may never be connected to the 230 VAC mains under any circumstances.

Make sure that the sensor is correctly mounted and locked.

The manufacturer accepts no liability for damage caused by improper use.

2 Mounting Instructions

The sensor supports the Zhaga connectivity standard for plug and play luminaire extension. This allows flexible integration into luminaires without tools. The connectivity interface is designed according to Zhaga Book 18 Ed. 2.

2.1 Installation on the Luminaire



Press and rotate clockwise until the sensor locks into place

! Important: The sensor must be attached to the DOWNWARD facing Zhaga-connector



When the sensor is locked in place, the white marking on the sensor has to point towards the street.

! Important: Mounting the sensor incorrect might lead to malfunctions or permanent damage.

In the illustration below, the lix.one solo sensor is mounted on the lower Zhaga socket. A D4i-compatible luminaire controller must be mounted on the upper Zhaga socket.

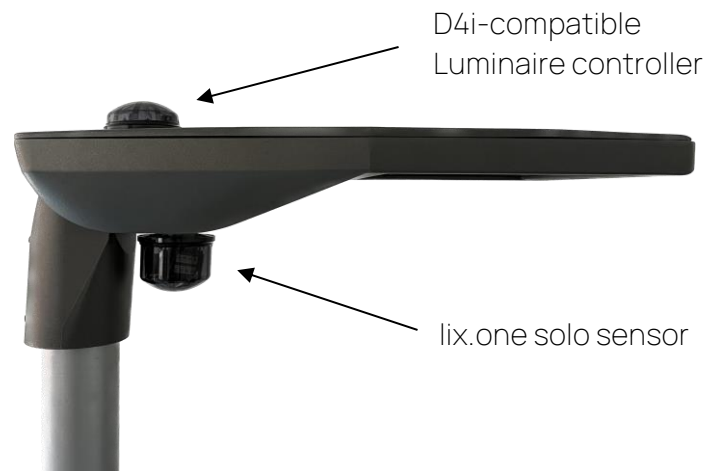


Figure 1: lix.one solo Luminaire Mounting

! Important: The lix.one solo sensor is a pure motion detector, which is without function without a likewise connected luminaire controller (DiiA Part 351 Type B Device).

3 Detection Area of the Sensor

The lix.one solo sensor is equipped with two radar sensors that look from the luminaire to the right and left into the road. Pedestrians are detected on both sides at approx. 20 m to 25 m, cars up to approx. 70 m, trucks and buses at 100 m and more.

Depending on an inclination of the luminaire or an inclination of the lower Zhaga socket on the luminaire, the detection range changes. This is shown in Figure 2. The sensor is designed for an inclination of 0° to 30°.

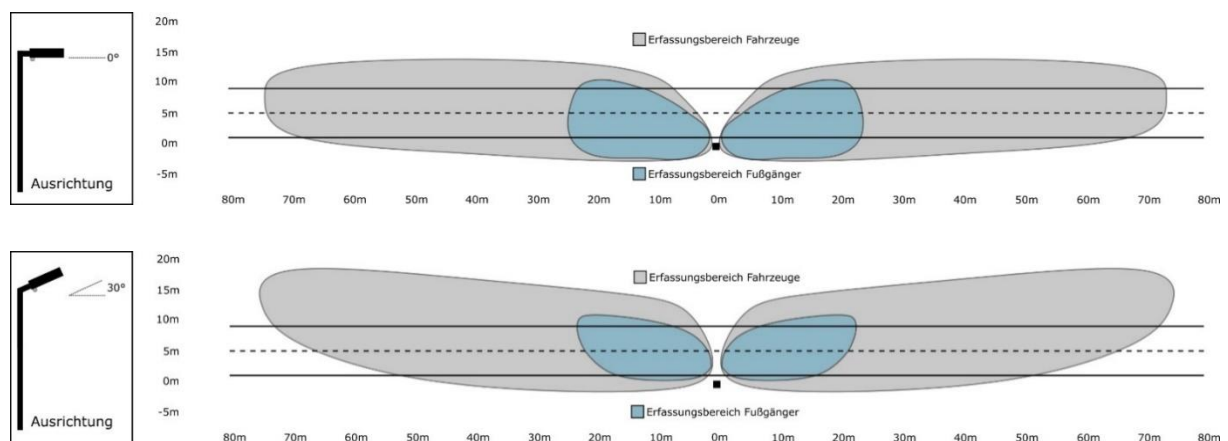


Figure 2: lix.one solo Detection Area

4 lix.one solo Status LEDs

The lix.one solo sensor has three status LEDs, which are visible for the user. The meaning of the LEDs is as follows:

- Red LED: Lights up when an object is detected
- Green LED: Lights up at a restart until the first valid DALI frame, which is addressed to the lix.one solo, has been received
- Blue LED: Lights up during initialization of the radio module

5 lixtec USB-Stick

A lixtec USB-Stick is required to use the lix.solo Configurator. It is plugged into a Windows notebook or PC and establishes a wireless connection to lix.one solo sensors within range.



Figure 3: lixtec USB-Stick

6 lix.solo Configurator

The configuration of the lix.one solo sensors is possible via the lix.solo Configurator. This is a user-friendly Windows app for displaying and configuring the lix.one solo sensor.

After starting the app, the basic view looks like this:

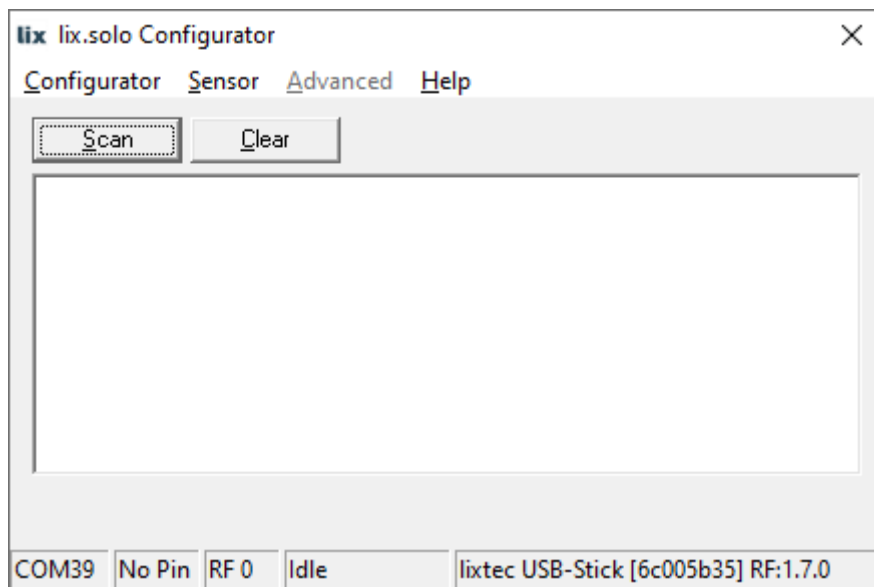


Figure 4: Basic View lix.solo Configurator

6.1 Connecting to a lix.one solo Sensor

Clicking the "Scan" button searches for lix.one solo sensors within range. If a lix.one solo sensor is within range, this (or several) will appear in the field below the "Scan" button as "lixtec Sensor ...".

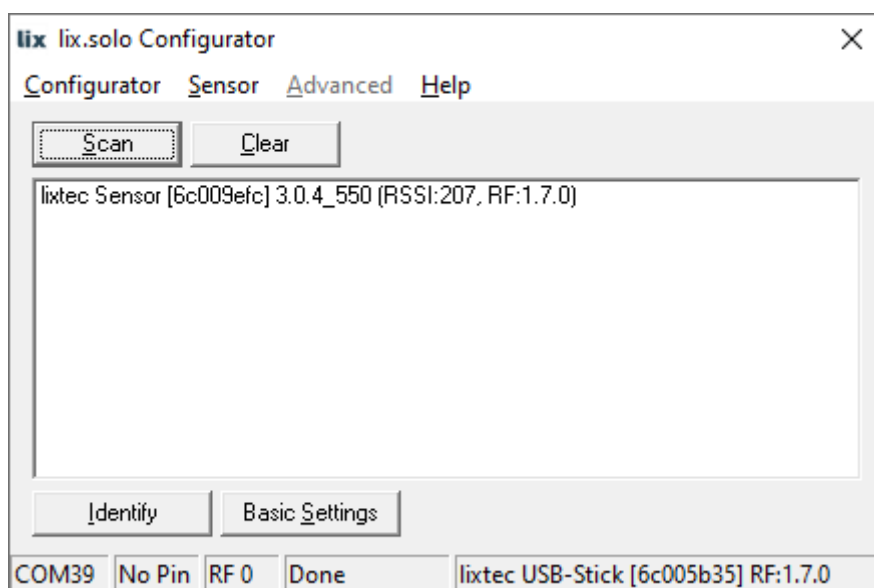


Figure 5: lix.solo Configurator / Scan

If a "lixtec sensor" is selected from the list with the mouse, a click on the "Identify" button helps to identify which sensor you are connected to.

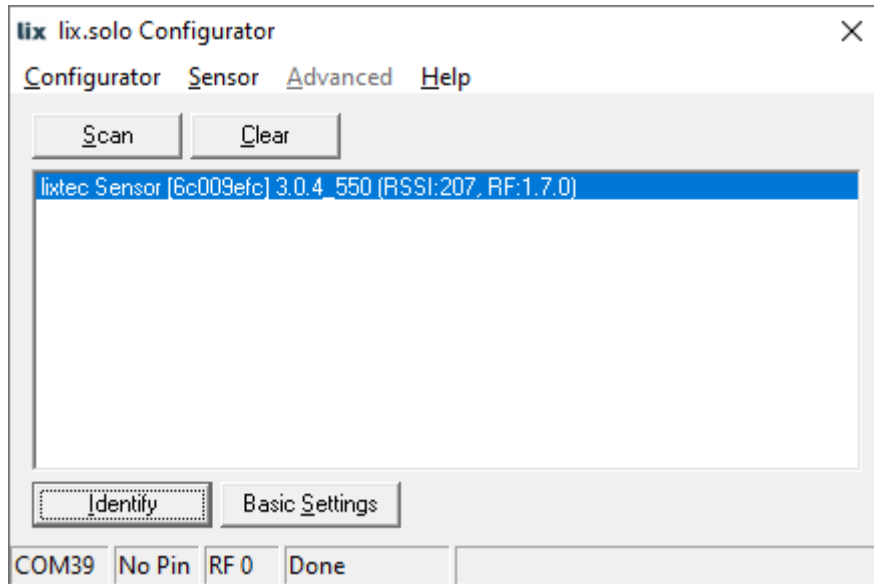


Figure 6: lix.solo Configurator / Identify

The connected sensor will play a flashing sequence with the 3 status LEDs (red, green, blue) lasting several seconds after clicking the "Identify" button.



Figure 7: lix.one solo / Flashing Sequence

- !** Important: In the factory default settings, all lix.one solo sensors are set to RF channel "0" and have no pin code set. If adjustments have already been made here, lix.one solo sensors on a different RF channel or with a set pin will not be found via a "Scan".

6.2 Basic Settings of the lix.one solo Sensor

If a "lixtec sensor" is selected from the list with the mouse, clicking on the "Basic Settings" button opens a pop-up window with the basic settings.

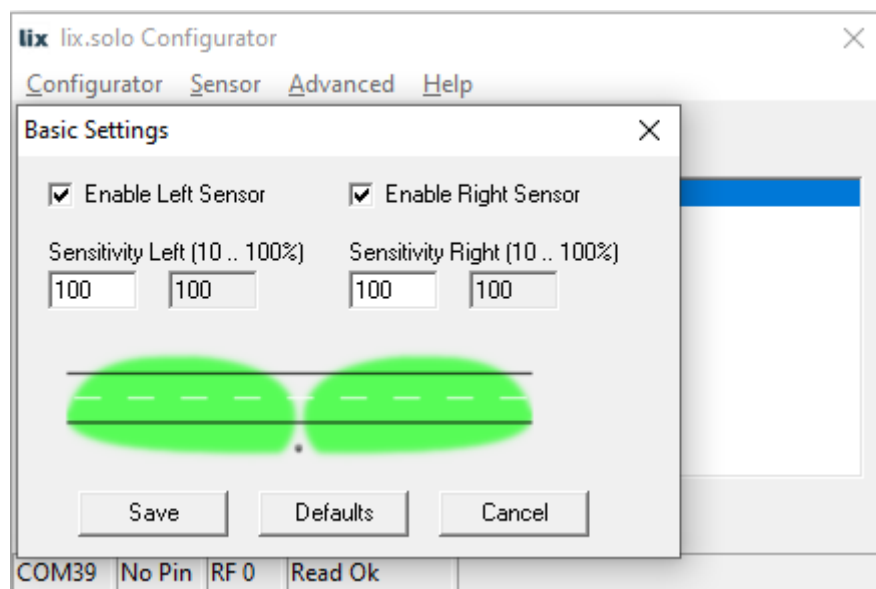


Figure 8: lix.one solo Sensor / Basic Settings

- "Enable Left/Right Sensor": By removing or setting the checkmark in the box and confirming with "Save", the left or right sensor will be deactivated or activated.
- „Sensitivity Left/Right...“: The sensitivity of the two radar sensors can be adjusted independently of each other. If there is an increase in false triggering (e.g. due to cross traffic), the sensitivity can be adjusted in 10% steps between 10% and 100%. Any change needs to be confirmed by clicking on the "Save" button.
- „Defaults“: By clicking this button and confirming with "Save", the factory settings are restored.
- „Cancel“: Clicking this button closes the pop-up window without changing the settings.

6.3 Settings Menu of the lix.one solo Sensor

If you click on the menu item "Sensor" in the lix.solo Configurator, a window with several selection options will open.

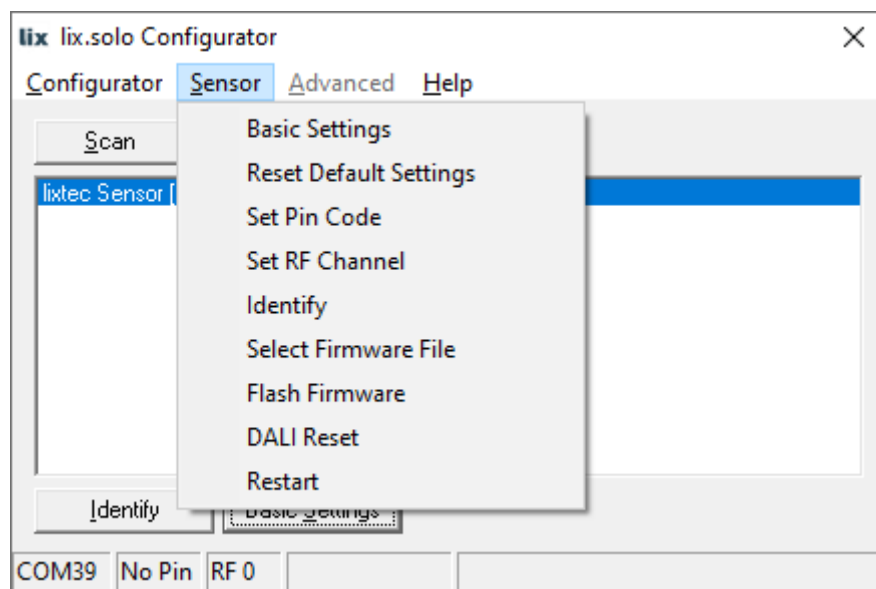


Figure 9: Sensor Options

- „Basic Settings“: Clicking on this menu item opens the pop-up window with the basic settings of the sensor (see 6.2 Basic Settings of the lix.one solo Sensor).
- „Reset Default Settings“: Clicking this menu item resets all settings of the sensor to the factory settings, including the RF channel ("0") and the pin code ("0").
- „Set Pin Code“: Clicking on this menu item opens a pop-up window in which a pin code for the sensor can be set from "0" to "9999999". "0" means no pin code. By checking "Change Configurator Pin Code", the Configurator is also set to this pin code at the same time.

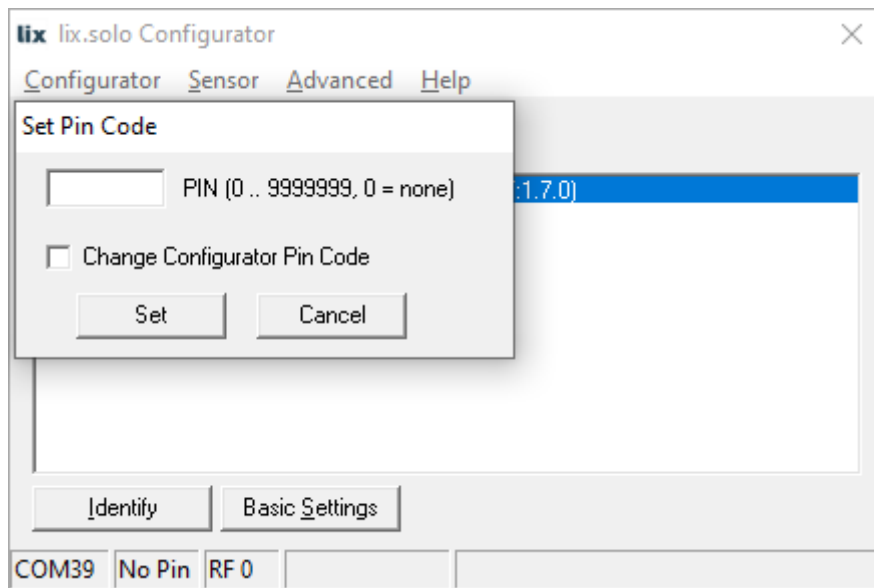


Figure 10: Sensor / Set Pin Code

- „Set RF Channel“: Clicking on this menu item opens a pop-up window in which the RF channel for the sensor can be set from "0" to "39". By setting the checkmark at "Change Configurator Pin Code", the Configurator is also set to this channel at the same time.

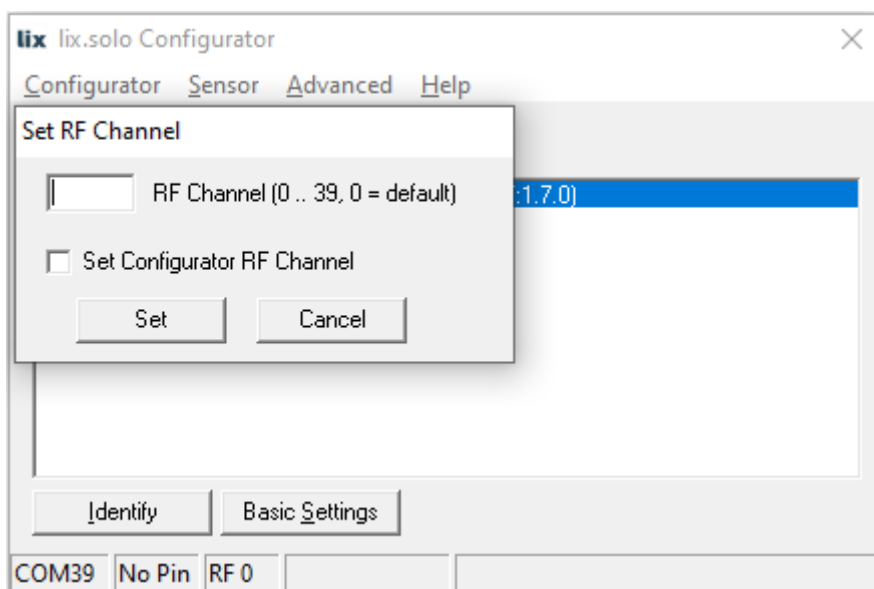


Figure 11: Sensor / Set RF Channel

- „Identify“: When you click on this button, the connected sensor will play a flashing sequence with the 3 status LEDs (red, green, blue) for several seconds so that you can see which sensor you are currently connected to (see also 6.1 Connecting to a lix.one solo Sensor).

- „Select Firmware File“: Clicking this button opens a Windows Explorer window where you can select a new firmware file on the PC.
- „Flash Firmware“: With a click on this button a previously selected firmware file is transferred to the sensor.
- „DALI Reset“: Clicking this button performs a DALI reset, e.g. resetting the short address (see also 7.1.1 Reset).
- „Restart“: Clicking on this button causes a reset and restart of the sensor.

6.4 Settings Menu of the lix.solo Configurator

If you click on the menu item "Configurator" in the lix.solo Configurator, a window with several selection options will open.

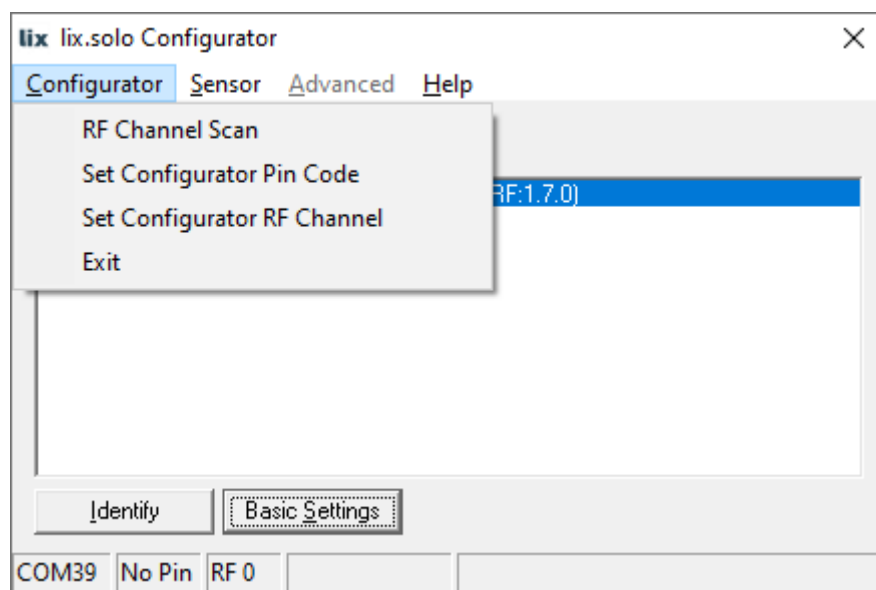


Figure 12: Configurator Options

- „RF Channel Scan“: With a click on this menu item all RF channels (“0” to “39”) are searched for lix.one solo sensors.



Important: Only sensors for which the pin code matches the pin code of the Configurator (factory setting: “0”) are displayed.

- „Set Configurator Pin Code“: If lix.one solo sensors were previously protected with an up to 7-digit pin code, this pin code must be set again on the Configurator in order to communicate with these sensors.
- „Set Configurator RF Channel“: If lix.one solo sensors were previously migrated to a different channel (delivery state: channel “0”), the same channel must be set on the Configurator in order to communicate with these sensors.

6.5 Advanced Settings Menu of the lix.one solo Sensor

If you click on the menu item "Advanced" in the lix.solo Configurator, a window with several selection options will open.

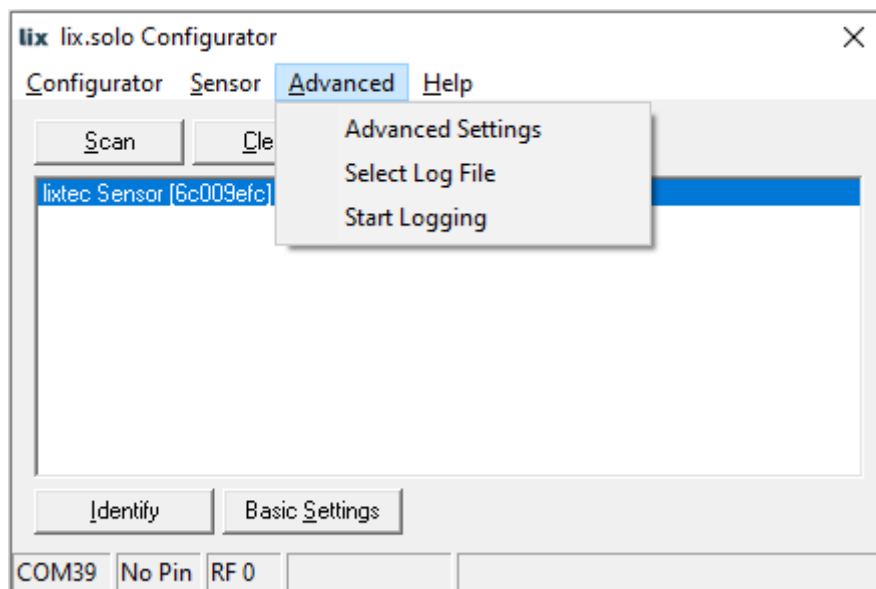


Figure 13: Advanced sensor options

- „Advanced Settings“: Clicking on this menu item opens the pop-up window with the advanced settings of the sensor (siehe 6.5.1 Advanced Settings).
- „Select Log File“: Clicking on this menu item opens a Windows® Explorer window in order to choose file name and location for the DALI communication logfile.
- „Start Logging“: Clicking on this menu item starts recording the DALI communication. A pop-up window opens and the DALI communication is logged until clicking the „End“ button.

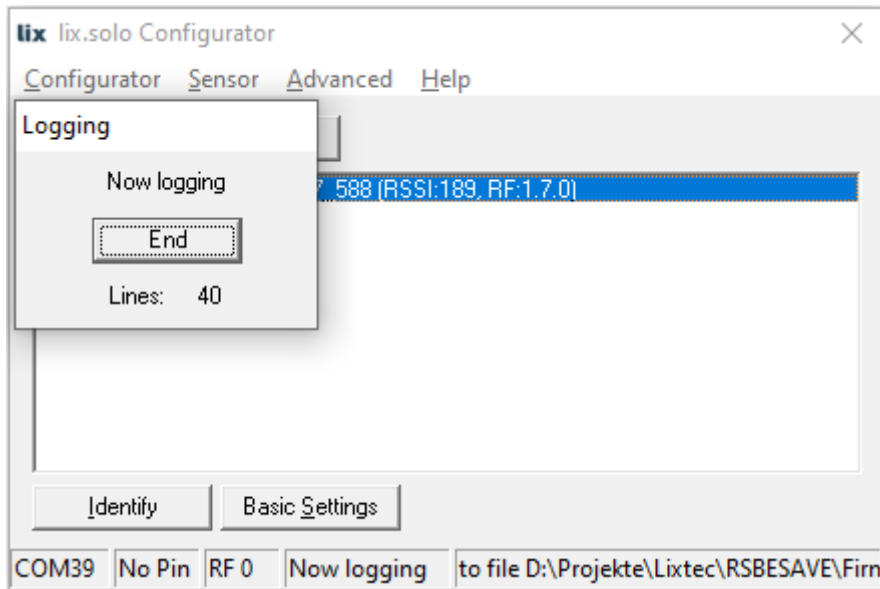


Figure 14: Po-up window „Logging“

After clicking the „End“ button, a pop-up windows stating “Logging finished” confirms that logging ended.

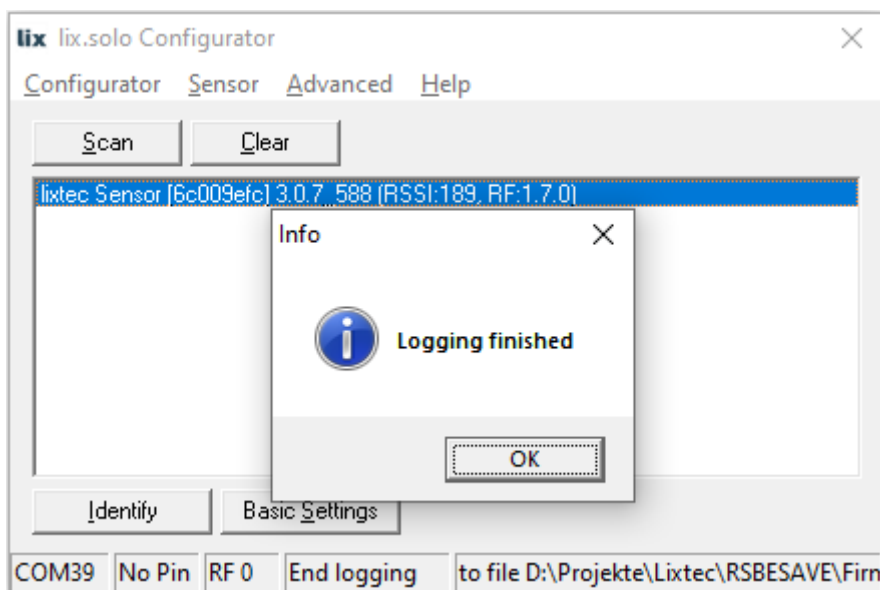


Figure 15: Pop-up window „Logging finished“

6.5.1 Advanced Settings

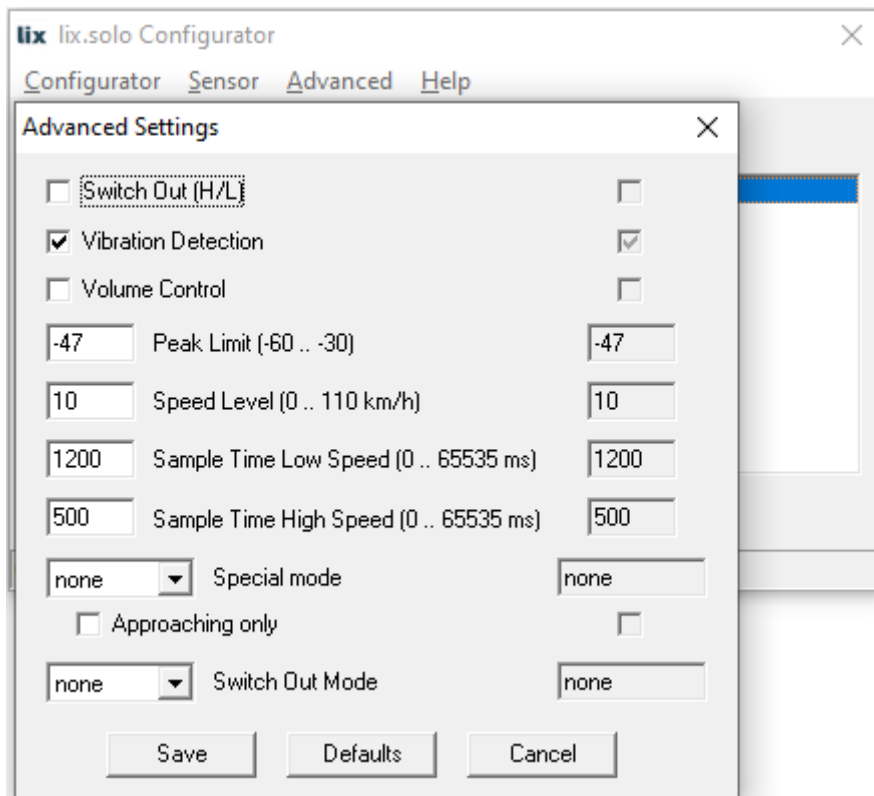


Figure 16: Advanced Settings

- Vibration Detection: Influences on the sensor through vibrations of the luminaire will be reduced by choosing this option. The vibration detection is activated by default.
- Volume Control: This function is used to count the vehicles. Attention: This function works with the lix.one solo only on two-lane roads with one lane in each direction. Counting will not work on roads with several lanes in one direction.
Attention: Detection of a vehicle is transmitted to the luminaire controller via a DALI telegram when it passes underneath the sensor. Vehicles must be counted on the luminaire controller; demand-based control does not work in this mode as the luminaires would switch on too late.
- Peak Level: Algorithm parameter, please do not change the default setting!
- Speed Level, Sample Time Low Speed, Sample Time High Speed: These settings affect the detection of objects. In the standard setting, objects below 10 km/h are evaluated over 1200 ms to determine whether they are a moving object or a disturbance. For objects above 10 km/h, this time is 500 ms by default.

Alternatively, these parameters can be used to hide objects above or below a certain speed by moving the speed level threshold and increasing the sample time above or below this threshold to 60000 ms.

- Special Mode: If the special mode "SpeedEV" (Speed event mode) is activated, information on the direction and speed of a detected object is also forwarded with the 24-bit event telegram (see 7.2.2 Extended Events). By ticking "Approaching only", only approaching objects are evaluated on both sensors. This prevents the same object from being evaluated twice when passing underneath the sensor.

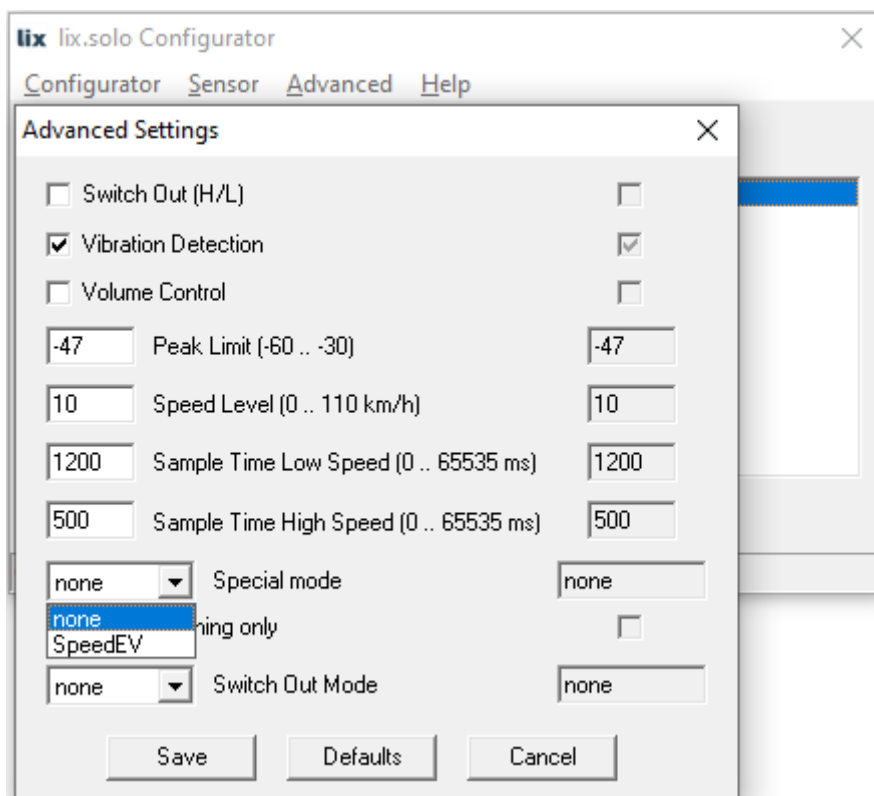


Figure 17: Advanced Settings / Special mode

- Switch Out (H/L): If detected, a digital signal can be output on pin 4 of the Zhaga connector. When the check mark is set, 24 VDC (or the operating voltage) is output at the pin; without a check mark, GND potential is output. The type of signal is selected in "Switch Out Mode".
- Switch Out Mode: In the drop-down menu can be selected which signal is output in Zhaga pin 4 when an object is detected:
 - o none: off, no signal
 - o 100msPuls: A 100 ms pulse is output on H/L for each detection.
 - o 200msPuls: A 200 ms pulse is output on H/L for each detection.
 - o RedLed: The signal, like the red LED, is permanently on H/L as long as an object is detected.
 - o Burst: When an object is detected, a 100 ms pulse is output cyclically on H/L with a 200 ms period for the duration of the detection.

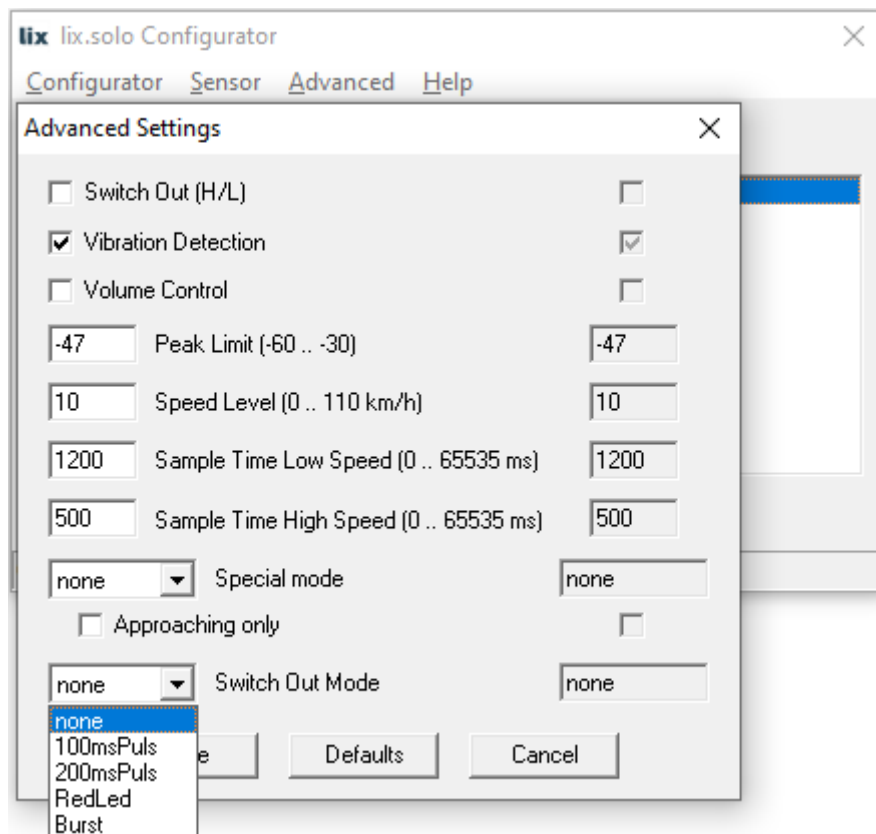


Figure 18: Advanced Settings / Switch Out Mode

7 DALI Functionality

In addition to configuration via the lix.solo Configurator, it is also possible to configure the sensor via DALI-2.

Electrical specifications, bit-timing, collision detection and frame encoding according to EN 62386-101 und EN 62386-103.

lix.one solo is a motion detector according to EN 62386-303.

lix.one solo is an input device type B according DiiA DALI Part 351.

lix.one solo has the following GTIN (Global Trade Item Number): 9120124990016

The lix.one solo sensor can be uniquely identified via DALI-2 using this GTIN.

7.1 Device Configuration

7.1.1 Reset

The RESET command sets all variables defined in EN 62386-103, Table 17 and 18 to the values defined in the "RESET VALUE" column.

Note: A reset can also be performed via the lix.solo Configurator.

7.2 Movement Sensor

7.2.1 Events

lix.one solo is a movement sensor with two possible states:

"Vacant & No Movement" or "Occupied & Movement"

These states are defined in EN 62386-303, Table 1. This table is shown below:

Table 1: "inputValue"

"inputValue"	Area State	Movement
0x00	Vacant	No
0x55	Vacant	Yes
0xAA	Occupied	No
0xFF	Occupied	Yes

7.2.2 Extended Events

In addition to normal events in case of a detection, the “Speed event mode” can be activated via the “Special mode” configuration (activation see 7.3.3 Memory Bank 2), starting from firmware v3.0.5-562. The 24-bit event frame (see EN 62386-103, Table 3 and EN 62386-303, Table 2) will then also include information on speed and direction of a detected object.

Table 2: Extended Events

Event name	Event information	Description
Standard event mode	00 0000 xxxxb	Default encoding according to EN 62386-303, Table 2
Speed event mode	1x xxxx xxxxb	Speed event mode active
Detection right sensor	10 xxxx xxxxb	Object detection on right sensor
Detection left sensor	11 xxxx xxxxb	Object detection on left sensor
Approaching object	1x 0xxx xxxxb	Object approaching the sensor
Receding object	1x 1xxx xxxxb	Object receding from the sensor
Object speed	1x xsss ssssb	s: object speed in 2 km/h resolution 0 ... 254 km/h (theoretical) 0 ... 114 km/h (lix.one solo)

7.3 Memory Banks

7.3.1 Memory Bank 0

Memory bank 0 is implemented according to EN 62386-103, Chapter 9.10.6, Table 12.

7.3.2 Memory Bank 1

Memory bank 1 is intended for additional OEM information, but is currently unused by lix.one solo.

7.3.3 Memory Bank 2

Memory bank 2 is implemented according to EN 62386-103, Chapter 9.10.2, Table 11.

Table 3: Memory Bank 2

Address	Description	Default Value	Reset Value	Memory Type
0x00	Address of last accessible memory location	0x18	no change	ROM
0x01	Indicator byte	0x01	no change	ROM
0x02	Memory bank lock byte	0xFF	0xFF	NVM
0x03	Allow detection right sensor	0x01	0x01	NVM
0x04	Allow detection left sensor	0x01	0x01	NVM
0x05	Reserved, don't change	0x00	0x00	NVM
0x06	Reserved, don't change	0x00	0x00	NVM
0x07	Reserved, don't change	0x01	0x01	NVM
0x08	Reserved, don't change	0x00	0x00	NVM
0x09	Reserved, don't change	0x00	0x00	NVM
0x0A	Reserved, don't change	0x00	0x00	NVM
0x0B	Reserved, don't change	0x00	0x00	NVM
0x0C	Reserved, don't change	0x00	0x00	NVM
0x0D	Reserved, don't change	0xFF	0xFF	NVM
0x0E	Reserved, don't change	0xCC	0xCC	NVM
0x0F	Reserved, don't change	0x00	0x00	NVM
0x10	Reserved, don't change	0x0A	0x0A	NVM
0x11	Reserved, don't change	0x03	0x03	NVM
0x12	Reserved, don't change	0x20	0x20	NVM
0x13	Reserved, don't change	0x01	0x01	NVM
0x14	Reserved, don't change	0x90	0x90	NVM
0x15	Sensitivity right sensor MSB	0x00	0x00	NVM
0x16	Sensitivity right sensor LSB	0x08	0x08	NVM
0x17	Sensitivity left sensor MSB	0x00	0x00	NVM
0x18	Sensitivity left sensor LSB	0x08	0x08	NVM
0x19	Special mode	0x00	0x00	NVM

To deactivate or activate one of the two sensors, the values listed in Table 4 must be set.

Table 4: Sensor De-/Activation

Address	Description	Value activated	Value deactivated
0x03	Allow detection right sensor	0x01	0x00
0x04	Allow detection left sensor	0x01	0x00

To reduce the sensitivity of the sensors, the values listed in Table 5 can be set. The sensitivity of the sensors can be set independently of each other. For the right sensor this value must be set for "0x16 / Sensitivity right sensor LSB", for the left sensor for "0x18 / Sensitivity left sensor LSB".

Table 5: Values for Sensor Sensitivity

Sensitivity	Value
100%	0x08
90%	0x09
80%	0x0A
70%	0x0B
60%	0x0C
50%	0x0D
40%	0x0E
30%	0x0F
20%	0x10
10%	0x11

Table 6 shows the possible values for „0x19 / Special mode“.

Table 6: Values for „Special mode“

Special mode	Value
Off	0x00
Speed event mode / approaching & receding objects	0x01
Speed event mode / approaching objects only	0x11

7.3.4 Memory Bank 201

Memory Bank 201 is implemented according to DALI Part 351, Table 4.