

Impuls Counting Module KNX-IMPZ2

Product Group 1

Use case: Integration of consumption meters with impuls outputs into the KNX bus.

The counting unit is designed to be used with a S0-Interface (according EN 43864) but can also be used with other impuls outputs with a potential free contact.

The two counting values can be two different meters or one meter with 2 tariffs. Switching the tariffs is done through the second input or over KNX.

Product Data Base: **impz_duo.pr4**

KNX Readable Data:

- Serial number
- Accumulated consumption
- Current flow rate/consumption rate
- Current time
- Current date
- Last reference date
- Last reference value
- Next reference date
- Consumption value
- Consumption Reset
- Consumption last reset date
- Consumption last reset time

KNX-IMPZ2	Article	Article Description	Article No.
EIB/KNX		Document: 5200_ex_IMPZ2.pdf	
	KNX-IMPZ2 -SK01	2 Channel S0 counter module with KNX interface SK01 plastic housing: 72 x 64 x 40 mm IP65	60201201
	KNX-IMPZ2 -REG	2 Channel S0 counter module with KNX interface DIN Rail mounted housing 2 units width (35 mm) IP20	60201202

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Imprint			

1 Application Description

Operating Principals and Areas of Application

The consumption counter by Arcus-EDS GmbH consists of a counter module with a battery buffered data memory and a KNX bus coupler for remote read-out and remote surveillance.

The counter ports are operable with most DIN 43864 S0-interfaces. They can also be wired with a potential-free contact.

The two counting values can be two different meters or one meter with 2 tariffs. Switching the tariffs is done through the second input or over KNX.

KNX sensors are set up using the ETS (KNX Tool Software) with the associated application program.

The device is delivered unprogrammed.

All functions are parameterized and programmed by ETS.

Functions, 2 Independent Counter

- Meter reading
- Capacity / Volumetric flow
- Consumption value
- Consumption reset date
- Consumption reset time
- Last reference date
- Last reference value
- Next reference date
- Serial number
- Time and date

Functions, Counter with 2 Scales

- Meter reading (Scale 1/2)
- Consumption value (Scale 1/2)
- Limit alarm (Scale 1/2)
- Capacity / Volumetric flow
- Consumption reset date
- Consumption reset time
- Last reference date
- Last reference value
- Next reference date
- Serial number
- Time and date

2 KNX Parameter

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2.1 General Settings

General Settings - KNX-IMPZ2

Parameter	Setting	Description
Use Daylight Saving Time	- no - yes	
Reset-PIN (0 without Pin)	0 .. 65535	A „PIN“ can be assigned in order to prevent unauthorized persons from resetting the consumption value. In order to reset the consumption value, that „PIN“ must be confirmed. This feature is deactivated if the assigned „PIN“ is „zero“.
Type of Counter	2 Independent Counter 1 Counter with 2 Scales	There are two types of counters available
If Flowrate drops	Send nothing Send value „zero“	There are two settings available
Use Limit Profile	yes no	Parameter Type of Counter = 2 Independent Counter If the setting is „No“, the object „Limit alarm“ will be set if one of the two „Limits“ set at „Parameters“ is reached. If the setting is „Yes“, the object „Limit alarm“ will be set at only one of the parameters set at „Limit values“, depending on the object „Alarm Profile“ (cf. Object chart)
		Parameter Type of Counter = 1 Counter with 2 Scales If the setting is „No“, the object „Limit alarm“ will be set if one of the two „Limits“ set at „Parameters“ is reached. If the setting is „Yes“, the object „Limit alarm“ will be set at only one of the parameters set at „Limit values“, depending on the object „Alarm Profile“ (cf. Object chart) The applied limit values will be selected depending on the object "selected scale". cf. 2.3 Counter with change of scale / object chart / alarm profile

2.2 Parameter - 2 Independent Counter

The screenshot shows the configuration interface for Channel 1 of the KNX-IMPZ2. The left sidebar contains a menu with 'General Settings', 'Channel 1' (selected), and 'Channel 2'. The main area displays the following parameters for Channel 1:

- Sending Values Cyclically:** Do Not Send
- Counts per Unit:** 10
- [Exponent]:** * 1
- Preset Counter Value [0 - no changes]:** 0
- Type of Flow Rate Measurement:** Volumetric Flow
- Flow Measurement Period:** Per Second
- Use of Limit 1:** Value Limit
- Limit 1:** 0
- [Exponent]:** * 1
- Use of Limit 2:** Value Limit
- Limit 2:** 0
- [Exponent]:** * 1

Parameter - 2 Independent Counter - KNX-IMPZ2

Parameter	Setting	Description
Sending Values Cyclically	• nicht senden • 1 .. 120 Minuten	Measured values will be sent in the preset cycle time. If cyclical sending is disabled, measured values will only be sent if changes in measured values occur. A minimum interval of 10 seconds is maintained in order to restrict bus load.
Count per Unit	0 .. 99	Impulse valence must be adjusted to the counter. The value to be set can be calculated from the impulse valence of the counter.
Exponent	10^{-10} .. 10^{10}	The value to be set can be calculated from the parameter value "Counts per Unit" and the display unit.
Preset Counter Value (0 - no change)	0 .. 4.294.967.295	If there is a difference between the value displayed in the cyclometer register and the object value „Meter reading“, the counter can be synchronized. All impulses already counted will be entered. Example: A consumption of 12.553 cbm and 1 imp/l equal a correction value of 12553.
Type of Flow Rate Measurement	Volumetric Flow Power Rating	There are two settings available
Flow Measurement Period	Per Second Per Minute Per Hour Per Day	Adjustment of the time base taken for the output of the amount of energy or the volumetric flow.

Parameter - 2 Independent Counter - KNX-IMPZ2 (continue)

Parameter	Setting	Description
Use of Limit 1/2	Value Limit Flow Upper Limit Flow Lower Limit Consumption Limit	The values are determined using the parameter sets „Limit 1" respectively „Limit 2", and the corresponding „Exponent".
Limit 1/2	0 .. 99	Limit determination
Exponent 1/2	10 ⁻¹⁰ .. 10 ¹⁰	see 4 Notes Settings the Pulse Rating

2.3 Parameter - 1 Counter with 2 Scales

General Settings	Channel 1
Channel 1	Sending Values Cyclically: Do Not Send Counts per Unit: 10 Counts per Unit Exponent: * 1 Preset Counter Value Scale 1 [0 - no changes]: 0 Preset Counter Value Scale 2 [0 - no changes]: 0 Type of Flow Rate: Volumetric Flow Flow Measurement Period: Per Second Use of Limit 1 Scale 1: Value Limit Limit 1 Scale 1: 0 Limit 1 Scale 1 Exponent: * 1 Use of Limit 2 Scale 1: Value Limit Limit 2 Scale 1: 0 Limit 2 Scale 1 Exponent: * 1 Use of Limit 1 Scale 2: Value Limit Limit 1 Scale 2: 0 Limit 1 Scale 2 Exponent: * 1 Use of Limit 2 Scale 2: Value Limit Limit 2 Scale 2: 0 Limit 2 Scale 2 Exponent: * 1

Parameter - 1 Counter with 2 Scales - KNX-IMPZ2

Parameter	Setting	Description
Sending Values Cyclically	• Do Not Send • 1 .. 120 minutes	Measured values will be sent in the preset cycle time. If cyclical sending is disabled, measured values will only be sent if changes in measured values occur. A minimum interval of 10 seconds is maintained in order to restrict bus load.
Count per Unit	0 .. 65535	Impulse valence must be adjusted to the counter. The value to be set can be calculated from the impulse valence of the counter. see 4 Notes Settings the Pulse Rating
Counts per Unit Exponent	10^{-10} .. 10^{+10}	The value to be set can be calculated from the parameter value „Counts per unit“ and the display unit. see 4 Notes Settings the Pulse Rating
Preset Counter Value Scale 1/2 (0 - no change)	0 .. 4.294.967.295	If there is a difference between the value displayed in the cyclometer register and the object value „Meter reading“, the counter can be synchronized. All impulses already counted will be entered. Example: A consumption of 12.553 cbm and 1 imp/l equal a correction value of 12553.
Type of Flow Rate Measurement	Volumetric Flow Power Rating	There are two settings available When setting „Electrical capacity“, the Parameter „Flow measurement period“ is not available.
Flow Measurement Period	Per Second Per Minute Per Hour Per Day	Adjustment of the time base taken for the output of the amount of energy or the volumetric flow.
Use of Limit 1/2 Scale 1/2	Value Limit Flow Upper Limit Flow Lower Limit Consumption Limit	The values are determined using the parameter sets „Limit 1/2 Scale 1/2“ and the corresponding „Limit 1/2 Scale 1/2 Exponent“.
Limit 1/2 Scale 1/2	0 .. 99	Limit determination
Limit 1/2 Scale 1/2 Exponent	10^{-10} .. 10^{+10}	see 4 Notes Settings the Pulse Rating

3 KNX Objects

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3.1 Objects - 2 Independent Counter

Objects - 2 Independent Counter - KNX-IMPZ2

No.	Label	Data Point Type				Function
0	Meter reading channel 1	DPT	14.076	Volume	4 Byte	Measured value
1	Meter reading channel 2	DPT	14.076	Volume	4 Byte	Measured value
2	Capacity / Volumetric flow channel 1	DPT	14.077	Volumetric flow	4 Byte	Measured value
3	Capacity / Volumetric flow channel 2	DPT	14.077	Volumetric flow	4 Byte	Measured value
4	Reference value channel 1	DPT	14.076	Volume	4 Byte	Measured value
5	Reference value channel 2	DPT	14.076	Volume	4 Byte	Measured value
6	Consumption value channel 1	DPT	14.076	Volume	4 Byte	Measured value
7	Consumption value channel 2	DPT	14.076	Volume	4 Byte	Measured value
8	Serial number channel 1	DPT	16.001	String	14 Byte	Identification
9	Serial number channel 2	DPT	16.001	String	14 Byte	Identification
10	Limit alarm channel 1	DPT	1.001	On/Off	1 Bit	
11	Limit alarm channel 2	DPT	1.001	On/Off	1 Bit	
12	Current time	DPT	10.001	time	3 Byte	time
13	Current date	DPT	11.001	date	3 Byte	date
14	Last reference date	DPT	11.001	date	3 Byte	date
15	Next reference date	DPT	11.001	date	3 Byte	date
16	Consumption reset				16 Bit	Reset
17	Consumption reset time	DPT	10.001	time	3 Byte	time
18	Consumption reset date	DPT	11.001	date	3 Byte	date
19	Alarm Profile	DPT	1.001	On/Off	1 Bit	

Object Description - 2 Independent Counter - KNX-IMPZ2

No.	Label	Description
0 1	Meter reading channel 1/2	Corresponds with current meter reading (total consumption)

Object Description - 2 Independent Counter - KNX-IMPZ2 (continue)

No.	Label	Description
2 3	Capacity / Volumetric flow channel 1/2	Current capacity in kWh per time unit or Volumetric flow in cbm per time unit. The time unit can be set using the parameter „Flow measurement period“.
4 5	Reference value channel 1/2	Meter reading at the last reference date, 0:00 am.
6 7	Consumption value channel 1/2	The amount consumed since the last consumption value reset
8 9	Serial number channel 1/2	The distinct serial number (e.g. serial number of the counter).
10 11	Limit alarm channel 1/2	Will be set if limit is reached. (cf. „General settings“, „Using limits“ and object „Alarm profile“)
12	Current time	Corresponds with internal time
13	Current date	Corresponds with internal date
14	Last reference date	The date when the last reference value was saved, 0:00 am.
15	Next reference date	The date when the next reference value will be saved, 0:00 am.
16	Consumption reset	Consumption value will be set to „zero“, the objects „Consumption reset time“ and „Consumption reset date“ will be refreshed and saved. If „Reset-PIN“ in „General Settings“ is other than „zero“, this „PIN“ must be used in order to actuate a reset. If „Reset-PIN“ is set to „zero“, a different „PIN“ other than „zero“ must be used in order to actuate a reset.
17	Consumption reset time	The time when the last consumption reset was carried out.
18	Consumption reset date	The date when the last consumption reset was carried out.
19	Alarm Profile	This object is only used if the parameter „Use Limit Profile“ in the „General settings“ is set to „Yes“. If the setting is „ZERO“, the parameterized „Limit 1“ will actuate the setting of the object „Limit alarm“. If the setting is „ONE“, the parameterized „Limit 2“ will actuate the setting of the object „Limit alarm“.

Following Objects can be Sent to

Object	Function
Current time	Set internal time
Current date	Set internal date
Next reference date	Set next reference date
Consumption reset	Consumption value will be set to „zero“, the objects „Consumption reset time“ and „Consumption reset date“ will be refreshed and saved. If „Reset-PIN“ in „General Settings“ is other than „zero“, this „PIN“ must be used in order to actuate a reset. If „Reset-PIN“ is set to „zero“, a different „PIN“ other than „zero“ must be used in order to actuate a reset.
Alarm Profile	This object is only used if the parameter „Use Limit Profile“ in the „General settings“ is set to „Yes“. If the setting is „ZERO“, the parameterized „Limit 1“ will actuate the setting of the object „Limit alarm“. If the setting is „ONE“, the parameterized „Limit 2“ will actuate the setting of the object „Limit alarm“.

3.2 Objects - 1 Counter with 2 Scales

Objects - 1 Counter with 2 Scales - KNX-IMPZ2

No.	Label	Data Point Type	Function
0	Scale value 1	DPT 14.076 Volume 4 Byte	Measured value
1	Scale value 2	DPT 14.076 Volume 4 Byte	Measured value
2	Capacity / Volumetric flow	DPT 14.077 Volumetric flow 4 Byte	Measured value
4	Reference value scale 1	DPT 14.076 Volume 4 Byte	Measured value
5	Reference value scale 2	DPT 14.076 Volume 4 Byte	Measured value
6	Consumption value scale 1	DPT 14.076 Volume 4 Byte	Measured value
7	Consumption value scale 2	DPT 14.076 Volume 4 Byte	Measured value
8	Serial number	DPT 16.001 String 14 Byte	Identification
9	Selected scale	DPT 1.001 1 Bit	
10	Limit alarm scale 1	DPT 1.001 On/Off 1 Bit	
11	Limit alarm scale 2	DPT 1.001 On/Off 1 Bit	
12	Current time	DPT 10.001 time 3 Byte	time
13	Current date	DPT 11.001 date 3 Byte	date
14	Last reference date	DPT 11.001 date 3 Byte	date
15	Next reference date	DPT 11.001 date 3 Byte	date
16	Consumption reset	16 Bit	Reset
17	Consumption reset time	DPT 10.001 time 3 Byte	time
18	Consumption reset date	DPT 11.001 date 3 Byte	date
19	Alarm Profile	DPT 1.001 On/Off 1 Bit	

Objects - 1 Counter with 2 Scales - KNX-IMPZ2

No.	Label	Description
0 1	Scale value 1/2	Corresponds with the current meter reading (total consumption), sub-divided by scales.
2	Capacity / Volumetric flow	Current capacity in kWh per time unit or volumetric flow in cbm per time unit. Time unit can be set using the parameter „Flow measurement period“.
4 5	Reference value scale 1/2	Meter reading at the last reference date, 0:00 am.
6 7	Consumption value scale 1/2	Amount used since last consumption value reset, sub-divided by scales.
8	Serial number	The distinct serial number (e.g. serial number of the counter).
9	Selected scale	Corresponds with the current scale „ZERO“ Scale 1 „ONE“ Scale 2 More Information see hhhhhhh 1 Counter with 2 Scales
10 11	Limit alarm scale 1/2	Will be set if limit is reached. (cf. Parameter „General settings“ „Use limit profile“ and object „Alarm profile“)
12	Current time	Corresponds with internal time
13	Current date	Corresponds with internal date
14	Last reference date	The date when the last reference value was saved, 0:00 am.
15	Next reference date	The date when the next reference value will be saved, 0:00 am.
16	Consumption reset	Consumption value will be set to „zero“ , the objects „Consumption reset time“ and „Consumption reset date“ will be refreshed and saved. If „Reset-PIN“ in „General Settings“ is other than „zero“, this „PIN“ must be used in order to actuate a reset. If „Reset-PIN“ is set to „zero“, a different „PIN“ other than „zero“ must be used in order to actuate a reset.
17	Consumption reset time	The time when the last consumption value reset was carried out.
18	Consumption reset date	The date when the last consumption value reset was carried out.

Objects - 1 Counter with 2 Scales - KNX-IMPZ2 (continue)

No.	Label	Description
19	Alarm Profile	This object is only used if the parameter „Use Limits" in the „General settings" is set to „Yes". If the setting is „ZERO", the parameterized „Limit 1" will actuate the setting of the object „Limit alarm". If the setting is „ONE", the parameterized „Limit 2" will actuate the setting of the object „Limit alarm". At both settings, please pay also attention to the value of the object „Selected scale". When setting „Selected scale" = „ZERO", limit 1/2, scale 1 is in use. When setting „Selected scale" = „ONE", limit 1/2, scale 2 is in use.

Following Objects can be Sent to

Object	Function
Current time	Set internal time
Current date	Set internal date
Next reference date	Set next reference date
Consumption reset	Consumption value will be set to „zero", the objects „Consumption reset time" and „Consumption reset date" will be refreshed and saved. If „Reset-PIN" in „General Settings" is other than „zero", this „PIN" must be used in order to actuate a reset. If „Reset-PIN" is set to „zero", a different „PIN" other than „zero" must be used in order to actuate a reset.
Alarm Profile	This object is only used if the parameter „Use Limit Profile" in the „General settings" is set to „Yes". If the setting is „ZERO", the parameterized „Limit 1" will actuate the setting of the object „Limit alarm". If the setting is „ONE", the parameterized „Limit 2" will actuate the setting of the object „Limit alarm".

4 Notes

1 Counter with 2 Scales

When using this type of counter, only one counter will be provided, offering the possibility to distinguish consumption between two scales. Switchover between the scales is carried out via a contact or switch that can be connected to the counter port „Scale / S0 [2]“. Information on scales must be supplied by the provider respectively the operator.

For remote data read-out with the KNX/EIB system, the following objects are available. If the scale port is permanently open, switchover can also be carried out using Object „Selected scale“.

Settings the Pulse Rating

For example, water

Impulse Valence Counter	Impulse / Unit in ETS	Exponent in ETS Display in m ³
1 Imp. / 1 Liter	1	3
1 Imp. / 10 Liter	1	2
1 Imp. / 25 Liter	4	1
1 Imp. / 50 Liter	2	1
1 Imp. / 100 Liter	1	1

For example, current

Impulse Valence Counter	Impulse / Unit in ETS	Exponent in ETS Display in kWh
500 Imp. / kWh	5	2
1000 Imp. / kWh	1	3
2000 Imp. / kWh	2	3
5000 Imp. / kWh	5	3
10.000 Imp. / kWh	10	3

For example, gas

Impulse Valence Counter	Impulse / Unit in ETS	Exponent in ETS Display in m ³
1 Imp. / 0,001m ³	1	3
1 Imp. / 0,01m ³	1	2
1 Imp. / 0,025 m ³	4	1

5 Product Page

The Counter-Modul **KNX-IMPZ2** is used for remote reading and remote monitoring of metering data

The module is suitable to detect values of heat-, water-, current- and gas counter with S0-Interface.

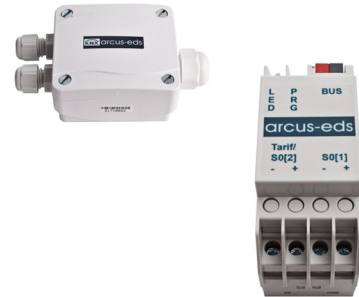
The two counting values can be two different meters or one meter with 2 tariffs. Switching the tariffs is done through the second input or over KNX.

The device has an integrated bus coupling unit and needs no auxiliary power.

The Counter-Modul **KNX-IMPZ2-SK01** is delivered in a housing of an impact resistant glass pallet reinforced plastic with gasket and achieves the protection class IP65.

The Counter-Modul **KNX-IMPZ2-REG** is intended for DIN rail mounting in dry indoor environment. Mounting is done by clipping the device on the DIN rail. Protection class IP20 is achieved.

Article-No.: 6020120x



KNX-IMPZ2
2 Channel Impuls Counter
SK01 IP65
REG IP20

Areas of Application

- General monitoring of consumption values

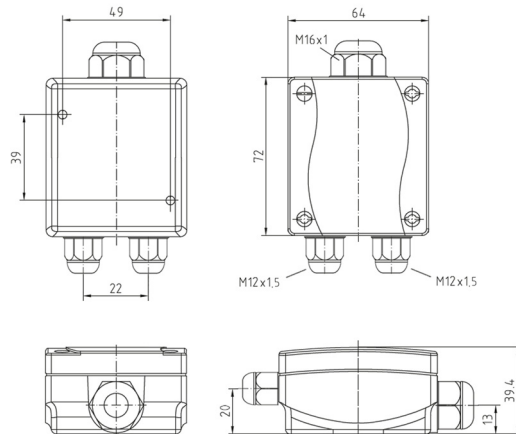
The counting unit is designed to be used with a S0-Interface (according EN 43864) but can also be used with other impuls outputs with a potential free contact.
The two counting values can be two different meters or one meter with 2 tariffs. Switching the tariffs is done through the second input or over KNX.

Operating Temperature: -20 .. +55 °C
Storage Temperature: -20 .. +85 °C

Operating Voltage: 21 .. 32VDC
Power Consumption: ca. 240mW (at 24VDC)

Protection Class:

KNX-IMPZ2-SK01: IP65
KNX-IMPZ2-REG: IP20



6 Technical Data

Technical Data - KNX-IMPZ2

Operating Voltage	EIB/KNX bus voltage 21 .. 32 VDC
Power Consumption	ca. 240 mW (at 24VDC)
Auxiliary Supply	not required
Bus Coupler	integrated
Ambient Temperature Electronic Measuring Equipment Casing	Operation: -20 .. +55 °C Storage: -20 .. +85 °C
Start-up with ETS	impz_duo.pr4
Circuit Points	EIB-2-pole clamps (red / black)
Protection Class SK01	IP65
Assembly Type SK01	Assembly with 2 screws finery
Casing Type SK01	Plastic housing grey
Casing Dimensions SK01	115 x 65 x 50 mm (W x H x D)
Article Number SK01	60201201
Protection Class REG	IP20
Assembly Type REG	DIN rail mounting
Casing Dimensions REG	2 TE (35 mm)
Article Number REG	60201202

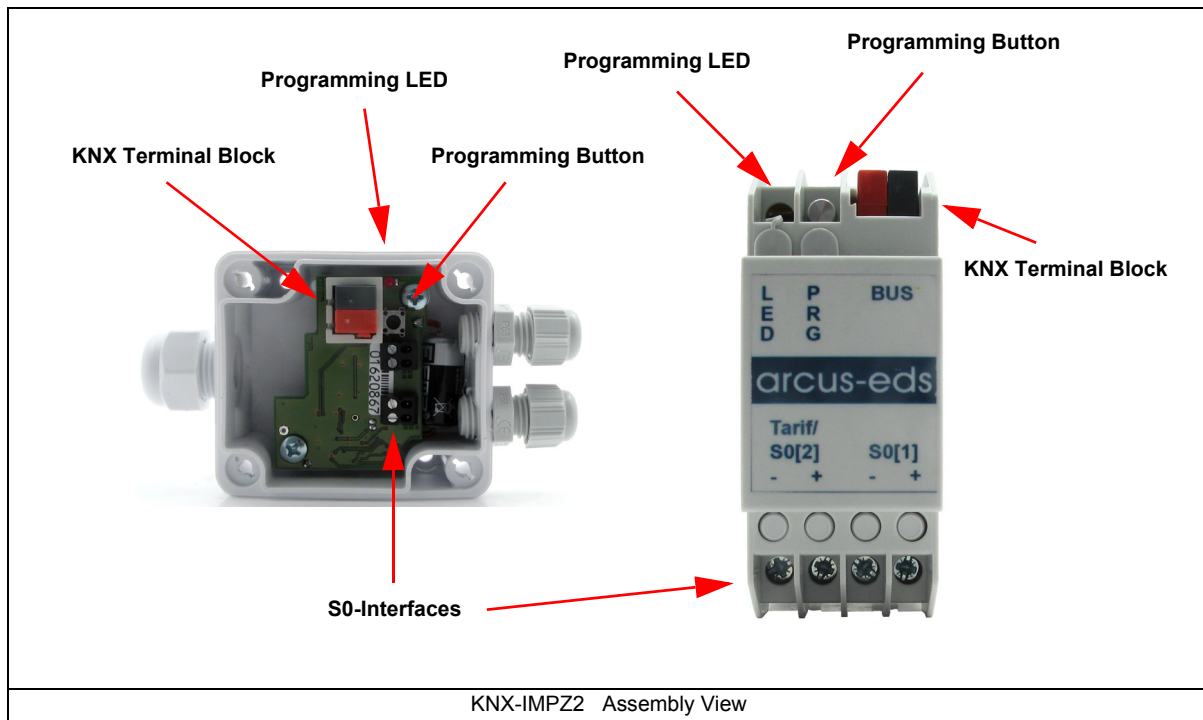
7 Startup

The KNX Sensor is set up using the ETS (KNX Tool Software) and the applicable application program.

The sensor is delivered unprogrammed.

All functions are programmed and parameterized with ETS.

Please read the ETS instructions.



8 Montage

The Counter-Modul **KNX-IMPZ2-SK01** is for outdoor and indoor areas.

It fulfills protection class IP65.

Mounting is done on wall through 2 screw holes.

The cover of the device can be removed by turning the screws on the top.

First attach the sensor to the wall or ceiling, then insert the KNX Bus cable into the slot on the side of the casing (PG Connection).

Detach the bus clamp from the device, attach the cable and replace the clamp onto the board.

After successfully programming the device, screw the cover back on.

Be careful not to damage the electronics with tools and cable heads.

The Counter-Modul **KNX-IMPZ2-REG** is intended for DIN rail mounting in dry indoor environment. Mounting is done by clipping the device on the DIN rail.

Protection class IP20 is achieved.

In Case of Bus Voltage Recurrence

The controller and outputs start with their current values and the ETS parameter settings are saved.

Discharge Program and Reset Sensor

In order to delete the programming (projecting) and to reset the module back to delivery status, it must be switched to zero potential (disconnect the EIB bus coupler).

Press and hold the programming button while reconnecting the EIB bus coupler and wait until the programming LED lights up (approx. 5-10 seconds).

Now you can release the programming button.

The module is ready for renewed projecting.

If you release the programming button too early, repeat the aforementioned procedure.

Imprint

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Safety Regulations

Attention! Installation and mounting must be carried out by a qualified electrician.

The buyer/operator of the facility has to make sure that all relevant safety regulations, issued by VDE, TÜV and the responsible energy suppliers are respected. There is no warranty for defects and damages caused by improper use of the devices or by non-compliance with the operating manuals.

Warranty

We take over guarantees as required by law.

Please contact us if malfunctions occur. In this case, please send the device including a description of the error to the company's address named below.

Manufacturer



Registered Trademarks



The CE trademark is a curb market sign that exclusively directs to authorities and does not include any assurance of product properties.



Registered trademark of the Konnex Association.