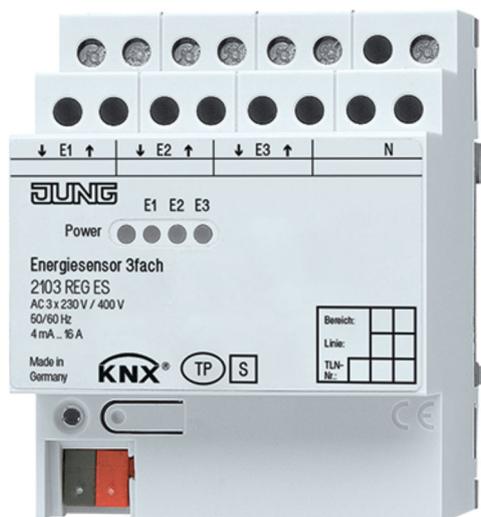KNX®

JUNG

Energy detector 3-gang
Ref.-no. 2103 REG ES

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Date of the documentation: 06.2020

Table of Contents

1. Information on the Product

1.1. Product Catalogue

Product name:	Energy detector 3-gang
Use:	Phys. Sensors
Design:	REG (for rail mounting)
Ref. no.	2103 REG ES

1.2. Application purpose

The energy counter detects the active energy supplied or drawn from the mains for up to three phases with a high level of accuracy.

In addition, the energy counter also records voltage, current, active power, reactive power and frequency. The resulting energy costs are calculated for up to three Rates.

With the aid of integrated monitoring functions, peak loads can be detected, reported and avoided by means of additional measures.

All information, limiting values and measured values are accessible via KNX telegrams.

The device is suitable both for direct current measurement and for current measurement with external current transformers. The connection of external current transformers allows the measurement of greater currents of up to 75 A. Accordingly, higher outputs can be recorded.

ⓘ   This KNX device is not an electric meter for billing purposes as defined by the standards (e.g. IEC 62052-11).

1.3. Intended use

Energy counter for alternating or three-phase current 110/400 V AC / 50 Hz + 60 Hz, for recording and visualising consumption values in KNX.

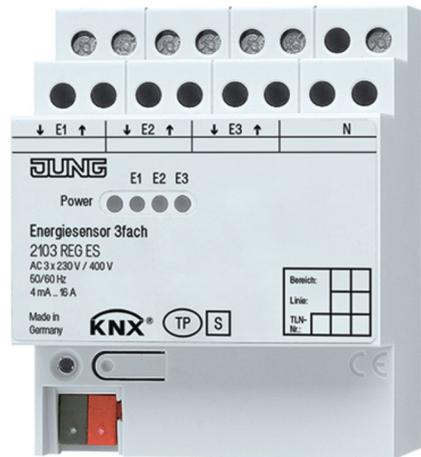Not approved for billing purposes.

1.4.   Structure of the device

Figure 1: Structure of the device variant

1.5.   Technical data

General

Certification mark	KNX
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Max. atmospheric humidity:	95%
Weight	approx. 300 g
Protection level:	IP 20
Installation width	72 mm / 4 rail units
Installation position	Any (preferably top output terminals)
Minimum distances	None
Fastening type	Snapping onto top hat rails in closed housing (e.g. small distributors, etc.)

Connection terminals for mains power supply and inputs

Connection type	Screw terminal
Single-wire	0.5 ... 4 mm²
Stranded without ferrule	0.5 ... 4 mm²
Stranded with ferrule	0.5 ... 2.5 mm²
Connection torque	max. 0.8 Nm

KNX supply

KNX Medium	TP 1
Commissioning mode	S-Mode
KNX rated voltage	DC 21 ... 32 V SELV
Current consumption by KNX bus:	≤ 18.9 mA
Connection type KNX	Connection terminal

External supply via E1

Rated voltage	AC 230 ... 240 V~
Mains frequency	50 / 60 Hz
Power loss	max. 2 W

Inputs E1 .. E3

Rated voltage:	3x230/400 V AC
Rated voltage range:	85 - 265 V AC

Rated current range:	
With direct measurement	(corr. to 2.5 W) - 16 A
With operation with external current transformers	(corr. to 37 W) - 75 A

Rated frequency:	50 / 60 Hz
Measurands:	Voltage (rms value)
	Current (rms value)
	Frequency
	Active power (signed +/-)
	Reactive power (signed +/-)
	Active energy (signed +/-)

Measuring accuracy [1]:

Without external current transformer:	Active consumption (2 mA ... 10 mA) +/- 5%, +/-150 mW
	Active consumption (10 mA ... 200 mA) +/- 2%
	Active consumption (200 mA ... 16 A) +/- 1%

With external current transformers:	Active consumption (30 mA ... 150 mA) +/- 10%, +/- 2 W
	Active consumption (150 mA ... 3 A) +/- 3%
	Active consumption (3 A ... 75 A) +/- 2%

Pulse LED	6400 / kWh
Pulse duration	4.9 ms
Power loss voltage measurement:	≤ 0.03 W / phase
Power loss current measurement	≤ 0.8 W / phase
Power consumption from mains:	< 1 W

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[1] The stated values only apply if the currents an voltage are sine and undistorted and the output factor is 1.

2.   Safety instructions

Electrical devices may only be installed and mounted by electrically skilled persons.

Danger of electric shock. Always disconnect before carrying out work on the device or load. At the same time, take into account all circuit breakers that supply dangerous voltage to the device or load.

Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

Use circuit breakers for the leads (rated current ≤ 16 A).

When using external current transformers, comply with the documentation of the current transformers. The external current transformers are also to be regarded as live on the secondary side.

Danger of electric shock. During installation and cable routing, comply with the regulations and standards which apply for SELV circuits.

During installation, ensure sufficient insulation between the mains voltage and the bus! Ensure a minimum distance of at least 4 mm between bus and mains voltage wires.

Do not open the device or operate it outside of its technical specifications.

These instructions are an integral part of the product, and must remain with the end customer.

3. Mounting and electrical connection

> ⚠️ **DANGER!**
>
> **Electric shock when live parts are touched. An electric shock can be fatal.**
>
> **Before working on the device, disconnect the connection cables and cover live parts in the area.**
>
> **Do not remove the housing cover! Dangerous voltages may still be present even after removing the connections!**

3.1. Operation without external current transformer

3.1.1. Mounting and connection
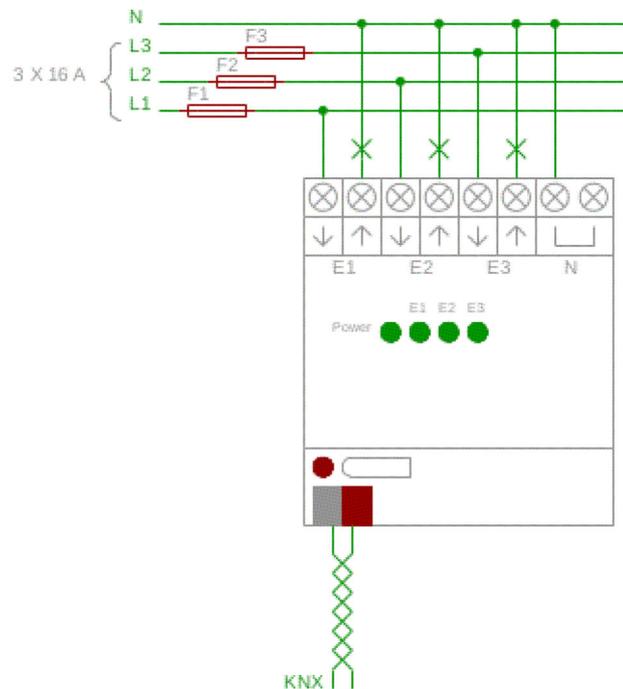
Figure 2:   Connection diagram for direct current measurement

■   Snap the device onto the DIN rail. The terminals for the mains should be located at the top.

■   Connect the mains, load and bus terminal as shown in Fig. 2. In so doing, the neutral conductor must be connected to the device.
On removal, the neutral conductor must be disconnected from the device last.

ⓘ   NOTE: A load must always be inserted between the output and the neutral conductor (>< symbol). The output and neutral conductor may not be connected without a load.

ⓘ   NOTE: The mains infeeds L1, L2 and L3 must be protected with ≤ 16 A.

ⓘ   NOTE: L2 and L3 are not required for the operation of the energy counter and can be optionally left out, as the device is only supplied via L1 on the mains side.

3.2.   Operation with external current transformers

If the device is operated with external current transformers, then the external current transformers are to be installed in a distribution cabinet on a DIN rail according to DIN EN 60715.

The device only supports external current transformers with a primary current of 75 A and a 5 A secondary current. We recommend using the same transformer type for each of the three inputs of the energy detector 2103 REG ES. Current transformers of type PACT MCR-V1-21-44-75-5A-1 (PHOENIX CONTACT Reference number 2277611) are recommended with the accessories of the support rail adapter PACT MCR-RA (PHOENIX CONTACT Reference number 2277598).

ⓘ   The accuracy of the measurement is primarily dependent on the current transformer type used.

3.2.1.   Mounting and connection

> ⚠ **DANGER!**
>
> **Electric shock when live parts are touched. An electric shock can be fatal.**
>
> **Before working on the device, disconnect the connection cables and cover live parts in the area.**
>
> **Do not remove the housing cover! Dangerous voltages may still be present even after removing the connections!**
>
> **In transformer mode, the external current transformers are also to be regarded as live on the secondary side.**
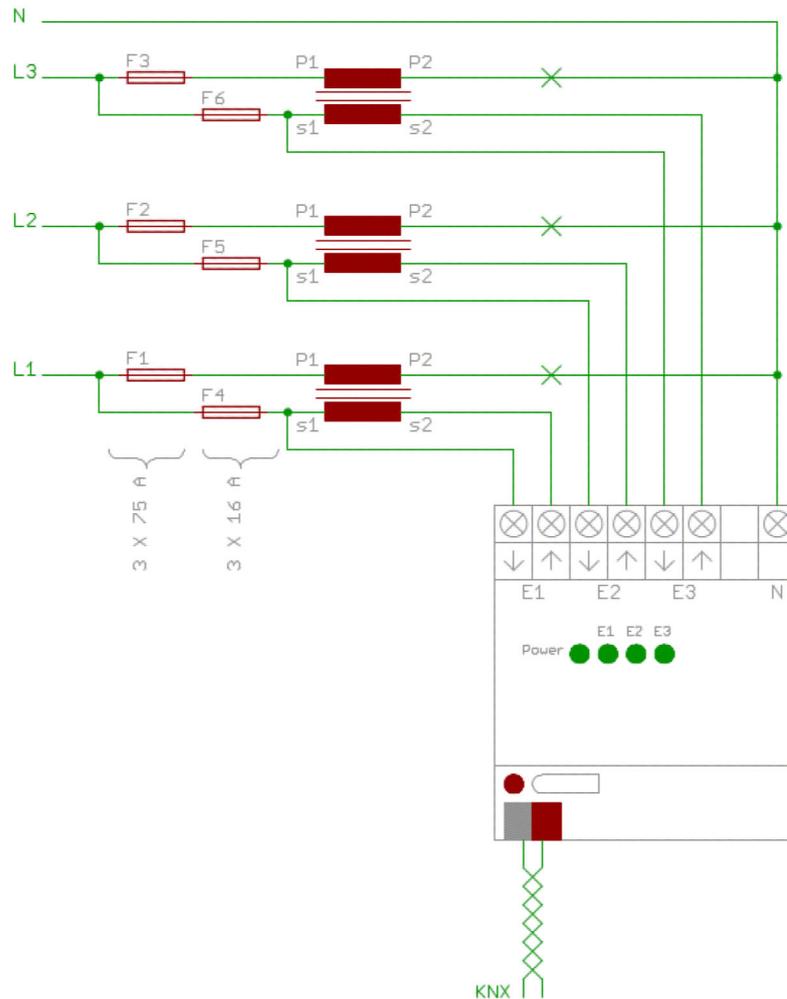
Figure 3: Connection diagram for current measurement using current transformers

- Snap the device onto the DIN rail. The terminals for the mains should be located at the top.

- If the device is operated with external current transformers, then connect according to Fig. 3.
  When connecting the cables to the screw terminals of the device, the neutral conductor must be connected to the device first. On removal, the neutral conductor must be disconnected from the device last.

- ⓘ NOTE: A load must always be inserted between the output and the neutral conductor (>< symbol). The output and neutral conductor may not be connected without a load.

- The mains voltage infeed lines to the primary sides of the current transformers must be protected according to the primary rated current and the current rating of the cable with F1, F2, F3 fuses (max. 75 A).

- The secondary sides of the current transformers are connected in a single-pole manner to the mains voltage using a cable to be protected with the rated current of the energy detector 2103 REG ES. The poles of the secondary sides of the current transformers are to be connected using the inputs E1, E2 and E3 of the energy detector 2103 REG ES. The cable cross-section must be 2.5 mm^2.

3.2.2. Operational instructions

ℹ️ During operation with open secondary sides, high voltages can occur on current transformers. For this reason, the current transformers must always be connected to the inputs E1, E2, E3, before reconnecting the primary circuit.

ℹ️ The connection of the current transformers to the inputs E1, E2 and E3 of the energy detector 2103 REG ES prevents such surge voltages.

ℹ️ The connection of the secondary sides of the current transformers with the input voltage means that the current transformers and their connections have a 230 V voltage potential.

ℹ️ The secondary sides of the current transformers are therefore live parts and must be covered, so that cannot be touched after installation.

4. Commissioning

> ⚠️ **DANGER!**
>
> **Electric shock when live parts are touched. An electric shock can be fatal.**
>
> **Before working on the device, disconnect the connection cables and cover live parts in the area.**
>
> **Do not remove the housing cover! Dangerous voltages may still be present even after removing the connections!**
>
> **In transformer mode, the external current transformers are also to be regarded as live on the secondary side.**

After setting the physical address, loading the application by means of ETS and connecting to the mains voltage, the energy counter is ready for operation.

The Power LED lights up continuously if the energy counter is in operation and the energy saving mode is not active. Channel LEDs E1, E2 and E3 indicate the measurement of an energy amount of 1/6400 kWh at the respective channel by lighting up briefly.

If the Power saving mode is activated, the Power LED goes out and no energy is counted.

5. Application

The operation of the energy detector 2103 REG ES with external current convertors is supported from Version 0.2 of the device software onwards.

You can determine the version level using the "Device information" ETS function (Fig. 4).
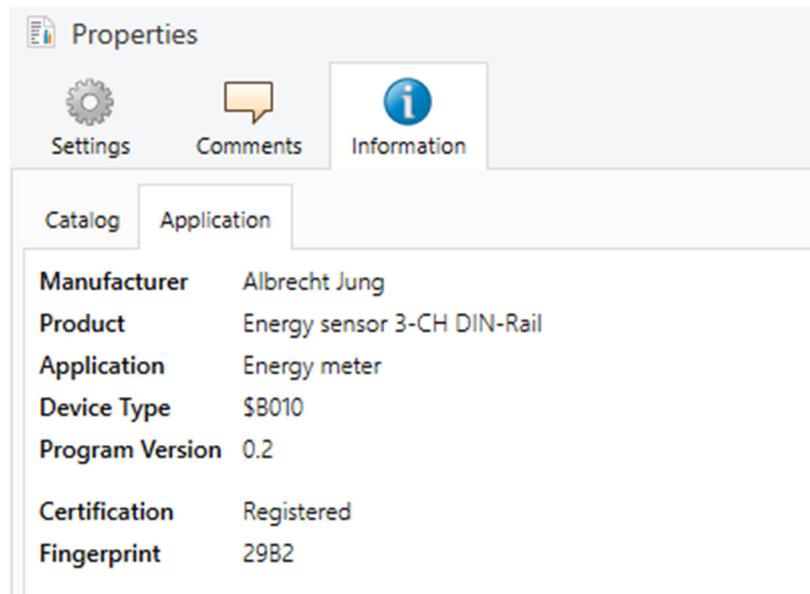
Figure 4: ETS: Device information

ⓘ   If the device software is an older version, then an update to Version 0.2 or higher is required.

5.1. Specification

Bus coupling unit:	E981.03
KNX type class:	3b
Number of communication objects:	125
Configuration:	S-Mode without Plug-In
ETS:	Version 3.0d or higher, Patch A

5.2. Overview

5.2.1. Measured values

Channel 1   Channel 2   Channel 3

3-phase values

| Voltage *U* |
| Current *I* |
| Active Power *P* |
| Reactive Power *Q* |
| Frequency |

| Active Power *P* |
| Reactive Power *Q* |
| Frequency |
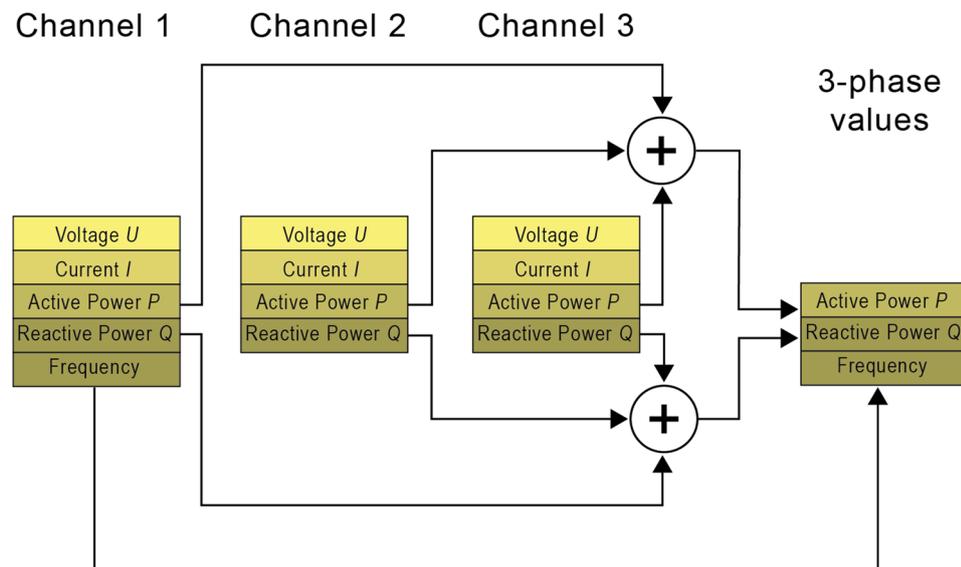
Figure 5: Diagram - Measured values

The energy detector permits the monitoring of electrical loads to up to three phases with a shared neutral conductor. Each channel can measure:

- Voltage (rms value)
- Current (rms value)
- Active power
- Reactive power

Additionally, active power and reactive power are added up across all channels as three-phase current variables, and also the mains frequency is provided.

According to the configuration, the measured values will be transmitted to the KNX bus, either cyclically and / or on a change or explicit request. For some variables, a telegram is transmitted if a limit value is fallen below or exceeded.

ℹ   The measured values are calculated in intervals of one second.

ℹ   The transmission process is distributed over a time period of one second in order to reduce the bus load.

5.2.2. Energy counter

The device possesses 32 counting units (hereinafter referred to as counter), which count the electrical energy. Exactly one communication object of type DPT 13.010 is assigned to each of these counters and their value reflects the current counter level or the counter in Watt/hours. The following figure shows an overview of the counters of the device:

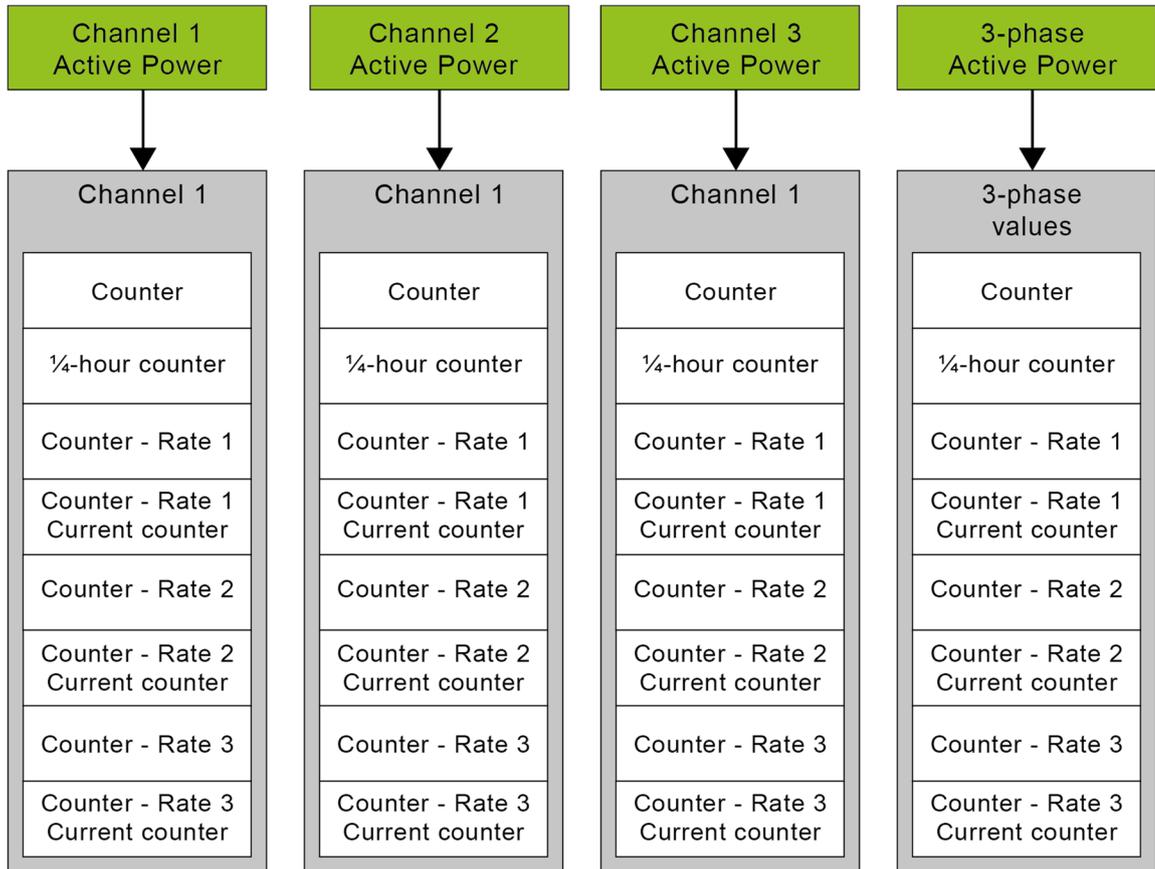| Channel 1 Active Power	Channel 2 Active Power	Channel 3 Active Power	3-phase Active Power
Channel 1	**Channel 1**	**Channel 1**	**3-phase values**
Counter	Counter	Counter	Counter
¼-hour counter	¼-hour counter	¼-hour counter	¼-hour counter
Counter - Rate 1	Counter - Rate 1	Counter - Rate 1	Counter - Rate 1
Counter - Rate 1 Current counter	Counter - Rate 1 Current counter	Counter - Rate 1 Current counter	Counter - Rate 1 Current counter
Counter - Rate 2	Counter - Rate 2	Counter - Rate 2	Counter - Rate 2
Counter - Rate 2 Current counter	Counter - Rate 2 Current counter	Counter - Rate 2 Current counter	Counter - Rate 2 Current counter
Counter - Rate 3	Counter - Rate 3	Counter - Rate 3	Counter - Rate 3
Counter - Rate 3 Current counter	Counter - Rate 3 Current counter	Counter - Rate 3 Current counter	Counter - Rate 3 Current counter

Figure 6: Overview of all energy counters of the device

All the counters of a device each count the active energy measured in the appropriate channel. Mathematically, the counting of the active energy corresponds to a temporal integration of the active power. Thus, a counter only counts when the basic active power does not equal zero. The counting is balanced, i.e. if the active power is positive, then the counter increases. If it is negative, then it decreases. A negative active power corresponds to a reverse output flow. The balanced counting means that the counter level can contain both positive and negative values.

Fig. 6 shows the relationship between the appropriate counters and the corresponding active power. The counters of Channel 1, 2 or 3 are alternating current counters, which only count the energy in one channel or one phase. By contrast, the counters for the three-phase current count the total energy flowing in all three channels or all three phases.

In addition, each type of counter possesses special characteristics. These are shown as a comparison in the following table:

	Counters, total	Counters, 1/4-hour	Counters, Rate n	Current counter Rate n
Basic output for the counting variable	Active power of the channel or active three-phase current power	Active power of the channel or active three-phase current power	Active power of the channel or active three-phase current power	Active power of the channel or active three-phase current power
Counting condition	Always	Always	Only if Rate n is currently active	Only if Rate n is currently active
Resettable	Via communication object	Via communication object	Via communication object	Via communication object
Automatic reset	Never	Ever quarter of an hour (i.e. at hh:00, hh:15, hh:30, hh:45)	Never	Configuration (at the start of a Rate or via trigger objects)
Cyclical transmission possible	Yes	Yes	Yes	No
Transmission possible on change	Yes	No	Yes	Yes
Readable communication object	Yes	Yes	Yes	Yes
Value after ETS download / power failure / restart	Configurable (0 or last value)	0	Configurable (0 or last value)	Configurable (0 or last value)

Table 1:   Properties of the energy counters, where Rate n stands for the three Rates 1, 2 and 3.

As the table shows, the counters "Counter, Rate n" and "Current counter, Rate n" only count when the appropriate Rate is currently active. Rates 1, 2 and 3 exist. They can be activated or deactivated independently of one another. In so doing, activation or deactivation occurs either using configurable times or using the "Rate switch" object on the bus.

According to Table 1, the reset of the intermediate counter is controlled either using the activation or deactivation events of the Rates or using trigger objects, of which two are available for each intermediate counter.

If an intermediate counter is controlled using the activation or deactivation object of a Rate, i.e. the corresponding parameter "Via Rate parameters" is set for the intermediate counter, then the Rate counter always resets itself to zero at the beginning of the appropriate Rate.

If, by contrast, the parameter "Via trigger objects" is set for an intermediate counter, then two trigger objects are available for each intermediate counter. When Trigger 1 is received, the intermediate counter is reset and restarted. When Trigger 2 is received, the counter level of the intermediate counter is transmitted on the bus. In addition, it is possible to configure whether receipt of Trigger 2 also causes a stop.

The counter levels are calculated in intervals of one second.

If there is a power failure to the KNX system, the values of the energy counters (but not the 1/4-hour counters) are backed up and reloaded to the appropriate communication objects on restarting.

5.2.3. Rate counters

In addition, the device possesses three counting units (hereinafter referred to as cost counters), which count the costs for each Rate. Exactly one communication object of type DPT 13.xxx is assigned to each of these counters and their value reflects the current cost level in Euro cents. The following figure shows the three cost counters in relation to the basic measurand and the three-phase current counters:
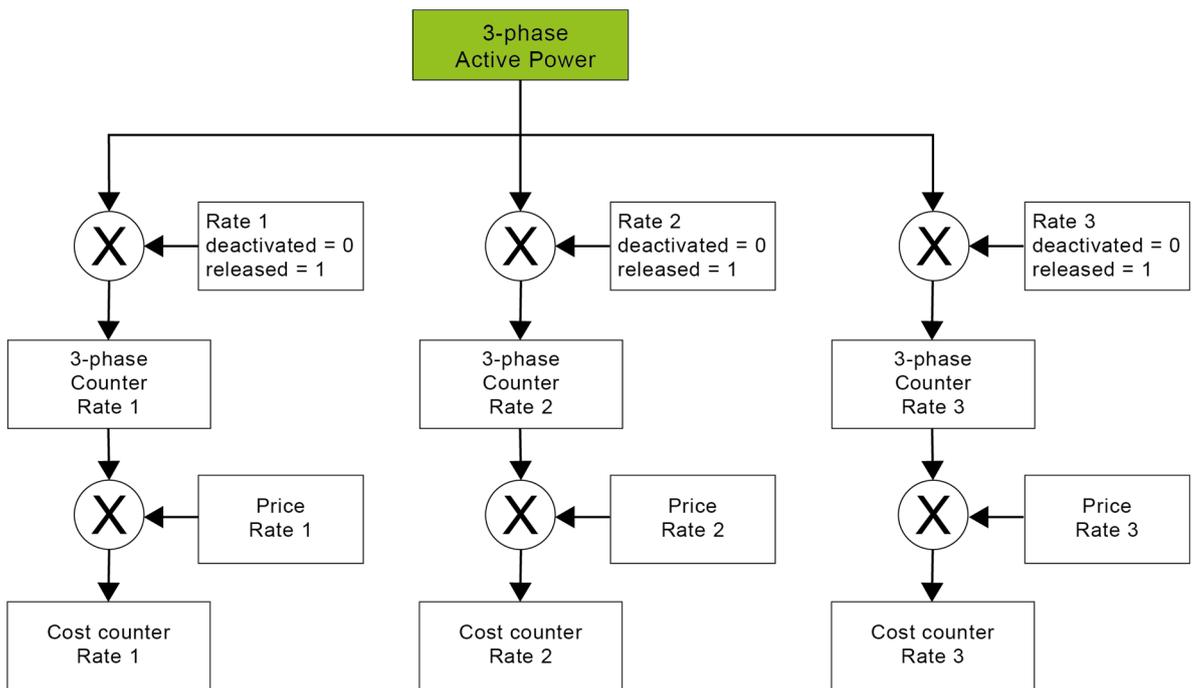
Figure 7: Calculation of the cost counters

As Fig. 7 shows, all three Rate-related three-phase current counters are derived from the measurand of the active three-phase current power. This is counted in the time during which the appropriate Rate is active (or mathematically integrated by time). The value of a cost counter results from the multiplication of the three-phase current counter with the price of the appropriate Rate.

We would like to point out that the three-phase current counter values and cost counter values shown in Fig. 7 can also be negative, if the basic active three-phase current power is negative.

In this context, the resulting negative costs can be interpreted as a remuneration.

If there is a power failure to the KNX system, the values of the Rate counters are backed up and reloaded to the appropriate communication objects on restarting.

The following table summarises the properties of the cost counters:

	Cost counter, Rate 1	Cost counter, Rate 2	Cost counter, Rate 3
Basic energy counter	Three-phase current counter, Rate 1	Three-phase current counter, Rate 2	Three-phase current counter, Rate 3
Resettable	Only synchronous to three-phase current counter, Rate 1 via communication object	Only synchronous to three-phase current counter, Rate 2 via communication object	Only synchronous to three-phase current counter, Rate 3 via communication object
Automatic reset	Never	Never	Never
Cyclical transmission possible	Yes	Yes	Yes
Transmission possible on change	Yes	Yes	Yes
Readable communication object	Yes	Yes	Yes
Value after ETS download / power failure / restart	According to three-phase current counter, Rate 1	According to three-phase current counter, Rate 2	According to three-phase current counter, Rate 3

Table 2:   Properties of the cost counter

5.3. Object table

ⓘ Depending on the configuration, some objects may not be available.

Object	Name	Object function	Type	DPT	Flag
0	General	Power saving mode	1 bit	1.003	CRWT-
Description: Power saving mode ("0" = Power saving mode off, "1" = Power saving mode on). In Power saving mode, no measurements occur and no energy is counted.					

Object	Name	Object function	Type	DPT	Flag
1	General	Time	3 bytes	10.001	C-W-R
Description: Internal clock of the energy counter. The current time must be set for the time-bound functions after switch-on.					

Object	Name	Object function	Type	DPT	Flag
2	General	Time Request	1 bit	1.xxx	C--T-
Description: After switch-on, this object can be transmitted with a configurable value, in order to request the current time from a KNX clock.					

Object	Name	Object function	Type	DPT	Flag
3	General	In Use	1 bit	1.xxx	C--T-
Description: This object can be transmitted cyclically with a configurable value and represents a status message for the operation of the energy counter.					

Object	Name	Object function	Type	DPT	Flag
4	Gen. measure	Request measured values	1 bit	1.xxx	C-W--
Description: On receiving this object with the configurable value, the energy counter sends the measured values Voltage, Current strength and Frequency.					

Object	Name	Object function	Type	DPT	Flag
5	Gen. measure	Request power values	1 bit	1.xxx	C-W--
Description: On receiving this object with the configurable value, the energy counter sends the measured values Active power and Reactive power.					

Object	Name	Object function	Type	DPT	Flag
6, 12, 18	Ch*n* MV	Voltage (rms.)	2 bytes	9.020	CR-T-
Description: The effective value of the channel voltage in *mV*.					

Object	Name	Object function	Type	DPT	Flag
7, 13, 19	Ch*n* MV	Current (rms.)	2 bytes	9.021	CR-T-
Description: The effective value of the channel current strength in *mA*.					

Object	Name	Object function	Type	DPT	Flag
8, 14, 20, 24	Ch*n* MV	Effective power	4 bytes	14.056	CR-T-
Description: The effective power of the channel in *W*.					

Object	Name	Object function	Type	DPT	Flag
9, 15, 21, 25	Ch*n* external LV	Effective power LV	4 bytes	14.056	CRWT-
Description: The external limit value of the channel's effective power in *W*, at which, if over or undershot, a monitoring telegram can be transmitted, can be changed using this object. The new limit value is stored permanently or in the volatile memory, according to the configuration.					

Object	Name	Object function	Type	DPT	Flag
10, 16, 22, 26	Ch*n* LV, exceed/below	Effective power	1 bit	1.xxx	C--T-
Description: If the limit value for the effective power is over or undershot, a monitoring telegram can be transmitted, whose value is "1" on overshooting or "0" on undershooting.					

Object	Name	Object function	Type	DPT	Flag
11, 17, 23, 27	Ch*n* MV	Reactive power	4 bytes	14.056	CR-T-
Description: The reactive power of the channel in *VAr*.					

Object	Name	Object function	Type	DPT	Flag
28	MV	Frequency	4 bytes	14.033	CR-T-
Description: The mains frequency in *Hz*.					

Object	Name	Object function	Type	DPT	Flag
29, 52, 75, 98	Ch*n* EC	Total counter level	4 bytes	13.010	CR-T-

Description: The total counter level of the channel in *Wh*. The counter levels "C1 EC" (Object 29), "C2 EC" (Object 52) and "C3 EC" (Object 75) are alternating current counters, which only count the energy in a channel or one phase. By contrast, the counter level "3-phase values EC" (Object 98) counts the total energy of all three channels or all three phases.

Object	Name	Object function	Type	DPT	Flag
30, 53, 76, 99	Ch*n* EC	Reset total counter level	1 bit	1.017	C-W--

Description: The total counter level of the channel is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
31, 54, 77, 100	Ch*n* EC	¼-hour counter reading	4 bytes	13.010	CR-T-

Description: The counter level attained by the last complete ¼ hour of the ¼-hour counter of the channel in *Wh*. The counter levels "C1 EC" (Object 31), "C2 EC" (Object 54) and "C3 EC" (Object 77) pertain to the alternating current counters, which only count the energy in one channel or one phase. By contrast, the counter level "3-phase values EC" (Object 100) counts the total energy of all three channels or all three phases.

Object	Name	Object function	Type	DPT	Flag
32, 55, 78, 101	Chn EC external EV	¼ hour counter reading-LV	4 bytes	13.010	CRWT-

Description: The external limit value of the counter level of the ¼-hour counter of the channel in *Wh*, at which, if over or undershot, a monitoring telegram can be transmitted, can be changed using this object. The new limit value is stored permanently or in the volatile memory, according to the configuration.

Object	Name	Object function	Type	DPT	Flag
33, 56, 79, 102	Chn EC LV, exceed/below	¼-hour counter reading	1 bit	1.xxx	C--T-

Description: If the limit value for the counter level of the ¼-hour counter of the channel is over or undershot, a monitoring telegram can be transmitted, whose value is "1" on overshooting or "0" on undershooting.

Object	Name	Object function	Type	DPT	Flag
34, 57, 80, 103	Ch*n* EC rate 1	Counter reading	4 bytes	13.010	CR-T-

Description: The counter level of the channel for Rate 1 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
35, 58, 81, 104	Ch*n* EC rate 1	Reset counter reading	1 bit	1.017	C-W--

Description: The counter level of the channel for Rate 1 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
36, 59, 82, 105	Ch*n* EC Rate 1	Curr. count. reading	4 bytes	13.010	CR-T-

Description: The intermediate counter level of the channel for Rate 1 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
37, 60, 83, 106	Ch*n* EC Rate 1	Reset Curr. count. reading	1 bit	1.017	C-W--

Description: The intermediate counter level of the channel for Rate 1 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
38, 61, 84, 107	Ch*n* EC Rate 1	Trigger 1 Curr. count. reading	1 bit	1.017	C-W--

Description: If appropriate configured, the intermediate counter of the channel for Rate 1 is reset and started on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
39, 62, 85, 108	Ch*n* EC Rate 1	Trigger 2 Curr. count. reading	1 bit	1.017	C-W--

Description: If appropriately configured, the intermediate counter level of the channel for Rate 1 is transmitted on receiving this object. The intermediate counter is optionally stopped. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
40, 63, 86, 109	Ch*n* EC Rate 2	Counter reading	4 bytes	13.010	CR-T-

Description: The counter level of the channel for Rate 2 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
41, 64, 87, 110	Ch*n* EC Rate 2	Reset counter reading	1 bit	1.017	C-W--

Description: The counter level of the channel for Rate 2 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
42, 65, 88, 111	Ch*n* EC Rate 2	Curr. count. reading	4 bytes	13.010	CR-T-

Description: The intermediate counter level of the channel for Rate 2 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
43 66, 89, 112	Ch*n* EC Rate 2	Reset Curr. count. reading	1 bit	1.017	C-W--

Description: The intermediate counter level of the channel for Rate 2 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
44, 67, 90, 113	Ch*n* EC Rate 2	Trigger 1 Curr. count. reading	1 bit	1,017	C-W--

Description: If appropriate configured, the intermediate counter of the channel for Rate 2 is reset and started on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
45, 68, 91, 114	Ch*n* EC Rate 2	Trigger 2 Curr. count. reading	1 bit	1.017	C-W--

Description: If appropriately configured, the intermediate counter level of the channel for Rate 2 is transmitted on receiving this object. The intermediate counter is optionally stopped. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
46, 69, 92, 115	Ch*n* EC Rate 3	Counter reading	4 bytes	13.010	CR-T-

Description: The counter level of the channel for Rate 3 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
47, 70, 93, 116	Ch*n* EC Rate 3	Reset counter reading	1 bit	1.017	C-W--

Description: The counter level of the channel for Rate 3 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
42, 71, 94, 117	Ch*n* EC Rate 3	Curr. count. reading	4 bytes	13.010	CR-T-

Description: The intermediate counter level of the channel for Rate 3 in *Wh*.

Object	Name	Object function	Type	DPT	Flag
49, 72, 95, 118	Ch*n* EC Rate 3	Reset Curr. count. reading	1 bit	1.017	C-W--

Description: The intermediate counter level of the channel for Rate 3 is reset on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
50, 73, 96, 119	Ch*n* EC Rate 3	Trigger 1 Curr. count. reading	1 bit	1.017	C-W--

Description: If appropriate configured, the intermediate counter of the channel for Rate 3 is reset and started on receiving this object. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
51, 74, 97, 120	Ch*n* EC Rate 3	Trigger 2 Curr. count. reading	1 bit	1.017	C-W--

Description: If appropriately configured, the intermediate counter level of the channel for Rate 3 is transmitted on receiving this object. The intermediate counter is optionally stopped. The value of the object is irrelevant here.

Object	Name	Object function	Type	DPT	Flag
121	Rate	Change rate	1 bytes	5.xxx	CRWT-

Description: With this object, it is possible to specify which rate should currently apply. Permissible values are "0" = No Rate, "1" = Rate 1, "2" = Rate 2 and "3" = Rate 3. The currently valid rate is output on level this object.

Object	Name	Object function	Type	DPT	Flag
122	Rate	Rate 1 - Costs	4 bytes	13.xxx	CR-T-

Description: The object contains the currently incurred costs for Rate 1. These are calculated from the counter level of the three-phase current energy counter for Rate 1.

Object	Name	Object function	Type	DPT	Flag
123	Rate	Rate 2 - Costs	4 bytes	13.xxx	CR-T-

Description: The object contains the currently incurred costs for Rate 2. These are calculated from the counter level of the three-phase current energy counter for Rate 2.

Object	Name	Object function	Type	DPT	Flag
124	Rate	Rate 3 - Costs	4 bytes	13.xxx	CR-T-
Description: The object contains the currently incurred costs for Rate 3. These are calculated from the counter level of the three-phase current energy counter for Rate 3.					

Object	Name	Object function	Type	DPT	Flag
125	Rate	Rate 1 - Price	2 bytes	7.xxx	C-WT-
Description: The object can be used to specify a price for Rate 1 via the bus. If a telegram is transmitted to this object, then the price configured by the ETS is overwritten. However, the price of the Rate will be set back to the price configured by the ETS on the next ETS download. The transmitted integer value is interpreted in 0.1 ct/kWh.					

Object	Name	Object function	Type	DPT	Flag
126	Rate	Rate 2 - Price	2 bytes	7.xxx	C-WT-
Description: The object can be used to specify a price for Rate 2 via the bus. If a telegram is transmitted to this object, then the price configured by the ETS is overwritten. However, the price of the Rate will be set back to the price configured by the ETS on the next ETS download. The transmitted integer value is interpreted in 0.1 ct/kWh.					

Object	Name	Object function	Type	DPT	Flag
127	Rate	Rate 3 - Price	2 bytes	7.xxx	C-WT-
Description: The object can be used to specify a price for Rate 3 via the bus. If a telegram is transmitted to this object, then the price configured by the ETS is overwritten. However, the price of the Rate will be set back to the price configured by the ETS on the next ETS download. The transmitted integer value is interpreted in 0.1 ct/kWh.					

5.4. Parameters

ⓘ   Depending on the configuration, some setting options may not be available. In these cases, they are not shown in the ETS.

Description:	Values:	Comment:
→ *General*		
Sending delay after bus voltage return (s)	**2**...255	The automatic transmission of objects after bus voltage return can be delayed, in order to reduce the bus load. Setting of the seconds of the delay time.
Offset for ¼-hour counter values (s)	0...**2**...255	The transmission of ¼-hour counter values at the end of every ¼ hour can be delayed, in order to reduce the bus load, when multiple energy counters are being used. In the standard setting "2", for example, the values are transmitted at hh:00:02, hh:15:02, hh:30:02, hh:45:02. Setting of the seconds of the delay time.
Request time after bus voltage return	**Yes** No	Here, it is possible to set whether an object for requesting the time is transmitted after a bus voltage return.
Value of communication object 'Time request'	**0** 1	The object for requesting the time has the value specified here.
Send object 'In use'	**0**...65535	A status message for the operation of the energy counter can be transmitted cyclically. Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Value of object 'In use'	**0** 1	The status message for the operation of the energy counter has the value specified here.
→ *Measurement*		
Nominal frequency	**50 Hz** 60 Hz	The correct nominal frequency of the power network must be specified here for the measurements to be made with the specified accuracy.
Current range	**Direct measurement 16 A** Transformer measurement 75 A	Here, it is necessary to set whether the device is operated with or without external current transformers.
Appr. comm. object ‚Request measured values'	Yes **No**	Here, it is possible to enable the object for requesting the measured values.

Description:	Values:	Comment:
Request measured values	**0** 1 0 or 1	Measured values are only transmitted when the received object for the request matches the value configured here.
Appr. comm. object 'Request power values'	Yes **No**	Here, it is possible to enable the object for requesting the power values.
Request power values	**0** 1 0 or 1	Power values are only transmitted when the received object for the request matches the value configured here.
Release Channel 1	Yes **No**	Access to the measured and power values of Channel 1 can be enabled here.
Release Channel 2	Yes **No**	Access to the measured and power values of Channel 2 can be enabled here.
Release Channel 3	Yes **No**	Access to the measured and power values of Channel 3 can be enabled here.
Release 3-phase values	Yes **No**	Access to the measured and power values of the three-phase current variables can be enabled here.
Release frequency measurement	Yes **No**	Access to the measured frequency can be enabled here.
Send frequency cyclically (s)	**0**...172800	The measured frequency can be transmitted cyclically. Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Send frequency on change (0.1 Hz)	**0**...650	The measured frequency can be transmitted on changes. Setting of the frequency change, at which the measured frequency is transmitted, or switch-off of this function with the value 0.

Description:	Values:	Comment:
→ *Measurement - Channel 1*		
Send measured values cyclically (s)	**0**...172800	The following measured values of Channel 1 can be transmitted cyclically: Voltage (rms..) Current (rms..) Effective power Reactive power Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Send voltage on change (V)	**0**...265	The voltage measured on Channel 1 can be transmitted on changes. Setting of the voltage change, at which the measured voltage is transmitted, or switch-off of this function with the value 0.
Send current intensity on change (0.1 A)	**0**...160	The current intensity measured on Channel 1 can be transmitted on changes. Setting of the current intensity change, at which the measured current intensity is transmitted, or switch-off of this function with the value 0.
Send effective power on change (W)	**0**...4240	The effective power measured on Channel 1 can be transmitted on changes. Setting of the effective power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.
Telegram on limit value (Effective power)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the effective power measured on Channel 1 is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the active power measured on Channel 1 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (h)	**0**..4240	Specification of the limit value for the effective power measured on Channel 1.

Description:	Values:	Comment:
Hysteresis (W)	**0**..4240	A hysteresis can be configured for the over or undershooting of a limit value of the effective power measured on Channel 1. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the effective power measured on Channel 1.
Send reactive power on change (W)	**0**...4240	The reactive power measured on Channel 1 can be transmitted on changes. Setting of the reactive power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.

→ *Measurement - Channel 2*

Description:	Values:	Comment:
Send measured values cyclically (s)	**0**...172800	The following measured values of Channel 2 can be transmitted cyclically: Voltage (rms.) Current (rms.) Effective power Reactive power Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Send voltage on change (V)	**0**...265	The voltage measured on Channel 2 can be transmitted on changes. Setting of the voltage change, at which the measured voltage is transmitted, or switch-off of this function with the value 0.
Send current intensity on change (0.1 A)	**0**...160	The current intensity measured on Channel 2 can be transmitted on changes. Setting of the current intensity change, at which the measured current intensity is transmitted, or switch-off of this function with the value 0.
Send effective power on change (W)	**0**...4240	The effective power measured on Channel 2 can be transmitted on changes. Setting of the effective power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.

Description:	Values:	Comment:
Telegram on limit value (effective power)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the effective power measured on Channel 2 is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the effective power measured on Channel 2 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (W)	**0**..4240	Specification of the limit value for the effective power measured on Channel 2.
Hysteresis (W)	**0**..4240	A hysteresis can be configured for the over or undershooting of a limit value of the effective power measured on Channel 2. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the effective power measured on Channel 2.
Send reactive power on change (W)	**0**...4240	The reactive power measured on Channel 2 can be transmitted on changes. Setting of the reactive power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.

→ *Measurement - Channel 3*

Send measured values cyclically (s)	**0**...172800	The following measured values of Channel 3 can be transmitted cyclically: Voltage (rms.) Current (rms.) Effective power Reactive power Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Send voltage on change (V)	**0**...265	The voltage measured on Channel 3 can be transmitted on changes. Setting of the voltage change, at which the measured voltage is transmitted, or switch-off of this function with the value 0.

Description:	Values:	Comment:
Send current intensity on change (0.1 A)	**0**...160	The current intensity measured on Channel 3 can be transmitted on changes. Setting of the current intensity change, at which the measured current intensity is transmitted, or switch-off of this function with the value 0.
Send effective power on change (W)	**0**...4240	The effective power measured on Channel 3 can be transmitted on changes. Setting of the effective power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.
Telegram on limit value (effective power)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the effective power measured on Channel 3 is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the effective power measured on Channel 3 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (W)	**0**..4240	Specification of the limit value for the effective power measured on Channel 3.
Hysteresis (W)	**0**..4240	A hysteresis can be configured for the over or undershooting of a limit value of the effective power measured on Channel 3. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the effective power measured on Channel 3.
Send reactive power on change (W)	**0**...4240	The reactive power measured on Channel 3 can be transmitted on changes. Setting of the reactive power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.

Description:	Values:	Comment:
→ *Measurement - 3-phase values*		
Send measured values cyclically (s)	**0**...172800	The following three-phase current measured values can be transmitted cyclically: Effective power Reactive power Setting of the seconds of the cycle time or switch-off of this function with the value 0.
Send effective power on change (W)	**0**...12720	The effective three-phase current power can be transmitted on changes. Setting of the effective power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.
Telegram on limit value (effective power)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the effective three-phase current power is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the effective three-phase current power can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (W)	**0**..12720	Specification of the limit value for the effective three-phase current power.
Hysteresis (W)	**0**..12720	A hysteresis can be configured for the over or undershooting of a limit value of the effective three-phase current power. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the measured effective three-phase current power
Send reactive power on change (W)	**0**...12720	The reactive three-phase current power can be transmitted on changes. Setting of the reactive power change, at which the measured effective power is transmitted, or switch-off of this function with the value 0.

Description:	Values:	Comment:
→ *Energy counter*		
Channel 1	Yes **No**	Access to the counter values of Channel 1 can be enabled here.
Channel 2	Yes **No**	Access to the counter values of Channel 2 can be enabled here.
Channel 3	Yes **No**	Access to the counter values of Channel 3 can be enabled here.
3-phase values	Yes **No**	Access to the counter values of three-phase current variables can be enabled here.
→ *Energy counter - Channel 1*		
Telegram on limit value (¼-hour counter value)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the ¼-hour counter value of Channel 1 is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the ¼-hour counter level of Channel 1 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (Wh)	**0**...1060	Specification of the limit value for the ¼-hour counter level of Channel 1
Hysteresis (Wh)	**0**...1060	A hysteresis can be configured for the over or undershooting of a limit value for the ¼-hour counter level of Channel 1. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the ¼-hour counter level of Channel 1.
Counter after ETS download	**No reaction** Reset	Here, it is possible to set whether the counter levels of Channel 1 remain unchanged after an ETS download or are reset to 0.

Description:	Values:	Comment:
Send counter cyclically (s)	**0**...172800	The following counter levels of Channel 1 can be transmitted cyclically: Counter level
		¼-hour counter level
		Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the seconds of the cycle time or switch-off of this function with the value 0.
1/4-hour counter value cyclic sending	**Yes** No	The ¼-hour counter level of Channel 1 can be excluded from the cyclical transmission configured above, in order to reduce the bus load.
Send counter on change (Wh)	**0**...4240	The following counter levels of Channel 1 can be transmitted on a change by a configured value: Counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the change at which the counter levels are to be transmitted.
Send current counter on change (Wh)	**0**...4240	The following current counter levels of Channel 1 can be transmitted on a change by a configured value: Current counter level, Rate 1 Current counter level, Rate 2 Current counter level, Rate 3 Setting of the change at which the current counter levels are to be transmitted.
Current counter Rate 1	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 1 for Rate 1 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 1 - Trigger 2	**Stop** Continue	If the current counter of Channel 1 for Rate 1 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 2	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 1 for Rate 2 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.

Description:	Values:	Comment:
Current counter Rate 2 - Trigger 2	**Stop** Continue	If the current counter of Channel 1 for Rate 2 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 3	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 1 for Rate 3 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 3 - Trigger 2	**Stop** Continue	If the current counter of Channel 1 for Rate 3 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Approve object 'Counter reading total counter reset'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 1.
Approve object 'Reset counter reading rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 1 for Rate 1.
Approve object 'Reset current counter rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 1 for Rate 1.
Approve object 'Reset counter reading rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 1 for Rate 2.
Approve object 'Reset current counter rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 1 for Rate 2.
Approve object 'Reset counter reading rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 1 for Rate 3.
Approve object 'Reset current counter rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 1 for Rate 3.

→ *Energy counter - Channel 2*

Description:	Values:	Comment:
Telegram on limit value (¼-hour counter value)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the ¼-hour counter value of Channel 2 is over or undershot.

Description:	Values:	Comment:
Accept limit value from bus	**Volatile** Permanent	The limit value for the ¼-hour counter level of Channel 2 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (Wh)	**0**...1060	Specification of the limit value for the ¼-hour counter level of Channel 2
Hysteresis (Wh)	**0**...1060	A hysteresis can be configured for the over or undershooting of a limit value for the ¼-hour counter level of Channel 2. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the ¼-hour counter level of Channel 2.
Counter after ETS download	**No reaction** Reset	Here, it is possible to set whether the counter levels of Channel 2 remain unchanged after an ETS download or are reset to 0.
Send counter cyclically (s)	**0**...172800	The following counter levels of Channel 2 can be transmitted cyclically: Counter level ¼-hour counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the seconds of the cycle time or switch-off of this function with the value 0.
1/4-hour counter value cyclic sending	**Yes** No	The ¼-hour counter level of Channel 2 can be excluded from the cyclical transmission configured above, in order to reduce the bus load.
Send counter on change (Wh)	**0**...4240	The following counter levels of Channel 2 can be transmitted on a change by a configured value: Counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the change at which the counter levels are to be transmitted.

Description:	Values:	Comment:
Send current counter on change (Wh)	**0**...4240	The following current counter levels of Channel 2 can be transmitted on a change by a configured value: Current counter level, Rate 1 Current counter level, Rate 2 Current counter level, Rate 3 Setting of the change at which the current counter levels are to be transmitted.
Current counter Rate 1	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 2 for Rate 1 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 1 - Trigger 2	**Stop** Continue	If the current counter of Channel 2 for Rate 1 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 2	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 2 for Rate 2 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 2 - Trigger 2	**Stop** Continue	If the current counter of Channel 2 for Rate 2 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 3	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 2 for Rate 3 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 3 - Trigger 2	**Stop** Continue	If the current counter of Channel 2 for Rate 3 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Approve object 'Counter reading total counter reset'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 2.
Approve object 'Reset counter reading rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 2 for Rate 1.
Approve object 'Reset current counter rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 2 for Rate 1.

Description:	Values:	Comment:
Approve object 'Reset counter reading rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 2 for Rate 2.
Approve object 'Reset current counter rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 2 for Rate 2.
Approve object 'Reset counter reading rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 2 for Rate 3.
Approve object 'Reset current counter rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 2 for Rate 3.

→ *Energy counter - Channel 3*

Description:	Values:	Comment:
Telegram on limit value (¼-hour counter value)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the ¼-hour counter value of Channel 3 is over or undershot.
Accept limit value from bus	**Volatile** Permanent	The limit value for the ¼-hour counter level of Channel 3 can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (Wh)	**0**...1060	Specification of the limit value for the ¼-hour counter level of Channel 3
Hysteresis (Wh)	**0**...1060	A hysteresis can be configured for the over or undershooting of a limit value for the ¼-hour counter level of Channel 3. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the ¼-hour counter level of Channel 3.
Counter after ETS download	**No reaction** Reset	Here, it is possible to set whether the counter levels of Channel 3 remain unchanged after an ETS download or are reset to 0.

Description:	Values:	Comment:
Send counter cyclically (s)	**0**...172800	The following counter levels of Channel 3 can be transmitted cyclically: Counter level
		¼-hour counter level
		Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the seconds of the cycle time or switch-off of this function with the value 0.
1/4-hour counter value cyclic sending	**Yes** No	The ¼-hour counter level of Channel 3 can be excluded from the cyclical transmission configured above, in order to reduce the bus load.
Send counter on change (Wh)	**0**...4240	The following counter levels of Channel 3 can be transmitted on a change by a configured value: Counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the change at which the counter levels are to be transmitted.
Send current counter on change (Wh)	**0**...4240	The following current counter levels of Channel 3 can be transmitted on a change by a configured value: Current counter level, Rate 1 Current counter level, Rate 2 Current counter level, Rate 3 Setting of the change at which the current counter levels are to be transmitted.
Current counter Rate 1	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 3 for Rate 1 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 1 - Trigger 2	**Stop** Continue	If the current counter of Channel 3 for Rate 1 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 2	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 3 for Rate 2 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.

Description:	Values:	Comment:
Current counter Rate 2 - Trigger 2	**Stop** Continue	If the current counter of Channel 3 for Rate 2 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 3	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of Channel 3 for Rate 3 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 3 - Trigger 2	**Stop** Continue	If the current counter of Channel 3 for Rate 3 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Approve object 'Counter reading total counter reset'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 3.
Approve object 'Reset counter reading rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 3 for Rate 1.
Approve object 'Reset current counter rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 3 for Rate 1.
Approve object 'Reset counter reading rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 3 for Rate 2.
Approve object 'Reset current counter rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 3 for Rate 2.
Approve object 'Reset counter reading rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 3 for Rate 3.
Approve object 'Reset current counter rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of Channel 3 for Rate 3.

→ *Energy counters - 3-phase values*

Telegram on limit value (¼-hour counter value)	Yes **No**	Here, it is possible to set whether a telegram is transmitted when a limit value of the ¼-hour counter value of the three-phase current variables is over or undershot.

Description:	Values:	Comment:
Accept limit value from bus	**Volatile** Permanent	The limit value for the ¼-hour counter level of the three-phase current variables can be overwritten with an object. Setting of whether the new limit value applies until the next reset / bus voltage failure or permanently overwrites the value configured with the ETS.
Limit value (Wh)	**0**...3180	Specification of the limit value for the ¼-hour counter level of the three-phase current variables.
Hysteresis (Wh)	**0**...3180	A hysteresis can be configured for the over or undershooting of a limit value for the ¼-hour counter level of the three-phase current variables. On overshooting, the actual limit value is Limit value + ½ hysteresis and, on undershooting, Limit value - ½ hysteresis. Specification of the hysteresis for the ¼-hour counter level of the three-phase current variables.
Counter after ETS download	**No reaction** Reset	Here, it is possible to set whether the counter levels of the three-phase current variables remain unchanged after an ETS download or are reset to 0.
Send counter cyclically (s)	**0**...172800	The following counter levels of the three-phase current variables can be transmitted cyclically: Counter level ¼-hour counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the seconds of the cycle time or switch-off of this function with the value 0.
1/4-hour counter value cyclic sending	**Yes** No	The ¼-hour counter level of the three-phase current variables can be excluded from the cyclical transmission configured above, in order to reduce the bus load.

Description:	Values:	Comment:
Send counter on change (Wh)	**0**...12720	The following counter levels of the three-phase current variables can be transmitted on a change by a configured value: Counter level Counter level, Rate 1 Counter level, Rate 2 Counter level, Rate 3 Setting of the change at which the counter levels are to be transmitted.
Send current counter on change (Wh)	**0**...12720	The following current counter levels of the three-phase current variables can be transmitted on a change by a configured value: Current counter level, Rate 1 Current counter level, Rate 2 Current counter level, Rate 3 Setting of the change at which the current counter levels are to be transmitted.
Current counter Rate 1	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of the three-phase current variables for Rate 1 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 1 - Trigger 2	**Stop** Continue	If the current counter of the three-phase current variables for Rate 1 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 2	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of the three-phase current variables for Rate 2 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.
Current counter Rate 2 - Trigger 2	**Stop** Continue	If the current counter of the three-phase current variables for Rate 2 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Current counter Rate 3	**Via Rate parameters** Via trigger objects	Here, it is possible to specify whether the current counter of the three-phase current variables for Rate 3 is to be activated using Rate parameters (i.e. time or Rate object) or via trigger objects.

Description:	Values:	Comment:
Current counter Rate 3 - Trigger 2	**Stop** Continue	If the current counter of the three-phase current variables for Rate 3 is to be activated via trigger objects, the counter is either stopped on receipt of trigger object 2 or continues counting.
Approve object 'Counter reading total counter reset'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of the three-phase current variables.
Approve object 'Reset counter reading rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of the three-phase current variables for Rate 1.
Approve object 'Reset current counter rate 1'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of the three-phase current variables for Rate 1.
Approve object 'Reset counter reading rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of the three-phase current variables for Rate 2.
Approve object 'Reset current counter rate 2'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of the three-phase current variables for Rate 2.
Approve object 'Reset counter reading rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the counter level of Channel 1 for Rate 3.
Approve object 'Reset current counter rate 3'	Yes **No**	Here, it is possible to enable the object for resetting the current counter level of the three-phase current variables for Rate 3.

→ *Rate*

Release Rate 1	Yes **No**	Here, it is possible to enable the configuration of the Rate data for Rate 1.
Release Rate 2	Yes **No**	Here, it is possible to enable the configuration of the Rate data for Rate 2.
Release Rate 3	Yes **No**	Here, it is possible to enable the configuration of the Rate data for Rate 3.
Rate after bus voltage return	**No Rate** Rate 1 Rate 2 Rate 3 As above	Specification of which Rate is to apply after bus voltage return. The set Rate applies until a different Rate is selected after receipt of the current time or another Rate is specified via the Rate object.

Description:	Values:	Comment:
→ *Rate 1*		
Price (0.1 ct/kWh)	**0**...65536	Setting of the kWh price for Rate 1. The integer value is interpreted in 0.1 ct/kWh.
Start (hour)	**0**...23	Setting of the start hour of Rate 1.
Start (minute)	**0**...59	Setting of the start minute of Rate 1.
Start (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 1 starts.
End (hour)	**0**...23	Setting of the end hour of Rate 1.
End (minute)	**0**...59	Setting of the end minute of Rate 1.
End (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 1 ends.
→ *Rate 2*		
Price (0.1 ct/kWh)	**0**...65536	Setting of the kWh price for Rate 1. The integer value is interpreted in 0.1 ct/kWh.
Start (hour)	**0**...23	Setting of the start hour of Rate 2.
Start (minute)	**0**...59	Setting of the start minute of Rate 2.
Start (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 2 starts.
End (hour)	**0**...23	Setting of the end hour of Rate 2.
End (minute)	**0**...59	Setting of the end minute of Rate 2.

Description:	Values:	Comment:
End (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 2 ends.

→ Rate 3

Price (0.1 ct/kWh)	**0**...65536	Setting of the kWh price for Rate 1. The integer value is interpreted in 0.1 ct/kWh.
Start (hour)	**0**...23	Setting of the start hour of Rate 3.
Start (minute)	**0**...59	Setting of the start minute of Rate 3.
Start (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 3 starts.
End (hour)	**0**...23	Setting of the end hour of Rate 3.
End (minute)	**0**...59	Setting of the end minute of Rate 3.
End (weekday)	**Every day** Mon Tue Wed Thu Fri Sat Sun	Setting of the day at which Rate 3 ends.

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