



APPLICATION MANUAL

EK-CF2-TP



INTERFACE FOR LOAD MONITORING AND CONTROL

Summary

1. Scope of the document	3
2. Product description.....	4
2.1. Measurement acquisition	4
3. Connection elements	5
4 Configuration	5
5 Commissioning.....	5
6. Software working cycle	6
1.	6
2.	6
3.	6
6.3.1 State variables (communication objects)	6
6.3.2 Cyclic sending.....	6
7. Function description	7
6.1. Offline operation.....	7
6.2. Online operation.....	7
8. Operating parameters	8
7.1. General parameters	8
6.3.3 TA configuration	9
7.2. Channel configuration	10
7.3. Configuration of a power threshold function	11
7.4. Configuration of a load control function	12
9. Application program for ETS	14
8.1. About EK-CF2-TP	14
8.2. General settings	15
8.3. Channel information	17
8.4. Measurement channel X	18
8.5. Thresholds Y Channel X	19
8.6. Load control channel X	22
10. Logic functions	26
9.1. Parameters and communication objects.....	26
11. Summary of KNX communication objects	28
12. Warning	36
11.1. Other information	36

Revision	Description	Date
1.0.0	Emission	04/07/2017
1.2	Correction to par. 7.3 on the function of thresholds and measurement.	

1. Scope of the document

This application manual describes application details for the ekinex® Interface for Load monitoring and control EK-CF2-TP.

The document is aimed at the system configurator as a description and reference of device features and ETS application programming. For installation, mechanical and electrical details of the device please refer to the technical description datasheet.

Application manual and ETS application programs are available for download at www.ekinex.com.

Document	Filename (## = version)	Version	Device revision	Latest update
Technical datasheet	STEKCF2TP_EN.pdf	EK-CF2-TP	A1.0	07/2017
Application manual	MAEKCF2TP_EN.pdf	EK-CF2-TP		
Application program	APEKCF2TP##.knxprod	EK-CF2-TP		

2. Product description

The ekinex® interface for consumption measurement and load management EK-CF2-TP is a S-mode KNX device used for:

- measuring the instantaneous current absorbed by (up to) three single-phase electric circuits or by a three-phase electric circuit;
- controlling electrical loads with priority disconnection (and reconnection).

The current measurement (max 60 Amp) is performed through the connection of three current transformers Ekinex ® EK-TA-...

In the application program, the acquisition of an external current measurement, which can be managed as "measurement channel n°4".

The load control includes a customizable load limit threshold; once this threshold is reached, the device disconnects the loads connected to the KNX output channel, according to a priority logic.

The device is powered by the KNX bus line with a 30 VDC SELV voltage and does not require auxiliary power.

Product code	Number of configurable inputs	Suitable transformers (to be ordered separately)
EK-CF2-TP	3 x current transformers	Transformer code – Nominal current [A] EK-TA-05A 0...5 EK-TA-20A 0...20 EK-TA-30A 0...30 EK-TA-40A 0...40 EK-TA-50A 0...50 EK-TA-60A 0...60

2.1. Measurement acquisition

The interface EK-CF2-TP has 3 input channels for signal measurement through current transformers up to 60 A).

Through ETS configuration the following measurements can be achieved:

- instantaneous current indirect measurement (mA) through transformers EK-TA-...
- instantaneous power calculation (W and kW)
- total energy (kWh)
- sending on the bus of current, power and energy measurements.

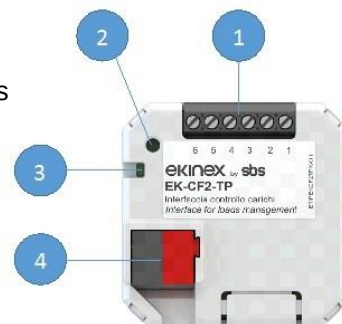


In order to be able to measure the power, the device must be used in combination with current transformers EK-TA-... (to be ordered separately).

3. Connection elements

The elements needed to connect the device are the following:

1. terminal block for the connection of max 3 current transformers
2. programming pushbutton
3. programming LED
4. terminal block for KNX bus connection



4 Configuration

The exact functionality of the device depends on the software settings.

In order to configure and commission the device you need ETS4 or later releases and the proper ekinex® application program.

The application program allows the configuration of all working parameters for the device, through ETS4/5 software tool. The device-specific application program has to be loaded into ETS or, as alternative, the whole ekinex® product database can be loaded; at this point, all the instances of the selected device type can be added to the project.

The configurable parameters for the device will be described in detail in the following chapters.

The configuration can, and usually will, be performed completely offline; the actual transfer of the programmed configuration to the device takes place during commissioning phase.

Product code	EAN	No. of channels	ETS application software ### = release)	Communication objects (max nr.)	Group addresses (max nr.)
EK-CF2-TP		3	APEKCF2TP###.knxprod	224	254

5 Commissioning

After the device has been configured within the ETS project according to user requirements, the commissioning of the device requires the following activities:

- electrically connect the device, as described in the product datasheet, to the bus line on the final network or through a properly setup network for programming; the system will include in any case an interface device towards the PC where ETS is installed;
- apply power to the bus;
- switch device operation to programming mode by pressing the programming pushbutton located on the front side of the housing. In this mode of operation, the programming LED is turned on steady; after that, start the programming (which, in case of first configuration, must include the physical address of the device).

6. Software working cycle

The activities performed by the software of the device are the following:

- Detection of the measures on the inputs interfaced with TA
- Calculation of instantaneous power (W and kW)
- Counting of total energy (kWh)
- Sending on the bus of current, power and energy measured values
- Load control / Threshold control
- Possibility to manage up to 8 loads / thresholds for each measurement channel
- Power threshold (W) for load / threshold control and related Hysteresis (W), separately configurable for each measurement channel
- Possibility to selectively exclude loads / thresholds to monitor from the bus
- Configurable disconnection and reconnection delay (s) for each channel

There are also other particular events, which can trigger additional features. These events are, for example, the bus power failure or restore, or the loading of a new ETS configuration.

6.3.1 State variables (communication objects)

The variable changed by the events of each input can be one of the types made available by the KNX standard for the communication objects.

When the state variable is linked to a group address, it officially becomes a KNX communication object: as such, it inherits all the characteristics of the communication objects, such as the possibility to be modified by other devices through a telegram or the use of flags to determine how the object's modification affects its transmission on the bus.

6.3.2 Cyclic sending

For most features, it is possible to setup the sending of a telegram not only a value linked to a state changes (typically after an input transition), but also on a regular basis when that state is active.

This behavior, also called "*cyclic sending*", can be separately set for each of the two states associated to an input or a pushbutton.

If an input is configured as "*send values or sequences*", the cyclic sending is available only if a single communication object is linked to that input.

7. Function description

After switching on the bus, which also acts as a power supply, the device becomes fully functional after a very short time needed for reinitialization. A delay is programmable for the device to become active on the bus in order to avoid a bus traffic overload during the first moments of start-up of the whole network.

In case of a bus power failure (voltage lower than 19 V for 1 s or more), the device becomes unreactive: the timing functions are not active, neither are the programmed group addresses.

As soon as the bus voltage is restored, the device will resume operation in its previous state (which is saved on power fail), unless different initialization settings are programmed.

6.1. Offline operation

A fully unprogrammed device does not operate in standby mode. Since the operation relies entirely on the exchange of information through communication objects, there is no part of the device that can operate independently from a KNX bus.

6.2. Online operation

In general the device works like a configurable digital sensor that is listening to own inputs or outputs of other devices. On input events the device performs output functionality over KNX bus like sending values or controlling external devices like KNX actuators.

8. Operating parameters

7.1. General parameters

The formula for calculating the absorbed power (in W) for every single channel, and to sum the input channels, is the following: $W = I \times V \times \cos \varphi$

It takes into consideration:

- The nominal network voltage (V), to be defined in the parameters;
- The $\cos \varphi$ phase difference between current and voltage, to be defined in the parameters.

As previously stated, you can connect up to 3 TA to their related channels, in order to control 3 single-phase and 1 three-phase loads, using the channel no.4 as sum of the channels no.1-2-3. The result will be both communication objects indicating the power of the single channels in W and/or in kW, and communication objects indicating the power in W and/or in kW as result of the sum of the channels.

Moreover, you can use channel no.4 as an independent channel, to acquire via bus an external power measurement, which can be useful for load and/or threshold control.

Every channel can be enabled both at the acquisition of the nominal input measurement, both from bus.

If not used, it can be disabled.

Warning: the two poles for either disabled or unused channels must be shorted, in order to ensure the proper ground link.

Interface for load monitoring and control > General

About EK-CF2-TP	Delay after bus voltage recovery	00:00:03	hh:mm:ss
General	Measuring channel 1	enable CT input 1	
CT configuration	Power factor (cosφ)	0.90	
+ Channel 1	Measuring channel 2	enable CT input 2	
+ Channel 2	Power factor (cosφ)	0.90	
+ Channel 4	Measuring channel 3	disable	
+ Logic functions	Power supply voltage	enable CT input 3	
	Measuring channel 4	enable from bus	
	Power supply voltage	400 V	
	Power factor (cosφ)	0.90	

6.3.3 TA configuration

In this section, the TAs to be connected to channels 1-2-3 can be parametrized, by inserting the measurement range characteristics (5, 20, 30, 40, 50 and 60 A).

Moreover, it is possible to perform a calibration for a more precise and linear measurement.

If the parameter “Enable measurement correction” is enabled, you can proceed to insert the requested values in the windows called “current point x measured by input and channel”.

Pratically, you must proceed like this:

- Through ETS > Diagnostics, verify the current measurement detected in a point with low absorption, inserting the detected value in the window called “Current point 1 measured by input”.
- Without changing load or conditions, with a current clamp, measure the current and insert the value in the window called “current point 1 measured by user”.
- Increase the load, according to the maximum measurement of the TA, and repeat the two measurements inserting them in the windows called respectively “Current point 2 measured by input” and “Current point 2 measured by user”.

This way, the device will perform an auto-calibration of the absorbed current linearization curve, in order to obtain measurements that are more precise.

Interface for load monitoring and control > CT configuration

Channel	CT type at input	Enable measure correction
Channel 1	20 A	☒ disabled ☐ enabled
Channel 2	30 A	☒ disabled ☐ enabled
Channel 3	20 A (dropdown menu open showing 5A, 20 A, 30 A, 40 A, 50 A, 60 A)	☒ disabled ☐ enabled

7.2. Channel configuration

For each channel, once configured, we have the possibility to setup a series of parameters:

- The cyclic and/or on change sending of the measured power and current
- The cyclic and/or on change sending of the calculated total energy (kWh)
- The possibility to reset the calculated total energy counter (kWh), which is particularly useful if other parameters are modified but you do not want to temper with those settings
- The enabling of the “Thresholds” function
- The possibility to reset the value of the “Thresholds”, which is particularly useful if other parameters are modified but you do not want to temper with those settings
- The enabling of the “Load control” function
- The possibility to reset the value of the “Load control”, which is particularly useful if other parameters are modified but you do not want to temper with those settings

Interface for load monitoring and control > Channel 1 > Configuration

About EK-CF2-TP	Power and current values on change sending	0	W
General	(0 means no sending on change of measured power value)		
CT configuration	Power and current values cyclical sending	no sending	
Channel 1	Energy counter sending on change	0	kWh
Configuration	(0 means no sending on change)		
Thresholds	Energy counter cyclic sending	no sending	
Load control	Counter reset after downloading the application sw	☐ no ☒ yes	
Channel 2	Enable thresholds	☐ disabled ☒ enabled	
Channel 4	Threshold reset after downloading the application sw	☐ no ☒ yes	
Logic functions	Enable load control	☐ disabled ☒ enabled	
	Load control reset after downloading the application sw	☐ no ☒ yes	

7.3. Configuration of a power threshold function

The use of the “Thresholds” function, independent of the “Load Control” function, can be useful to define measured Power thresholds for which it is necessary to define a technical alarm, an operating logic or disconnection of one or more users.

It is possible to send the value of the power thresholds, expressed in Watts, to the bus.

Furthermore, up to 8 “Threshold” functions can be parameterized and used for each channel.

For each configured threshold, the following parameters can be parametrized:

- Value of intervention in Watt
- Mode of operation of the reached threshold status (inverted / not inverted) in order to use the communication object in negative logic without additional logic objects
- Mode of intervention (if the threshold is above or below the set value)
- Hysteresis of intervention
- Delay of activation
- Cyclic sending of the state
- Disable the threshold from bus

Interface for load monitoring and control > Channel 1 > Thresholds

About EK-CF2-TP	Threshold 1	☐ disabled ☒ enabled
General	Value	500 W
CT configuration	Status	☒ not inverted ☐ inverted
Channel 1	Type	☐ below ☒ above
Configuration	Hysteresis	500 W
Thresholds	disable from bus	☒ no ☐ yes
Load control	Threshold activation delay	0 s
+ Channel 2	Status cyclical sending	no sending
+ Channel 4	Threshold 2	☒ disabled ☐ enabled
+ Logic functions	Threshold 3	☒ disabled ☐ enabled
	Threshold 4	☒ disabled ☐ enabled
	Threshold 5	☒ disabled ☐ enabled

7.4. Configuration of a load control function

Thanks to the use of the “Load control” function, the loads connected to the monitored sockets can be inserted into a coordinated management logic, taking into account the operating priorities, by programming their activation in order to prevent them from overstepping the contractual power or find the most convenient energy time slot.

The communication objects enabled through this function allow to achieve, among other things, the status of the active load control cycle (“Status of load control channel x”) in order to be able to pair an output that will be used as a buzzer.

Moreover, in case of problems, the load control cycle can be reset and restarted by means of the communication object “Reset load control channel x”.

It is also possible to send on the bus the value of the power thresholds of the load control, in Watt.

Up to 8 functions for each channel can be parametrized and used.

For each configured threshold, the following parameters can be parametrized:

- Number of loads to be monitored (from 1 to 8, 1 = less priority)
- Enable of load control reset: the active load control cycle can be reset from the bus, in order to recalibrate the system after modifications or other technical needs
- Reset mode: if the reset signal sends a 1 or a 0
- Threshold writing for load control, initial value of load control cycle
- Load control Hysteresis value writing
- Load disconnection and reconnection time; disconnection and reconnection times are the same for all channel loads
- Load control status cyclic sending, in order to cyclically communicate if the cycle is running and send a periodical signal (e.g. a buzzer)
- Threshold status reset time: possibility to reset the status signal after a preset time
- Load “x” contro exclusion: it exposes a communication object that excludes the load “x” from the bus, in order not to involve it in the controlled disconnection-reconnection cycle. This function can be enabled with the possibility to re-enable it by a preset amount of time, by setting on load “x” exclusion the parameter called “enabled with load exclusion reset” and defining the time into the parameter called “load exclusion reset time”.

--- Interface for load monitoring and control > Channel 1 > Load control

About EK-CF2-TP	Load control number enabled	8
General	Load control reset	☐ disabled ☒ enabled
CT configuration	Load control reset mode	☒ not inverted ☐ inverted
Channel 1	Threshold for load control	2900 W
Configuration	Load control hysteresis	50 W
Thresholds	Load deactivation time	10 s
Load control	Load reactivation time	10 s
Channel 2	Load status cyclical sending	no sending
Channel 4	Load control threshold status reset time	none
Logic functions	Load 1 control exclusion	disabled
	Load 2 control exclusion	disabled
	Load 3 control exclusion	disabled

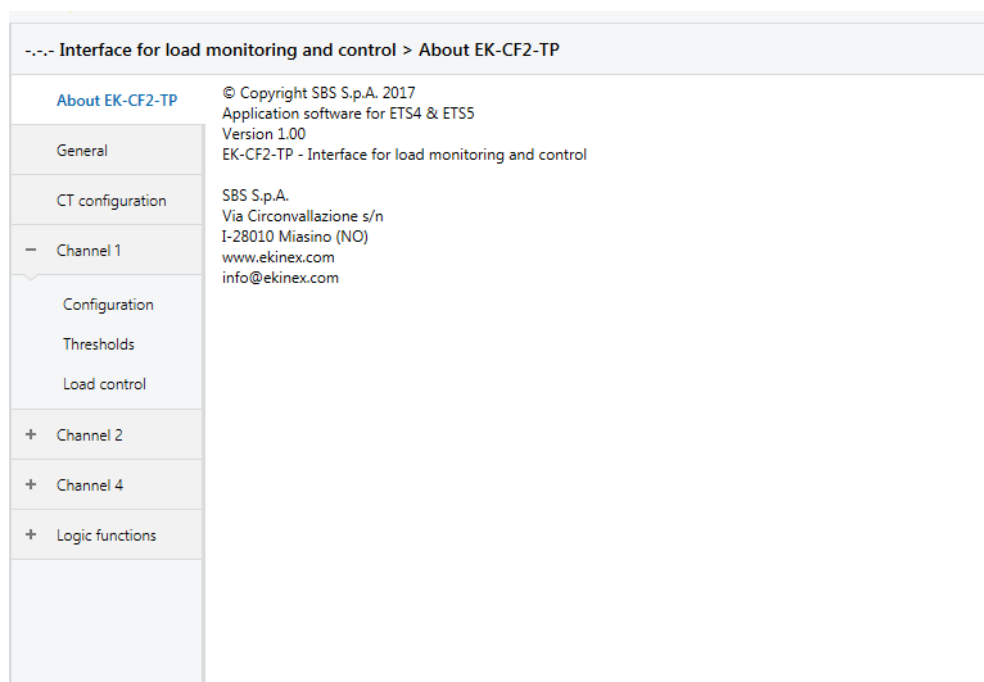
9. Application program for ETS

In the following chapters, there is the list of folder, parameters and communication objects of the application program.



The parameter values highlighted in bold represent the default value.

The device settings are divided in two main groups: the general settings and the channel-specific settings. The settings are grouped in folders. The following figure shows the tree structure of the application program, with the main folders:



8.1. About EK-CF2-TP

The folder **About EK-CF2-TP** is for information purposes only and does not contain parameters to be set. The information given is:

© Copyright Ekinex S.p.A. 2019
Software applicativo per ETS4
Versione 1.00 (o successive)
Comando a 2-4 pulsanti

Ekinex S.p.A.
Via Novara, 37
I-28010 Vaprio d'Agogna (NO) Italy
www.ekinex.com
info@ekinex.com

8.2. General settings

The parameters in this section define the overall behaviour of the device, including the setting that defines which and how many channels are available.

Nome parametro	Condizioni	Valori
Delay after bus voltage recovery		00:00:03 hh:mm:ss [campo 00:00:00 ... 18:12:15]
Channel 1		enable CT input enable from bus disable
Power factor (cosf)	Channel 1 = enable CT input 1	Da 0,1 a 1 (0,9)
Channel 2		enable CT input enable from bus disable
Power factor (cosf)	Channel 2 = enable CT input 2	Da 0,1 a 1 (0,9)
Channel 3		enable CT input enable from bus disable
Power factor (cosf)	Channel 3 = enable CT input 3	Da 0,1 a 1 (0,9)
Power supply Voltage(V)	Channel 1 = enable CT input 1 o Channel 2 = enable CT input 2 o Channel 3 = enable CT input 3	Da 220 a 440 Vac 230
Channel 4		Ch1+Ch2+Ch3 enable from bus disable
Power supply Voltage(V)	Channel 4 = Ch1+Ch2+Ch3	Da 220 a 440 Vac 400
Power factor (cosf)	Channel 4 = Ch1+Ch2+Ch3	Da 0,1 a 1 (0,9)

Nome oggetto	Condizioni	Dimens.	Flags	DPT	Nr. Ogg. Com.
Instantaneous current Channel X (mA)	Channel X = enable CT input	4 Byte	CR---	[9.021] DPT_Value_Curr	0,51,102,153
	X = 1..4				

Nome oggetto	Condizioni	Dimens.	Flags	DPT	Nr. Ogg. Com.
Instantaneous Power Channel X (W)	Channel X = enable CT input	4 Byte	CR---	[14.056] power (W)	1.52.103,154
	X = 1..4				
Instantaneous Power Channel X (kW)	Channel X = enable CT input	2 Byte	CR---	[9.024] power (kW)	1.52.103,154
	X = 1..4				
Instantaneous Power Channel X da bus	Channel X = enable from bus	2 Byte	C-W-T	[9.024] power (kW)	2,53,104,155
	X = 1..4				
Total energy consumed on measuring Channel X	Channel X ≠ disable	2 Byte	CR---	[9.024] energy (kWh)	3,54,105,156
	X = 1..4				
Total energy consumed couter reset Channel X	Channel X ≠ disable	1 Bit	C-W-T	[1.015] Reset	4,55,106,157
	X = 1..4				

8.3. Channel information

This folder is active if at least one channel (1...3) is configured as internal enabled or if channel 4 is configured as "Ch1+Ch2+Ch3".

Nome parametro	Condizioni	Valori
CT type at input1	Channel 1 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	5A 20A 30A 40A 50A 60A
Enable measure correction	Channel 1 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	disabled enabled
CT type at input2	Channel 2 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	5A 20A 30A 40A 50A 60A
Enable measure correction	Channel 2 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	disabled enabled
CT type at input3	Channel 3 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	5A 20A 30A 40A 50A 60A
Enable measure correction	Channel 3 = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	disabled enabled

8.4. Measurement channel X

Nome parametro	Condizioni	Valori
Powe and current vlues on change sending	Channel X = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	From 0 to1000 W 0
	0 = not send	
Power and current values cyclical sending	Channel X = enable CT input, o Channel 4 = Ch1+Ch2+Ch3	0 [values 0 s ... 120 min]
	0 = not send ciclico	
Energy counter sending on change	Channel X ≠ disable	From 0 to50 kWh 0
	0 = not send	
Power value cyclical reading	Channel X = enable from bus, o Channel 4 = enable from bus	0 [values 0 s ... 120 min]
	0 = not read	
Power value at startup reading	Channel X = enable from bus, o Channel 4 = enable from bus	no Yes
	0 = not send	
Power value reading timeout	Channel X = enable from bus, o Channel 4 = enable from bus	00:00:00 hh:mm:ss [campo 00:00:00 ... 18:12:15]
	0 = not timeout	
Energy counter cyclic sending	Channel X ≠ disable	0 [values 0 s ... 120 min]
	0 = not send	
Counter reset after downloading the application sw	Channel X ≠ disable	Yes No
Enable thresholds	Channel X ≠ disable	enable disable
Threshold reset after downloading the application sw	Enable thresholds = enable	Yes No
Enable load control	Channel X ≠ disable	enable disable
Load control reset after downloading the application sw	Enable load control= enable	Yes No

8.5. Thresholds Y Channel X

<i>Nome parametro</i>	<i>Condizioni</i>	<i>Valori</i>
ThresholdY	Enable thresholds = enable	enable disable
ValueY	ThresholdY Channel X = enable	Da 10 a 32000 W 500
Status Y	ThresholdY Channel X = enable	Negata Not Negata
TypeY	ThresholdY Channel X = enable	Sotto Sopra
HysteresisY	ThresholdY Channel X = enable	From 1 To 1000 W 500
Disable from bus	ThresholdY Channel X = enable	Yes no
Disable modeY	ThresholdY Channel X = enable	inverted (= 0) not inverted (=1)
Status cyclical sendingY	ThresholdY Channel X = enable	0 [values 0 s ... 120 min]
Threshold activation delay	ThresholdY Channel X = enable	0 (nessun ritardo) [values 0 s ... 240 s]

<i>Nome oggetto</i>	<i>Condizioni</i>	<i>Dimens.</i>	<i>Flags</i>	<i>DPT</i>	<i>Nr. Ogg. Com.</i>
Channel X Threshold1	Threshold1 = enable	4 byte	-WC-- -	[14.056] power (W)	5,56,107,158
Channel X Threshold2	Threshold2 = enable	4 byte	-WC-- -	[14.056] power (W)	6,57,108,159
Channel X Threshold3	Threshold3 = enable	4 byte	-WC-- -	[14.056] power (W)	7,58,109,160
Channel X Threshold4	Threshold4 = enable	4 byte	-WC-- -	[14.056] power (W)	8,59,110,161
Channel X Threshold 5	Threshold5 = enable	4 byte	-WC-- -	[14.056] power (W)	9,60,111,162
Channel X Threshold 6	Threshold6 = enable	4 byte	-WC-- -	[14.056] power (W)	10,61,112,163

Nome oggetto	Condizioni	Dimens.	Flags	DPT	Nr. Ogg. Com.
Channel X Threshold 7	Threshold7 = enable	4 byte	-WC-- -	[14.056] power (W)	11,62,113,164
Channel X Threshold 8	Threshold8 = enable	4 byte	-WC-- -	[14.056] power (W)	12,63,114,165
Channel X Threshold 1 block	DisableThreshold 1 da bus = Yes	1 bit	C-W-T	[1.003] enable	13,64,115,166
Channel X Threshold 2 block	DisableThreshold 2 da bus = Yes	1 bit	C-W-T	[1.003] enable	14,65,116,167
Channel X Threshold 3 block	DisableThreshold 3 da bus = Yes	1 bit	C-W-T	[1.003] enable	15,66,117,168
Channel X Threshold 4 block	DisableThreshold 4 da bus = Yes	1 bit	C-W-T	[1.003] enable	16,67,118,169
Channel X Threshold 5 block	DisableThreshold 5 da bus = Yes	1 bit	C-W-T	[1.003] enable	17,68,119,170
Channel X Threshold 6 block	DisableThreshold 6 da bus = Yes	1 bit	C-W-T	[1.003] enable	18,69,120,171
Channel X Threshold 7 block	DisableThreshold 7 da bus = Yes	1 bit	C-W-T	[1.003] enable	19,70,121,172
Channel X Threshold 8 block	DisableThreshold 8 da bus = Yes	1 bit	C-W-T	[1.003] enable	20,71,122,173
Channel x - Threshold 1 status	Threshold1 = enable	1bit	CR_T- -	[1.001] switch	21,72,123,174
Channel x - Threshold 2 status	Threshold2 = enable	1bit	CR_T- -	[1.001] switch	22,73,124,175
Channel x - Threshold 3 status	Threshold3 = enable	1bit	CR_T- -	[1.001] switch	23,74,125,176
Channel x - Threshold 4 status	Threshold4 = enable	1bit	CR_T- -	[1.001] switch	24,75,126,177
Channel x - Threshold 5 status	Threshold5 = enable	1bit	CR_T- -	[1.001] switch	25,76,127,178
Channel x - Threshold 6 status	Threshold6 = enable	1bit	CR_T- -	[1.001] switch	26,77,128,179
Channel x - Threshold 7 status	Threshold7 = enable	1bit	CR_T- -	[1.001] switch	27,78,129,180

Nome oggetto	Condizioni	Dimens.	Flags	DPT	Nr. Ogg. Com.
Channel x - Threshold 8 status	Threshold8 = enable	1bit	CR_T- -	[1.001] switch	28,79,130,181

8.6. Load control channel X

X from 1 to 3 or external

<i>Nome parametro</i>	<i>Condizioni</i>	<i>Valori</i>
Load control number enabled	Enable load control X = enable	From 1 To 8 1
Load control reset	Enable load control X = enable	enable disable
Load control reset mode	Enable load control X = enable	inverted (= 0) not inverted (=1)
Threshold for Load control	Enable load control X = enable	From 100 To 30000 W 2900
Load control Hysteresis	Enable load control X = enable	From 50 To 1000 W 50
Load deactivation time	Enable load control X = enable	10 [values 10 s ... 300 s]

Nome parametro	Condizioni	Valori
Load reactivation time	Enable load control X = enable	10 [values 10 s ... 300 s]
Load status cyclical sending	Enable load control X = enable	0 [values 0 s ... 120 min]
Load 1 control exclusion	Enable load control X = enable	disable enable enable with load control reset enabled
Load 1 control exclusion Mode	Load 1 control exclusion X = enable	inverted (= 0) not inverted (=1)
Load 2 control exclusion	Load control number enabledX >= 2	disable enable enable with load control reset enabled
Load 2 control exclusion Mode	Load 2 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load 3 control exclusion	Load control number enabledX >= 3	disable enable enable with load control reset enabled
Load 3 control exclusion Mode	Load 3 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load 4 control exclusion	Load control number enabledX >= 4	disable enable enable with load control reset enabled
Load 4 control exclusion Mode	Load 4 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load 5 control exclusion	Load control number enabledX >= 5	disable enable enable with load control reset enabled
Load 5 control exclusion Mode	Load 5 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load 6 control exclusion	Load control number enabledX >= 6	disable enable enable with load control reset enabled
Load 6 control exclusion Mode	Load 6 control exclusion X = enabled	inverted (= 0) not inverted (=1)

Nome parametro	Condizioni	Valori
Load 7 control exclusion	Load control number enabled X >= 7	disable enable enable with load control reset enabled
Load 7 control exclusion Mode	Load 6 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load 8 control exclusion	Load control number enabled X = 8	disable enable enable with load control reset enabled
Load 8 control exclusion Mode	Load 8 control exclusion X = enabled	inverted (= 0) not inverted (=1)
Load status cyclical sending	Enable load control X = enable Load C control exclusion = enable	0 [values 0 s ... 120 min]
Load control threshold status reset time	Enable load control X = enable	0 [values 0 s ... 120 min]

Nome oggetto	Condizioni	Dim.	Flags	DPT	N° Ogg. Com.
Channel X- load control power threshold writing	Enable load control = enable	4 Byte	C-WT- -	[14.056] power (W)	29,80,131,182
Channel X- load control power threshold reading	Enable load control = enable	4 Byte	CR_T- -	[14.056] power (W)	30,81,132,183
Channel X- Load 1 control status	Enable load control = enable	1bit	CR_T- -	[1.001] switch	31,82,133,184
Channel X- Load 2 control status	Enable load control = enable e Load control number enabled>1	1bit	CR_T- -	[1.001] switch	32,83,134,185
Channel X- Load 3 control status	Enable load control = enable e Load control number enabled>2	1bit	CR_T- -	[1.001] switch	33,84,135,186
Channel X- Load 4 control status	Enable load control = enable e Load control number enabled>3	1bit	CR_T- -	[1.001] switch	34,85,136,187
Channel X- Load 5 control status	Enable load control = enable e Load control number enabled >4	1bit	CR_T- -	[1.001] switch	35,86,137,188
Channel X- Load 6 control status	Enable load control = enable e Load control number enabled>5	1bit	CR_T- -	[1.001] switch	36,87,138,189

Nome oggetto	Condizioni	Dim.	Flags	DPT	N° Ogg. Com.
Channel X- Load 7 control status	Enable load control = enable e Load control number enabled>6	1bit	CR_T- -	[1.001] switch	37,88,139,190
Channel X- Load 8 control status	Enable load control = enable e Load control number enabled >7	1bit	CR_T- -	[1.001] switch	38,89,140,191
Channel X Load 1 control exclusion	Load 1 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	39,90,141,192
Channel X Load 2 control exclusion	Load 2 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	40,91,142,193
Channel X Load 3 control exclusion	Load 3 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	41,92,143,194
Channel X Load 4 control exclusion	Load 4 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	42,93,144,195
Channel X Load 5 control exclusion	Load 5 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	43,94,145,196
Channel X Load 6 control exclusion	Load 6 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	44,95,146,197
Channel X Load 7 control exclusion	Load 7 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	45,96,147,198
Channel X Load 8 control exclusion	Load 8 control exclusion = enabled	1bit	CR_T- -	[1.001] switch	46,97,148,199
Channel X - Load control reset	Enable load control = enable	1bit	C_WT- -	[1.015] reset	47,98,149,200
Channel X - Load control reset status	Enable load control = enable	1bit	CR_T- -	[1.001] switch	48,99,149,201
Channel X – Load load threshold status	Enable load control = enable	1bit	CR_T- -	[1.005] alarm	49,100,150,202
Channel X – Load load threshold status reset	Enable load control = enable	1bit	C_WT- -	[1.015] reset	50,101,151,203

10. Logic functions

The device EK-CF2-TP allows using some common logic functions (AND, OR, NOT and exclusive OR) in order to implement complex functions in the building automation system.

You can configure:

- 4 channels of logical functions
- 4 inputs for each channel

Each object value, if desired, can be individually inverted by inserting a NOT logic operator.

For each channel, a parameter *Delay after bus voltage recovery* is available: this parameter represents the time interval between the bus voltage recovery and the first reading of the input communication objects for evaluating the logic functions.



In case of incorrect connection of the input communication object or electrical trouble on bus resulting in a failed input reading request, the logic output of the corresponding channel can be calculated by setting the input values to default.

The communication function representing the logic function output is sent on the bus on event of change; alternatively, a cyclic sending can be set.

The folder is enabled if: *General* $\Rightarrow$ *Logic functions* = enabled.

9.1. Parameters and communication objects

The folder is active if: *General* $\Rightarrow$ *Logic functions* = enabled.

Nome parametro	Condizioni	Valori
Logic function		disabled / enabled
Logic operation	Logic Function = enabled	OR / AND / XOR
	XOR	
Delay after bus voltage recovery		00:00:04.000 hh:mm:ss.fff [campo 00:00:00.000 ... 00:10:55.350]
	<i>Time interval between bus voltage recovery and the first reading of the input communication objects for the evaluation of the logical functions.</i>	
Output cycling trasmission interval		not send [altri values 30 s ... 120 min]
	<i>Not send means that the Logic Function output state is updated on the bus only when there is a change. Different intervals imply that the output state is sent cyclically on the bus.</i>	
Logic objet x		disabled / enabled
Logic Object negated	Logic objet x = enabled	no / Yes
	<i>By negating the logical state of the corresponding input, it is possible to realize complex combinatorial logics. Example: Output = (NOT(Logic object 1) OR Logic object 2).</i>	
Logic object x read at startup	Logic objet x = enabled	no / Yes

Nome parametro	Condizioni	Valori
Logic object default value	Logic objet x = enabled	nothing / off / on
Output sending	Logic Function = enabled	both values only value 0 only value 1
Output Update	Logic Function = enabled	at value change at value or input change

Nome oggetto	Condizioni	Dim.	Flags	DPT	N° Ogg. Com.
Logic Function X, input 1	Logic Function X = enabled Logic objet 1 = enabled	1 Bit	C-W--	[1.001] switch	204,209,214,219
Logic Function X, input 2	Logic Function X = enabled Logic objet 2 = enabled	1 Bit	C-W--	[1.001] switch	205,210,215,220
Logic Function X, input 3	Logic Function X = enabled Logic objet 3 = enabled	1 Bit	C-W--	[1.001] switch	206,211,216,221
Logic Function X, input 4	Logic Function X = enabled Logic objet 4 = enabled	1 Bit	C-W--	[1.001] switch	207,212,217,222
Logic Function X, output	Logic Function X = enabled	1 Bit	C-W--	[1.001] switch	208,213,218,223

11. Summary of KNX communication objects

Nr.	Communication object name	Dimension	Flag	DPT Type
0	Channel 1 - Instantaneous current (mA)	2 Bytes	R-CT--	[9.021] DPT_Value_Curr
1	Channel 1 - Instantaneous power (kW)	4 Bytes	R-CT--	[14.056] DPT_power W
2	Channel 1 - Instantaneous power (W)	2 Bytes	R-CT--	[9.024] DPT_power KW
2	Channel 1 - Instantaneous power (kW) from bus	2 Bytes	-WC-U-	[9.024] DPT_power KW
3	Channel 1 - Total energy consumed (kWh)	4 Bytes	R-CT--	[13.013] DPT_energy(kWh)
4	Channel 1 - Total energy consumed counter reset	1 Bit	-WC---	[1.015] DPT_Reset
5	Channel 1 - Threshold 1	4 Bytes	-WC---	[14.056] DPT_power W
6	Channel 1 - Threshold 2	4 Bytes	-WC---	[14.056] DPT_power W
7	Channel 1 - Threshold 3	4 Bytes	-WC---	[14.056] DPT_power W
8	Channel 1 - Threshold 4	4 Bytes	-WC---	[14.056] DPT_power W
9	Channel 1 - Threshold 5	4 Bytes	-WC---	[14.056] DPT_power W
10	Channel 1 - Threshold 6	4 Bytes	-WC---	[14.056] DPT_power W
11	Channel 1 - Threshold 7	4 Bytes	-WC---	[14.056] DPT_power W
12	Channel 1 - Threshold 8	4 Bytes	-WC---	[14.056] DPT_power W
13	Channel 1 - Threshold 1 block	1 Bit	-WC-U-	[1.003] DPT_Enable
14	Channel 1 - Threshold 2 block	1 Bit	-WC-U-	[1.003] DPT_Enable
15	Channel 1 - Threshold 3 block	1 Bit	-WC-U-	[1.003] DPT_Enable
16	Channel 1 - Threshold 4 block	1 Bit	-WC-U-	[1.003] DPT_Enable
17	Channel 1 - Threshold 5 block	1 Bit	-WC-U-	[1.003] DPT_Enable
18	Channel 1 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
19	Channel 1 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
20	Channel 1 - Threshold 7 block	1 Bit	-WC-U-	[1.003] DPT_Enable
21	Channel 1 - Threshold 1 status	1 Bit	R-CT--	[1.001] DPT_switch
22	Channel 1 - Threshold 2 status	1 Bit	R-CT--	[1.001] DPT_switch
23	Channel 1 - Threshold 3 status	1 Bit	R-CT--	[1.001] DPT_switch
24	Channel 1 - Threshold 4 status	1 Bit	R-CT--	[1.001] DPT_switch
25	Channel 1 - Threshold 5 status	1 Bit	R-CT--	[1.001] DPT_switch
26	Channel 1 - Threshold 6 status	1 Bit	R-CT--	[1.001] DPT_switch
27	Channel 1 - Threshold 7 status	1 Bit	R-CT--	[1.001] DPT_switch
28	Channel 1 - Threshold 8 status	1 Bit	R-CT--	[1.001] DPT_switch
29	Channel 1 - Load control power threshold writing	4 Bytes	-WC---	[14.056] DPT_power W
30	Channel 1 - Load control power threshold reading	4 Bytes	R-CT--	[14.056] DPT_power W
31	Channel 1 - Load 1 control status	1 Bit	R-CT--	[1.001] DPT_switch
32	Channel 1 - Load 2 control status	1 Bit	R-CT--	[1.001] DPT_switch
33	Channel 1 - Load 3 control status	1 Bit	R-CT--	[1.001] DPT_switch

Nr.	Communication object name	Dimension	Flag	DPT Type
34	Channel 1 - Load 4 control status	1 Bit	R-CT--	[1.001] DPT_switch
35	Channel 1 - Load 5 control status	1 Bit	R-CT--	[1.001] DPT_switch
36	Channel 1 - Load 6 control status	1 Bit	R-CT--	[1.001] DPT_switch
37	Channel 1 - Load 7 control status	1 Bit	R-CT--	[1.001] DPT_switch
38	Channel 1 - Load 8 control status	1 Bit	R-CT--	[1.001] DPT_switch
39	Channel 1 - Load 1 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
40	Channel 1 - Load 2 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
41	Channel 1 - Load 3 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
42	Channel 1 - Load 4 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
43	Channel 1 - Load 5 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
44	Channel 1 - Load 6 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
45	Channel 1 - Load 7 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
46	Channel 1 - Load 8 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
47	Channel 1 - Load control reset	1 Bit	-WC-U-	[1.015] DPT_reset
48	Channel 1 - Load control status	1 Bit	R-CT--	[1.001] DPT_switch
49	Channel 1 -Threshold Load control status reset	1 Bit	R-CT--	[1.001] DPT_switch
50	Channel 1 - Load control status reset	1 Bit	-WC-U-	[1.015] DPT_reset
51	Channel 2 - Instantaneous current (mA)	2 Bytes	R-CT--	[9.021] DPT_Value_Curr
52	Channel 2 - Instantaneous power (kW)	4 Bytes	R-CT--	[14.056] DPT_power W
53	Channel 2 - Instantaneous power (W)	2 Bytes	R-CT--	[9.024] DPT_power KW
53	Channel 2 - Instantaneous power (kW) from bus	2 Bytes	R-CT--	[9.024] DPT_power KW
54	Channel 2 - Total energy consumed (kWh)	4 Bytes	R-CT--	[13.013] DPT_energy(KWh)
55	Channel 2 - Total energy consumed counter reset	1 Bit	-WC---	[1.015] DPT_Reset
56	Channel 2 - Threshold 1	4 Bytes	-WC---	[14.056] DPT_power W
57	Channel 2- Threshold 2	4 Bytes	-WC---	[14.056] DPT_power W
58	Channel 2 - Threshold 3	4 Bytes	-WC---	[14.056] DPT_power W
59	Channel 2 - Threshold 4	4 Bytes	-WC---	[14.056] DPT_power W
60	Channel 2 - Threshold 5	4 Bytes	-WC---	[14.056] DPT_power W
61	Channel 2 - Threshold 6	4 Bytes	-WC---	[14.056] DPT_power W
62	Channel 2 - Threshold 7	4 Bytes	-WC---	[14.056] DPT_power W
63	Channel 2 - Threshold 8	4 Bytes	-WC---	[14.056] DPT_power W
64	Channel 2 - Threshold 1 block	1 Bit	-WC-U-	[1.003] DPT_Enable
65	Channel 2 - Threshold 2 block	1 Bit	-WC-U-	[1.003] DPT_Enable
66	Channel 2 - Threshold 3 block	1 Bit	-WC-U-	[1.003] DPT_Enable

Nr.	Communication object name	Dimension	Flag	DPT Type
67	Channel 2 - Threshold 4 block	1 Bit	-WC-U-	[1.003] DPT_Enable
68	Channel 2 - Threshold 5 block	1 Bit	-WC-U-	[1.003] DPT_Enable
69	Channel 2 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
70	Channel 2 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
71	Channel 2 - Threshold 7 block	1 Bit	-WC-U-	[1.003] DPT_Enable
72	Channel 2 - Threshold 1 status	1 Bit	R-CT--	[1.001] DPT_switch
73	Channel 2 - Threshold 2 status	1 Bit	R-CT--	[1.001] DPT_switch
74	Channel 2 - Threshold 3 status	1 Bit	R-CT--	[1.001] DPT_switch
75	Channel 2 - Threshold 4 status	1 Bit	R-CT--	[1.001] DPT_switch
76	Channel 2 - Threshold 5 status	1 Bit	R-CT--	[1.001] DPT_switch
77	Channel 2 - Threshold 6 status	1 Bit	R-CT--	[1.001] DPT_switch
78	Channel 2 - Threshold 7 status	1 Bit	R-CT--	[1.001] DPT_switch
79	Channel 2 - Threshold 8 status	1 Bit	R-CT--	[1.001] DPT_switch
80	Channel 2 - Load control power threshold writing	4 Bytes	-WC---	[14.056] DPT_power W
81	Channel 2 - Load control power threshold reading	4 Bytes	R-CT--	[14.056] DPT_power W
82	Channel 2 - Load 1 control status	1 Bit	R-CT--	[1.001] DPT_switch
83	Channel 2 - Load 2 control status	1 Bit	R-CT--	[1.001] DPT_switch
84	Channel 2 - Load 3 control status	1 Bit	R-CT--	[1.001] DPT_switch
85	Channel 2 - Load 4 control status	1 Bit	R-CT--	[1.001] DPT_switch
86	Channel 2 - Load 5 control status	1 Bit	R-CT--	[1.001] DPT_switch
87	Channel 2 - Load 6 control status	1 Bit	R-CT--	[1.001] DPT_switch
88	Channel 2 - Load 7 control status	1 Bit	R-CT--	[1.001] DPT_switch
89	Channel 2 - Load 8 control status	1 Bit	R-CT--	[1.001] DPT_switch
90	Channel 2 - Load 1 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
91	Channel 2 - Load 2 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
92	Channel 2 - Load 3 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
93	Channel 2 - Load 4 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
94	Channel 2 - Load 5 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
95	Channel 2 - Load 6 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
96	Channel 2 - Load 7 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
97	Channel 2 - Load 8 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
98	Channel 2 - Load control reset	1 Bit	-WC-U-	[1.015] DPT_reset
99	Channel 2 - Load control status	1 Bit	R-CT--	[1.001] DPT_switch
100	Channel 2 -Threshold Load control status reset	1 Bit	R-CT--	[1.001] DPT_switch

Nr.	Communication object name	Dimension	Flag	DPT Type
101	Channel 2 - Load control status reset	1 Bit	-WC-U-	[1.015] DPT_reset
102	Channel 3 - Instantaneous current (mA)	2 Bytes	R-CT--	[9.021] DPT_Value_Curr
103	Channel 3 - Instantaneous power (kW)	4 Bytes	R-CT--	[14.056] DPT_power W
104	Channel 3 - Instantaneous power (W)	2 Bytes	R-CT--	[9.024] DPT_power KW
104	Channel 3 - Instantaneous power (kW) from bus	2 Bytes	R-CT--	[9.024] DPT_power KW
105	Channel 3 - Total energy consumed (kWh)	4 Bytes	R-CT--	[13.013] DPT_energy(kWh)
106	Channel 3 - Total energy consumed counter reset	1 Bit	-WC---	[1.015] DPT_Reset
107	Channel 3 - Threshold 1	4 Bytes	-WC---	[14.056] DPT_power W
108	Channel 3 - Threshold 2	4 Bytes	-WC---	[14.056] DPT_power W
109	Channel 3 - Threshold 3	4 Bytes	-WC---	[14.056] DPT_power W
110	Channel 3 - Threshold 4	4 Bytes	-WC---	[14.056] DPT_power W
111	Channel 3 - Threshold 5	4 Bytes	-WC---	[14.056] DPT_power W
112	Channel 3 - Threshold 6	4 Bytes	-WC---	[14.056] DPT_power W
113	Channel 3 - Threshold 7	4 Bytes	-WC---	[14.056] DPT_power W
114	Channel 3 - Threshold 8	4 Bytes	-WC---	[14.056] DPT_power W
115	Channel 3 - Threshold 1 block	1 Bit	-WC-U-	[1.003] DPT_Enable
116	Channel 3 - Threshold 2 block	1 Bit	-WC-U-	[1.003] DPT_Enable
117	Channel 3 - Threshold 3 block	1 Bit	-WC-U-	[1.003] DPT_Enable
118	Channel 3 - Threshold 4 block	1 Bit	-WC-U-	[1.003] DPT_Enable
119	Channel 3 - Threshold 5 block	1 Bit	-WC-U-	[1.003] DPT_Enable
120	Channel 3 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
121	Channel 3 - Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
122	Channel 3 - Threshold 7 block	1 Bit	-WC-U-	[1.003] DPT_Enable
123	Channel 3 - Threshold 1 status	1 Bit	R-CT--	[1.001] DPT_switch
124	Channel 3 - Threshold 2 status	1 Bit	R-CT--	[1.001] DPT_switch
125	Channel 3 - Threshold 3 status	1 Bit	R-CT--	[1.001] DPT_switch
126	Channel 3 - Threshold 4 status	1 Bit	R-CT--	[1.001] DPT_switch
127	Channel 3 - Threshold 5 status	1 Bit	R-CT--	[1.001] DPT_switch
128	Channel 3 - Threshold 6 status	1 Bit	R-CT--	[1.001] DPT_switch
129	Channel 3 - Threshold 7 status	1 Bit	R-CT--	[1.001] DPT_switch
130	Channel 3 - Threshold 8 status	1 Bit	R-CT--	[1.001] DPT_switch
131	Channel 3 - Load control power threshold writing	4 Bytes	-WC---	[14.056] DPT_power W
132	Channel 3 - Load control power threshold reading	4 Bytes	R-CT--	[14.056] DPT_power W
133	Channel 3 - Load 1 control status	1 Bit	R-CT--	[1.001] DPT_switch
134	Channel 3 - Load 2 control status	1 Bit	R-CT--	[1.001] DPT_switch
135	Channel 3 - Load 3 control status	1 Bit	R-CT--	[1.001] DPT_switch
136	Channel 3 - Load 4 control status	1 Bit	R-CT--	[1.001] DPT_switch

Nr.	Communication object name	Dimension	Flag	DPT Type
137	Channel 3 - Load 5 control status	1 Bit	R-CT--	[1.001] DPT_switch
138	Channel 3 - Load 6 control status	1 Bit	R-CT--	[1.001] DPT_switch
139	Channel 3 - Load 7 control status	1 Bit	R-CT--	[1.001] DPT_switch
140	Channel 3 - Load 8 control status	1 Bit	R-CT--	[1.001] DPT_switch
141	Channel 3 - Load 1 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
142	Channel 3 - Load 2 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
143	Channel 3 - Load 3 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
144	Channel 3 - Load 4 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
145	Channel 3 - Load 5 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
146	Channel 3 - Load 6 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
147	Channel 3 - Load 7 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
148	Channel 3 - Load 8 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
149	Channel 3 - Load control reset	1 Bit	-WC-U-	[1.015] DPT_reset
150	Channel 3 - Load control status	1 Bit	R-CT--	[1.001] DPT_switch
151	Channel 3 - Threshold Load control status reset	1 Bit	-WC-U-	[1.005] DPT_alarm
152	Channel 3 - Load control status reset	1 Bit	R-CT--	[1.001] DPT_switch
153	Channel 4 - Instantaneous current (mA)	2 Bytes	R-CT--	[9.021] DPT_Value_Curr
154	Channel 4 - Instantaneous power (kW)	4 Bytes	R-CT--	[14.056] DPT_power W
155	Channel 4 - Instantaneous power (W)	2 Bytes	R-CT--	[9.024] DPT_power KW
155	Channel 4 - Instantaneous power (kW) from bus	2 Bytes	R-CT--	[9.024] DPT_power KW
156	Channel 4 - Total energy consumed (kWh)	4 Bytes	R-CT--	[13.013] DPT_energy(kWh)
157	Channel 4 - Total energy consumed counter reset	1 Bit	-WC---	[1.015] DPT_Reset
158	Channel 4- Threshold 1	4 Bytes	-WC---	[14.056] DPT_power W
159	Channel 4- Threshold 2	4 Bytes	-WC---	[14.056] DPT_power W
160	Channel 4- Threshold 3	4 Bytes	-WC---	[14.056] DPT_power W
161	Channel 4- Threshold 4	4 Bytes	-WC---	[14.056] DPT_power W
162	Channel 4- Threshold 5	4 Bytes	-WC---	[14.056] DPT_power W
163	Channel 4- Threshold 6	4 Bytes	-WC---	[14.056] DPT_power W
164	Channel 4- Threshold 7	4 Bytes	-WC---	[14.056] DPT_power W
165	Channel 4- Threshold 8	4 Bytes	-WC---	[14.056] DPT_power W
166	Channel 4- Threshold 1 block	1 Bit	-WC-U-	[1.003] DPT_Enable
167	Channel 4- Threshold 2 block	1 Bit	-WC-U-	[1.003] DPT_Enable
168	Channel 4- Threshold 3 block	1 Bit	-WC-U-	[1.003] DPT_Enable

Nr.	Communication object name	Dimension	Flag	DPT Type
169	Channel 4- Threshold 4 block	1 Bit	-WC-U-	[1.003] DPT_Enable
170	Channel 4- Threshold 5 block	1 Bit	-WC-U-	[1.003] DPT_Enable
171	Channel 4- Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
172	Channel 4- Threshold 6 block	1 Bit	-WC-U-	[1.003] DPT_Enable
173	Channel 4- Threshold 7 block	1 Bit	-WC-U-	[1.003] DPT_Enable
174	Channel 4- Threshold 1 status	1 Bit	R-CT--	[1.001] DPT_switch
175	Channel 4- Threshold 2 status	1 Bit	R-CT--	[1.001] DPT_switch
176	Channel 4- Threshold 3 status	1 Bit	R-CT--	[1.001] DPT_switch
177	Channel 4- Threshold 4 status	1 Bit	R-CT--	[1.001] DPT_switch
178	Channel 4- Threshold 5 status	1 Bit	R-CT--	[1.001] DPT_switch
179	Channel 4- Threshold 6 status	1 Bit	R-CT--	[1.001] DPT_switch
180	Channel 4- Threshold 7 status	1 Bit	R-CT--	[1.001] DPT_switch
181	Channel 4- Threshold 8 status	1 Bit	R-CT--	[1.001] DPT_switch
182	Channel 4 - Load control power threshold writing	4 Bytes	-WC---	[14.056] DPT_power W
183	Channel 4 - Load control power threshold reading	4 Bytes	R-CT--	[14.056] DPT_power W
184	Channel 4 - Load 1 control status	1 Bit	R-CT--	[1.001] DPT_switch
185	Channel 4- Load 2 control status	1 Bit	R-CT--	[1.001] DPT_switch
186	Channel 4- Load 3 control status	1 Bit	R-CT--	[1.001] DPT_switch
187	Channel 4- Load 4 control status	1 Bit	R-CT--	[1.001] DPT_switch
188	Channel 4- Load 5 control status	1 Bit	R-CT--	[1.001] DPT_switch
189	Channel 4- Load 6 control status	1 Bit	R-CT--	[1.001] DPT_switch
190	Channel 4- Load 7 control status	1 Bit	R-CT--	[1.001] DPT_switch
191	Channel 4- Load 8 control status	1 Bit	R-CT--	[1.001] DPT_switch
192	Channel 4- Load 1 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
193	Channel 4- Load 2 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
194	Channel 4- Load 3 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
195	Channel 4- Load 4 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
196	Channel 4- Load 5 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
197	Channel 4- Load 6 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
198	Channel 4- Load 7 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
199	Channel 4- Load 8 control exclusion	1 Bit	-WC-U-	[1.003] DPT_enable
200	Channel 4 - Load control reset	1 Bit	-WC-U-	[1.015] DPT_reset
201	Channel 4 - Load control status	1 Bit	R-CT--	[1.001] DPT_switch
202	Channel 4 -Threshold Load control status reset	1 Bit	R-CT--	[1.001] DPT_switch

Nr.	Communication object name	Dimension	Flag	DPT Type
203	Channel 4 - Load control status reset	1 Bit	-WC- U-	[1.015] DPT_reset
204	Logic Function 1 input 1	1 Bit	-WC- U-	[1.001] DPT_switch
205	Logic Function 1 input 2	1 Bit	-WC- U-	[1.001] DPT_switch
206	Logic Function 1 input 3	1 Bit	-WC- U-	[1.001] DPT_switch
207	Logic Function 1 input 4	1 Bit	-WC- U-	[1.001] DPT_switch
208	Logic Function 1 output	1 Bit	R-CT--	[1.001] DPT_switch
209	Logic Function 2 input 1	1 Bit	-WC- U-	[1.001] DPT_switch
210	Logic Function 2 input 2	1 Bit	-WC- U-	[1.001] DPT_switch
211	Logic Function 2 input 3	1 Bit	-WC- U-	[1.001] DPT_switch
212	Logic Function 2 input 4	1 Bit	-WC- U-	[1.001] DPT_switch
213	Logic Function 2 output	1 Bit	R-CT--	[1.001] DPT_switch
214	Logic Function 3 input 1	1 Bit	-WC- U-	[1.001] DPT_switch
215	Logic Function 3 input 2	1 Bit	-WC- U-	[1.001] DPT_switch
216	Logic Function 3 input 3	1 Bit	-WC- U-	[1.001] DPT_switch
217	Logic Function 3 input 4	1 Bit	-WC- U-	[1.001] DPT_switch
218	Logic Function 3 output	1 Bit	R-CT--	[1.001] DPT_switch
219	Logic Function 4 input 1	1 Bit	-WC- U-	[1.001] DPT_switch
220	Logic Function 4 input 2	1 Bit	-WC- U-	[1.001] DPT_switch
221	Logic Function 4 input 3	1 Bit	-WC- U-	[1.001] DPT_switch
222	Logic Function 4 input 4	1 Bit	-WC- U-	[1.001] DPT_switch
223	Logic Function 4 output	1 Bit	R-CT--	[1.001] DPT_switch

Table A1. Dimensions and DPT for Communication Objects with independent inputs.

<i>Dimens.</i>	<i>DPT</i>
1 bit	[1.001] switch
2 bit	[2.*] 1-bit controlled
1 byte senza segno	[4.*] character [5.*] 8-bit unsigned value [20.*] 1-byte
1 byte percentuale	[4.*] character [5.*] 8-bit unsigned value [20.*] 1-byte
1 byte con segno	[6.*] 8-bit signed value
2 bytes senza segno	[7.*] 2-byte unsigned value
2 bytes con segno	[8.*] 2-byte signed value
2 bytes virgola mobile	[9.*] 2-byte float value

12. Warning

- Installation, electrical connection, configuration and commissioning of the device can only be carried out by qualified personnel.
- Opening the housing of the device causes the immediate end of the warranty period.
- ekinex® KNX defective devices must be returned to the manufacturer at the following address:

EKINEX S.p.A. Via Novara 37, I-28010 Vaprio d'Agogna (NO) Italy.

11.1. Other information

- This application manual is aimed at installers, system integrators and planners
- For further information on the product, please contact the ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com
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