



KLIC-MITTE

KNX - IT Terminal Gateway for Mitsubishi Electric Ecodan Units

ZCLMITTE

Application program version: [1.0]

User manual edition: [1.0]_c

www.zennio.com

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DOCUMENT UPDATES

Version	Changes	Page(s)
[1.0]_c	Correction in the cover image.	-
[1.0]_b	Clarification in Installation section for a correct configuration.	5

1 INTRODUCTION

1.1 KLIC-MITTE

KLIC-MITTE from Zennio is a new gateway that provides full-duplex communication between the KNX home automation system and **Mitsubishi Electric Ecodan** air-conditioning and hot water management systems through the IT Terminal interface.

Because of this **bidirectional** communication, the air conditioning system can be controlled from the home automation system in the same manner as it is through its own controls. Moreover, the actual status of the unit can be monitored and periodically sent to the KNX bus to inform other devices.

The most outstanding features of KLIC-MITTE are:

- Bidirectional control of Ecodan ME (Mitsubishi Electric) units through their **IT Terminal connector** (CN105).
- Control of the **main functions** of the Ecodan unit: On/Off, temperature, mode of operation, etc.
- **Error management** to handle specific error codes from the unit itself as well as any communication issues that may arise.
- **Two analogue-digital inputs**, for the connection of temperature probes, motion detectors or binary pushbuttons or switches.
- 10 customisable, multi-operation **logic functions**.
- **Heartbeat** or periodic “still-alive” notification.

1.2 INSTALLATION

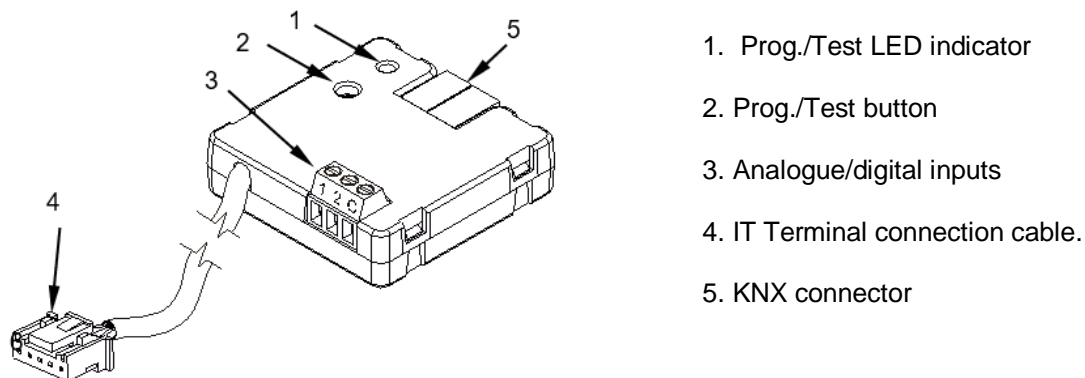


Figure 1. Element scheme

KLIC-MITTE connects to the KNX bus via the corresponding built-in terminal (5). Once the device is provided with power from the KNX bus, both the physical address and the KLIC-MITTE application program can be downloaded.

This device does not need any external power as it is entirely powered through the KNX bus.

The remaining elements are described next.

- **Prog./Test button (2):** a short press on this button will set the device into the programming mode, making the associated LED (1) light in red.

Note: if this button is held while plugging the device into the KNX bus, the device will enter into safe mode. The LED will blink in red every 0.5 seconds

- **Analogue-Digital Inputs (3):** input ports for the stripped cables of external elements such as switches, motion detectors, temperature probes, etc.
- **Communication cable (4):** cable with a CN105 connector that will connect KLIC-MITTE to the unit. The other end of the cable, therefore, is intended to be connected to the IT Terminal connector in the PCB board of the internal unit.

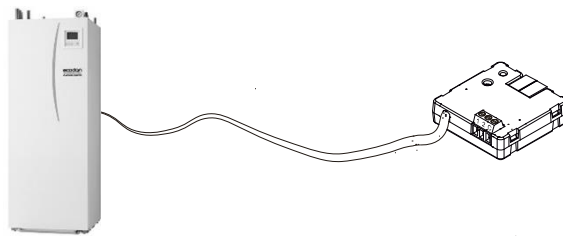


Figure 2. Connecting KLIC-MITTE to the Ecodan unit

Important: *KLIC-MITTE is designed for FTC5 control systems. For other control systems, that many functions are disabled must be taken into account. In addition, certain parameterisations made in the device can be ignored.*

Note: *For a correct parameterization and behaviour of the KLIC-MITTE, it must be considered that the units of the FTC5 control systems have internal switches that allow to enable and disable certain characteristics of it. Consult the Mitsubishi unit manual for more information.*

For detailed information about the technical features of KLIC-MITTE, as well as on security and installation procedures, please refer to the device **Datasheet**, bundled in the device packaging and also available at <http://www.zennio.com>.

1.3 START-UP AND POWER LOSS

Depending on the configuration, some specific actions will be performed during the device start-up. The integrator may set up an initial status to be sent to the unit after the bus power recovery, and whether certain objects should be sent to the bus after the power recovery, as described in later sections.

On the other hand, when a bus power failure takes place, the device will interrupt any pending actions, and will save its state so it can be recovered once the power supply is restored.

2 CONFIGURATION

2.1 GENERAL

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by entering the Parameters tab of the device.

ETS PARAMETERISATION

The “General” screen is shown in the first place, containing the following parameters:

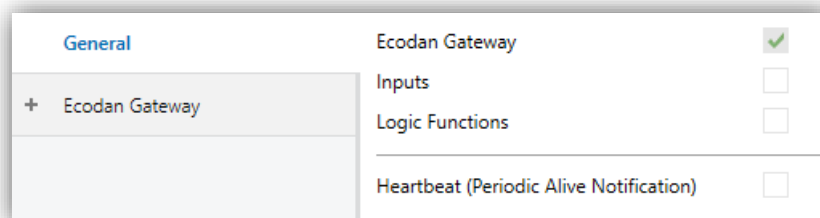
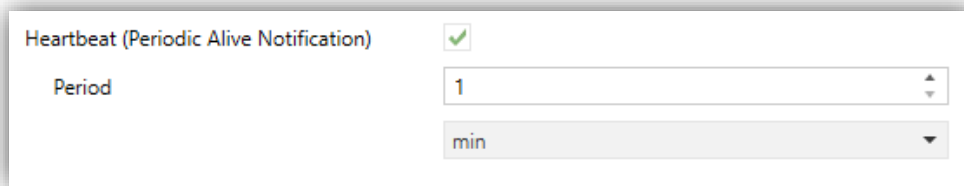


Figure 3. General

- **Ecodan Gateway** [*enabled*]¹: entails all functions specific to KLIC-MITTE, relating to communication with the Ecodan unit and management of the climate and hot water control system. For more information, see section 2.2.
- **Inputs** [*disabled/enabled*]: enables or disables the “Inputs” tab in the tree on the left. For more information, see section 2.3.
- **Logic Functions** [*disabled/enabled*]: enables or disables the “Logic Functions” tab in the tree on the left. For more information, see section 2.4.
- **Heartbeat (Periodic Alive Notification)** [*disabled/enabled*]: this parameter lets the integrator incorporate a one-bit object to the project (“**[Heartbeat] Object to Send ‘1’**”) that will be sent periodically with value “1” to notify that the device is still working (*still alive*).

¹ The default values of each parameter will be highlighted in blue in this document, as follows: [*default/rest of options*].



Heartbeat (Periodic Alive Notification)

Period

Figure 4. Heartbeat

Note: the first sending after download or bus failure takes place with a delay of up to 255 seconds, to prevent bus overload. The following sendings match the period set.

Regardless of the above parameters, the following objects are available by default:

- “[General] On/Off” and “[General] On/Off (Status)”: allow switching on (value “1”) and off (value “0”) the Ecodan unit or reading the current status, respectively.
- Several **error objects**. See section 2.2.33.
- “[Climate] Operation (Status)” and “[Climate] Allowed/Prohibited (Status)”: allow reading the current state of the climate.
- “[Climate] [Zone 1] Temperature Setpoint” and “[Climate] [Zone 1] Temperature Setpoint (Status)”: allow setting the desired temperature setpoint or reading the current value, respectively. See section 2.2.1 for further information.
- “[Climate] [Zone 1] Temperature Control Mode (Status)”: allows reading the type of control that the unit performs (Flow/Room/Compensation Curve) respectively. See section 2.2.1 for further information.

2.2 ECODAN GATEWAY

2.2.1 CONFIGURATION

KLIC-MITTE allows controlling and monitoring an Ecodan unit.

Through the KNX bus, commands to control the following basic functions can be sent to KLIC-MITTE:

- **On/Off** switch of the Ecodan unit.

- **Climate control and supervision:**
 - **Climate operation and permission status:** allows to know if the unit is working and if it is authorised.
 - **Climate mode:** depending on unit characteristics, climate mode can be changed between heating or cooling. Also, its status can be read.
 - Machine **climate setpoint temperature** of the available zones. The temperature can be modified within a range of values according to the selected **temperature control mode**.
 - 1 or 2 **climate zones** can be controlled.
 - **Climate temperature control mode:** using KLIC-MITTE, temperature control mode can be known (flow temperature, room temperature, compensation curve), but it only can be changed by wired remote control.

- **Flow temperature:** this mode allows setting a fluid setpoint for heating or cooling mode whose ranges will be:
 - **Heating:** [25...60] °C
 - **Cooling:** [5...25] °C

- **Room Temperature:** allows to establish a temperature setpoint for heating mode.
 - **Heating:** [10...30] °C

- **Compensation Curve:** is intended to be modified by the wired remote control, therefore, the sending of setpoints from KLIC-MITTE in this mode is meaningless.

Note: *When control by Compensation Curve is established only in Heating Mode, it should be taken into account that, in that case, the temperature control is performed entirely by the machine, so **any temperature setpoint sent to the KLIC will be ignored** and the flow temperature setpoint calculated by the machine using the compensation curve will return by the status object. Thus, as explained above, what is shown on the control and on the status object of the KLIC is:*

- **Wired remote control:** *shows the increase or decrease in temperature that the user wishes to perform on the flow temperature setpoint calculated by the machine.*
 - **KLIC-MITTE:** *flow temperature resulting from applying the internal compensation curve of the machine plus the increase desired by the user from the wired remote control.*
- **Domestic Home Water (DHW) control and supervision:** its operation is based on the activation of a heat pump that heats the water to the desired temperature.
 - **Setpoint temperature:** temperature at which the water in the DHW tank will be heated.
 - **DHW operating and permission status:** allows to discern when the unit is heating water and when it is not and if it is authorised.

On the other hand, KLIC-MITTE allows the configuration of the following advanced functions:

- **Advanced Modes:** allows to enable objects to activate the general **Holiday Mode**, and the **Economy** and **Forced Modes** in the DHW system.
- **Initial Configuration:** allows to define the desired initial value for the unit states after the device has been programmed or restarted.

In addition, KLIC-MITTE provides an **error management** function (see section 2.2.33), which allows sending messages to the KNX bus in case the A/C unit reports any errors.

ETS PARAMETRIZATION

The “Configuration” tab under Ecodan Gateway provides the following parameters:

Figure 5. Ecodan Gateway Configuration

UNIT TYPE

- **Climate Mode Available** [[Heating](#) / [Cooling/Heating](#)]. If “[Cooling/Heating](#)” are selected, the following 1-Bit object will be enabled: “[Climate] Operation Mode” and “[Climate] Operation Mode (Status)”. These will allow to choose under which mode (cold or heat) the unit will operate and to monitor its status.
- **Number of Available Zones** [[1](#) / [2](#)]: indicates the number of zones supported by the unit. Depending on which one it is, the objects corresponding to the second zone will be displayed. In a generic way, the objects shown by zone will be:
 - “[Climate] [Zone X] Temperature Setpoint”]: allows to set the desired setpoint according to the mode in which the temperature control is performed.

- “[Climate] [Zone X] Temperature Setpoint (Status)”: allows to know the setpoint temperature at which the machine is working.
- “[Climate] [Zone X] Temperature Control Mode (Status)”: 1-Byte object that allows to know the temperature control mode status. The available modes are listed in

Object Value	Control Mode
0	Flow Temperature
1	Room Temperature
2	Compensation Curve

Table 1. Temperature Control Modes.

- **Domestic Hot Water (DHW) [*enabled/disabled*]**: allows to show or hide the initial configuration objects and parameters linked to the ACS management (see section 2.2.2). The objects are as follows:
 - “[DHW] Operation (Status)”: 1-bit object that allows to know if the domestic home water management system is idled or operative.
 - “[DHW] Allowed/Prohibited (Status)”: 1-bit object to know if DHW system is allowed to be controlled.
 - “[DHW] Temperature Setpoint” and “[DHW] Temperature Setpoint (Status)”: allows to set and monitor the temperature setpoint for the water in the tank. Range: [40...60] °C.

ADVANCED MODES

- **Advanced Modes [*enabled/disabled*]**: allows to show or hide the following objects, as well as the configuration of the corresponding initial states, if the initial configuration has been selected as custom (see section 2.2.2).
 - “[General] Holiday Mode” y “[General] Holiday Mode (Status)”: 1-bit objects to control and monitor the activation of the Holiday Mode.

Furthermore, domestic hot water management system has two independent modes of operation. The 1-bit objects used to control and supervise them are as follows:

- “[DHW] Economy Mode” and “[DHW] Economy Mode (Status)”. The value “1” will cause economy mode activation, whereas value “0” will activate normal mode. Current status of this mode can be known with “[DHW] Economy Mode (Status)” object.
- “[DHW] Forced Mode” and “[DHW] Forced Mode (Status)”. Sending the value “1” through “[ACS] Forced Mode” will cause the hot water to activate, even if the ACS is in “Prohibited” mode.

COOLING/HEATING MODE AFTER ETS DONWLOAD

Zone 1 / Zone 2

- **Heating/Cooling after ETS Download** [[Flow Temperature](#) / [Room Temperature](#) / [Compensation Curve](#)]: allows to indicate the temperature control mode after download for heating mode. For Cooling Mode, due to intrinsic unit restrictions, only “Flow Temperature” is available.

Note: *If zone 1 is set to “Room Temperature”, this option will not be available in zone 2. The unit does not allow two zones operating in this mode.*

INITIAL CONFIGURATION

- **Initial Configuration** [[Default](#) / [Custom](#)]: enables or disables the “Initial Configuration” in the left menu. For more information, see section 2.2.2.

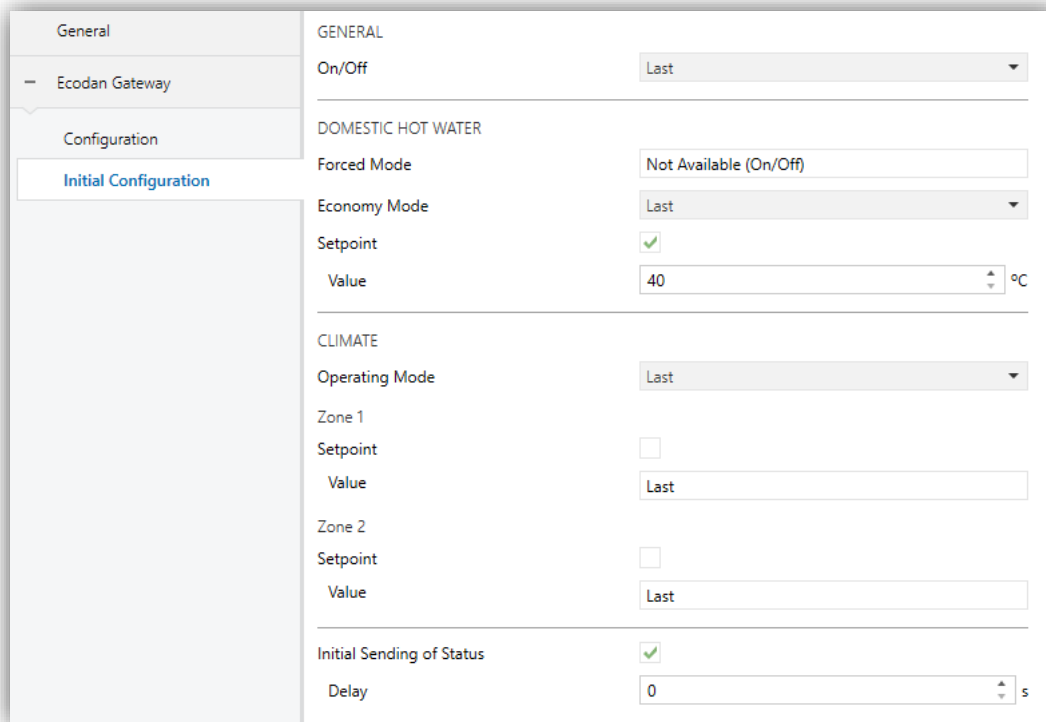
2.2.2 INITIAL CONFIGURATION

The custom initial configuration allows setting the desired status that KLIC-MITTE will send the unit after downloading or restarting the device. This status is defined in terms of On/Off, domestic home water and climate.

In addition, it is possible to activate an initial sending of this status to the KNX bus.

ETS PARAMETRISATION

After selecting “Custom” for the **Initial Configuration** option under the “Configuration” tab (see section 2.2.1), a new tab named **Initial Configuration** is displayed with the following parameters:



GENERAL	
On/Off	Last
DOMESTIC HOT WATER	
Forced Mode	Not Available (On/Off)
Economy Mode	Last
Setpoint	<input checked="" type="checkbox"/>
Value	40 °C
CLIMATE	
Operating Mode	Last
Zone 1	
Setpoint	<input type="checkbox"/>
Value	Last
Zone 2	
Setpoint	<input type="checkbox"/>
Value	Last
Initial Sending of Status	
	<input checked="" type="checkbox"/>
Delay	0 s

Figure 6. Ecodan Gateway. Initial configuration.

GENERAL

- **On/Off** [[Last](#) / [On](#) / [Off](#)].

When **Domestic Hot Water (DHW)** is enabled in “Configuration” tab (see section 2.2.1), the following parameters will be shown:

DOMESTIC HOT WATER

- **Forced Mode** [[Last](#) / [On](#) / [Off](#)]. It requires the **general** state of the machine to be **On** in order to be available.
- **Economy Mode** [[Last](#) / [On](#) / [Off](#)].

Note: Initial configuration of the ACS modes will only be available if **advanced modes** are enabled in “Configuration” tab (see section 2.2.1).

● **Setpoint** [[disabled/enabled](#)]:

➤ **Value:**

- [Last](#): only available if **Setpoint** parameter remains disabled.
- [40...60 °C](#): concrete value of the set temperature.

CLIMATE

● **Operating Mode** [[Last / Cooling / Heating](#)].

Zone 1 / Zone 2

● **Setpoint** [[disabled/enabled](#)]:

➤ **Value:**

- [Last](#): only available if **Setpoint** parameter remains disabled.
- [5...25...60 °C](#): concrete value of the set temperature. The available range varies depending on the selected operating mode.

● **Initial Sending of Status** [[disabled/enabled](#)] if this option is enabled, the corresponding status objects will be sent to the KNX bus with the indicated **delay** [[0...3600](#)] [s].

Note: even if the option to send the initial configuration is not enabled, the status sending could also take place if the initial stated configured is different from the one currently available on the machine.

Note: If “[Last](#)” is selected in any of the previous parameters, the same value will be maintained as it was before its restart.

2.2.3 ERROR HANDLING

KLIC-MITTE is capable of managing two error types that do not entail any previous parameter configuration:

- **Communication o internal error:** error in the communication process between KLIC-MITTE and the Ecodan unit.

In case KLIC-MITTE is unable to connect to the machine, it stops responding or returns wrong traces, the device will send the 1-Bit object “[**General**] **Internal Error: Communication**” with a value of “1”. If this happens, the green LED will remain on. Once the error is over, it the object will be sent with a value of “0”.

- **Error in the unit:** errors reported by the unit itself. KLIC-MITTE can notify the KNX bus about the reported error code, although referring to the specific documentation of the machine is advisable in order to obtain further information.

In case the unit reports an error, the binary object “[**General**] **Unit Error: Active Error**” will be sent with value “1”, while the 14-bytes object “[**General**] **Unit Error: Error Code**” will report the corresponding error code. Once the error is over, the binary object will send a value of “0” and error code object will update its value to “0”. Please, refer to Mitsubishi error codes documentation for details about the error codes.

2.3 INPUTS

KLIC-MITTE incorporates **two analogue/digital inputs**, each configurable as a:

- **Binary Input**, for the connection of a pushbutton or a switch/sensor.
- **Temperature Probe**, for the connection of a temperature sensor.
- **Motion Detector**, for the connection of a motion detector from Zennio.

2.3.1 BINARY INPUT

Please refer to the “**Binary Inputs**” user manual, available in the KLIC-MITTE product section, at the Zennio website (www.zennio.com).

2.3.2 TEMPERATURE PROBE

Please refer to the “**Temperature Probe**” user manual, available in the KLIC-MITTE product section, at the Zennio website (www.zennio.com).

2.3.3 MOTION DETECTOR

It is possible to connect motion detectors from Zennio to the input ports of KLIC-MITTE.

Please refer to the “**Motion Detector**” user manual, available in the KLIC-MITTE product section, at the Zennio website (www.zennio.com) for detailed information about the functionality and the configuration of the related parameters.

2.4 LOGIC FUNCTIONS

This module makes it possible to perform numeric and binary operations with incoming values received from the KNX bus, and to send the results through other communication objects specifically enabled for this purpose.

KLIC-MITTE can implement **up to 10 different and independent functions**, each of them entirely customisable and consisting in **up to 4 consecutive operations each**.

The execution of each function can depend on a configurable **condition**, which will be evaluated every time the function is **triggered** through specific, parameterisable communication objects. The result after executing the operations of the function can also be evaluated according to certain **conditions** and afterwards sent (or not) to the KNX bus, which can be done every time the function is executed, periodically or only when the result differs from the last one.

Please refer to the “**Logic Functions**” user manual (available in the KLIC-MITTE product section at the Zennio homepage, www.zennio.com) for detailed information about the functionality and the configuration of the related parameters.

ANNEX I. COMMUNICATION OBJECTS

- “Functional range” shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application program itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit	I	C - - W -	DPT_Switch	0/1	[General] On/Off	0 = Off; 1 = On
2	1 Bit	O	CTR - -	DPT_Switch	0/1	[General] On/Off (Status)	0 = Off; 1 = On
3	1 Bit	I	C - - W -	DPT_Switch	0/1	[General] Holiday Mode	0 = Off; 1 = On
4	1 Bit	O	CTR - -	DPT_Switch	0/1	[General] Holiday Mode (Status)	0 = Off; 1 = On
5	1 Bit	O	CTR - -	DPT_Alarm	0/1	[General] Unit Error: Active Error	Unit Error
6	14 Bytes	O	CTR - -	DPT_String_ASCII		[General] Unit Error: Error Code	See Unit Manual
7	1 Bit	O	CTR - -	DPT_Alarm	0/1	[General] Internal Error: Communication	Unable to Set Communication
8	1 Bit	O	CTR - -	DPT_Switch	0/1	[Climate] Operation (Status)	0 = Idle; 1 = Operative
9	1 Bit	O	CTR - -	DPT_Enable	0/1	[Climate] Allowed/Prohibited (Status)	0 = Prohibited; 1 = Allowed
10	1 Bit	I	C - - W -	DPT_Heat_Cool	0/1	[Climate] Operation Mode	0 = Cooling; 1 = Heating
11	1 Bit	O	CTR - -	DPT_Heat_Cool	0/1	[Climate] Operation Mode (Status)	0 = Cooling; 1 = Heating
12, 15	2 Bytes	I	C - - W -	DPT_Value_Temp	-273.00° - 670760.00°	[Climate][Zone x] Temperature Setpoint	[5...60] °C
13, 16	2 Bytes	O	CTR - -	DPT_Value_Temp	-273.00° - 670760.00°	[Climate][Zone x] Temperature Setpoint (Status)	[5...60] °C
14, 17	1 Byte	O	CTR - -	DPT_Temp_Ctrl_Mode		[Climate][Zone x] Temperature Control Mode (Status)	0 = Flow Temperature; 1 = Room Temperature; 2 = Compensation Curve
18	1 Bit	O	CTR - -	DPT_Switch	0/1	[DHW] Operation (Status)	0 = Idle; 1 = Operative
19	1 Bit	O	CTR - -	DPT_Enable	0/1	[DHW] Allowed/Prohibited (Status)	0 = Prohibited; 1 = Allowed
20	2 Bytes	I	C - - W -	DPT_Value_Temp	-273.00° - 670760.00°	[DHW] Temperature Setpoint	[40...60] °C
21	2 Bytes	O	CTR - -	DPT_Value_Temp	-273.00° - 670760.00°	[DHW] Temperature Setpoint (Status)	[40...60] °C
22	1 Bit	I	C - - W -	DPT_Switch	0/1	[DHW] Economy Mode	0 = Off; 1 = On
23	1 Bit	O	CTR - -	DPT_Switch	0/1	[DHW] Economy Mode (Status)	0 = Off; 1 = On
24	1 Bit	I	C - - W -	DPT_Switch	0/1	[DHW] Forced Mode	0 = Off; 1 = On
25	1 Bit	O	CTR - -	DPT_Switch	0/1	[DHW] Forced Mode (Status)	0 = Off; 1 = On
26, 30	2 Bytes	O	CTR - -	DPT_Value_Temp	-273.00° - 670760.00°	[Ix] Current Temperature	Temperature Sensor Value
27, 31	1 Bit	O	CTR - -	DPT_Alarm	0/1	[Ix] Overcooling	0 = No Alarm; 1 = Alarm
28, 32	1 Bit	O	CTR - -	DPT_Alarm	0/1	[Ix] Overheating	0 = No Alarm; 1 = Alarm
29, 33	1 Bit	O	CTR - -	DPT_Alarm	0/1	[Ix] Probe Error	0 = No Alarm; 1 = Alarm

34, 40	1 Bit	I	C--W-	DPT_Enable	0/1	[Ix] Input Lock	0 = Unlock; 1 = Lock
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Short Press] 0	Sending of 0
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Short Press] 1	Sending of 1
	1 Bit	I	CT-W-	DPT_Switch	0/1	[Ix] [Short Press] 0/1 Switching	Switching 0/1
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Short Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Short Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Short Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step Up)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step Down)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Shutter (Switched)	Switching of 0/1 (Stop/Step Up/Down)
35, 41	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Brighter	Increase Brightness
	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Darker	Decrease Brightness
	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Brighter/Darker	Switch Bright/Dark
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Short Press] Light On	Sending of 1 (On)
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Short Press] Light Off	Sending of 0 (Off)
	1 Bit	I	CT-W-	DPT_Switch	0/1	[Ix] [Short Press] Light On/Off	Switching 0/1
	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Run Scene	Sending of 0 - 63
	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Save Scene	Sending of 128 - 191
	1 Bit	I/O	CTRW-	DPT_Switch	0/1	[Ix] [Switch/Sensor] Edge	Sending of 0 or 1
	1 Byte		CT---	DPT_Value_1_Ucount	0 - 255	[Ix] [Short Press] Constant Value	0 - 255

					(Integer)	
	1 Byte		CT---	DPT_Scaling	0% - 100%	[Ix] [Short Press] Constant Value (Percentage) 0% - 100%
	2 Bytes		CT---	DPT_Value_2_Ucount	0 - 65535	[Ix] [Short Press] Constant Value (Integer) 0 - 65535
	2 Bytes		CT---	9.xxx	-671088.64 - 670760.96	[Ix] [Short Press] Constant Value (Float) Float Value
36, 42	1 Byte	I	C--W-	DPT_Scaling	0% - 100%	[Ix] [Short Press] Shutter Status (Input) 0% = Top; 100% = Bottom
	1 Byte	I	C--W-	DPT_Scaling	0% - 100%	[Ix] [Short Press] Dimming Status (Input) 0% - 100%
37, 43	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Long Press] 0 Sending of 0
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Long Press] 1 Sending of 1
	1 Bit	I	CT-W-	DPT_Switch	0/1	[Ix] [Long Press] 0/1 Switching Switching 0/1
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Long Press] Move Up Shutter Sending of 0 (Up)
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Long Press] Move Down Shutter Sending of 1 (Down)
	1 Bit		CT---	DPT_UpDown	0/1	[Ix] [Long Press] Move Up/Down Shutter Switching 0/1 (Up/Down)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Up Shutter Sending of 0 (Stop/Step Up)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Down Shutter Sending of 1 (Stop/Step Down)
	1 Bit		CT---	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Shutter (Switched) Switching of 0/1 (Stop/Step Up/Down)
	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Brighter Long Pr. -> Brighter; Release -> Stop
	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Darker Long Pr. -> Darker; Release -> Stop
	4 Bit		CT---	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Brighter/Darker Long Pr. -> Brighter/Darker; Release -> Stop
	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Long Press] Light On Sending of 1 (On)

	1 Bit		CT---	DPT_Switch	0/1	[Ix] [Long Press] Light Off	Sending of 0 (Off)
	1 Bit	I	CT-W-	DPT_Switch	0/1	[Ix] [Long Press] Light On/Off	Switching 0/1
	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Run Scene	Sending of 0 - 63
	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Save Scene	Sending of 128 - 191
	1 Bit	O	CTR--	DPT_Alarm	0/1	[Ix] [Switch/Sensor] Alarm: Breakdown or Sabotage	1 = Alarm; 0 = No Alarm
	2 Bytes		CT---	9.xxx	-671088.64 - 670760.96	[Ix] [Long Press] Constant Value (Float)	Float Value
	2 Bytes		CT---	DPT_Value_2_Ucount	0 - 65535	[Ix] [Long Press] Constant Value (Integer)	0 - 65535
	1 Byte		CT---	DPT_Scaling	0% - 100%	[Ix] [Long Press] Constant Value (Percentage)	0% - 100%
	1 Byte		CT---	DPT_Value_1_Ucount	0 - 255	[Ix] [Long Press] Constant Value (Integer)	0 - 255
38, 44	1 Bit		CT---	DPT_Trigger	0/1	[Ix] [Long Press/Release] Stop Shutter	Release -> Stop Shutter
39, 45	1 Byte	I	C--W-	DPT_Scaling	0% - 100%	[Ix] [Long Press] Dimming Status (Input)	0% - 100%
	1 Byte	I	C--W-	DPT_Scaling	0% - 100%	[Ix] [Long Press] Shutter Status (Input)	0% = Top; 100% = Bottom
46	1 Byte	I	C--W-	DPT_SceneNumber	0 - 63	[Motion Detector] Scene Input	Scene Value
47	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Motion Detector] Scene Output	Scene Value
48, 77	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[Ix] Luminosity	0-100%
49, 78	1 Bit	O	CTR--	DPT_Alarm	0/1	[Ix] Open Circuit Error	0 = No Error; 1 = Open Circuit Error
50, 79	1 Bit	O	CTR--	DPT_Alarm	0/1	[Ix] Short Circuit Error	0 = No Error; 1 = Short Circuit Error
51, 80	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[Ix] Presence State (Scaling)	0-100%
52, 81	1 Byte	O	CTR--	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] Presence State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
53, 82	1 Bit	O	CTR--	DPT_Occupancy	0/1	[Ix] Presence State (Binary)	Binary Value
	1 Bit	O	CTR--	DPT_Ack	0/1	[Ix] Presence: Slave Output	1 = Motion Detected
54, 83	1 Bit	I	C--W-	DPT_Window_Door	0/1	[Ix] Presence Trigger	Binary Value to Trigger the Presence Detection
55, 84	1 Bit	I	C--W-	DPT_Ack	0/1	[Ix] Presence: Slave Input	0 = Nothing; 1 = Detection from slave device
56, 85	2 Bytes	I	C--W-	DPT_TimePeriodSec	0 - 65535	[Ix] Presence: Waiting Time	0-65535 s.
57, 86	2 Bytes	I	C--W-	DPT_TimePeriodSec	0 - 65535	[Ix] Presence: Listening Time	1-65535 s.
58, 87	1 Bit	I	C--W-	DPT_Enable	0/1	[Ix] Presence: Enable	According to parameters
59, 88	1 Bit	I	C--W-	DPT_DayNight	0/1	[Ix] Presence: Day/Night	According to parameters
60, 89	1 Bit	O	CTR--	DPT_Occupancy	0/1	[Ix] Presence: Occupancy State	0 = Not Occupied; 1 = Occupied
61, 90	1 Bit	I	C--W-	DPT_Ack	0/1	[Ix] External Motion Detection	0 = Nothing; 1 = Motion detected by an external sensor
62, 67, 72, 91,	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[Ix] [Cx] Detection State (Scaling)	0-100%

96, 101							
63, 68, 73, 92, 97, 102	1 Byte	O	CTR--	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] [Cx] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
64, 69, 74, 93, 98, 103	1 Bit	O	CTR--	DPT_Switch	0/1	[Ix] [Cx] Detection State (Binary)	Binary Value
65, 70, 75, 94, 99, 104	1 Bit	I	C--W-	DPT_Enable	0/1	[Ix] [Cx] Enable Channel	According to parameters
66, 71, 76, 95, 100, 105	1 Bit	I	C--W-	DPT_Switch	0/1	[Ix] [Cx] Force State	0 = No Detection; 1 = Detection
106 - 137	1 Bit	I	C--W-	DPT_Bool	0/1	[LF] (1-Bit) Data Entry x	Binary Data Entry (0/1)
138 - 153	1 Byte	I	C--W-	DPT_Value_1_Ucount	0 - 255	[LF] (1-Byte) Data Entry x	1-Byte Data Entry (0-255)
154 - 169	2 Bytes	I	C--W-	DPT_Value_2_Ucount	0 - 65535	[LF] (2-Byte) Data Entry x	2-Byte Data Entry
				DPT_Value_2_Count	-32768 -32767		
				DPT_Value_Tempo	-273,00 - 670760,00		
170 - 177	4 Bytes	I	C--W-	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] (4-Byte) Data Entry x	4-Byte Data Entry
178 - 187	1 Bit	O	CTR--	DPT_Bool	0/1	[LF] Function x - Result	(1-Bit) Boolean
	1 Byte	O	CTR--	DPT_Value_1_Ucount	0 - 255	[LF] Function x - Result	(1-Byte) Unsigned
	2 Bytes	O	CTR--	DPT_Value_2_Ucount	0 - 65535	[LF] Function x - Result	(2-Byte) Unsigned
	4 Bytes	O	CTR--	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] Function x - Result	(4-Byte) Signed
	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[LF] Function x - Result	(1-Byte) Percentage
	2 Bytes	O	CTR--	DPT_Value_2_Count	-32768 - 32767	[LF] Function x - Result	(2-Byte) Signed
	2 Bytes	O	CTR--	DPT_Value_Temp	-273.00° - 670760.00°	[LF] Function x - Result	(2-Byte) Float
188	1 Bit		CT---	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically

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