*Zennio





inBOX 24 / inBOX 20

Multifunction Actuator for Flush Mounting

ZIO-IB24 ZIO-IB20

Application program version inBOX 20: [1.1]
Application program version inBOX 24: [1.4]
User manual edition: [1.4]_a

USER MANUAL

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DOCUMENT UPDATES

Version	Changes	Page(s)
[1.4]_a	 Changes in the application program of inBOX 24: Optimisation shutter channel module. 	-
[1.2]_a	 Changes in the application program of inBOX 24: Support for custom NTC probes. Optimisations of the inputs, heartbeat, shutter channel and temperature probe modules. 	-
[1.1]_a	Optimisations of the inputs, Heartbeat, individual outputs, logic functions, Master Light, motion detector, shutter channel and thermostat modules.	,

1 INTRODUCTION

1.1 inBOX 24 / inBOX 20

inBOX 24 and inBOX 20 from Zennio are two versatile KNX actuators featuring two relay outputs (together with four analogue-digital inputs, in the case of inBOX 24) and a variety of functions. Their particularly small size makes them suitable for installation within mechanism boxes, junction boxes, roller shutter boxes or any other location where the available space is limited.

The most outstanding features are:

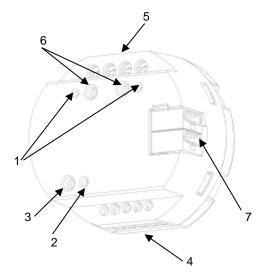
- 2 relay outputs, configurable as:
 - 1 shutter channel (with or without slats), or
 - Up to 2 individual ON/OFF outputs.
- 4 multi-purpose inputs (only in inBOX 24), configurable as:
 - Temperature probe, either models provided by Zennio or other NTC temperature probes from other suppliers, being in that case possible to configure their parameters in ETS.
 - > Binary inputs (i.e., pushbuttons, switches, sensors),
 - Motion detectors.
- 10 customisable, multi-operation logic functions.
- 4 independent thermostats (only in inBOX 24).
- Scene-triggered action control, with an optional delay in the execution.
- Master light control (only in inBOX 24) for an easy, out-of-the-box control of a set of luminaires (or functionally equivalent devices) one of which acts as a general lamp and the others as secondary lamps.
- Manual operation / supervision of the 2 or 4 relay outputs through the onboard pushbuttons and LEDs.
- Heartbeat or periodical "still-alive" notification.

1.2 INSTALLATION

inBOX 24 / 20 connects to the KNX bus through the on-board KNX connector.

Once the device is powered from the KNX bus, both the individual address and the associated application program may be downloaded.

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



- **1.** Output status LED.
- 2. Prog./Test LED.
- 3. Prog./Test pushbutton.
- 4. Inputs.
- 5. Outputs.
- 6. Output control button.
- 7. KNX connector.

Figure 1. inBOX 24. Elements

Note: the above element diagram refers to inBOX 24. It is entirely analogous for inBOX 20, although the inputs are not available.

The main elements of the device are described next.

■ Test/Prog. Pushbutton (3): a short press on this button sets the device into the programming mode, making the associated LED (2) light in red.

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

• Outputs (5): output ports for the insertion of the stripped cables of the systems being controlled by the actuator (see section 2.3). Please secure the

connection by means of the on-board screws.

♣ Inputs (4): input ports for the insertion of the stripped cables of external elements such as switches / motion detectors / temperature probes, etc. One of the two cables of each element needs to be connected to one of the slots labelled "1" to "4", while the other cable should be connected to the slot labelled as "C". Note that all the external input devices share the "C" slot for one of the two cables. Please secure the connection by means of the on-board screws.

To get detailed information about the technical features of this device, as well as on the installation and security procedures, please refer to the corresponding **Datasheet**, bundled with the original package of the device and also available at www.zennio.com.

1.3 START-UP AND POWER LOSS

During the start-up of the device, the Test/Prog. LED will blink in blue colour for a few seconds before the device is ready. External orders will not be executed during this time, but afterwards.

Depending on the configuration, some specific actions will also be performed during the start-up. For example, the integrator can set whether the output channels should switch to a particular state and whether the device should send certain objects to the bus after the power recovery. Please consult the next sections of this document for further details.

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. For safety reasons, the **shutter channel** will be stopped (i.e., the relays will open) if a power loss takes place, while the individual outputs will switch to the specific state configured in ETS (if any).

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

From the General screen it is possible to activate/deactivate all the required functionality.

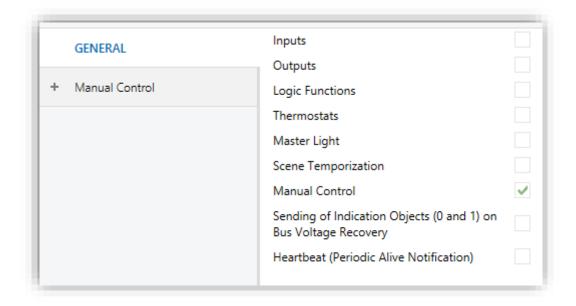


Figure 2. Default screen

Once activated, Inputs (only on inBOX 24), Outputs, Logic Functions, Thermostats (only on inBOX 24), Master Light (only on inBOX 24), Scene Temporisation and Manual Control bring additional tabs to the menu on the left. These functions and their parameters will be explained in later sections of this document.

The **Manual Control** function is enabled by default, and so is the corresponding configuration tab.

Sending of Indication Objects (0 and 1) on Bus Voltage Recovery: this parameter lets the integrator activate two new communication objects ("Reset 0" and "Reset 1"), which will be sent to the KNX bus with values "0" and "1" respectively whenever the device begins operation (for example, after a bus power failure). It is possible to parameterise a certain delay to this sending (0 to 255 seconds).



Figure 3. Sending of Indication objects on bus voltage recovery

♣ Heartbeat (Periodical Alive Notification): 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).



Figure 4. Heartbeat (Periodical Alive Notification).

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.

2.2 INPUTS (ONLY inBOX 24)

inBOX 24 incorporates four analogue/digital inputs, each configurable as a:

- Binary Input, for the connection of a pushbutton or a switch/sensor.
- Temperature Probe, to connect a temperature sensor from Zennio or NTC probes from third parties (the latter requires configuring their parameters in ETS).
- Motion Detector, for the connection of a motion detector from Zennio.

2.2.1 BINARY INPUT

Please refer to the specific user manual "Binary Inputs", available in the inBOX 24 product section, at the Zennio website (www.zennio.com).

2.2.2 TEMPERATURE PROBE

Please refer to the specific user manual "**Temperature Probe**", available in the inBOX 24 product section, at the Zennio website (<u>www.zennio.com</u>).

2.2.3 MOTION DETECTOR

It is possible to connect motion detectors from Zennio to the input ports of inBOX 24.

Please refer to the specific user manual "**Motion Detector**", available in the inBOX 24 product section, at the Zennio website (www.zennio.com).

2.3 OUTPUTS

The inBOX 24 / 20 actuators incorporate 2 relay outputs, each configurable as a:

Individual binary outputs, which allows an independent control of loads.

Shutter channel, which allow controlling the motion of shutters or blinds.

For detailed information about the functionality and the configuration of the related parameters, please refer to the following specific manuals, all of them available in the inBOX 24 / 20 product section at the Zennio homepage (www.zennio.com):

- Individual outputs.
- Shutter channels.

2.3.1 MANUAL CONTROL

inBOX 24 / 20 allows manually switching the state of its output relays through the respective pushbuttons on the top of the device. A specific pushbutton is therefore available per output.

Manual operation can be done in two different ways, named as **Test On Mode** (for testing purposes during the configuration of the device) and **Test Off Mode** (for a normal use, anytime). Whether both, only one, or none of these modes can be accessed needs to be parameterised in ETS. Moreover, it is possible to enable a specific binary object for locking and unlocking the manual control in runtime.

Note:

- ♣ The Test Off mode will be active (unless it has been disabled by parameter) after a download or a reset with no need of a specific activation the pushbuttons will respond to user presses from the start.
- On the contrary, switching to the **Test On mode** (unless disabled by parameter) needs to be done by long-pressing the Prog./Test button (for at least three seconds), until the LED is no longer red and turns yellow. From that moment, once the button is released, the LED light will remain green to confirm that the device has switched from the Test Off mode to the Test On

mode. After that, an additional press will turn the LED yellow and then off, once the button is released. This way, the device leaves the Test On mode. Note that it will also leave this mode if a bus power failure takes place.

Test Off Mode

Under the Test Off Mode, the outputs can be controlled through both their communication objects and the actual pushbuttons located on the top of the device.

When one of these buttons is pressed, the output will behave as if an order had been received through the corresponding communication object, depending on whether the output is configured as an individual output or as a shutter channel.

- Individual output: a simple press (short or long) will make the output switch its on-off state, which will be reported to the KNX bus through the corresponding status object, if enabled.
- ♣ Shutter Channel: when the button is pressed, the device will act over the output according to the length of the button press and to the current state.
 - ➤ A **long press** makes the shutter start moving (upwards or downwards, depending on the button being pressed). The LED will light in green until the end of the motion. If the button gets pressed being the shutter already at the top or bottom positions, nothing will happen (the LED will not light).
 - A **short press** will make the shutter drive stop (if in motion), as it normally does when a step/stop order is received from the KNX bus. In case of not being the shutter in motion, pressing the button does not cause any action, unless slats/lamellas have been parameterized in such case, a step movement (up/down, depending on the button pressed) will take place. The status objects will be sent to the bus when corresponding.
- Disabled output: outputs disabled by parameter will not react to button presses under the Test Off mode.

Regarding the lock, timer, alarm and scene functions, the device will behave under the Test Off mode as usual. Button presses during this mode are entirely analogous to the reception of the corresponding orders from the KNX bus.

Test On Mode

After entering the Test On mode, it will only be possible to control the outputs through the on-board pushbuttons. Orders received through communication objects will be ignored, with independence of the channel or the output they are addressed to.

Depending on whether the output has been parameterised as an individual output or as part of a shutter channel, the reactions to the button presses will differ.

- Individual output: short or long pressing the button will commute the on-off state of the relay.
- ♣ Shutter channel: pressing the button will make the shutter drive move upward or downward (depending on the button) until the button is released again, thus ignoring the position of the shutter and the parameterised times.

Note: after leaving the Test On mode, the status objects will recover the values they had prior to entering Test On. As the device is never aware of the actual position of the shutter (as the shutter drive does not provide any feedback), these values may not show the real position. This can be solved by performing a complete move-up or move-down order, or by calibrating the shutter position in the Test On mode until it matches the status objects.

■ Disabled output: under the Test On mode, short and long presses will cause the same effect for disabled outputs as for individual outputs (i.e., the relay will switch its state).

The lock, timer, alarm and scene functions will not work while the device is under the Test On mode. Status objects will not be sent to the bus, either.

<u>Important</u>: the device is delivered from factory with the outputs configured as disabled, and with both manual modes (Test Off and Test On) enabled.

ETS PARAMETERISATION

The **Manual Control** is configured from the Configuration tab itself under Manual Control.

The only two parameters are:



Figure 5. Manual control screen

- Manual Control: options are "<u>Disabled</u>", "<u>Only Test Mode Off</u>", "<u>Only Test Mode On</u>" and "<u>Test Mode Off + Test On Mode</u>" (default). Depending on the selection, the device will permit using the manual control under the Test Off, the Test On, or both modes. Note that, as stated before, using the Test Off mode does not require any special action, while switching to the Test On mode does require long-pressing the Prog./Test button.
- Lock Manual Control: unless the above parameter has been "<u>Disabled</u>", the Lock Manual Control parameter provides an optional procedure for locking the manual control in runtime. When this checkbox is enabled, object "Manual Control Lock" turns visible, as well as two more parameters:
 - ➤ Value: defines whether the manual control lock/unlock should take place respectively upon the reception (through the aforementioned object) of values "0" and "1", or the opposite.
 - Initialization: sets how the manual control should remain after the device start-up (after an ETS download or a bus power failure): "<u>Unlocked</u>", "<u>Locked</u>" or "<u>Last Value</u>" (default; on the very first start-up, this will be Unlocked).

2.4 LOGIC FUNCTIONS

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

inBOX 24 / 20 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, parameterizable 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 specific "**Logic Functions**" user manual (available in the inBOX 24 / 20 product section at the Zennio homepage, <u>www.zennio.com</u>) for detailed information about the functionality and the configuration of the related parameters.

2.5 THERMOSTATS (ONLY inBOX 24)

inBOX 24 implements **four Zennio thermostats** which can be enabled and configured independently.

Please refer to the specific "**Zennio Thermostat**" user manual (available in the inBOX 24 product section at the Zennio homepage, <u>www.zennio.com</u>) for detailed information about the functionality and the configuration of the related parameters.

2.6 MASTER LIGHT (ONLY inBOX 24)

The Master Light function brings the option to monitor the state of up to 12 light sources –or any other functionally-similar element whose state is transmitted through a binary object– and, depending on those states, perform a *master order* every time a certain trigger signal (again, a binary value) is received through a specific object.

Such master order will consist in:

- A general switch-off order, if at least one of the up to twelve status objects is found to be on.
- A **courtesy switch-on** order, if none of the up to twelve status objects is found to be on.

Note that the above switch-off and switch-on orders are not necessarily a binary value being sent to the bus – it is up to the integrator the decision of what to send to the KNX bus in both cases: a shutter order, a thermostat setpoint or mode switch order, a constant value, a scene... Only the trigger object and the twelve status objects are required to be binary (on/off).

The most typical scenario for this Master Light control would be a hotel room with a master pushbutton next to the door. When leaving the room, the guest will have the possibility of pressing on the master pushbutton and make all the lamps turn off together. Afterwards, back on the room and with all the lamps off, pressing on the same master pushbutton will only make a particular lamp turn on (e.g., the closest lamp to the door) – this is the courtesy switch-on.

ETS PARAMETERISATION

Once the Master Light function has been enabled, a specific tab will be included in the menu on the left. This new parameter screen contains the following options:

Number of State Objects: defines the number of one-bit status objects required. The minimum (and default) value is "1", and the maximum is "12". These objects are called "[ML] Status Object n".

■ Trigger Value: sets the value ("0", "1" or "0/1", being the latter the default option) that will trigger, when received through "[ML] Trigger", the master action (the general switch-off or the courtesy switch-on).

General Switch-Off.

- ➤ **Delay**: defines a certain delay (once the trigger has been received) before the execution of the general switch-off. The allowed range is 0 to 255 seconds.
- ➤ Binary Value: if checked, object "[ML] General Switch-off: Binary Object" will be enabled, which will send one "0" whenever the general switch-off takes off.
- Scaling: if checked, object "[ML] General Switch-off: Scaling" will be enabled, which will send a percentage value (configurable in "Value") whenever the general switch-off takes off.
- > Scene: if checked, object "[ML] General Switch-off: Scene" will be enabled, which will send a scene run / save order (configurable in "Action" and "Scene Number") whenever the general switch-off takes off
- ➤ HVAC: if checked, object "[ML] General Switch-off: HVAC mode" will be enabled, which will send an HVAC thermostat mode value (configurable in "Value", being the options "Auto", "Comfort", "Standby", "Economy" and "Building Protection") whenever the general switch-off takes off

Note: the above options are not mutually exclusive; it is possible to send values of different nature together.

Courtesy Switch-On:

The parameters available here are entirely analogous to those already mentioned for General Switch-Off. However, in this case the names of the objects start with "[ML] Courtesy Switch-On (...)". On the other hand, sending scene save orders is not possible for the courtesy switch-on (only orders to play scenes are allowed).

Note: object "[ML] Courtesy Switch-On: Binary Object" sends the value "1"

(when the courtesy switch-on takes place), in contrast to object "[ML] General Switch-Off: Binary Object", which sends the value "0" (during the general switch-off, as explained above).

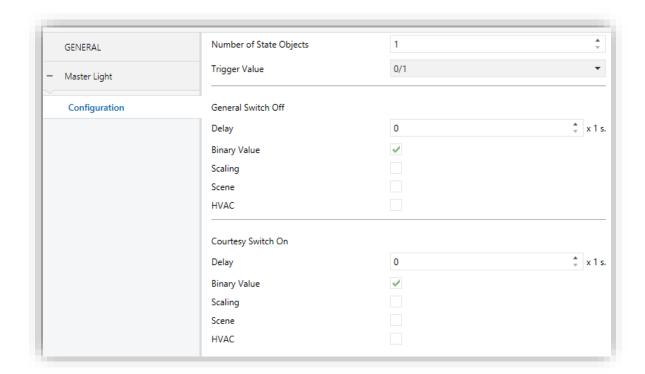


Figure 6. Sending of Indication objects on bus voltage recovery

2.7 SCENE TEMPORISATION

The scene temporisation allows imposing **delays over the scenes of the outputs**. These delays are defined in parameters, and can be applied to the execution of one or more scenes that may have been configured.

Please bear in mind that, as multiple delayed scenes can be configured for each individual output or shutter channel, in case of receiving an order to execute one of them when a previous temporisation is still pending for that output or that channel, such temporisation will be interrupted and only the delay and the action of the new scene will be executed.

ETS PARAMETERISATION

Prior to setting the **scene temporisation**, it is necessary to have one or more scenes configured in some of the outputs. When entering the Configuration window under Scene Temporization, all configured scenes will be listed, together with a few checkboxes to select which of them need to be temporised, as shown in Figure 7.

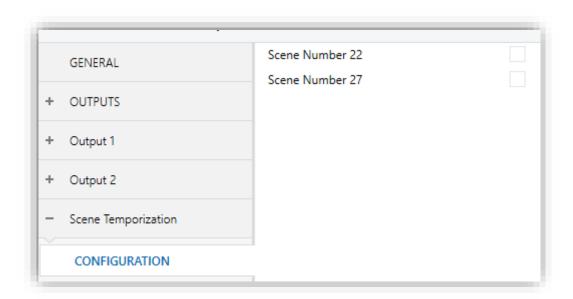


Figure 7. Scene temporisation

Enabling a certain scene number n brings a new tab with such name to the menu on the left, from which it is possible to configure the temporisation of that scene for each of the outputs where it has been configured.

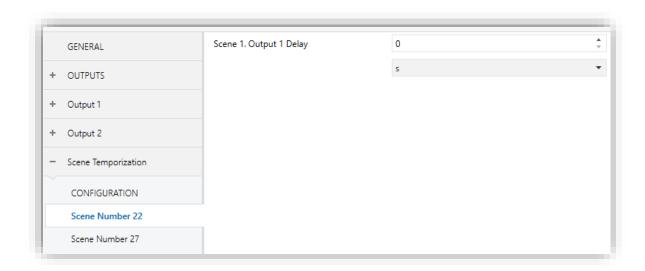


Figure 8. Configuration of the scene temporisation

Therefore, parameter "**Scene m. Z Delay**" defines the delay that will be applied to the action defined in Z for the execution of scene m (where Z may be a specific individual output, shutter channel or fan coil module). The range of this delay is 0 to 3600 seconds, 0 to 1440 minutes or 0 to 24 hours.

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.

Note: objects referring to inputs, thermostats and the master light control only apply to inBOX 24.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		C T -	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically
2	1 Bit		C T -	DPT_Trigger	0/1	Reset 0	Voltage Recovery -> Sending 0
3	1 Bit		C T -	DPT_Trigger	0/1	Reset 1	Voltage Recovery -> Sending 1
4	1 Bit	I	C - W	DPT_Enable	0/1	Manual Control Lock	0 = Lock; 1 = Unlock
4	1 Bit	I	C - W	DPT_Enable	0/1	Manual Control Lock	0 = Unlock; 1 = Lock
5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36	1 Bit	I	C - W	DPT_Bool	0/1	[LF] (1-Bit) Data Entry x	Binary Data Entry (0/1)
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52	1 Byte	I	C - W	DPT_Value_1_Ucount	0 - 255	[LF] (1-Byte) Data Entry x	1-Byte Data Entry (0-255)
53, 54, 55, 56, 57, 58, 59,				DPT_Value_2_Uncount	0 - 65535		2-Byte Data Entry
60, 61, 62, 63, 64, 65, 66,	2 Bytes	I	C - W	W DPT_Value_2_Count	-32768 - 32767	[LF] (2-Byte) Data Entry x	
67, 68				9.xxx	-671088.64 - 670433.28		
69, 70, 71, 72, 73, 74, 75, 76	4 Bytes	I	C - W	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] (4-Byte) Data Entry x	4-Byte Data Entry
	1 Bit	0	C R - T -	DPT_Bool	0/1	[LF] Function x - Result	(1-Bit) Boolean
	1 Byte	0	C R - T -	DPT_Value_1_Ucount	0 - 255	[LF] Function x - Result	(1-Byte) Unsigned
77 70 70 00 01 02 02	2 Bytes	0	CR-T-	DPT_Value_2_Ucount	0 - 65535	[LF] Function x - Result	(2-Byte) Unsigned
77, 78, 79, 80, 81, 82, 83, 84, 85, 86	4 Bytes	0	CR-T-	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] Function x - Result	(4-Byte) Signed
01,00,00	1 Byte	0	CR-T-	DPT_Scaling	0% - 100%	[LF] Function x - Result	(1-Byte) Percentage
	2 Bytes	0	CR-T-	DPT_Value_2_Count	-32768 - 32767	[LF] Function x - Result	(2-Byte) Signed
	2 Bytes	0	CR-T-	9.xxx	-671088.64 - 670433.28	[LF] Function x - Result	(2-Byte) Float
87	1 Byte	I	C - W	DPT_SceneControl	0-63; 128-191	[Outputs] Scenes	0 - 63 (Execute 1 - 64); 128 - 191 (Save 1 - 64)

	1 Bit	I	C - W	DPT BinaryValue	0/1	[Ox] On/Off	N.O. (0=Open Relay; 1=Close
88, 96	1 Bit	I	C - W	, DPT_BinaryValue	0/1	[Ox] On/Off	Relay) N.C. (0=Close Relay; 1= Open
				-	· · · · · · · · · · · · · · · · · · ·		Relay)
89, 97	1 Bit	0	C R - T -	DPT_BinaryValue	0/1	[Ox] On/Off (Status)	0=Output Off; 1=Output On
90, 98	1 Bit	I	C - W	DPT_Enable	0/1	[Ox] Lock	0=Unlock; 1=Lock
91, 99	1 Bit	I	C - W	DPT_Start	0/1	[Ox] Timer	0=Switch Off; 1=Switch On
92, 100	1 Bit	I	C - W	DPT_Start	0/1	[Ox] Flashing	0=Stop; 1=Start
93, 101	1 Bit	I	C - W	DPT_Alarm	0/1	[Ox] Alarm	0=Normal; 1=Alarm
93, 101	1 Bit	I	C - W	DPT_Alarm	0/1	[Ox] Alarm	0=Alarm; 1=Normal
94, 102	1 Bit	I	C - W	DPT_Ack	0/1	[Ox] Unfreeze Alarm	Alarm=0 + Unfreeze=1 => End Alarm
95, 103	1 Bit	0	C R - T -	DPT_State	0/1	[Ox] Warning Time (Status)	0=Normal; 1=Warning
104	1 Byte	I	C - W	DPT_SceneControl	0-63; 128-191	[Shutter] Scenes	0 - 63 (Execute 1 - 64); 128 - 191 (Save 1 - 64)
105	1 Bit	I	C - W	DPT_UpDown	0/1	[Cx] Move	0 = Raise; 1 = Lower
106	1 Bit	I	C - W	DPT_Step	0/1	[Cx] Stop/Step	0 = Stop/StepUp; 1 = Stop/StepDown
	1 Bit	I	C - W	DPT_Trigger	0/1	[Cx] Stop	0 = Stop; 1 = Stop
107	1 Bit	I	C - W	DPT_Trigger	0/1	[Cx] Switched Control	0, 1 = Up, Down or Stop, Depending on the Last Move
108	1 Bit	I	C - W	DPT_Enable	0/1	[Cx] Lock	0 = Unlock; 1 = Lock
109	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Cx] Shutter Positioning	0% = Top; 100% = Bottom
110	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Cx] Shutter Position (Status)	0% = Top; 100% = Bottom
111	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Cx] Slats Positioning	0% = Open; 100% = Closed
112	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Cx] Slats Position (Status)	0% = Open; 100% = Closed
113	1 Bit	0	CR-T-	DPT_Switch	0/1	[Cx] Rising Relay (Status)	0 = Open; 1 = Closed
114	1 Bit	0	CR-T-	DPT_Switch	0/1	[Cx] Lowering Relay (Status)	0 = Open; 1 = Closed
115	1 Bit	0	CR-T-	DPT_Switch	0/1	[Cx] Movement (Status)	0 = Stopped; 1 = Moving
116	1 Bit	0	CR-T-	DPT_UpDown	0/1	[Cx] Movement Direction (Status)	0 = Upward; 1 = Downward
117	1 Bit	I	C - W	DPT_Switch	0/1	[Cx] Auto: On/Off	0 = On; 1 = Off
117	1 Bit	I	C - W	DPT_Switch	0/1	[Cx] Auto: On/Off	0 = Off; 1 = On
110	1 Bit	0	CR-T-	DPT_Switch	0/1	[Cx] Auto: On/Off (Status)	0 = On; 1 = Off
118	1 Bit	0	CR-T-	DPT_Switch	0/1	[Cx] Auto: On/Off (Status)	0 = Off; 1 = On
119	1 Bit	I	C - W	DPT_UpDown	0/1	[Cx] Auto: Move	0 = Raise; 1 = Lower
120	1 Bit	I	C - W	DPT_Step	0/1	[Cx] Auto: Stop/Step	0 = Stop/StepUp; 1 = Stop/StepDown
	1 Bit	I	C - W	DPT_Trigger	0/1	[Cx] Auto: Stop	0 = Stop; 1 = Stop
121	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Cx] Auto: Shutter Positioning	0% = Top; 100% = Bottom

122	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Cx] Auto: Slats Positioning	0% = Open; 100% = Closed
400	1 Bit	I	C-WTU	DPT_Scene_AB	0/1	[Cx] Sunshine/Shadow	0 = Sunshine; 1 = Shadow
123	1 Bit	I	C-WTU	DPT_Scene_AB	0/1	[Cx] Sunshine/Shadow	0 = Shadow; 1 = Sunshine
	1 Bit	I	C-WTU	DPT_Heat_Cool	0/1	[Cx] Cooling/Heating	0 = Heating; 1 = Cooling
124	1 Bit	I	C-WTU	DPT_Heat_Cool	0/1	[Cx] Cooling/Heating	0 = Cooling; 1 = Heating
	1 Bit	I	C-WTU	DPT_Occupancy	0/1	[Cx] Presence/No Presence	0 = Presence; 1 = No Presence
125	1 Bit	I	C-WTU	DPT_Occupancy	0/1	[Cx] Presence/No Presence	0 = No Presence; 1 = Presence
	1 Bit	I	C - W	DPT_Alarm	0/1	[Cx] Alarm x	0 = No Alarm; 1 = Alarm
126, 127	1 Bit	I	C - W	DPT_Alarm	0/1	[Cx] Alarm x	0 = Alarm; 1 = No Alarm
128	1 Bit	I	C - W	DPT_Ack	0/1	[Cx] Unfreeze Alarm	Alarm1 = Alarm2 = No Alarm + Unfreeze (1) => End Alarm
129	1 Bit	I	C - W	DPT_Scene_AB	0/1	[Cx] Move (Reversed)	0 = Lower; 1 = Raise
130, 131	1 Bit	I	C - W	DPT_Ack	0/1	[Cx] Direct Positioning x	0 = No Action; 1 = Go to Position
132, 133	1 Bit	I	C - W	DPT_Ack	0/1	[Cx] Direct Positioning x (Save)	0 = No Action; 1 = Save Current Position
134	1 Byte	I	C - W	DPT_SceneControl	0-63; 128-191	[Thermostat] Scene Input	Scene Value
135, 136, 165, 166, 195, 196, 225, 226	2 Bytes	I	C - W	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Temperature Source x	External Sensor Temperature
137, 167, 197, 227	2 Bytes	0	C R - T -	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Effective Temperature	Effective Control Temperature
138, 168, 198, 228	1 Byte	I	C - W	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Tx] Special Mode	1-byte HVAC Mode
120 160 100 220	1 Bit	I	C - W	DPT_Ack	0/1	[Tx] Special Mode: Comfort	0 = Nothing; 1 = Trigger
139, 169, 199, 229	1 Bit	I	C - W	DPT_Switch	0/1	[Tx] Special Mode: Comfort	0 = Off; 1 = On
140 170 200 220	1 Bit	I	C - W	DPT_Ack	0/1	[Tx] Special Mode: Standby	0 = Nothing; 1 = Trigger
140, 170, 200, 230	1 Bit	I	C - W	DPT_Switch	0/1	[Tx] Special Mode: Standby	0 = Off; 1 = On
141 171 201 221	1 Bit	I	C - W	DPT_Ack	0/1	[Tx] Special Mode: Economy	0 = Nothing; 1 = Trigger
141, 171, 201, 231	1 Bit	I	C - W	DPT_Switch	0/1	[Tx] Special Mode: Economy	0 = Off; 1 = On
142 172 202 222	1 Bit	I	C - W	DPT_Ack	0/1	[Tx] Special Mode: Protection	0 = Nothing; 1 = Trigger
142, 172, 202, 232	1 Bit	I	C - W	DPT_Switch	0/1	[Tx] Special Mode: Protection	0 = Off; 1 = On
143, 173, 203, 233	1 Bit	I	C - W	DPT_Window_Door	0/1	[Tx] Window Status (Input)	0 = Closed; 1 = Open
144, 174, 204, 234	1 Bit	I	C - W	DPT_Trigger	0/1	[Tx] Comfort Prolongation	0 = Nothing; 1 = Timed Comfort
145, 175, 205, 235	1 Byte	0	C R - T -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Tx] Special Mode Status	1-byte HVAC Mode
146, 176, 206, 236	2 Bytes	I	C - W	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Setpoint	Thermostat Setpoint Input
140, 1/0, 200, 230	2 Bytes	I	C - W	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Basic Setpoint	Reference Setpoint
147, 177, 207, 237	1 Bit	I	C - W	DPT_Step	0/1	[Tx] Setpoint Step	$0 = -0.5^{\circ}\text{C}; 1 = +0.5^{\circ}\text{C}$

140 170 200 220	2.0.1	-		DDT Value Terrord	671000 640 670433 300	ET 1 Calacial Official	Elect Office DV-lec
148, 178, 208, 238	2 Bytes	I	C - W	DPT_Value_Tempd	-671088.640 - 670433.280	[Tx] Setpoint Offset	Float Offset Value
149, 179, 209, 239	2 Bytes	0	C R - T -	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Setpoint Status	Current Setpoint
150, 180, 210, 240	2 Bytes	0	C R - T -	DPT_Value_Temp	-273.00° - 670433.28°	[Tx] Basic Setpoint Status	Current Basic Setpoint
151, 181, 211, 241	2 Bytes	0	C R - T -	DPT_Value_Tempd	-671088.64° - 670433.28°	[Tx] Setpoint Offset Status	Current Setpoint Offset
152, 182, 212, 242	1 Bit	I	C - W	DPT_Reset	0/1	[Tx] Setpoint Reset	Reset Setpoint to Default
132, 132, 212, 212	1 Bit	I	C - W	DPT_Reset	0/1	[Tx] Offset Reset	Reset offset
153, 183, 213, 243	1 Bit	I	C - W	DPT_Heat_Cool	0/1	[Tx] Mode	0 = Cool; 1 = Heat
154, 184, 214, 244	1 Bit	0	C R - T -	DPT_Heat_Cool	0/1	[Tx] Mode Status	0 = Cool; 1 = Heat
155, 185, 215, 245	1 Bit	I	C - W	DPT_Switch	0/1	[Tx] On/Off	0 = Off; 1 = On
156, 186, 216, 246	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] On/Off Status	0 = Off; 1 = On
157, 187, 217, 247	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Tx] Control Variable (Cool)	PI Control (Continuous)
158, 188, 218, 248	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Tx] Control Variable (Heat)	PI Control (Continuous)
159, 189, 219, 249	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Control Variable (Cool)	2-Point Control
139, 169, 219, 249	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Control Variable (Cool)	PI Control (PWM)
160 100 220 250	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Control Variable (Heat)	2-Point Control
160, 190, 220, 250	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Control Variable (Heat)	PI Control (PWM)
161, 191, 221, 251	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Additional Cool	Temp >= (Setpoint+Band) => "1"
162, 192, 222, 252	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] Additional Heat	Temp <= (Setpoint-Band) => "1"
163, 193, 223, 253	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] PI State (Cool)	0 = PI signal 0%; 1 = PI signal greater than 0%
164, 194, 224, 254	1 Bit	0	C R - T -	DPT_Switch	0/1	[Tx] PI State (Heat)	0 = PI signal 0%; 1 = PI signal greater than 0%
255	1 Bit	I	C - W	DPT_Trigger	0/1	[ML] Trigger	Trigger the Master Light Function
256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267	1 Bit	I	C - W	DPT_Switch	0/1	[ML] Status Object x	Binary Status
268	1 Bit	0	C R - T -	DPT_Switch	0/1	[ML] General Status	Binary Status
269	1 Bit		C T -	DPT_Switch	0/1	[ML] General Switch Off: Binary Object	Switch Off Sending
270	1 Byte		C T -	DPT_Scaling	0% - 100%	[ML] General Switch Off: Scaling	0-100%
271	1 Byte		C T -	DPT_SceneNumber	0 - 63	[ML] General Switch Off: Scene	Scene Sending
272	1 Byte		C T -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[ML] General Switch Off: HVAC mode	Auto, Comfort, Standby, Economy, Building Protection
273	1 Bit		C T -	DPT_Switch	0/1	[ML] Courtesy Switch On: Binary Object	Switch On Sending
274	1 Byte		C T -	DPT_Scaling	0% - 100%	[ML] Courtesy Switch On: Scaling	0-100%
275	1 Byte		C T -	DPT_SceneNumber	0 - 63	[ML] Courtesy Switch On: Scene	Scene Sending
276	1 Byte		C T -	DPT_HVACMode	1=Comfort	[ML] Courtesy Switch On: HVAC mode	Auto, Comfort, Standby, Economy,

					2=Standby 3=Economy 4=Building Protection		Building Protection
277, 281, 285, 289	2 Bytes	0	CR-T-	DPT_Value_Temp	-273.00° - 670433.28°	[Ix] Current Temperature	Temperature sensor value
278, 282, 286, 290	1 Bit	0	CR-T-	DPT_Alarm	0/1	[Ix] Overcooling	0 = No Alarm;1 = Alarm
279, 283, 287, 291	1 Bit	0	CR-T-	DPT_Alarm	0/1	[Ix] Overheating	0 = No Alarm;1 = Alarm
280, 284, 288, 292	1 Bit	0	CR-T-	DPT_Alarm	0/1	[Ix] Probe Error	0 = No Alarm;1 = Alarm
293, 299, 305, 311	1 Bit	I	C - W	DPT_Enable	0/1	[Ix] Input Lock	0 = Unlock; 1 = Lock
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Short Press] 0	Sending of 0
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Short Press] 1	Sending of 1
	1 Bit	I	C - W T -	DPT_Switch	0/1	[Ix] [Short Press] 0/1 Switching	Switching 0/1
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Short Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Short Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Short Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		C T -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step Up)
	1 Bit		C T -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step Down)
	1 Bit		C T -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Shutter (Switched)	Switching of 0/1 (Stop/Step Up/Down)
294, 300, 306, 312	4 Bit		C T -	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		C T -	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		С Т -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%)	[Ix] [Short Press] Brighter/Darker	Switch Bright/Dark

					0xF (Inc. by 1%)		
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Short Press] Light On	Sending of 1 (On)
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Short Press] Light Off	Sending of 0 (Off)
	1 Bit	I	C - W T -	DPT_Switch	0/1	[Ix] [Short Press] Light On/Off	Switching 0/1
	1 Byte		C T -	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Run Scene	Sending of 0 - 63
	1 Byte		C T -	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Save Scene	Sending of 128 - 191
	1 Bit	I/O	CRWT-	DPT_Switch	0/1	[Ix] [Switch/Sensor] Edge	Sending of 0 or 1
	1 Byte		C T -	DPT_Value_1_Ucount	0 - 255	[Ix] [Short Press] Constant Value (Integer)	0 - 255
	1 Byte		C T -	DPT_Scaling	0% - 100%	[Ix] [Short Press] Constant Value (Percentage)	0% - 100%
	2 Bytes		C T -	DPT_Value_2_Ucount	0 - 65535	[Ix] [Short Press] Constant Value (Integer)	0 - 65535
	2 Bytes		C T -	9.xxx	-671088.64 - 670433.28	[Ix] [Short Press] Constant Value (Float)	Float Value
205 201 207 212	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Ix] [Short Press] Shutter Status (Input)	0% = Top; 100% = Bottom
295, 301, 307, 313	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Ix] [Short Press] Dimming Status (Input)	0% - 100%
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Long Press] 0	Sending of 0
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Long Press] 1	Sending of 1
	1 Bit	I	C - W T -	DPT_Switch	0/1	[Ix] [Long Press] 0/1 Switching	Switching 0/1
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Long Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Long Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		C T -	DPT_UpDown	0/1	[Ix] [Long Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		C T -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step Up)
296, 302, 308, 314	1 Bit		C T -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step Down)
	1 Bit		C T -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Shutter (Switched)	Switching of 0/1 (Stop/Step Up/Down)
					0x0 (Stop) 0x1 (Dec. by 100%)		
	4 Bit		C T -	DPT_Control_Dimming	0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%) 	[Ix] [Long Press] Brighter	Long Pr> Brighter; Release -> Stop
					0xF (Inc. by 1%)		
	4 Bit		C T -	DPT_Control_Dimming	0x0 (Stop)	[Ix] [Long Press] Darker	Long Pr> Darker; Release ->

					0v1 (Dec by 100%)		Cton
					0x1 (Dec. by 100%)		Stop
					0x7 (Dec. by 1%)		
					0x8 (Stop)		
					0xD (Inc. by 100%)		
					 0xF (Inc. by 1%)		
					0x0 (Stop) 0x1 (Dec. by 100%)		
	4 Bit		C T -	DPT_Control_Dimming	0x7 (Dec. by 1%) 0x8 (Stop) 0xD (Inc. by 100%)	[Ix] [Long Press] Brighter/Darker	Long Pr> Brighter/Darker; Release -> Stop
					0xF (Inc. by 1%)		
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Long Press] Light On	Sending of 1 (On)
	1 Bit		C T -	DPT_Switch	0/1	[Ix] [Long Press] Light Off	Sending of 0 (Off)
	1 Bit	I	C - W T -	DPT_Switch	0/1	[Ix] [Long Press] Light On/Off	Switching 0/1
	1 Byte		C T -	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Run Scene	Sending of 0 - 63
	1 Byte		C T -	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Save Scene	Sending of 128 - 191
	1 Bit	0	C R - T -	DPT_Alarm	0/1	[Ix] [Switch/Sensor] Alarm: Breakdown or Sabotage	1 = Alarm; 0 = No Alarm
	2 Bytes		C T -	9.xxx	-671088.64 - 670433.28	[Ix] [Long Press] Constant Value (Float)	Float Value
	2 Bytes		C T -	DPT_Value_2_Ucount	0 - 65535	[Ix] [Long Press] Constant Value (Integer)	0 - 65535
	1 Byte		C T -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Constant Value (Percentage)	0% - 100%
	1 Byte		C T -	DPT_Value_1_Ucount	0 - 255	[Ix] [Long Press] Constant Value (Integer)	0 - 255
297, 303, 309, 315	1 Bit		C T -	DPT_Trigger	0/1	[Ix] [Long Press/Release] Stop Shutter	Release -> Stop Shutter
298, 304, 310, 316	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Ix] [Long Press] Dimming Status (Input)	0% - 100%
230, 304, 310, 310	1 Byte	I	C - W	DPT_Scaling	0% - 100%	[Ix] [Long Press] Shutter Status (Input)	0% = Top; 100% = Bottom
317	1 Byte	I	C - W	DPT_SceneNumber	0 - 63	[Motion Detector] Scene Input	Scene Value
318	1 Byte		C T -	DPT_SceneControl	0-63; 128-191	[Motion Detector] Scene Output	Scene Value
319, 348, 377, 406	1 Byte	0	CR-T-	DPT_Scaling	0% - 100%	[Ix] Luminosity	0-100%
320, 349, 378, 407	1 Bit	0	C R - T -	DPT_Alarm	0/1	[Ix] Open Circuit Error	0 = No Error; 1 = Open Circuit Error
321, 350, 379, 408	1 Bit	0	C R - T -	DPT_Alarm	0/1	[Ix] Short Circuit Error	0 = No Error; 1 = Short Circuit Error

322, 351, 380, 409	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Ix] Presence State (Scaling)	0-100%
323, 352, 381, 410	1 Byte	0	C R - T -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] Presence State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
324, 353, 382, 411	1 Bit	0	C R - T -	DPT_Switch	0/1	[Ix] Presence State (Binary)	Binary Value
324, 333, 382, 411	1 Bit	0	C R - T -	DPT_Start	0/1	[Ix] Presence: Slave Output	1 = Motion Detected
325, 354, 383, 412	1 Bit	I	C - W	DPT_Window_Door	0/1	[Ix] Presence Trigger	Binary Value to Trigger the Presence Detection
326, 355, 384, 413	1 Bit	I	C - W	DPT_Start	0/1	[Ix] Presence: Slave Input	0 = Nothing; 1 = Detection from slave device
327, 356, 385, 414	2 Bytes	I	C - W	DPT_TimePeriodSec	0 - 65535	[Ix] Presence: Waiting Time	0-65535 s.
328, 357, 386, 415	2 Bytes	I	C - W	DPT_TimePeriodSec	0 - 65535	[Ix] Presence: Listening Time	1-65535 s.
329, 358, 387, 416	1 Bit	I	C - W	DPT_Enable	0/1	[Ix] Presence: Enable	According to parameters
330, 359, 388, 417	1 Bit	I	C - W	DPT_DayNight	0/1	[Ix] Presence: Day/Night	According to parameters
331, 360, 389, 418	1 Bit	0	CR-T-	DPT_Occupancy	0/1	[Ix] Presence: Occupancy State	0 = Not Occupied; 1 = Occupied
332, 361, 390, 419	1 Bit	I	C - W	DPT_Start	0/1	[Ix] External Motion Detection	0 = Nothing; 1 = Motion detected by an external sensor
333, 338, 343, 362, 367, 372, 391, 396, 401, 420, 425, 430	1 Byte	0	C R - T -	DPT_Scaling	0% - 100%	[Ix] [Cx] Detection State (Scaling)	0-100%
334, 339, 344, 363, 368, 373, 392, 397, 402, 421, 426, 431	1 Byte	0	C R - T -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] [Cx] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
335, 340, 345, 364, 369, 374, 393, 398, 403, 422, 427, 432	1 Bit	0	C R - T -	DPT_Switch	0/1	[Ix] [Cx] Detection State (Binary)	Binary Value
336, 341, 346, 365, 370, 375, 394, 399, 404, 423, 428, 433	1 Bit	I	C - W	DPT_Enable	0/1	[Ix] [Cx] Enable Channel	According to parameters
337, 342, 347, 366, 371, 376, 395, 400, 405, 424, 429, 434	1 Bit	I	C - W	DPT_Switch	0/1	[Ix] [Cx] Force State	0 = No Detection; 1 = Detection



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