



MAXinBOX Hospitality

Two/Four-Pipe Fan Coil Controller with Two Digital Outputs and 6 Analogue/Digital Inputs

ZN1IO-MBH1

Application program version: [1.1]
User manual edition: [1.1]_a

CONTENTS

С	onter	nts		2								
D	ocum	nent L	Jpdates	3								
1	In	Introduction										
	1.1	MAX	XinBOX Hospitality	4								
	1.2	Inst	allation	5								
	1.3	Star	t-Up and Power Loss	6								
	1.4	Stat	us Indicators	6								
	1.	.4.1	Binary Outputs	7								
	1.	.4.2	Fan Coil Control Outputs (Valve / Fan)	7								
2	C	onfigu	uration	8								
	2.1	Gen	eral	8								
		ET	S Parameterisation	8								
	2.2	Inpu	ıts	9								
	2.3	Bina	ary Outputs1	0								
	2.4	Fan	Coil	1								
	2.5	Logi	c Functions1	2								
	2.6	Mas	ster Light	3								
		ЕТ	TS Parameterisation1	3								
	2.7	Mar	nual Control1	6								
		ЕТ	TS Parameterisation1	9								
Α	NNE	(I. Co	mmunication Objects2	0								

DOCUMENT UPDATES

Version	Changes	Page(s)
[1.1]_a	 Changes in the application program: Optimisation of the timed actions management in the logic functions module. Improvement of the inputs management (certain configurations / combinations were leading to occasional deviations in the readings). Name change of certain fan control or valve control objects. 	-
	Name change of certain fan control or valve control objects.	20

1 INTRODUCTION

1.1 MAXINBOX HOSPITALITY

MAXinBOX Hospitality from Zennio is a versatile KNX multi-function actuator destined to cover the climate control needs in KNX environments with integrated **fan coil units** where both the fan speed and the opening of the water pipe valves are controlled by relays.

This actuator provides up to seven relay outputs. Two of them can be enabled and **configured independently**, while the other five allow the integrator control a two-tube or four-tube fan coil unit.

At a glance, the most outstanding features of MAXinBOX Hospitality are:

7 relay outputs:

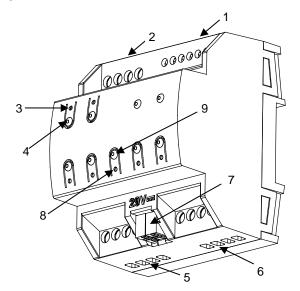
- > 2 relay outputs configurable as binary outputs,
- ➤ 5 relay outputs for controlling the valves and the fan level (up to three levels) of a two/four pipe fan-coil unit.
- 6 multi-purpose inputs, each of them configurable as:
 - > Temperature probe,
 - Binary input (i.e., pushbuttons, switches, sensors),
 - > Motion detector.
- 10 customisable, multi-operation logic functions.
- Master light control 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 relay outputs through the on-board pushbuttons and LEDs.

1.2 INSTALLATION

MAXinBOX Hospitality connects to the KNX bus through the on-board KNX connector.

Once the device is provided with power 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. Multi-purpose Inputs.
- 2. Fan-Control Outputs.
- 3. Output Status LED Indicator.
- 4. Manual Control Pushbutton.
- 5. Valve Control Outputs.
- 6. Multi-purpose Binary Outputs.
- 7. KNX Bus Connector.
- 8. Prog./Test LED.
- 9. Prog./Test Pushbutton.

Figure 1 MAXinBOX Hospitality Elements

The main elements of the device are described next.

• Prog./Test Pushbutton (9): a short press on this button sets the device into the programming mode, making the associated LED (8) light in red.

<u>Note</u>: 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 (2, 5 and 6): output ports for the insertion of the stripped cables of the systems being controlled by the actuator (see sections 2.3 and 2.4). Please secure the connection by means of the on-board screws.

• Inputs (1): 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 "6", 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 onboard screws.

For detailed information about the technical features of the device and for safety instructions or about the installation process, 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 device start-up, the Prog./Test LED will blink **in blue colour** for a few seconds before MAXinBOX Hospitality 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, MAXinBOX Hospitality will interrupt any pending actions, and will save its state so it can be recovered once the power supply is restored. In addition, the individual outputs will switch to the specific state configured in parameters.

1.4 STATUS INDICATORS

Each of the outputs of MAXinBOX Hospitality incorporates a light indicator that reflects its current state.

1.4.1 BINARY OUTPUTS

The LED indicator will only light while the relay remains closed, i.e., while the output is on. It will not light will the output is off.

Please refer to section 2.3 for details about the individual binary outputs.

1.4.2 FAN COIL CONTROL OUTPUTS (VALVE / FAN)

Regarding the **valve control outputs**, the LED indicator of each output will behave analogously as the LEDs of the binary outputs: it will remain off while the corresponding valve is closed (open relay) and on while the corresponding valve is open (closed relay),

Regarding the **fan control outputs**, the two LED indicators provide information about the current fan speed level:

- Fan switched off: both LEDs off.
- Fan at speed level 1: both LEDs blinking every 1 second.
- Fan at speed level 2: both LEDs blinking every 0.5 seconds.
- Fan at speed level 3: both LEDs steadily on.

In case **less than three different speed levels** have been parameterised, the LEDs will stay steadily on while the fan is at the maximum level (e.g., level 2), and as described above for the lower levels (e.g., levels 1 and off).

Please refer to section 2.4 for details about the fan coil control outputs.

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 right-clicking into the device and selecting *Edit Parameters*.

ETS PARAMETERISATION

From the "General" screen it is possible to mark/unmark the appropriate checkboxes to enable the required functionality. The only one active by default is "**Manual Control**" (see section 2.7), thus the corresponding tab will also be available from the beginning in the tab tree on the left.

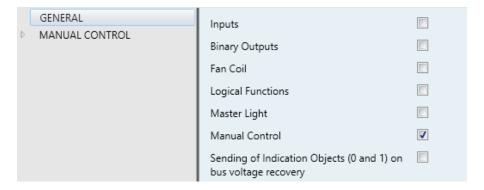


Figure 2 General screen

- Once activated, Inputs, Binary Outputs, Fan Coil, Logical Functions, Manual Control (enabled by default) and Master Light bring additional tabs to the menu on the left. These functions and their parameters will be explained in later sections of this document.
- 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).

2.2 INPUTS

MAXinBOX Hospitality provides 6 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 (model ZN1AC-NTC68 S/E/F from Zennio).
- Motion Detector, to connect a motion detector (models ZN1IO-DETEC-P and ZN1IO-DETEC-X from Zennio).

<u>Important</u>: older models of the Zennio motion detector (e.g., ZN1IO-DETEC and ZN1IO-DETEC-N) will not work properly with MAXinBOX Hospitality. In addition, model ZN1IO-DETEC-P requires setting the voltage selection switch located on the rear to position "3.3V" (please refer to its specific datasheet).

For detailed information about the functionality and the configuration of the parameters involved, please refer to the following specific manual, available under the MAXinBOX Hospitality product section, at the Zennio homepage (www.zennio.com):

- "Binary Inputs in MAXinBOX Hospitality",
- "Temperature Sensor in MAXinBOX Hospitality",
- "Motion Detector in MAXinBOX Hospitality".

2.3 BINARY OUTPUTS

MAXinBOX Hospitality incorporates **two multi-purpose binary outputs**, each of which can be enabled and configured in parameters independently, allowing the control of up to **two different loads**. Each output can be enabled or disabled by parameter and perform different functions.

Their parameterisation is similar to that of the individual relay outputs of any other MAXinBOX actuators. Note that they all work **independently**, although it is possible to group them as required through joint group addresses. It is also possible to configure each of them as "<u>normally open</u>" or "<u>normally closed</u>", so they open / close on the reception of a "0" or of a "1" through the KNX bus.

When the binary outputs have been activated in the "General" parameter screen, the "Binary Outputs" section will be available in the tree on the left, containing itself a tab named "Configuration".



Enabling these checkboxes will bring additional entries to the tab tree, for the specific configuration of each individual output.

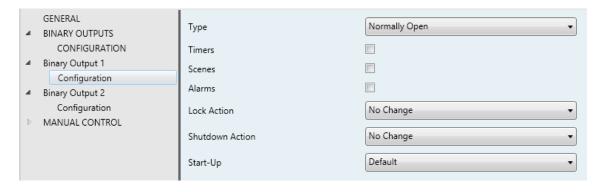


Figure 3 Binary Outputs - Configuration

All outputs are disabled by default. Depending on the function selected for each output, some additional tabs will be included in the tree on the left. For a detailed description of these functions and on their configuration, please refer to the specific manual "Individual Outputs in MAXinBOX Hospitality", available at www.zennio.com.

2.4 FAN COIL

MAXinBOX Hospitality incorporates one fan coil control module, which will be responsible for operating the relays than open and close the water pipe valves, and the relays that set the fan speed level. The latter can be achieved through relay accumulation (more relays closed means a higher fan speed) or through relay commutation (one specific relay will be available per level), depending on the configuration.

For a detailed description of these functions and on their configuration, please refer to the specific manual "Relays Fan Coil in MAXinBOX Hospitality", available at www.zennio.com.

2.5 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.

MAXinBOX Hospitality allows enabling and fully customising up to **ten different logic functions** with their corresponding input objects, whose size can be 1 bit, 1 byte, 2 bytes or 4 bytes.

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 specific manual "Logic Functions in MAXinBOX Hospitality", available at the www.zennio.com website, for detailed information about the functionality and the configuration of the related parameters.

2.6 MASTER LIGHT

The Master Light function brings the option to monitor the state of up to 12 light sources —or any other element with similar functionality 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 1-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]

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General Switch-Off: Binary Object", which sends the value "0" (during the general switch-off, as explained above).

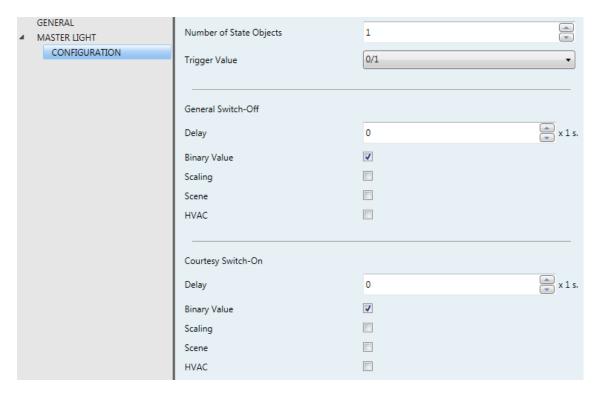


Figure 4 Master Light

2.7 MANUAL CONTROL

MAXinBOX Hospitality 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 should be accessible 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.

Notes:

- The available control modes (Test On / Test Off) and the lock object can be enabled and disabled in MAXinBOX Hospitality independently for the individual binary outputs and for the fan coil outputs (valves and fan).
- 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.

This device is delivered from factory with the Test On and Test Off modes **already** enabled in parameters for all outputs.

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, so it has no effect if the output is locked or under alarm status. The status objects of the different functions will still be sent in the usual way.

The action performed depends on the output type.

- Binary output: a simple press (short or long) will make the output (if enabled in parameters) switch its on-off state. This will be reported to the KNX bus through the corresponding status object, if enabled.
- Fan: a simple press (short or long) implies an increase or decrease of the fan speed (provided that the fan coil has been enabled in parameters), depending on the button pressed. This action will depend on the fan type (relay accumulation / relay commutation), the control type (cyclical or non-cyclical) and the minimum switch time configured. In particular:
 - If the fan is already at the maximum speed level, a further increase will have no effect (in case of a non-cyclical control) or will switch back to the minimum level (in case of a cyclical control).
 - If the fan is already at the minimum speed level, a further decrease will have no effect (in case of a non-cyclical control) or will switch back to the maximum level (in case of a cyclical control).
- ✔ Valve: a simple press (short or long) will make the valve switch its open/closed state, provided that the fan coil has been enabled in parameters. In case the fan coil control type has been configured in parameters as "applied to the fan" (instead of "applied to the valve"), this may also imply:
 - A switch-on of the fan, if it is found to be stopped and the valve opens, provided that the desired fan speed is other than zero.
 - ➤ A switch-off of the fan, it is found to be in motion and the valve closes, provided that the current mode is Heating (under Cooling, the fan will remain as is).

Regarding the lock, timer, alarm and scene functions, the device will behave as usual under the Test Off mode. 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 output they are addressed to.

On the other hand, to prevent interference with the normal operation and since the Test On mode is intended for testing, once the device leaves the Test On mode it will switch back to its previous state.

Depending on the parameterisation of the output, the reactions to the button presses will differ.

- Binary output: short or long pressing the button will commute the on-off state of the relay, even if the output is not enabled in parameters.
- Fan: a simple press (short or long) implies an increase or decrease of the fan speed, depending on the button pressed.
 - In case the fan coil module is **disabled in parameters**, it will work as non-cyclical and through relay switching (with a 0.3 s delay).
 - In **any other case**, the Test On mode will still respect the cyclical / non-cyclical configuration, and the relay management type parameterised.
- Valves: a simple press (short or long) will make the valve switch its open/closed state. The behaviour is analogous as for the Test Off mode, although both valves will be controllable in Test On even if not enabled in parameters.

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. However, alarms and lock orders received during the Test On mode will be taken into account once the device leaves this mode.

ETS PARAMETERISATION

The **Manual Control** is configured from a specific tab which can be enabled from the "General" screen (see section 2.1).

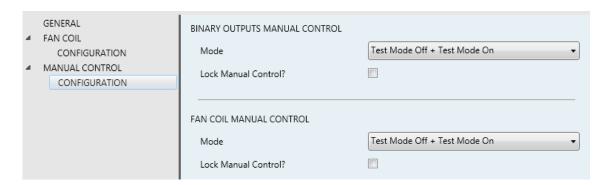


Figure 5 Manual Control

The parameters available in this screen are grouped into two sections, as it is possible to **configure independently the behaviour of the Manual Control for both**, the *fan coil* and the individual binary outputs:

■ Mode: options are "<u>Disabled</u>", "<u>Only Test Mode Off</u>", "<u>Only Test Mode On</u>" and "Test Mode Off + Test Mode On" (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 set to "<u>Disabled</u>", enabling the Lock Manual Control parameter will provide a runtime procedure for locking the manual control. When this checkbox is enabled, object "Manual Control Lock" turns visible, as well as two more parameters:
 - ➤ Value: defines whether the lock/unlock of the manual control 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): "Unlocked", "Locked" or by default, "Last Value" (unlocked after the first start-up).

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	1/0	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		C T	DPT_Trigger	0/1	Reset 0	Voltage Recovery -> Sending of 0
2	1 Bit		C T	DPT_Trigger	0/1	Reset 1	Voltage Recovery -> Sending of 1
3	1 Bit	ı	C W -	DPT_Switch	0/1	Lock Manual Control (Binary Outputs)	0 = Lock; 1 = Unlock
3	1 Bit	Ι	C W -	DPT_Switch	0/1	Lock Manual Control (Binary Outputs)	0 = Unlock; 1 = Lock
4	1 Bit	Ι	C W -	DPT_Switch	0/1	Lock Manual Control (Fan Coil)	0 = Unlock; 1 = Lock
4	1 Bit	Ι	C W -	DPT_Switch	0/1	Lock Manual Control (Fan Coil)	0 = Lock; 1 = Unlock
5, 9, 13, 17, 21, 25	2 Bytes	0	C T R	DPT_Value_Temp	-273,00 - 670760,00	[Ix] Current Temperature	Temperature sensor value
6, 10, 14, 18, 22, 26	1 Bit	0	C T R	DPT_Alarm	0/1	[Ix] Overcooling	0 = No Alarm; 1 = Alarm
7, 11, 15, 19, 23, 27	1 Bit	0	C T R	DPT_Alarm	0/1	[Ix] Overheating	0 = No Alarm; 1 = Alarm
8, 12, 16, 20, 24, 28	1 Bit	0	C T R	DPT_Alarm	0/1	[Ix] Probe Error	0 = No Alarm; 1 = Alarm
29	1 Byte	Ι	C W -	DPT_SceneControl	0-63; 128-191	[Motion Sensor] Scene Input	Scene Value
30	1 Byte		C T	DPT_SceneControl	0-63; 128-191	[Motion Sensor] Scene Output	Scene Value
31, 55, 79, 103, 127, 151	1 Byte	0	C T R	DPT_Scaling	0% - 100%	[Ix] Luminosity	0-100%
32, 56, 80, 104, 128, 152	1 Bit	0	C T R	DPT_Alarm	0/1	[Ix] Open Circuit Error	0 = No Error; 1 = Open Circuit Error
33, 57, 81, 105, 129, 153	1 Bit	0	C T R	DPT_Alarm	0/1	[Ix] Short Circuit Error	0 = No Error; 1 = Short Circuit Error
34, 58, 82, 106, 130, 154	1 Byte	0	C T R	DPT_Scaling	0% - 100%	[Ix] Presence State (Scaling)	0-100%
35, 59, 83, 107, 131, 155	1 Byte	0	C T R	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] Presence State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
36, 60, 84, 108, 132,	1 Bit	0	C T R	DPT_Occupancy	0/1	[Ix] Presence State (Binary)	Binary Value
156	1 Bit	0	C T R	DPT_Trigger	0/1	[Ix] Presence: Slave Output	1 = Motion Detected
37, 61, 85, 109, 133, 157	1 Bit	I	C W -	DPT_Trigger	0/1	[Ix] Presence Trigger	Binary Value to Trigger the Presence Detection

38, 62, 86, 110, 134, 158	1 Bit	I	C W -	DPT_Trigger	0/1	[Ix] Presence: Slave Input	0 = Nothing; 1 = Detection from slave device
39, 63, 87, 111, 135, 159	1 Bit	ı	C W -	DPT_Trigger	0/1	[Ix] External Motion Detection	0 = Nothing; 1 = Motion detected by an external sensor
40, 45, 50, 64, 69, 74, 88, 93, 98, 112, 117, 122, 136, 141, 146, 160, 165, 170	1 Byte	О	C T R	DPT_Scaling	0% - 100%	[Ix][Cy] Detection State (Scaling)	0-100%
41, 46, 51, 65, 70, 75, 89, 94, 99, 113, 118, 123, 137, 142, 147, 161, 166, 171	1 Byte	0	C T R	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix][Cy] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
42, 47, 52, 66, 71, 76, 90, 95, 100, 114, 119, 124, 138, 143, 148, 162, 167, 172	1 Bit	0	C T R	DPT_Switch	0/1	[Ix][Cy] Detection State (Binary)	Binary Value
43, 48, 53, 67, 72, 77, 91, 96, 101, 115, 120, 125, 139, 144, 149, 163, 168, 173	1 Bit	ı	C W -	DPT_Switch	0/1	[Ix][Cy] Channel Lock	According to parameters
44, 49 ,54, 68, 73, 78, 92, 97, 102, 116, 121, 126, 140, 145, 150, 164, 169, 174	1 Bit	I	C W -	DPT_Switch	0/1	[Ix][Cy] Force State	0 = No Detection; 1 = Detection
175, 181, 187, 193, 199, 205	1 Bit	ı	C W -	DPT_Switch	0/1	[Ix] Input Lock	1 = Locked; 0 = Unlocked
	1 Bit		C T	DPT_Switch	0/1	[Ix] [Short Press] 0	Sending of 0
	1 Bit	<u> </u>	C T	DPT_Switch	0/1	[Ix] [Short Press] 1	Sending of 1
176, 182, 188, 194, 200, 206	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Short Press] 0/1 Switching	Switching 0/1
200, 200	1 Bit 1 Bit		C T	DPT_UpDown DPT_UpDown	0/1 0/1	[Ix] [Short Press] Move Up Shutter [Ix] [Short Press] Move Down Shutter	Sending of 0 (Up) Sending of 1 (Down)
	1 Bit	-	CT				
	I BIL		61	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		СТ	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Down Shutter	
	1 Bit		СТ	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Shutter (switched)	Switching of 0/1 (Stop/Step up/down)
	4 Bit		СТ	DPT_Control_Dimming	Ox0 (Stop) 0x1 (Dec. by 100%) () 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) () 0xF (Inc. by 1%)	[Ix] [Short Press] Brighter	Increase Brightness
	4 Bit		СТ	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%)	[Ix] [Short Press] Darker	Decrease Brightness
	4 Bit		СТ	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%)	[Ix] [Short Press] Brighter/Darker	Switch Bright/Dark
	1 Bit		C T	DPT_Switch	0/1	[Ix] [Short Press] Dimmer ON	Sending of 1 (ON)
	1 Bit		C T	DPT_Switch	0/1	[Ix] [Short Press] Dimmer OFF	Sending of 0 (OFF)
	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Short Press] Dimmer 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	1/0	CTRW-	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%	(i ercertage)	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 -	[Ix] [Short Press] Constant Value (float)	Float value

					670760.96		
177, 183, 189, 195,	1 Byte	ı	C W -	DPT_Scaling	0% - 100%	[Ix] [Short Press] Shutter Status (input)	0% = Top; 100% = Bottom
201, 207	1 Byte	ı	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	ı	C T - W -	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)
	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)
178, 184, 190, 196,	4 Bit		СТ	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%)	[Ix] [Long Press] Brighter	Long Pr> Brighter; Release -> Stop
202, 208	4 Bit		СТ	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%)	[Ix] [Long Press] Darker	Long Pr> Darker; Release -> Stop
	4 Bit		СТ	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%)	[Ix] [Long Press] Brighter/Darker	Long Pr> Brighter/Darker; Release -> Stop
	1 Bit		C T	DPT_Switch	0/1	[Ix] [Long Press] Dimmer ON	Sending of 1 (ON)
	1 Bit		C T	DPT_Switch	0/1	[Ix] [Long Press] Dimmer OFF	Sending of 0 (OFF)
	1 Bit	ı	C T - W -	DPT_Switch	0/1	[Ix] [Long Press] Dimmer 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 T R	DPT_Alarm	0/1	[Ix] [Switch/Sensor] Alarm: Breakdown or sabotage	1 = Alarm; 0 = No Alarm
	2 Bytes		C T	9.xxx	-671088.64 - 670760.96	[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%	(i crecitage)	0% - 100%
	1 Byte		C T	DPT_Value_1_Ucount	0 - 255	[Ix] [Long Press] Constant Value (Integer)	0 - 255
179, 185, 191, 197, 203, 209	1 Bit		C T	DPT_Trigger	0/1	[Ix] [Long Press/Release] Stop Shutter	Release -> Stop Shutter
180, 186, 192, 198,	1 Byte	I	C W -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Dimming Status (input)	0% - 100%
204, 210	1 Byte	ı	C W -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Shutter Status (input)	0% = Top; 100% = Bottom
211-242	1 Bit	ı	C W -	DPT_Bool	0/1	[LF] (1 bit) Data Entry 1	Binary Data Entry (0/1)
243-258	1 Byte	I	C W -	DPT_Value_1_Ucount	0 - 255	[LF] (1 byte) Data Entry 1	1 byte Data Entry (0-255)
259-274	2 Bytes	I	C W -	DPT_Value_2_Ucount DPT_Value_2_Count DPT_Value_Temp	0 - 65535 -32768 - 32767 -273,00 - 670760,00	[LF] (2 bytes) Data Entry 1	2 bytes Data Entry
275-282	4 Bytes	_	C W -	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] (4 bytes) Data Entry 1	4 bytes Data Entry
	1 Bit	0	C T R	DPT_Bool	0/1	[LF] Function 1 - Result	(1 bit) Boolean
	1 Byte	0	C T R	DPT_Value_1_Ucount	0 - 255	[LF] Function 1 - Result	(1 byte) Unsigned
	2 Bytes	0	C T R	DPT_Value_2_Ucount	0 - 65535	[LF] Function 1 - Result	(2 bytes) Unsigned
283-292	4 Bytes	0	C T R	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] Function 1 - Result	(4 bytes) Signed
	1 Byte	0	C T R	DPT_Scaling	0% - 100%	[LF] Function 1 - Result	(1 byte) Percentage
	2 Bytes	0	C T R	DPT_Value_2_Count	-32768 - 32767	[LF] Function 1 - Result	(2 bytes) Signed
	2 Bytes	0	C T R	DPT_Value_Temp	-273,00 - 670760,00	[LF] Function 1 - Result	(2 bytes) Float
293	1 Bit	I	C W -	DPT_Trigger	0/1	[ML] Trigger	Trigger the Master Light Function
294-305	1 Bit	I	C W -	DPT_Switch	0/1	[ML] Status Object X	Binary Status
306	1 Bit		C T	DPT_Switch	0/1	[ML] General Switch-Off: Binary Object	Off Sending
307	1 Byte		C T	DPT_Scaling	0% - 100%	[ML] General Switch-Off: Scaling	0-100%
308	1 Byte		C T	DPT_SceneControl	0-63; 128-191	[ML] General Switch-Off: Scene	Scene Sending
309	1 Byte		СТ	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[ML] General Switch-Off: HVAC mode	Auto, Comfort, Standby, Economy, Building Protection

310	1 Bit		C T	DPT_Switch	0/1	[ML] Courtesy Switch-On: Binary Object	On Sending
311	1 Byte		C T	DPT_Scaling	0% - 100%	[ML] Courtesy Switch-On: Scaling	0-100%
312	1 Byte		C T	DPT_SceneControl	0-63; 128-191	[ML] Courtesy Switch-On: Scene	Scene Sending
313	1 Byte		СТ	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[ML] Courtesy Switch-On: HVAC mode	Auto, Comfort, Standby, Economy, Building Protection
314	1 Byte	ı	C W -	DPT_SceneControl	0-63; 128-191	[Outputs] Scenes	0 - 63 (Execute 1 - 64); 128 - 191 (Save 1 - 64)
215 222	1 Bit	-	C W -	DPT_BinaryValue	0/1	[Ox] On/Off	N.O. (0=Open Relay; 1=Close Relay)
315, 323	1 Bit	_	C W -	DPT_BinaryValue	0/1	[Ox] On/Off	N.C. (0=Close Relay; 1= Open Relay)
316, 324	1 Bit	0	C T R	DPT_BinaryValue	0/1	[Ox] On/Off (Status)	0=Output Off; 1=Output On
317, 325	1 Bit	I	C W -	DPT_Enable	0/1	[Ox] Lock	0=Unlock; 1=Lock
318, 326	1 Bit	I	C W -	DPT_Start	0/1	[Ox] Timer	0=Switch Off; 1=Switch On
319, 327	1 Bit	I	C W -	DPT_Start	0/1	[Ox] Flashing	0=Stop; 1=Start
220, 220	1 Bit	I	C W -	DPT_Alarm	0/1	[Ox] Alarm	0=Normal; 1=Alarm
320, 328	1 Bit	I	C W -	DPT_Alarm	0/1	[Ox] Alarm	0=Alarm; 1=Normal
321, 329	1 Bit	I	C W -	DPT_Trigger	0/1	[Ox] Unfreeze Alarm	Alarm=0 + Unfreeze=1 => End Alarm
322, 330	1 Bit	0	C T R	DPT_Trigger	0/1	[Ox] Warning Time (Status)	0=Normal; 1=Warning
331	1 Byte	I	C W U	DPT_SceneControl	0-63; 128-191	[Fan Coil] Scenes	0 - 63 (Execute 1 - 64)
332	1 Bit	I	C W U	DPT_Switch	0/1	[FC1] On/Off	0 = Off; 1 = On
333	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] On/Off (Status)	0 = Off; 1 = On
334	1 Bit	I	C W U	DPT_Heat_Cool	0/1	[FC1] Mode	0 = Cool; 1 = Heat
335	1 Bit	0	C T R	DPT_Heat_Cool	0/1	[FC1] Mode (Status)	0 = Cool; 1 = Heat
007	1 Bit	I	C W U	DPT_Switch	0/1	[FC1] Fan: Manual/Automatic	0 = Automatic; 1 = Manual
336	1 Bit	ı	C W U	DPT_Switch	0/1	[FC1] Fan: Manual/Automatic	0 = Manual; 1 = Automatic
207	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Manual/Automatic (Status)	0 = Automatic; 1 = Manual
337	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Manual/Automatic (Status)	0 = Manual; 1 = Automatic
338	1 Bit	ı	C W U	DPT_Step	0/1	[FC1] Manual Fan: Step Control	0 = Down; 1 = Up
339	1 Bit	ı	C W U	DPT_Switch	0/1	[FC1] Manual Fan: Speed 0	0 = Off; 1 = On
340	1 Bit	I	C W U	DPT_Switch	0/1	[FC1] Manual Fan: Speed 1	0 = Off; 1 = On
341	1 Bit	I	C W U	DPT_Switch	0/1	[FC1] Manual Fan: Speed 2	0 = Off; 1 = On
342	1 Bit	ı	C W U	DPT_Switch	0/1	[FC1] Manual Fan: Speed 3	0 = Off; 1 = On
343	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Speed 0 (Status)	0 = Off; 1 = On
344	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Speed 1 (Status)	0 = Off; 1 = On
345	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Speed 2 (Status)	0 = Off; 1 = On
346	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Fan: Speed 3 (Status)	0 = Off; 1 = On
347	1 Byte	1	C W U	DPT_Value_1_Ucount	0 - 255	[FC1] Manual Fan: Enumeration Control	0 = S0; 1 = S1; 2 = S2; 3 = S3

	1 Byte	I	C W U	DPT_Value_1_Ucount	0 - 255	[FC1] Manual Fan: Enumeration Control	0 = S0; 1 = S1; 2 = S2
	1 Byte	1	C W U	DPT_Value_1_Ucount	0 - 255		0 = S0; 1 = S1
	1 Byte	0	C T R	DPT_Value_1_Ucount	0 - 255	[FC1] Fan: Speed Enumeration (Status)	S0 = 0; S1 = 1; S2 = 2; S3 = 3
348	1 Byte	0	C T R	DPT_Value_1_Ucount	0 - 255	[FC1] Fan: Speed Enumeration (Status)	S0 = 0; S1 = 1; S2 = 2
	1 Byte	0	C T R	DPT_Value_1_Ucount	0 - 255	[FC1] Fan: Speed Enumeration (Status)	S0 = 0; S1 = 1
	1 Byte	I	c w u	DPT_Scaling	0% - 100%	[FC1] Manual Fan: Percentage Control	0% = S0; 1-33% = S1; 34-66% = S2; 67- 100% = S3
349	1 Byte	I	C W U	DPT_Scaling	0% - 100%	[FC1] Manual Fan: Percentage Control	0% = S0; 1-50% = S1; 51-100% = S2
	1 Byte	ı	C W U	DPT_Scaling	0% - 100%	[FC1] Manual Fan: Percentage Control	0% = S0; 1-100% = S1
	1 Byte	О	C T R	DPT_Scaling	0% - 100%	[FC1] Fan: Speed Percentage (Status)	S0 = 0%; S1 = 33,3%; S2 = 66,6%; S3 = 100%
350	1 Byte	0	C T R	DPT_Scaling	0% - 100%	[FC1] Fan: Speed Percentage (Status)	S0 = 0%; S1 = 50,2%; S2 = 100%
	1 Byte	0	C T R	DPT_Scaling	0% - 100%	[FC1] Fan: Speed Percentage (Status)	S0 = 0%; S1 = 100%
	1 Byte	I	C W U	DPT_Scaling	0% - 100%	[FC1] Cooling Fan: Continuous Control	0 - 100 %
351	1 Byte	ı	c w u	DPT_Scaling	0% - 100%	[FC1] Cooling Valve: PI Control (Continuous)	0 - 100 %
	1 Byte	I	C W U	DPT_Scaling	0% - 100%	[FC1] Heating Fan: Continuous Control	0 - 100 %
352	1 Byte	ı	C W U	DPT_Scaling	0% - 100%	[FC1] Heating Valve: PI Control (Continuous)	0 - 100 %
353	1 Bit	_	C W U	DPT_OpenClose	0/1	[FC1] Cooling Valve: PWM Control (1 bit)	0 = Open Valve; 1 = Close Valve
303	1 Bit	-	C W U	DPT_OpenClose	0/1	[FC1] Cooling Valve: PWM Control (1 bit)	0 = Close Valve; 1 = Open Valve
354	1 Bit		C W U	DPT_OpenClose	0/1	[FC1] Heating Valve: PWM Control (1 bit)	0 = Open Valve; 1 = Close Valve
334	1 Bit	ı	C W U	DPT_OpenClose	0/1	[FC1] Heating Valve: PWM Control (1 bit)	0 = Close Valve; 1 = Open Valve
	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Cooling Valve (Status)	0 = Open; 1 = Closed
355	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Cooling Valve (Status)	0 = Closed; 1 = Open
333	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Valve (Status)	0 = Open; 1 = Closed
	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Valve (Status)	0 = Closed; 1 = Open
356	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Heating Valve (Status)	0 = Open; 1 = Closed
	1 Bit	0	C T R	DPT_OpenClose	0/1	[FC1] Heating Valve (Status)	0 = Closed; 1 = Open
357	1 Bit	ı	C W U	DPT_Start	0/1	[FC1] Cooling Valve: Trigger Purge	0 = Stop; 1 = Start
	1 Bit	ı	C W U	DPT_Start	0/1	[FC1] Valve: Trigger Purge	0 = Stop; 1 = Start
358	1 Bit	Ι	C W U	DPT_Start	0/1	[FC1] Heating Valve: Trigger Purge	0 = Stop; 1 = Start
359	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Cooling Valve: Purge (Status)	0 = Not Active; 1 = Active
337	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Valve: Purge (Status)	0 = Not Active; 1 = Active
360	1 Bit	0	C T R	DPT_Switch	0/1	[FC1] Heating Valve: Purge (Status)	0 = Not Active; 1 = Active
361	1 Bit	0	C T R	DPT_Bool	0/1	[FC1] Control Value - Error	0 = No Error; 1 = Error
362	2 Bytes		C W U	DPT_Value_Temp	-273,00 - 670760,00	[FC1] Ambient Temperature	Ambient Temperature
363	2 Bytes	I	C W U	DPT_Value_Temp	-273,00 - 670760,00	[FC1] Setpoint Temperature	Setpoint Temperature

364	2 Bytes	1/0	CTRWU	DPT_TimePeriodMin	0 - 65535	[FC1] Duration of Manual Override of Fan	0: Forever; 1 - 1440 min; >1440: 1440 min
	2 Bytes	1/0	CTRWU	DPT_TimePeriodHrs	0 - 65535	[FC1] Duration of Manual Override of Fan	0: Forever; 1 - 24 h; >24: 24 h



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Zennio Avance y Tecnología S.L.

C/ Río Jarama, 132. Nave P-8.11 45007 Toledo (Spain).

Tel. +34 925 232 002. Fax. +34 925 337 310. www.zennio.com info@zennio.com

