



# IWAC Display v2

## Access Controller with Display

ZVIIWACDV2

Application Program Version: 3.0

User manual edition: [3.0]\_a

[www.zennio.com](http://www.zennio.com)

# CONTENTS

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|                                      |    |
|--------------------------------------|----|
| Contents .....                       | 2  |
| Document Updates .....               | 3  |
| 1 Introduction .....                 | 4  |
| 1.1 IWAC Display v2 .....            | 4  |
| 1.2 Installation.....                | 5  |
| 1.3 Start-Up and power loss.....     | 7  |
| 2 Configuration .....                | 8  |
| 2.1 General.....                     | 8  |
| 2.2 Inputs .....                     | 11 |
| 2.2.1 Binary Input .....             | 11 |
| 2.2.2 Temperature Probe .....        | 11 |
| 2.2.3 Motion Detector .....          | 11 |
| 2.3 Buttons .....                    | 12 |
| 2.3.1 Configuration .....            | 12 |
| 2.3.2 Left/Central/Right Button..... | 13 |
| 2.4 Display .....                    | 17 |
| 2.4.1 Translations .....             | 18 |
| 2.4.2 Texts.....                     | 19 |
| 2.5 Access control .....             | 22 |
| ANNEX I. Communication Objects.....  | 23 |

## DOCUMENT UPDATES

| Version | Changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Page(s) |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| [3.0]_a | <p><b>Changes in the application program:</b></p> <ul style="list-style-type: none"> <li>Updating of the access control module: <ul style="list-style-type: none"> <li><b>BLE</b> (Bluetooth Low Energy) module.</li> <li>New object to inform the language and region after the correct reading of a NFC card or BLE key data: <b>"[Access] Locale"</b>.</li> <li>New binary object to inform if accesses granted during a KNX bus failure: <b>"[Access] Offline access"</b>.</li> <li>Possibility to choose the action when one of the groups with granted access tries to access an occupied room.</li> <li>New parameter to select the timeout for the second access attempt.</li> <li>Possibility to restrict the use of the <i>Make Up Room</i> state.</li> </ul> </li> <li>Optimisation of modules: binary inputs, temperature probe and motion sensor</li> </ul> | -       |
| [2.1]_a | <p><b>Changes in the application program:</b></p> <ul style="list-style-type: none"> <li>Improvement in card reading.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -       |
| [2.0]_a | <p><b>Changes in the application program:</b></p> <ul style="list-style-type: none"> <li>New object to send the language recorded on the card when it is read.</li> <li>New object to know the current date and time of the device.</li> <li>New group available to be selected as a white list entry: Custom.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -       |

# 1 INTRODUCTION

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## 1.1 IWAC DISPLAY V2

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IWAC Display v2 from Zennio is a KNX interface presented as an access control system to rooms or other parts of the installation through reading ID cards.

The most notable features of this device are:

- **Access control** to rooms using:
  - Cards with **NFC** (Near Field Communication) technology of MIFARE DESFire and MIFARE Classic types.
  - **BLE** (Bluetooth Low Energy) keys provided through the Zennio **ZenKey** application. Please refer to the “**ZenKey**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information.
- 2.4-inch **OLED** display with 128 x 64 pixels resolution.
- **Multilanguage**.
- **Buzzer** for an audible acknowledgement of user actions (with the possibility of disabling it by object).
- **Encrypted communication** with **Securel** for door opening.
- **Communication with Z-Access** for the management and monitoring of accesses.
- **3 touch buttons**, which can operate as individual control.
- Possibility of **locking / unlocking the touch panel** through binary object.
- Possibility of setting a **press detection delay**.
- **Two analogue/digital inputs** (for motion detectors, temperature probes, additional switches, etc.).
- **Heartbeat**.

## 1.2 INSTALLATION

IWAC Display v2 connects to the KNX bus through the on-board KNX connector. This device requires an external 24V DC power supply.

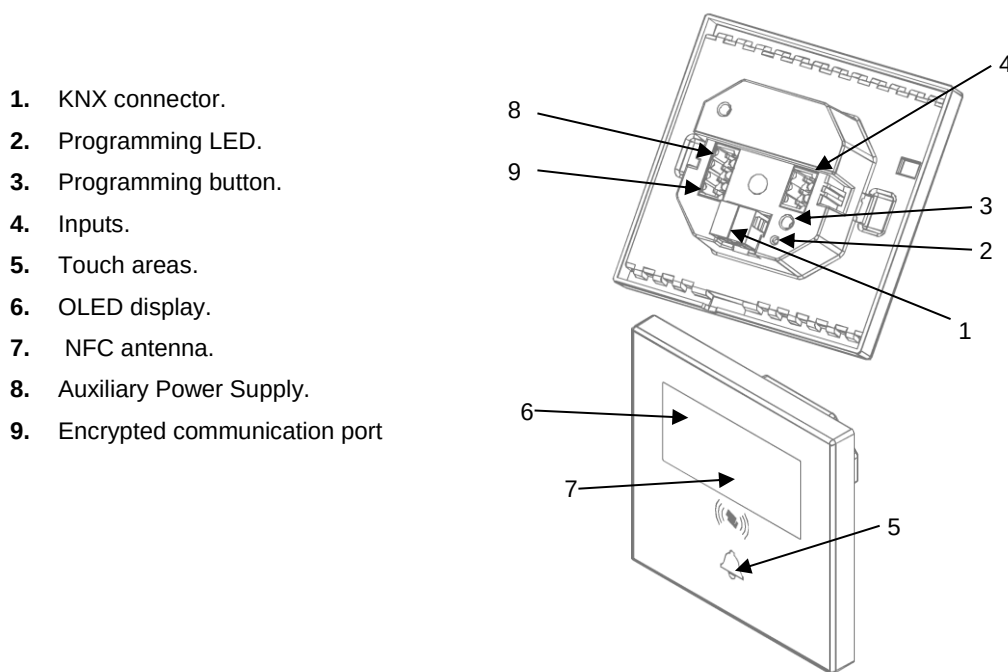


Figure 1. IWAC Display v2

The main elements of the device are described next.

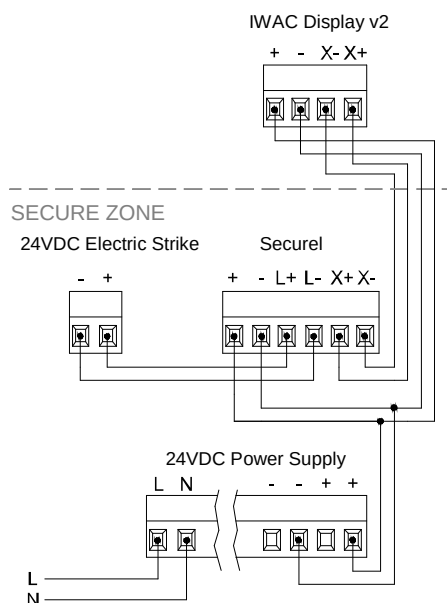
- **Programming button (3):** a short press on this button sets the device into the programming mode, making the associated LED (2) light in red.

**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.

- **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 need to be connected to one of the slots labelled “1” to “2”, 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.

- **Auxiliary power supply (8):** external power of IWAC Display v2 is supplied from Securel (see Figure 2).
- **Encrypted communication port (9):** input port to connect with Securel to make it possible the communication between both devices.

Figure 2 shows a connection diagram of IWAC, Securel, power supply and electric strike:



**Figure 2.** Access Control System connection diagram.

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](http://www.zennio.com).

## 1.3 START-UP AND POWER LOSS

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After the device start-up, it requests date and time through the object **“Request Date and Time”**. The group address of this object is the one that must be indicated in Z-Access to respond to the request.

For proper operation of the buttons, it is recommended not to be pressing them during the initialization, either after programming or after connecting the external power supply.

On the other hand, a KNX bus power failure **does not imply any change in the device status since it has external power supply**. Therefore, the device will continue operating normally, although, of course, there will be no communication with the KNX bus.

## 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 *Parameters* tab of the device.

#### ETS PARAMETERIZATION

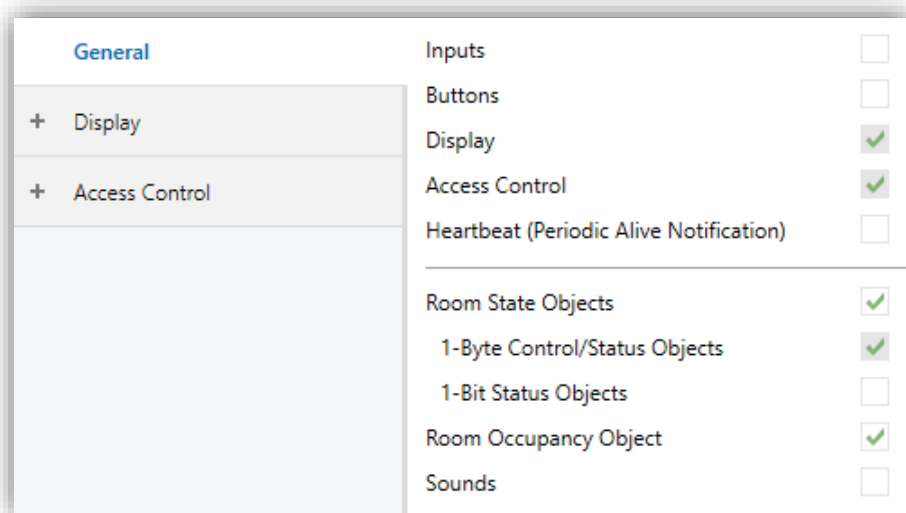


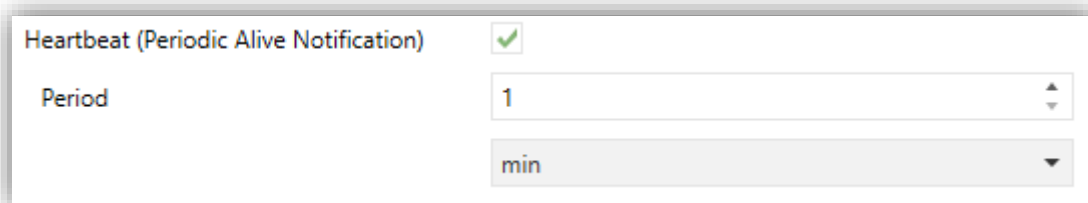
Figure 3. General Configuration.

- **Inputs** [[disabled/enabled](#)]<sup>1</sup>: enables or disables the “Inputs” tab in the tree on the left, depending on whether the device will or will not be connected any external accessories. See section 2.2 for details.
- **Buttons** [[disabled/enabled](#)]: enables or disables the “Buttons” tab in the tree on the left, depending on whether the device will or will not be connected any external accessories. See section 2.3 for details.
- **Display** [[enabled](#)]: read-only parameter to make it evident that the “Display” tab is always enabled in the tab tree on the left. See section 2.4 for details.

<sup>1</sup> The default values of each parameter will be highlighted in blue in this document, as follows: [[default/rest of options](#)].



- **Access Control** [[enabled](#)]: read-only parameter to make it evident that the “Access Control” tab is always enabled in the tab tree on the left. See section 0 for details.
- **Heartbeat (Periodical Alive Notification)** [[disabled/enabled](#)]: incorporates a one-bit object to the project (“**[Heartbeat] Object to Send ‘1’**”) that will be sent periodically with a value of “1” to notify that the device is still working (still *alive*).



Heartbeat (Periodic Alive Notification) ☒

Period

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.

- **Room State Objects** [[disabled/enabled](#)] and **Room Occupancy Object** [[disabled/enabled](#)]: parameters to enable objects intended for room state monitoring and notification.

Please refer to the “**Access Control**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information about the functionality and the configuration of the related parameters.

- **Sounds** [[disabled/enabled](#)]: incorporates the object “**Sound**” to enable/disable sound at runtime.
  - **Sounds Object Polarity** [[0 = Disable; 1 = Enable](#) / [0 = Enable; 1 = Disable](#)].

The project topology shows by default, in addition to the objects of the access control module, the following:

- “**[General] Scene: Send**” and “**[General] Scene: Receive**”: objects for respectively sending and receiving scene values from/to the KNX bus whenever it is necessary.

Please refer to the “**Access Control**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information about the rest of the available objects.

## 2.2 INPUTS

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IWAC Display v2 incorporates **2 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.
- **Motion Detector**, for the connection of a motion detector from Zennio.

### 2.2.1 BINARY INPUT

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Please refer to the “**Binary Inputs**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com).

### 2.2.2 TEMPERATURE PROBE

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Please refer to the “**Temperature Probe**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com).

### 2.2.3 MOTION DETECTOR

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It is possible to connect motion detectors from Zennio to the input ports of IWAC Display v2. This brings the device with the possibility of monitoring motion and presence in the room, as well as the light level. Depending on the detection, different response actions can be parameterised.

Please refer to the “**Motion Detector**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information about the functionality and the configuration of the related parameters.

## 2.3 BUTTONS

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### 2.3.1 CONFIGURATION

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As indicated in previous sections, IWAC Display v2 features **three buttons** at the user's disposal for the execution of different actions.

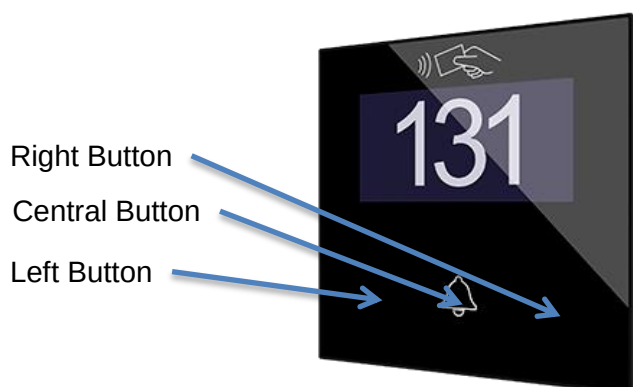


Figure 5. Buttons.

The touch panel of IWAC Display v2 can be optionally locked and unlocked anytime by writing a configurable one-bit value to a specific object provided for this purpose.

All the buttons are identical; this brings a high level of versatility for a wide variety of applications. The following is a list of the functions that can be assigned to each button.

- Binary.
- Hold & release.
- Two objects (short press / long press).
- Scene.

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### ETS PARAMETERIZATION

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When the Buttons function has been activated in the “General” parameter screen, the “Buttons” section will be available in the tree on the left, containing itself a tab named Configuration.

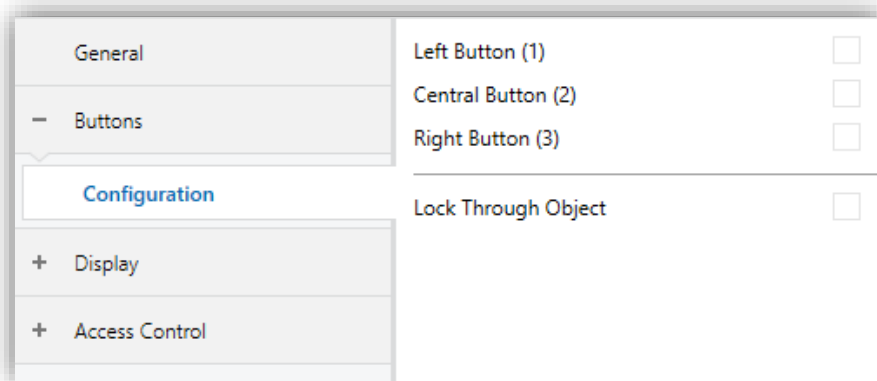


Figure 6. Buttons - Configuration.

- **Left (1) / Central (2) / Right (3) Button** [disabled/enabled]: after enable each button, will be available a new tab in the tree on the left.
- **Lock Through Object** [disabled/enabled]: the communication object “[Buttons] Lock” is added and the following parameter appears:
  - **Lock Object Polarity** [0 = Unlock; 1 = Lock / 0 = Lock; 1 = Unlock].

### 2.3.2 LEFT/CENTRAL/RIGHT BUTTON

The following is a list of the functions that can be assigned to each button.

- **Disabled**: while a button stays disabled, it will not be functional. Touching on it will not cause the execution of actions.
- **Binary**: whenever the user touches the button, a binary value will be sent to the KNX bus. This value is configurable and may be 0 or 1, or alternate with every touch according to the sequence  $1 \rightarrow 0 \rightarrow 1 \rightarrow \dots$
- **Hold & Release**: as soon as the user touches the button, a binary value (“0” or “1”, configurable) will be sent to the KNX bus. And as long as the user releases the button, another value (“0” or “1”, also configurable) will be sent through the same object.
- **Two Objects (short press / long press)**: an integer values or specific binary values will be sent both after a short or a long press (a different object will be used in each case).

- **Scene:** after the user touches the button, an order to run a specific scene (configurable) will be sent to the bus.

In all cases, it can be configured a **Press Detection Delay**.

## ETS PARAMETERIZATION

When an individual button has been enabled, a specific tab becomes available under “Buttons” in the tree on the left.

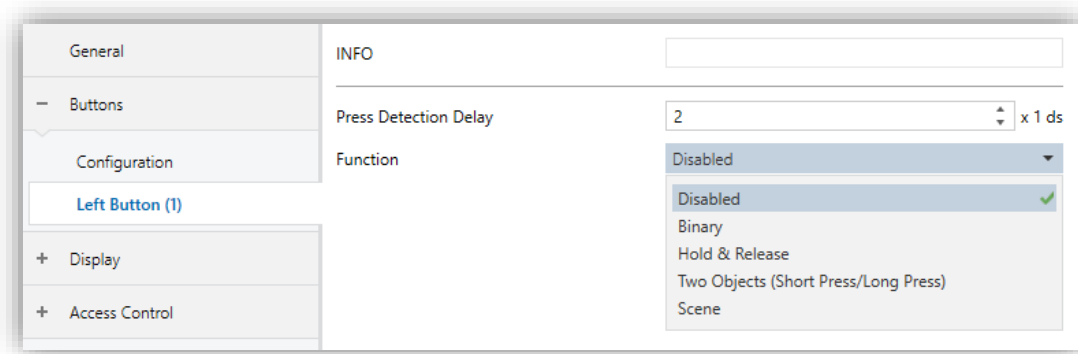


Figure 7. Button - Individual Button.

**Note:** the INFO textboxes are functionless. They simply bring the option to add a description to each button of the project.

- **Press Detection Delay** [1...2...255] [ds]: during this time, no press will be considered.
- **Function** [Disabled / Binary / Hold & Release / Two Objects (Short Press/Long Press) / Scene]: sets the desired function for the button:

Depending on the function, some more parameters are involved (as described next). Please note that in the next pages “[n]” is used as a general notation for the communication objects, where “n” depends on the particular button (1 → Left button, 2 → Central button and 3 → Right button).

## Binary

|          |        |
|----------|--------|
| Function | Binary |
| Action   | Send 0 |

Figure 8. Button – Binary.

- **Action** [[Send 0](#) / [Send 1](#) / [Toggle 0/1](#)]: sets the value to be sent to the bus (through object “[Button] [n] Binary Control”) when the user touches the button.

## Hold & Release

|                   |                                                                      |
|-------------------|----------------------------------------------------------------------|
| Function          | Hold & Release                                                       |
| Action on Hold    | <input type="radio"/> Send 0 <input checked="" type="radio"/> Send 1 |
| Action on Release | <input checked="" type="radio"/> Send 0 <input type="radio"/> Send 1 |

Figure 9. Button - Hold & Release.

- **Action on Hold / Release** [[Send 0](#) / [Send 1](#)]: sets the value to be sent to the bus (through “[Button] [n] Binary Control, Hold & Release”) when the user touches or releases the button, respectively.

## Two Objects (Short Press/Long Press)

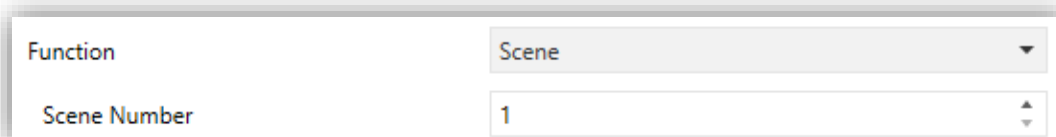
|                           |                                      |
|---------------------------|--------------------------------------|
| Function                  | Two Objects (Short Press/Long Press) |
| Action on Short Press     | Send 1-byte Value (Unsigned Int)     |
| Value                     | 0                                    |
| Action on Long Press      | Send 1-byte Value (Unsigned Int)     |
| Value                     | 0                                    |
| Long Press Threshold Time | 6 ds                                 |

Figure 10. Button - Two Objects (Short Press/Long Press).

- **Action on Short / Long Press** [[Send 0](#) / [Send 1](#) / [Toggle 0/1](#) / [Send 1-byte value](#)]: sets the value to be sent to the bus through “[Button] [n] Two Objects, Short press” or “[Button] [n] Two Objects, Long press” when the user short-presses or long-presses the button, respectively. In case of selecting the latter, an additional parameter (**Value** [\[0...255\]](#)) will be displayed to enter the desired one-byte value.
- **Long Press Threshold Time** [[4...6...255](#)] [*ds*]: sets the minimum time the user should hold the button in order to consider it a long press. The available range is 4 to 255 tenths of a second, being 6 tenths the default value.

**Note:** To detect a long press, the pressing time must be the sum of the **Press Detection Delay** plus the **Long Press Threshold Time**.

## Scene



The screenshot shows a configuration window for a button. It has two main sections. The top section is labeled 'Function' and contains a dropdown menu currently set to 'Scene'. The bottom section is labeled 'Scene Number' and contains a numeric input field with the value '1'.

Figure 11. Button – Scene.

- **Scene Number** [[1...64](#)]: number of the scene to be sent to the bus.



## 2.4 DISPLAY

IWAC Display v2 features a 2.4-inch OLED display with 128 x 64 pixels resolution. The screen shows to the user fixed information as well as notifications. The information that can be shown on the display is:

- **Name or number of the room.**
- **Room state.**
- **Notification of events.**

The characters supported in IWAC Display v2 are: Unicode U+0021 - U+00FF (refer to <https://www.utf8-chartable.de/unicode-utf8-table.pl> to see the character table for these codes).

### ETS PARAMETERIZATION

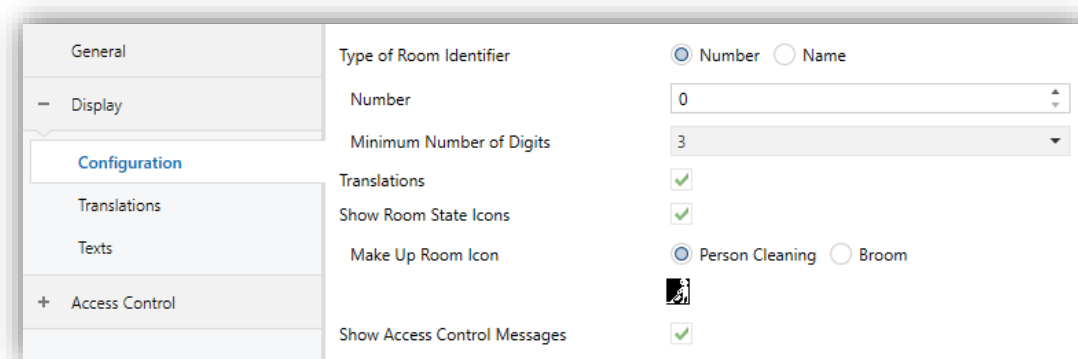


Figure 12. Display - Configuration.

This parameter screen contains the following options:

- **Type of Room Identifier** [[Number](#) / [Name](#)]: when selecting number, an additional parameter will be displayed:
  - **Minimum Number of Digits** [[Match Number](#) / [2](#) / [3](#) / [4](#)]: sets the minimum number of digits that will be shown (for example, if number is 19 and minimum number of digits 3, the display will show 019).



Figure 13. Room Identifier. Left: number, right: name.

- **Translations** [*disabled/enabled*]: enables or disables the “Translations” tab in the tree on the left. See section 2.4.1 for details.
- **Show Room State Icons** [*disabled/enabled*]: enables or disables the room status indicator icons to display on the screen. As indicated before, the room status are: *normal* (no icon), *make up* and *do not disturb*.
  - **Make Up Room Icon** [*Person Cleaning / Broom*]: icon that will be displayed when the room status is Make Up.

When in Do not disturb status, a lock is displayed.

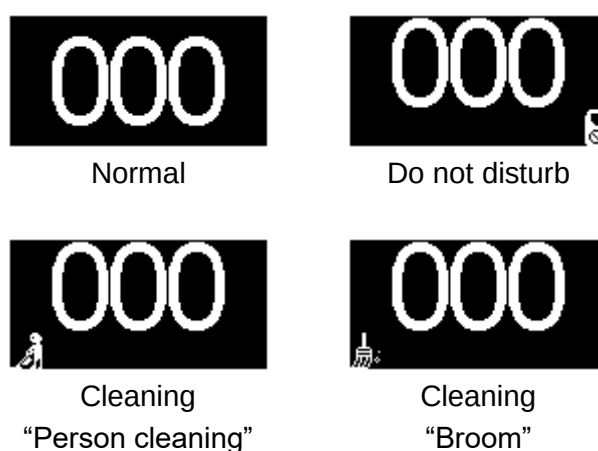


Figure 14. Room State.

Please refer to the “**Access Control**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information.

- **Show Access Control Messages** [*disabled/enabled*]: enables or disables the “Texts” tab in the tree on the left. See section 2.4.2 for details.

### 2.4.1 TRANSLATIONS

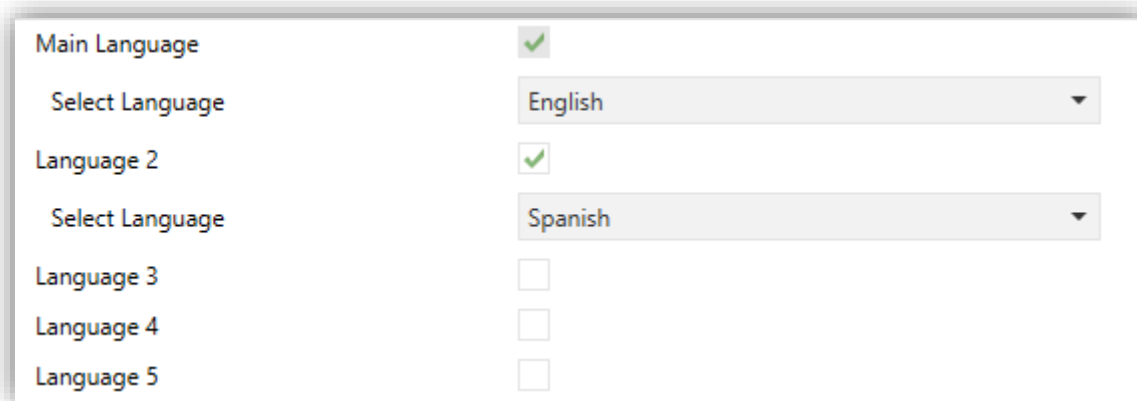
The information shown on the display can be translated into up to five different languages, among which the IWAC Display v2 will show the one corresponding to the language settings recorded on the access card.

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## ETS PARAMETERIZATION

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After enabling **Translations** in the “Configuration” screen of the display, a new tab will be incorporated into the tree on the left.



|                 |                                     |         |
|-----------------|-------------------------------------|---------|
| Main Language   | <input checked="" type="checkbox"/> | English |
| Select Language |                                     |         |
| Language 2      | <input checked="" type="checkbox"/> | Spanish |
| Select Language |                                     |         |
| Language 3      | <input type="checkbox"/>            |         |
| Language 4      | <input type="checkbox"/>            |         |
| Language 5      | <input type="checkbox"/>            |         |

Figure 15. Display – Translations.

This screen contains the following parameters:

- **Main Language** [enabled]: read-only parameter to make it evident that the main language is always enabled.
  - **Select Language**: list of the available languages.
- **Language X** [disabled/enabled]: enables or disables the additional language X.
  - **Select Language**: list of the available languages to select the language X.

### 2.4.2 TEXTS

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In the “Texts” tab, the texts of the messages prompted up when some events occur are configured:

- Access granted: reading a card with access permission.
- Access denied: reading a card with no access permission.
- Access granted when in “do not disturb”: reading a card with access permission when IWAC Display v2 is in do not disturb mode.
- Access granted when occupied room: reading a card with access permission when IWAC Display v2 is occupied.

- Access granted when in “do not disturb” and occupied room: reading a card with access permission when IWAC Display v2 is in do not disturb mode and occupied.

Please refer to the “**Access Control**” user manual, available under the IWAC Display v2 product section at [www.zennio.com](http://www.zennio.com), for detailed information.

## ETS PARAMETERIZATION

After enabling “**Show Access Control Messages**” in the “Configuration” screen, a new tab will be incorporated into the tree on the left.

| Message Type                                                | Main Language | Line 1        | Line 2         |
|-------------------------------------------------------------|---------------|---------------|----------------|
| Message When Access Is Granted                              |               | Access        | Granted        |
| Message When Access Is Denied                               |               | Access        | Denied         |
| Message When Access Is Granted (DND Active)                 |               | Please        | Do Not Disturb |
| Message When Access Is Granted (Occupied Room)              |               | Occupied      | Room           |
| Message When Access Is Granted (DND Active + Occupied Room) |               | Occupied Room | Do Not Disturb |

Figure 16. Display – Texts.

This screen is divided into up to five parts, depending on whether or not the room status and/or occupancy objects are available:

- **Message When Access Is Granted.**
- **Message When Access Is Denied.**
- **Message When Access Is Granted (DND Active).**

- **Message When Access Is Granted (Occupied Room).**
- **Message When Access Is Granted (DND Active + Occupied Room).**

Parameters **Line 1** and **Line 2** permit setting the texts for each message. If several languages have been enabled in the “Translations” tab (see section 2.4.1), it can be set the text for each language.



Figure 17. Messages displayed examples.

## 2.5 ACCESS CONTROL

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IWAC Display v2 incorporates a functional module for **access control to rooms** or other areas of a building by reading identification elements (**NFC cards and BLE keys**) issued to each user.

Please refer to the specific user manual "**Access Control**", available within the product section of the IWAC Display v2 at [www.zennio.com](http://www.zennio.com), for detailed information about the functionality and 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 programme itself.

| Number | Size     | I/O | Flags     | Data type (DPT)              | Functional Range | Name                                                   | Function                                             |
|--------|----------|-----|-----------|------------------------------|------------------|--------------------------------------------------------|------------------------------------------------------|
| 1      | 1 Byte   |     | C - - T - | DPT_SceneNumber              | 0 - 63           | [General] Scene: Send                                  | Scene Value                                          |
| 2      | 1 Byte   | I   | C - W - - | DPT_SceneNumber              | 0 - 63           | [General] Scene: Receive                               | Scene Value                                          |
| 3      | 1 Bit    | I   | C - W - - | DPT_Enable                   | 0/1              | [General] Sound                                        | 0 = Enable; 1 = Disable                              |
|        | 1 Bit    | I   | C - W - - | DPT_Enable                   | 0/1              | [General] Sound                                        | 0 = Disable; 1 = Enable                              |
| 4      | 1 Byte   | I   | C - W T U | 1.xxx                        | 0/1              | [Access] Room State Indicator                          | 0 = Normal; 1 = Make Up Room; 2 = Do Not Disturb     |
| 5      | 1 Byte   | O   | C R - T - | 1.xxx                        | 0/1              | [Access] Room State                                    | 0 = Normal; 1 = Make Up Room; 2 = Do Not Disturb     |
| 6      | 1 Bit    | O   | C R - T - | DPT_Bool                     | 0/1              | [Access] Room State: Make Up Room (Status)             | 0 = No Active; 1 = Active                            |
| 7      | 1 Bit    | O   | C R - T - | DPT_Bool                     | 0/1              | [Access] Room State: Do Not Disturb (Status)           | 0 = No Active; 1 = Active                            |
| 8      | 1 Bit    | I   | C - W T U | DPT_Enable                   | 0/1              | [Access] Room State: "Make Up Room" State Availability | 0 = Not Available; 1 = Available                     |
| 9      | 1 Bit    | I   | C - W T U | DPT_Occupancy                | 0/1              | [Access] Presence: Occupancy State                     | 0 = Not Occupied; 1 = Occupied                       |
| 10     | 1 Bit    |     | C - - T - | DPT_Trigger                  | 0/1              | [Access] Request Date and Time                         | Make Request                                         |
| 11     | 8 Bytes  | O   | C R - - - | DPT_DateTime                 |                  | [Access] Date and Time (Status)                        | Current Date and Time                                |
| 12     | 14 Bytes | O   | C R - T - | DPT_String_8859_1            |                  | [Access] Access Log                                    | Access Log Data                                      |
| 13     | 2 Bytes  | O   | C R - T - | DPT_LanguageCodeAlpha2_ASCII |                  | [Access] Language                                      | User Language                                        |
| 14     | 4 Bytes  | O   | C R - T - | 1.xxx                        | 0/1              | [Access] Locale                                        | User Locale (ISO 639-1/ISO 3166-1 Four Letters Code) |
| 15     | 1 Bit    |     | C - - T - | DPT_Ack                      | 0/1              | [Access] Offline Access                                | Notify Offline Access                                |
| 16     | 1 Bit    | I   | C - W - - | DPT_Ack                      | 0/1              | [Access] Welcome Scenes: Trigger                       | 0 = Send Welcome Scene                               |
|        | 1 Bit    | I   | C - W - - | DPT_Ack                      | 0/1              | [Access] Welcome Scenes: Trigger                       | 1 = Send Welcome Scene                               |
| 17     | 1 Bit    | I   | C - W - - | DPT_DayNight                 | 0/1              | [Access] Welcome Scenes: Day/Night                     | 0 = Day; 1 = Night                                   |
|        | 1 Bit    | I   | C - W - - | DPT_DayNight                 | 0/1              | [Access] Welcome Scenes: Day/Night                     | 1 = Day; 0 = Night                                   |
| 18     | 1 Bit    | I   | C - W - - | DPT_Ack                      | 0/1              | [Access] Welcome Scenes: Guest First Access            | 1 = Guest First Access                               |
| 19     | 1 Bit    | I   | C - W - - | DPT_Enable                   | 0/1              | [Buttons] Lock                                         | 0 = Lock; 1 = Unlock                                 |

|            |        |   |           |                     |                                                                                                                            |                                                                    |                                      |
|------------|--------|---|-----------|---------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------|
|            | 1 Bit  | I | C - W - - | DPT_Enable          | 0/1                                                                                                                        | [Buttons] Lock                                                     | 0 = Unlock; 1 = Lock                 |
| 20, 22, 24 | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Short Press: "1"                         | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Short Press: "0/1"                       | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Binary Control: "0"                                   | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Binary Control: "1"                                   | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Binary Control: "0/1"                                 | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Binary Control, Hold&Release                          | 1-Bit Generic Control                |
|            | 1 Byte | O | C R - T - | DPT_Value_1_Ucount  | 0 - 255                                                                                                                    | [Button] [x] Two Objects, Short Press: 1-byte Value (Unsigned Int) | 0 - 255                              |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Short Press: "0"                         | 1-Bit Generic Control                |
| 21, 23, 25 | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Long Press: "1"                          | 1-Bit Generic Control                |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Long Press: "0/1"                        | 1-Bit Generic Control                |
|            | 1 Byte | O | C R - T - | DPT_Value_1_Ucount  | 0 - 255                                                                                                                    | [Button] [x] Two Objects, Long Press: 1-byte Value (Unsigned Int)  | 0 - 255                              |
|            | 1 Bit  | O | C R - T - | DPT_Switch          | 0/1                                                                                                                        | [Button] [x] Two Objects, Long Press: "0"                          | 1-Bit Generic Control                |
| 26         | 1 Bit  |   | C - - T - | DPT_Trigger         | 0/1                                                                                                                        | [Heartbeat] Object to Send '1'                                     | Sending of '1' Periodically          |
| 27, 33     | 1 Bit  | I | C - W - - | DPT_Enable          | 0/1                                                                                                                        | [Ix] Input Lock                                                    | 0 = Unlock; 1 = Lock                 |
| 28, 34     | 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) |
|            | 4 Bit  |   | C - - T - | DPT_Control_Dimming | 0x0 (Stop)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>0xD (Inc. by 100%)<br>...<br>0xF (Inc. by 1%) | [Ix] [Short Press] Brighter                                        | Increase Brightness                  |
|            | 4 Bit  |   | C - - T - | DPT_Control_Dimming | 0x0 (Stop)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>0xD (Inc. by 100%)<br>...                     | [Ix] [Short Press] Darker                                          | Decrease Brightness                  |



|        |         |     |              |                     |                                                                                                                            |                                                |                                       |
|--------|---------|-----|--------------|---------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------|
|        |         |     |              |                     | 0xF (Inc. by 1%)                                                                                                           |                                                |                                       |
|        | 4 Bit   |     | C - - T -    | DPT_Control_Dimming | 0x0 (Stop)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>0xD (Inc. by 100%)<br>...<br>0xF (Inc. by 1%) | [Ix] [Short Press] Brighter/Darker             | Switch Bright/Dark                    |
|        | 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<br>_ | 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 | C R W T<br>_ | 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                             |
| 29, 35 | 2 Bytes |     | C - - T -    | 9.xxx               | -671088.64 - 670433.28                                                                                                     | [Ix] [Short Press] Constant Value (Float)      | Float Value                           |
|        | 1 Byte  | I   | C - W - -    | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] [Short Press] Shutter Status (Input)      | 0% = Top; 100% = Bottom               |
| 30, 36 | 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<br>_ | 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)  |
|        | 4 Bit   |     | C - - T -    | DPT_Control_Dimming | 0x0 (Stop)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>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)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>0xD (Inc. by 100%)<br>...<br>0xF (Inc. by 1%) | [Ix] [Long Press] Darker<br><br>Long Pr. -> Darker; Release -> Stop                   |
|        | 4 Bit   |   | C - - T - | DPT_Control_Dimming | 0x0 (Stop)<br>0x1 (Dec. by 100%)<br>...<br>0x7 (Dec. by 1%)<br>0x8 (Stop)<br>0xD (Inc. by 100%)<br>...<br>0xF (Inc. by 1%) | [Ix] [Long Press] Brighter/Darker<br><br>Long Pr. -> Brighter/Darker; Release -> Stop |
|        | 1 Bit   |   | C - - T - | DPT_Switch          | 0/1                                                                                                                        | [Ix] [Long Press] Light On<br>Sending of 1 (On)                                       |
|        | 1 Bit   |   | C - - T - | DPT_Switch          | 0/1                                                                                                                        | [Ix] [Long Press] Light Off<br>Sending of 0 (Off)                                     |
|        | 1 Bit   | I | C - W T - | DPT_Switch          | 0/1                                                                                                                        | [Ix] [Long Press] Light On/Off<br>Switching 0/1                                       |
|        | 1 Byte  |   | C - - T - | DPT_SceneControl    | 0-63; 128-191                                                                                                              | [Ix] [Long Press] Run Scene<br>Sending of 0 - 63                                      |
|        | 1 Byte  |   | C - - T - | DPT_SceneControl    | 0-63; 128-191                                                                                                              | [Ix] [Long Press] Save Scene<br>Sending of 128 - 191                                  |
|        | 1 Bit   | O | C R - T - | DPT_Alarm           | 0/1                                                                                                                        | [Ix] [Switch/Sensor] Alarm: Breakdown or Sabotage<br>1 = Alarm; 0 = No Alarm          |
|        | 2 Bytes |   | C - - T - | 9.xxx               | -671088.64 - 670433.28                                                                                                     | [Ix] [Long Press] Constant Value (Float)<br>Float Value                               |
|        | 2 Bytes |   | C - - T - | DPT_Value_2_Ucount  | 0 - 65535                                                                                                                  | [Ix] [Long Press] Constant Value (Integer)<br>0 - 65535                               |
|        | 1 Byte  |   | C - - T - | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] [Long Press] Constant Value (Percentage)<br>0% - 100%                            |
|        | 1 Byte  |   | C - - T - | DPT_Value_1_Ucount  | 0 - 255                                                                                                                    | [Ix] [Long Press] Constant Value (Integer)<br>0 - 255                                 |
| 31, 37 | 1 Bit   |   | C - - T - | DPT_Trigger         | 0/1                                                                                                                        | [Ix] [Long Press/Release] Stop Shutter<br>Release -> Stop Shutter                     |
| 32, 38 | 1 Byte  | I | C - W - - | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] [Long Press] Dimming Status (Input)<br>0% - 100%                                 |
|        | 1 Byte  | I | C - W - - | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] [Long Press] Shutter Status (Input)<br>0% = Top; 100% = Bottom                   |
| 39     | 1 Byte  | I | C - W - - | DPT_SceneNumber     | 0 - 63                                                                                                                     | [Motion Detector] Scene Input<br>Scene Value                                          |
| 40     | 1 Byte  |   | C - - T - | DPT_SceneControl    | 0-63; 128-191                                                                                                              | [Motion Detector] Scene Output<br>Scene Value                                         |
| 41, 70 | 1 Byte  | O | C R - T - | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] Luminosity<br>0-100%                                                             |
| 42, 71 | 1 Bit   | O | C R - T - | DPT_Alarm           | 0/1                                                                                                                        | [Ix] Open Circuit Error<br>0 = No Error; 1 = Open Circuit Error                       |
| 43, 72 | 1 Bit   | O | C R - T - | DPT_Alarm           | 0/1                                                                                                                        | [Ix] Short Circuit Error<br>0 = No Error; 1 = Short Circuit Error                     |
| 44, 73 | 1 Byte  | O | C R - T - | DPT_Scaling         | 0% - 100%                                                                                                                  | [Ix] Presence State (Scaling)<br>0-100%                                               |
| 45, 74 | 1 Byte  | O | C R - T - | DPT_HVACMode        | 1=Comfort<br>2=Standby                                                                                                     | [Ix] Presence State (HVAC)<br>Auto, Comfort, Standby, Economy, Building Protection    |

|                        |         |   |                  |                   | 3=Economy<br>4=Building<br>Protection                           |                                     |                                                        |
|------------------------|---------|---|------------------|-------------------|-----------------------------------------------------------------|-------------------------------------|--------------------------------------------------------|
| 46, 75                 | 1 Bit   | O | <b>C R - T -</b> | DPT_Switch        | 0/1                                                             | [Ix] Presence State (Binary)        | Binary Value                                           |
|                        | 1 Bit   | O | <b>C R - T -</b> | DPT_Start         | 0/1                                                             | [Ix] Presence: Slave Output         | 1 = Motion Detected                                    |
| 47, 76                 | 1 Bit   | I | <b>C - W - -</b> | DPT_Window_Door   | 0/1                                                             | [Ix] Presence Trigger               | Binary Value to Trigger the Presence Detection         |
| 48, 77                 | 1 Bit   | I | <b>C - W - -</b> | DPT_Start         | 0/1                                                             | [Ix] Presence: Slave Input          | 0 = Nothing; 1 = Detection from slave device           |
| 49, 78                 | 2 Bytes | I | <b>C - W - -</b> | DPT_TimePeriodSec | 0 - 65535                                                       | [Ix] Presence: Waiting Time         | 0-65535 s.                                             |
| 50, 79                 | 2 Bytes | I | <b>C - W - -</b> | DPT_TimePeriodSec | 0 - 65535                                                       | [Ix] Presence: Listening Time       | 1-65535 s.                                             |
| 51, 80                 | 1 Bit   | I | <b>C - W - -</b> | DPT_Enable        | 0/1                                                             | [Ix] Presence: Enable               | According to parameters                                |
| 52, 81                 | 1 Bit   | I | <b>C - W - -</b> | DPT_DayNight      | 0/1                                                             | [Ix] Presence: Day/Night            | According to parameters                                |
| 53, 82                 | 1 Bit   | O | <b>C R - T -</b> | DPT_Occupancy     | 0/1                                                             | [Ix] Presence: Occupancy State      | 0 = Not Occupied; 1 = Occupied                         |
| 54, 83                 | 1 Bit   | I | <b>C - W - -</b> | DPT_Start         | 0/1                                                             | [Ix] External Motion Detection      | 0 = Nothing; 1 = Motion detected by an external sensor |
| 55, 60, 65, 84, 89, 94 | 1 Byte  | O | <b>C R - T -</b> | DPT_Scaling       | 0% - 100%                                                       | [Ix] [Cx] Detection State (Scaling) | 0-100%                                                 |
| 56, 61, 66, 85, 90, 95 | 1 Byte  | O | <b>C R - T -</b> | DPT_HVACMode      | 1=Comfort<br>2=Standby<br>3=Economy<br>4=Building<br>Protection | [Ix] [Cx] Detection State (HVAC)    | Auto, Comfort, Standby, Economy, Building Protection   |
| 57, 62, 67, 86, 91, 96 | 1 Bit   | O | <b>C R - T -</b> | DPT_Switch        | 0/1                                                             | [Ix] [Cx] Detection State (Binary)  | Binary Value                                           |
| 58, 63, 68, 87, 92, 97 | 1 Bit   | I | <b>C - W - -</b> | DPT_Enable        | 0/1                                                             | [Ix] [Cx] Enable Channel            | According to parameters                                |
| 59, 64, 69, 88, 93, 98 | 1 Bit   | I | <b>C - W - -</b> | DPT_Switch        | 0/1                                                             | [Ix] [Cx] Force State               | 0 = No Detection; 1 = Detection                        |
| 99, 103                | 2 Bytes | O | <b>C R - T -</b> | DPT_Value_Temp    | -273.00° - 670433.28°                                           | [Ix] Current Temperature            | Temperature Sensor Value                               |
| 100, 104               | 1 Bit   | O | <b>C R - T -</b> | DPT_Alarm         | 0/1                                                             | [Ix] Overcooling                    | 0 = No Alarm; 1 = Alarm                                |
| 101, 105               | 1 Bit   | O | <b>C R - T -</b> | DPT_Alarm         | 0/1                                                             | [Ix] Overheating                    | 0 = No Alarm; 1 = Alarm                                |
| 102, 106               | 1 Bit   | O | <b>C R - T -</b> | DPT_Alarm         | 0/1                                                             | [Ix] Probe Error                    | 0 = No Alarm; 1 = Alarm                                |

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RoHS