Zennio
Passion for KNX innovation

KLIC-DI SKY

KNX Interface for Commercial A/C Units

ZN1CL-KLIC-DI

Application program version: [1.12]
User manual edition: [1.12]_a

www.zennio.com

USER MANUAL

Contents

DOCUMENT UPDATES

Version	Changes	Page(s)
[1.12.]_a	Changes in the application program: • Compatibility with new air-conditioning system models. • Name changed in parameter “Internal Temp. Sending Time”. • Name changed in object “Internal Temperature (Status)”.	-
	Names changed in the “Internal Temp. Sending Time” parameter and the “Internal Temperature (Status)” object.	9, 14, 19
[1.11]_a	Changes in the application program: • Compatibility with new air-conditioning system models (and their respective functionality).	
[1.10]_a	Changes in the application program: • Improvement of the compatibility with certain models to prevent communication interruption at the start-up.	-

1 INTRODUCTION

1.1 KLIC-DI

KLIC-DI is an interface that allows full-duplex communication between a KNX domotic system and **commercial and industrial** air-conditioning units, through two possible application programs.

- **KLIC-DI VRV**, for industrial A/C systems with a variable refrigerant volume.
- **KLIC-DI SKY**, for other commercial A/C systems.

Because of this **bidirectional** communication, the air conditioning unit can be controlled in the same manner as through its own controls, while the real status of the air-conditioning unit is monitored and periodically sent to the KNX bus to inform other devices.

Figure 1. KLIC-DI

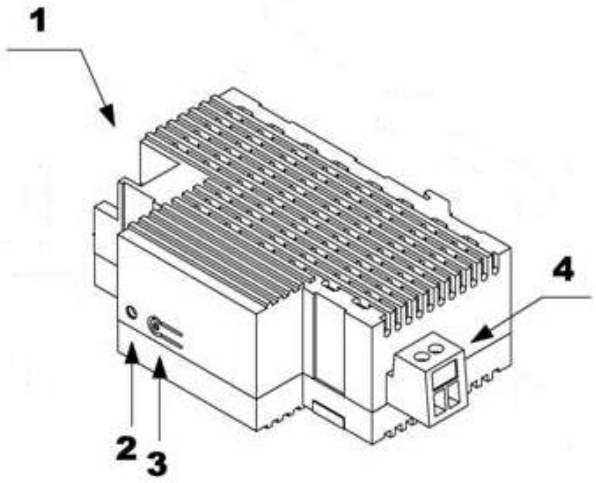
KLIC-DI includes the following features, among others:

- Bidirectional control over industrial and commercial A/C units.
- Control of the main features of the A/C units: On/Off, Temperature, Mode of operation, Fan speed, Swing, etc.

- Error management to handle specific A/C unit error codes as well as any communication errors that may arise.

- LED indicator that allows monitoring the bidirectional traffic flow.

1.2 INSTALLATION



1.- KNX Connector

2.- LED Indicator

3.- Programming Button

4.- Input Terminal for the Two-Wire Communication Cable.

Figure 2. Element scheme

KLIC-DI connects to the KNX bus via the corresponding built-in terminals (1). On the other hand, this device is connected to the internal PCB board of the A/C unit (P1/P2 connectors), using a 2-wire cable. See Figure 3.

Important: *in case of aiming to control the air conditioning both through KLIC-DI and through the incorporated wired remote control of the actual unit, please refer to the "Control types" subsection, under section 2.2 in order to ensure that both of them have been properly configured.*

Once the device is provided with power supply from the KNX bus, both the physical address and the KLIC-DI application program for commercial A/C systems can be downloaded.

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

The functionality of the main elements is explained below:

- **Programming Button (3)**: a short press on this button will set the device into the programming mode, making the red component of the LED (2) indicator

light up. If the button is held while plugging the device into the KNX bus, KLIC-DI will go into secure mode, making the red colour of the LED blink intermittently.

- **LED Indicator (2)**: three-colour (red, blue and green) light indicator that reflects the current state of the device. Apart from showing whether the device is under the programming or secure modes, this LED will also show react to the communication between KLIC-DI and the A/C unit, which may be particularly useful during the installation process. The meaning of the different colour components is explained next:

  - **Red Component (still)**: KLIC-DI is under the programming mode.
  - **Red Component (blinking)**: KLIC-DI is under the secure mode.
  - **Green Component (still)**: KLIC-DI is not connected to the A/C unit, or the A/C unit is disconnected from the power supply.
  - **Green Component (blinking)**: transmission or data flow from the A/C machine towards KLIC-DI.
  - **Blue Component (blinking)**: transmission or data flow from KLIC-DI towards the A/C machine.

  Note: *each colour component works with independence of the others. Therefore, for example, if KLIC-DI is set into the programming mode being the A/C unit disconnected, the perceived colour will be typically a still orange, as the red and green components are lighting (still).*

- **Input Terminal for the Two-Wire Communication Cable (4)**: slot for the connection of the two-wire communication cable that will connect KLIC-DI to the A/C unit. The other end of the cable, therefore, is intended to be connected to the P1/P2 ports from the PCB board of the internal unit, or from the wired remote control of the A/C unit.

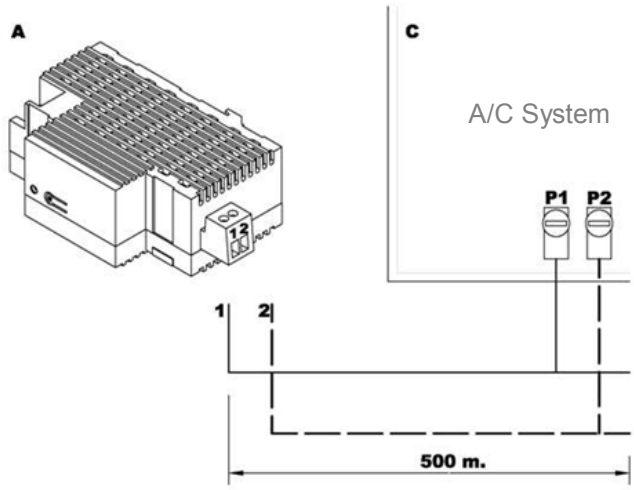


Figure 3. Connecting KLIC-DI to the P1/P2 Bus (Master Mode).

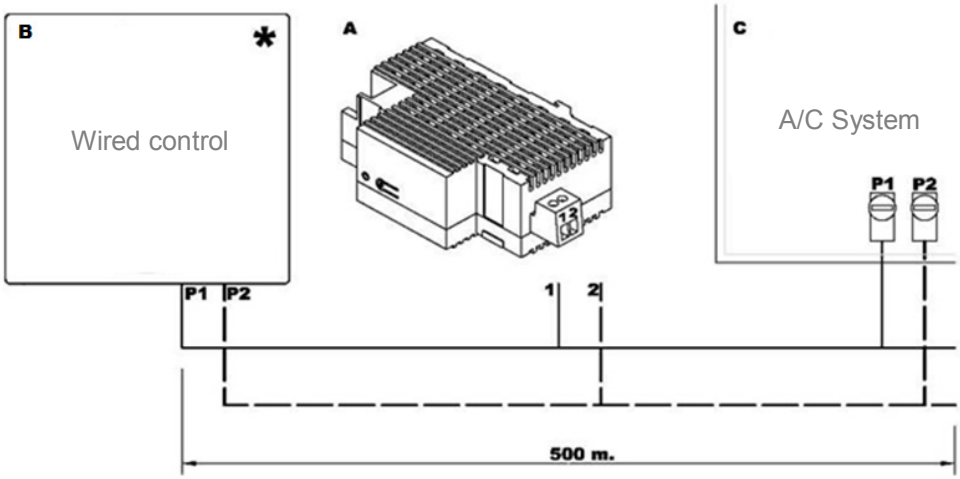


Figure 4. Connecting KLIC-DI to the P1/P2 Bus with a Wired Remote Control (Slave Mode)

Connection Diagram Legend	
A	KLIC-DI
B	Wired control
C	A/C unit
P1-P2	Connection base for the A/C unit
1-2	Zennio input terminal
*	The wired remote control needs to work contrary to the mode (slave/master) set for KLIC-DI. See section 2.2.

For detailed information about the technical features of Z41, as well as on security and installation procedures, please refer to the device **Datasheet**, included within the device packaging and also available at http://www.zennio.com. Reading the KLIC-DI **installation note**, available at the same website, is also encouraged.

Note: *sections following this point will focus on the KLIC-DI SKY application program for commercial A/C machines, and its specific configuration. Please refer to the KLIC-DI VRV user manual in case of running that particular application program.*

2 CONFIGURATION

2.1 BASIC CONTROL

KLIC-DI allows controlling and monitoring an air-conditioning unit the same way it would be through the wired remote control provided with it.

Through the KNX bus, the following basic functionalities of the air conditioning unit can be controlled:

- **ON/OFF** switch of the air-conditioning unit.
- **Temperature Setpoint** between 16 and 32 ºC.
- **Operation Mode**: Auto, Heat, Cool, Fan and Dry.
- **Fan Speed**: configuration of 2 or 3 speed levels (depending on the levels provided by the A/C unit).

These functionalities imply changes in the state of the machine, which are periodically sent to KLIC-DI. When KLIC-DI receives from the machine a state different to the previous one, it updates the status objects and sends them to the KNX bus.

2.2 ADVANCED FUNCTIONALITY

Apart from basic control functions over the air-conditioning system, KLIC-DI offers other advanced functionalities that provide added value to the wired remote control:

- **Scene Configuration**: allows establishing a specific parameter combination to be sent to the machine in order to generate a determined climate ambient. KLIC-DI allows configuring up to 4 different scenes.
- **Temporary Switch-Off**: allows an automatic and temporary switch-off of the machine (after a pre-established delay, if set up) when the communication object associated to this function changes its value. A typical application of

this functionality is linking a window sensor to the automatic switch-off object, which will make KLIC-DI switch the machine off while the window is open.

- **Setpoint Restriction**: temperature setpoints of commercial air conditioning systems are typically limited to the range 16-32ºC (please refer to the user manual of the actual unit). This function of the KLIC-DI device allows configuring custom temperature ranges in ETS for the Heat and Cool modes, provided that the custom values stay within the original range. In case of receiving a temperature command from the KNX bus with a value exceeding the configured range, the temperature value sent by KLIC-DI to the machine will be the corresponding limit value.

- **Internal Temperature** and **Reference Temperature**: commercial A/C units include several sensors for measuring the temperature at different internal points. KLIC-DI monitors the value of one of these internal measures, called **Internal Temperature**, which, together with the **Reference Temperature**, is used for switching between the Auto-Cool and Auto-Heat modes of the A/C machine. The **Reference Temperature** is the actual ambient temperature of the room under climate control. It is necessary that KLIC-DI provides the machine with this value, which implies that it should be sent first to KLIC-DI through the corresponding communication object (generally from an external sensor).

  The A/C unit can control the Auto-Heat and Auto-Cool modes by three different ways:

  1. The machine receives the Reference Temperature and, basing on a hysteresis value pre-configured by the installer of the machine, it determines the corresponding auto mode.

  2. The machine receives the Internal Temperature and, basing on a hysteresis value pre-configured by the installer of the machine, it determines the corresponding auto mode.

  3. The machine establishes the auto mode according to the average value between the Reference Temperature and the Internal Temperature.

  The concrete temperature value that triggers the commutation between the Auto-Cool and Auto-Heat modes depends on the configuration established in

the A/C unit itself. In all of the above cases, this value is compared to the temperature setpoint so that if the temperature setpoint is higher, the Auto-Heat mode is established; and if the temperature setpoint is lower than this value, the Auto-Cool mode is established.

Note: *it is highly recommended to link the Reference Temperature to a temperature sensor that periodically monitors the real temperature of the room, as it may happen that the pre-configuration of the unit is unknown, causing a wrong behaviour of the Auto mode. The Reference Temperature communication object has a default value of 25ºC*.

- **Error Management**: allows sending messages to the KNX bus informing about errors. Error management handles both external errors from the A/C unit itself and those that may arise in the KLIC-DI – A/C unit communication process.

  Apart from informing about the occurrence of possible errors it is also possible to configure the sending of the error type. In case of internal errors, the numerical code sent will match one of the error types shown in Table 1.

Error code	Internal Error Type
1	Data reception failed (inadequate speed, parity, etc.)
2	Communication time exceeded (Time Out)
3	Incorrect checksum
4	Incorrect response from the machine

Table 1. Internal error types

  Regarding the numerical codes sent in the event of external errors, they should be looked up in the user manual of the installed air-conditioning system, according to ANNEX II: Correspondence with A/C unit error codes.

- **Initial Configuration**: allows establishing the desired initial parameters for the state of the A/C unit after downloading or restarting the device from ETS, or after recovering from a bus failure. The following may be configured:

ON/OFF state, temperature, mode, fan and swing of the machine. It is also possible to send the initial values to the KNX bus after the start-up.

- **Control Type**: permits defining the control type, *master* or *slave*, that KLIC-DI will work according to (**important when KLIC-DI will be used together with the wired remote control of the A/C unit**).

  The master control type will correspond to the device directly communicating with the machine. It will also be in charge of retransmitting the instructions to the slave control, if any. This configuration will still permit controlling the machine from the slave control.

  This feature allows connecting to the same installation both the KLIC-DI interface and the wired remote control of the A/C unit, provided that they are not both configured as masters or as slaves. In case of having both controls configured as masters, the screen of the A/C unit control will show the error code "149" (0x95), while the error code "U5" will be as well sent.

  Note: switching the wired control between the slave and master modes requires interrupting the power supply in order to make the wired control re-initialise under the new mode.

  Important: *the **BRC1E51A7** wired control can only operate as a master control (in case of using this model in the installation, it is necessary to configure KLIC-DI as a slave control). On the other hand, for the **BRC1E52A7** model, it is advisable to configure KLIC-DI as a master, to prevent collisions.*

2.3 TESTING KLIC-DI FROM AN IR REMOTE

KLIC-DI incorporates –next to the LED indicator– an infrared receiver that may be used together with any of the Zennio IR remotes (such as models ZN1IRZ38 and ZN1IRZAS) to check the proper control of the A/C machine from KLIC-DI.

Note: *KLIC-DI will only respond to infrared orders under the programming mode (i.e., with the red component of the LED on).*

The action performed by each button of the IR control is shown in Figure 5.

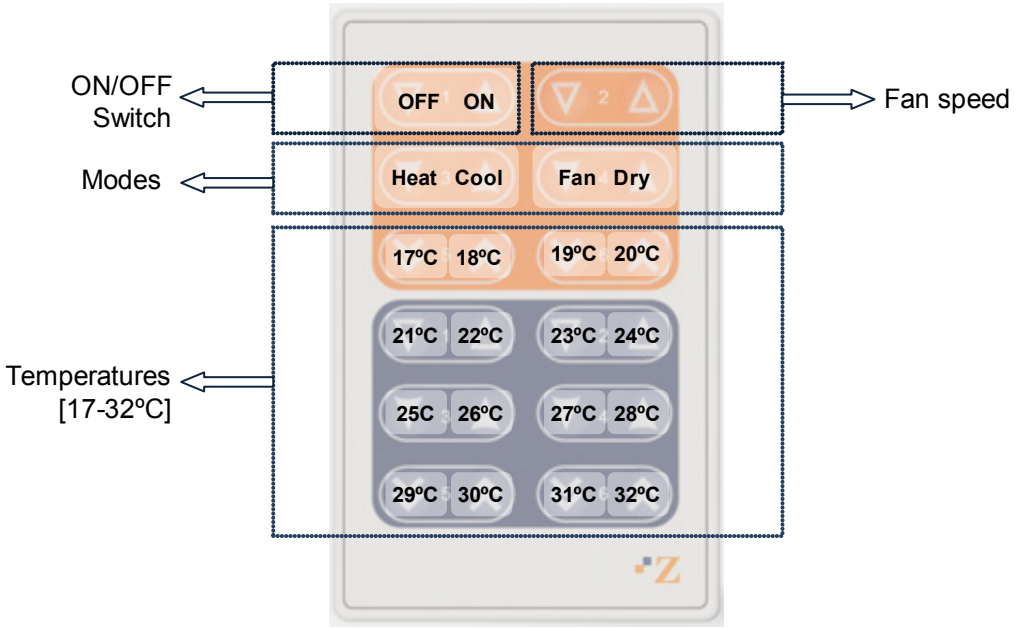


Figure 5. Testing KLIC-DI from the IR Remote

3 ETS PARAMETERISATION

To begin with the parameterisation process of the KLIC-DI interface it is necessary, once the ETS program has been opened, to import the database of the product (**KLIC-DI SKY** application program).

Next, the device should be added to the project. And then, one right-click on the device will permit selecting "Edit parameters", in order to start the configuration.

In the following sections a detailed explanation is provided about how to parameterise the different functionalities of the device in ETS.

3.1 DEFAULT CONFIGURATION

This section shows the default configuration the device configuration starts from.

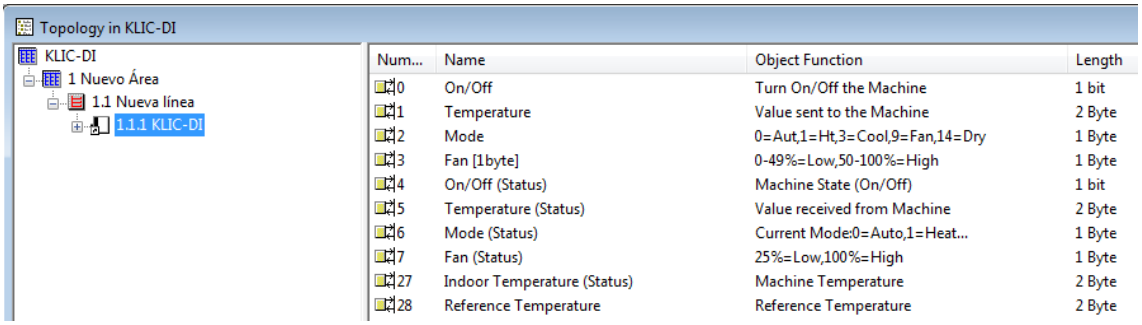


Figure 6. Default Topology

The default topology window (Figure 6) contains the communication objects associated to the reception of the control orders for the basic operation of the A/C unit: ON/OFF, Temperature, Mode and Fan. In addition, the corresponding status objects –which will report the updated state values of the A/C system to the KNX bus– are also shown.

When entering the parameter edition for the first time, the following window will be shown

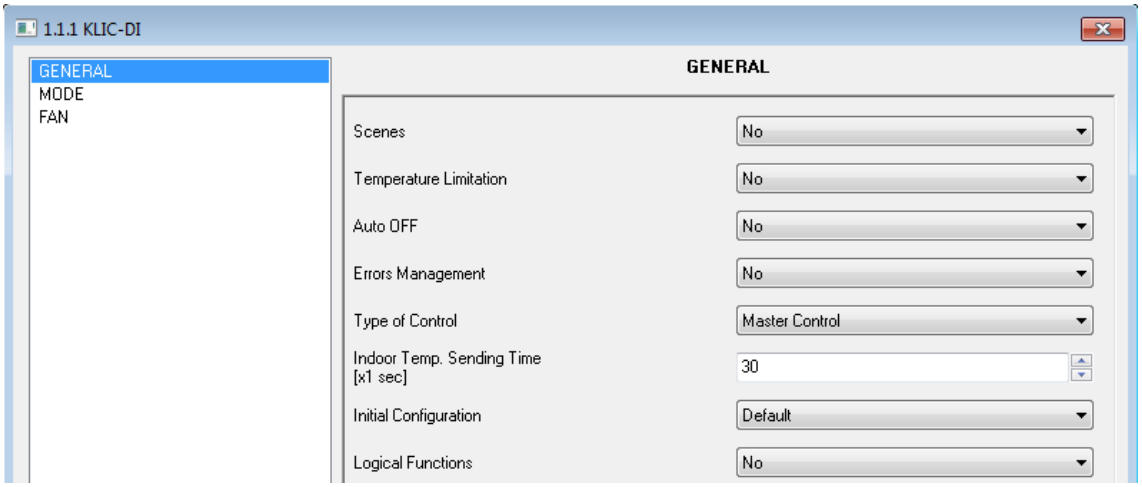


Figure 7. Default General Configuration

As shown in Figure 7, the configuration window is initially divided into three main tabs:

- **General**: allows individually enabling the control over the advanced functionalities of the A/C unit.
- **Mode**: allows selecting the communication objects to be used to control the mode of operation of the A/C unit.
- **Fan**: allows configuring features related to the fan speed of the A/C unit.

The next sections cover all of the above in detail.

3.2 GENERAL

From the General parameter window it is possible to select the advanced functionalities of the A/C system (Scenes, Temperature limitation, Auto OFF, Error management and Initial configuration) to be controlled. All of them, which will be explained in the next section, are disabled by default.

From the General window it is also possible to configure the desired **control type** for KLIC-DI (master control or slave control) and the **Internal temperature sending time** (30-255, in seconds), which allows carrying out a periodical sending to the KNX bus of the internal temperature measured by the machine, unless the value remains unchanged.

3.2.1 SCENES

After enabling this function, the left menu will show a new tab named Scenes, from where it will be possible to set up different scenes (up to 4), consisting each of them in a set of orders to be sent to the A/C unit upon the reception, through the KNX bus and by means of the **Scenes** object, of the corresponding scene value (decreased by 1, according to the KNX standard).

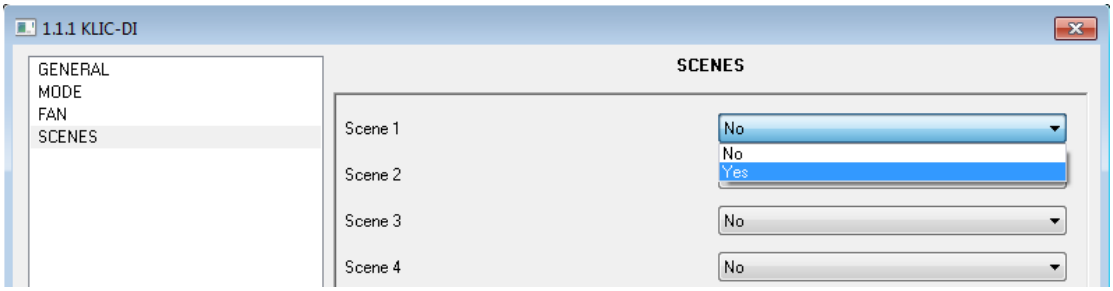


Figure 8. Scene Configuration

For every enabled scene, the particular parameters that may be configured are the following:

- **Scene number.** Sets the scene number (1-64) on whose reception (through the Scenes object, decreased by one) the corresponding configured orders will be sent to the A/C machine. The available orders are:
  - **ON/OFF.** Brings the possibility of setting the A/C machine state: No change, on or off.
  - **Temperature.** No change, or a New temperature setpoint (from 16ºC to 32ºC).
  - **Mode.** No change, Auto, Heat, Dry, Fan or Cool.
  - **Viento.** No change, minimum or maximum.

An example of scene configuration is shown in **Figure 9**.

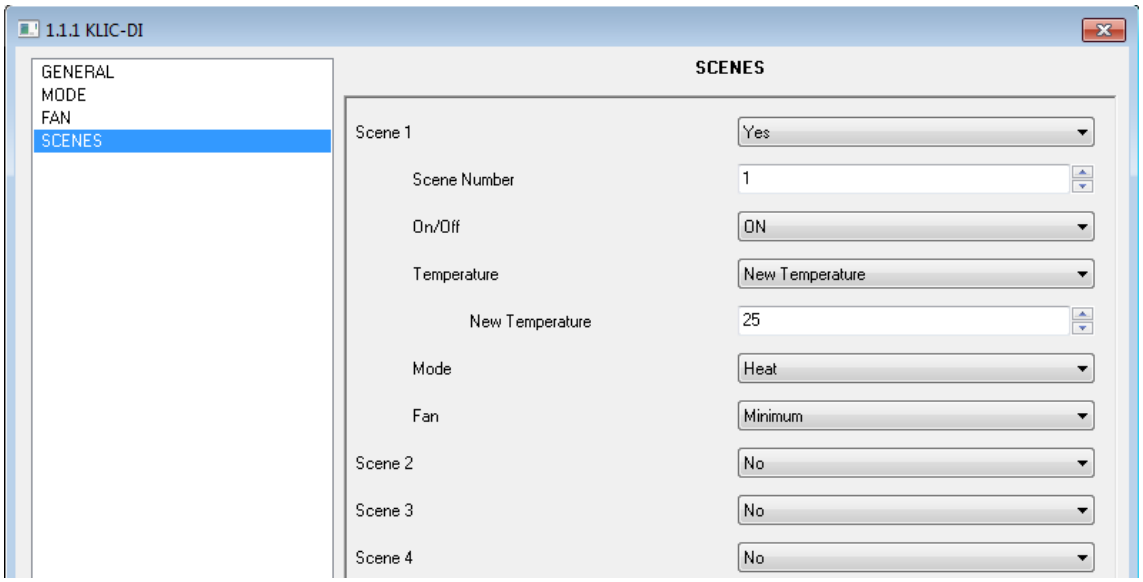


Figure 9. Scene Configuration Example (Scene 1)

3.2.2 TEMPERATURE LIMITATION

The A/C unit imposes restrictions to the temperature setpoint (typically, only values in the range 16ºC - 32ºC are available). Nevertheless, KLIC-DI offers the possibility of establishing new temperature limits provided that they are still within the A/C unit predefined limits (please refer to the A/C unit user manual for details).

Temperature limits can be customised independently for the two modes of operation that require a temperature setpoint: Cool and Heat).

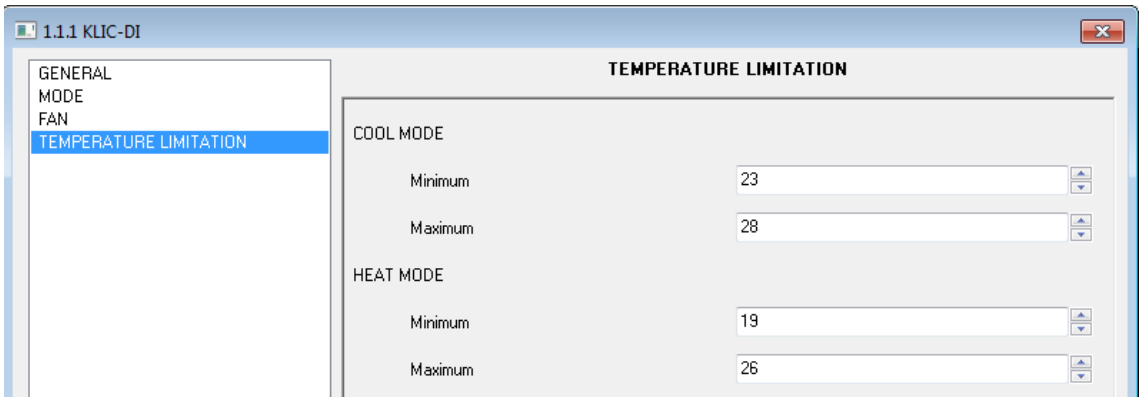


Figure 10. Setting Temperature Limits.

Important: *to make KLIC-DI aware of these customised limits, the specific* ***Temperature Limitation*** *communication object must be set to "1". To control the machine back with the predefined temperature limitations, the mentioned object needs to be sent the value "0".*

Once established the new temperature limits for every mode and enabled the functionality, when an out-of-range value is received from the KNX bus, the A/C machine will actually be sent a value equal to the corresponding temperature limit (thus, truncating the out-of-range value).

Note: *when custom temperature limits are configured in ETS, this functionality is automatically enabled by default ("Temperature Limitation" acquires the value "1") and it will be the personalised ranges that will control the unit behaviour once it gets switched on*.

3.2.3 AUTO OFF

This option allows an automatic and temporary switch-off of the A/C machine if a value change (from value "0" to value "1") in the associated communication object (**Auto-OFF**, typically intended to be linked to an open/closed window sensor) happens.

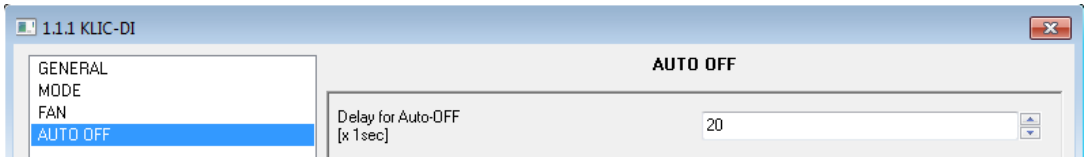


Figure 11. Auto OFF

The only configurable parameter is:

- **Delay for Auto-OFF**: sets the time, in seconds, KLIC-DI waits before automatically switching the A/C machine off.

Once the A/C machine has been automatically switched off, any ON order will not be sent to the machine until the object "Auto-OFF" acquires the value "0". However, any other control orders (setpoint, fan speed, etc.) received during the open window state will in fact be taken into account by KLIC-DI and applied afterwards, once the Auto-Off object is back set to "0" (which will make the machine leave the temporary off state and unconditionally turn on again).

Note: *switch-on orders sent to the A/C unit from a wired remote control configured as a master will not be ignored during the open window state (Auto-OFF=1), as KLIC-DI has no authority over the wired remote control*.

3.2.4 ERROR MANAGEMENT

From this parameter window it is possible to enable the sending of messages to the KNX bus to report the occurrence of errors, including both internal errors regarding the communication between KLIC-DI and the A/C unit, and external errors affecting the A/C unit itself.

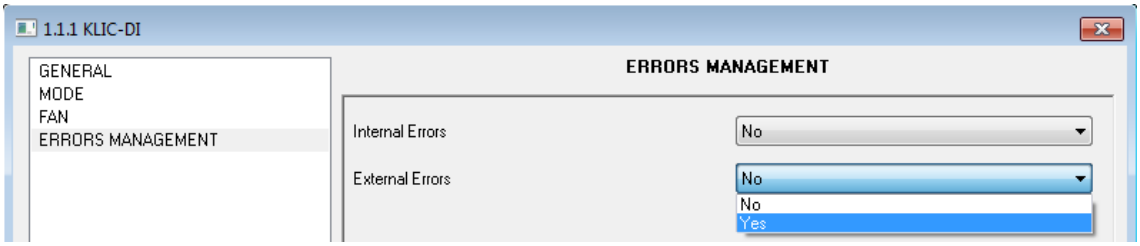


Figure 12. Configuring the Error Management.

It is possible to select whether to report none, internal, external or both types of error:

- **Internal errors**: when enabled, two new communication objects show up: "**Internal error**" (1 bit), and "**Type of internal error**" (1 byte). The first one indicates if an internal error is active (value "1") or not (value "0"). The second object indicates the specific code that identifies the error (a numerical value between 1 and 4. See Table 1).

- **External errors**: when enabled, two new communication objects show up: "**External Error**" and "**Type of external error**". The first one indicates if an external error is active (value "1") or not (value "0"). The second object indicates the specific code that identifies the error (please refer to the specific user manual of the A/C unit and to ANNEX II: Correspondence with A/C unit error codes).

3.2.5 TYPE OF CONTROL

The control type of the KLIC-DI interface is also parameterised from the General window. This can be **Master Remote Control** or **Slave Remote Control**, depending on whether or not there is an additional wired remote control in the bus. Please refer to the "Control type" subsection under section 2.2.

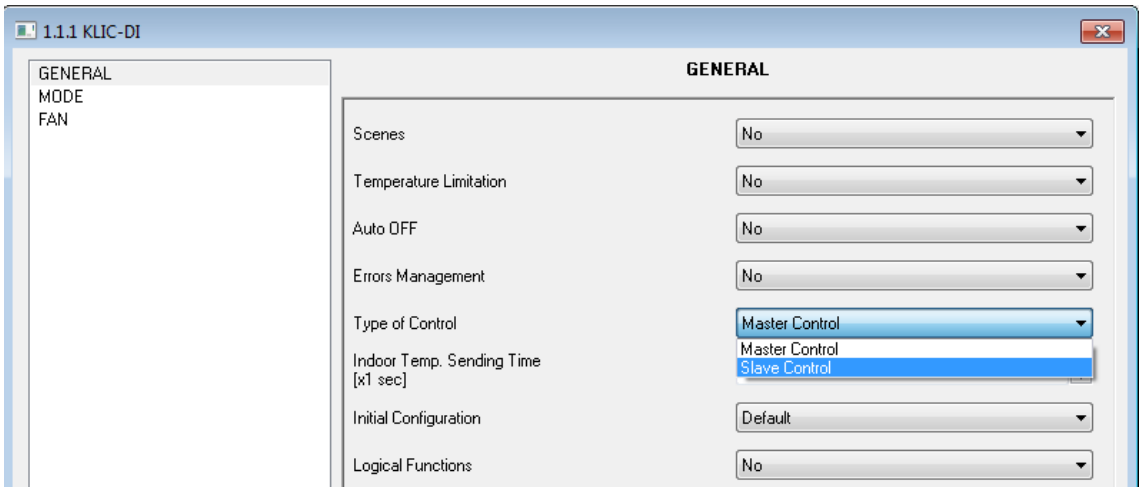


Figure 13. Configuring the Control Type.

3.2.6 INTERNAL TEMPERATURE SENDING TIME

The "**Internal Temp. Sending Time [x1 sec]**" parameter permits defining a period, between 30 and 255 seconds, to cyclically send the internal temperature measured by the A/C machine itself and sent to KLIC-DI during the internal communication process. This value will be sent to the KNX bus through the "**Internal temperature (status)**" object. Note that it will not be sent unless the value is different from the last sent, and that in the event of non having a built-in sensor in the machine for performing this measure, abnormal values may be sent to the bus.

3.2.7 INITIAL CONFIGURATION

This functionality allows setting the desired initial state that KLIC-DI will send the A/C unit on the recovery from power losses in the KNX bus. This state can be the one by default or a custom state (on the first boot, after ETS downloads/resets, the default configuration is sent). If the latter is selected, the window in Figure 14 will be shown.

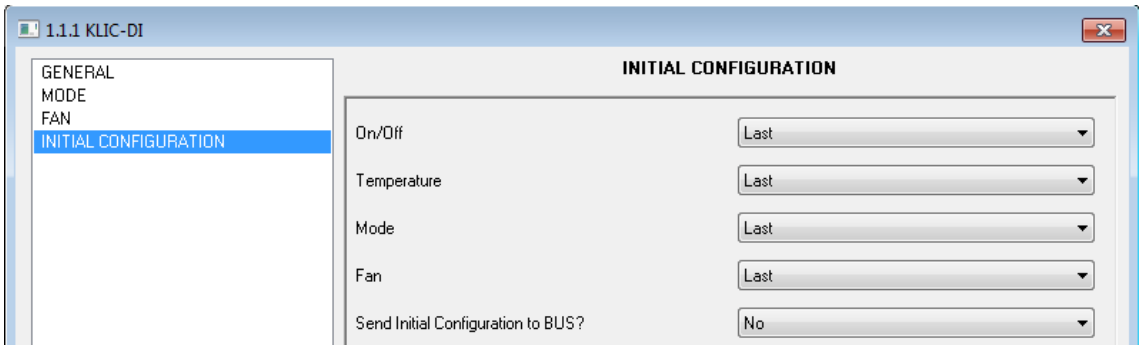


Figure 14. Initial Configuration

The variables whose initial state can be set are:

- **ON/OFF**: last (the state the machine had before the power failure), ON or OFF.
- **Temperature**: last or custom (a new field appears to set the custom initial temperature setpoint, between 16ºC and 32ºC).
- **Mode**: Last, Auto, Heat, Dry, Fan or Cool.
- **Fan**: Last, Minimum or Maximum.

Moreover, the status objects can be sent to the bus when applying the initial settings:

- **Send initial configuration to bus?**: If enabled ("Yes"), a new field will appear next, "**Delay**", where to configure the time, in seconds, KLIC-DI will delay the sending of the status objects to the KNX bus.

  Note: *if the parameterised delay is too short, the status objects sent to the bus may not show the selected custom configuration. In such case, an additional transmission of the objects will take place once the custom configuration becomes effective and has been confirmed by the machine.*

3.2.8 LOGICAL FUNCTIONS

This section of the application program is capable of performing arithmetic and binary logic operations with incoming data from the KNX bus, and of sending the result through other communication objects specifically enabled in the actuator for this operation.

Up to 5 different logical functions, independent of each other, can be enabled, each capable of performing **between 1 and 4 operations**. To make use of them, they need to be enabled from the following ETS window, which appears after selecting "Yes" under "Logical Functions" in the General parameter window.

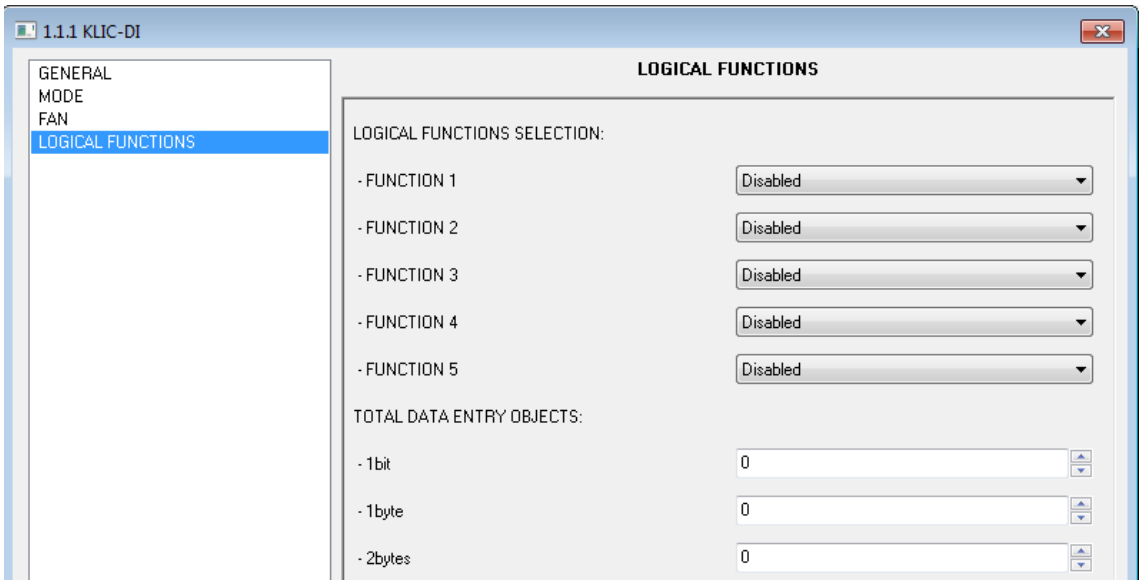


Figure 15. Configuring the Logical Function Module

To obtain detailed information about the use and the ETS parameterisation of the logical functions, please refer to the "**Logical Functions X5**" specific document, available at: http://www.zennio.com.

3.3 MODE

As explained in section 3.1, the Mode specific window allows configuring what type of communication objects will be required for controlling the mode of operation of the A/C machine.

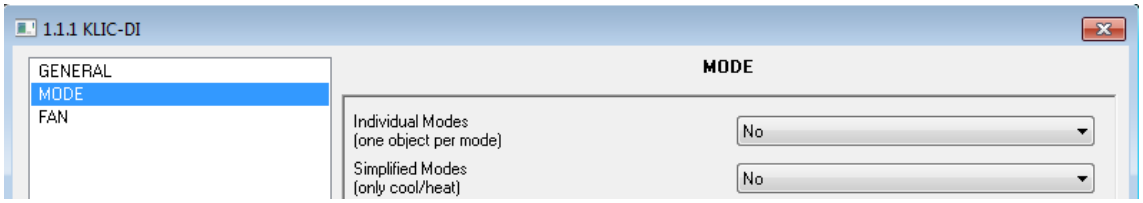


Figure 16. Mode Window

- **Individual modes**: selecting this option brings 10 new 1-bit communication objects, five of which will be associated to the reception, from the KNX bus, of mode switch orders (Auto, Cool, Heat, Fan and Dry, respectively) while the other five will be used by KLIC-DI to inform the KNX bus about the updated state of each function, as it is sent by the A/C machine.

Equivalently, the 1-byte objects "**Mode**" and "**Mode (status)**" are available by default and permit switching between the different modes of operation as well as checking the currently active mode, respectively.

In case of having activated the **Individual modes** option, it will be possible to switch from one mode to another by simply sending the value "1" to the control object corresponding to the new mode. After that, KLIC-DI will acknowledge the new mode by sending a "1" through the status object (unless the machine has, for whatever reason, not changed the mode).

- **Simplified modes**: enabling this option activates the "**Simplified Mode**" 1-bit object. This object allows switching from the Cool and the Heat modes by respectively sending the values "0" or "1" to the object. There is no status object associated to this control object.

3.4 FAN

This window configures several features related to the fan speed (or the volume of the air flow) of the A/C machine.

Figure 17. Fan

- **Number of levels**: allows specifying the number of the fan levels distinguished by the A/C unit, which may be **2 or 3 levels**. The fan speed is related to two 1-byte objects: "**Fan [1 Byte]**" and "**Fan (Status)**", for controlling and reporting the fan speed, respectively. The control orders are to be received from the KNX bus as percentage values, which will be then interpolated according to the specification explained below. The same interpolation will be applied over the values sent by KLIC-DI through the status object.

  - **Two levels**: the fan speed percentages will be interpolated according to Table 2.

Initial Speed Percentage	Interpolated Speed Percentage	Level
0-49%	25%	Minimum
50-100%	100%	Maximum

Table 2. Fan Speed Percentage for Two Levels

- **Three levels**: the fan speed percentages will be interpolated according to Tabla 3.

Initial Speed Percentage	Interpolated Speed Percentage	Level
0-32%	25%	Minimum
33-65%	50%	Middle
66-100%	100%	Maximum

Table 3. Fan Speed Percentage for Three Levels

- **Step control**: enabling this feature ("Yes") brings up the "**Fan [1 bit]**" 1-bit object, which allows increasing (by sending the value "1") or decreasing (value "0") the fan speed by one level (for example, under a three-level paramerisation and under the minimum fan speed level, the value "1" sent via the "Fan [1 bit]" object will make the fan speed level change to “medium”).

The step control is **non-cyclical**. This means that, being at the minimum level (0%), any decrease order will be ignored by the unit, which will maintain the same fan level unless an order to increase it is received. Analogously, when the fan speed is at its maximum (100%), it will remain unchanged until a decrease order is received.

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.

- "**1st boot**" shows the cases where an object is assigned a certain value by the application program after a device download or a full reset. In case the value of such assignment can be parameterised, √ is shown in column "**P**". Objects showing a hyphen (-) are not assigned a particular value and therefore can be assumed to be initialised with the value "0", or with the corresponding updated value in case they depend on an external element (sensors, etc.). Moreover, if the object is sent (or is there an option to send it) to the bus (write or read requests) after a download or a device reset from ETS, the marks **(W)** or **(R)** will be shown, respectively for transmissions or read requests.

- "**Reboot**" shows the cases where an object is assigned a certain value by the application program after a bus power failure. In case the value of such assignment can be parameterised, √ is shown in column "**P**". Objects showing a hyphen (-) are not assigned a particular value and therefore can be assumed to maintain their previous value after the failure, or with the corresponding updated value in case they depend on external elements. Moreover, if the object is sent (or is there an option to send it) to the bus (write or read requests) after a bus failure, the marks **(W)** or **(R)** will be shown, respectively for transmissions or read requests.

Number	Size	I/O	Flags	Data type (DPT)	Functional range	1st boot	P	Reboot	P	Name	Function
0	1 Bit	I	C - - W U	DPT_Switch	0/1	0		-		On/Off	Turn On/Off the Machine
1	2 Bytes	I	C - - W U	DPT_Value_Temp	16ºC – 32ºC or ac. to param.	25ºC		-	√	Temperature	Value sent to the Machine
2	1 Byte	I	C - - W U	DPT_HVACContrMode	0=Auto 1=Heat 3=Cool 9=Fan 14=Dry	-		-		Mode	0=Aut,1=Ht,3=Cool,9=Fan,14=Dry
3	1 Byte	I	C - - W U	DPT_Scaling	0%-100%	-		-		Fan [1byte]	0-49%=Low,50-100%=High
	1 Byte	I	C - - W U	DPT_Scaling	0%-100%	-		-		Fan [1byte]	0-32%Min,33-65%Mid,>65%Max
4	1 Bit	O	C T R - -	DPT_Switch	0/1	0 W		- W	√	On/Off (Status)	Machine State (On/Off)
5	2 Bytes	O	C T R - -	DPT_Value_Temp	16ºC – 32ºC or ac. to param.	25ºC W		- W	√	Temperature (Status)	Value received from Machine
6	1 Byte	O	C T R - -	DPT_HVACContrMode	0=Auto 1=Heat 3=Cool 9=Fan	3 W		- W	√	Mode (Status)	Current Mode:0=Auto,1=Heat...

Number	Size	I/O	Flags	Data type (DPT)	Functional range	1st boot	P	Reboot	P	Name	Function
					14=Dry						
7	1 Byte	O	C T R - -	DPT_Scaling	0%-100%	25% W		- W	√	Fan (Status)	25%Min,50%Mid,100%Max
	1 Byte	O	C T R - -	DPT_Scaling	0%-100%	25% W		- W	√	Fan (Status)	25%=Low,100%=High
8	1 Bit	I	C T - W U	DPT_Switch	0/1	0		-		Auto Mode	1=Set Auto Mode;0=Nothing
9	1 Bit	I	C T - W U	DPT_Switch	0/1	1		-		Cool Mode	1=Set Cool Mode;0=Nothing
10	1 Bit	I	C T - W U	DPT_Switch	0/1	0		-		Heat Mode	1=Set Heat Mode;0=Nothing
11	1 Bit	I	C T - W U	DPT_Switch	0/1	0		-		Fan Mode	1=Set Fan Mode;0=Nothing
12	1 Bit	I	C T - W U	DPT_Switch	0/1	0		-		Dry Mode	1=Set Dry Mode;0=Nothing
13	1 Bit	I	C - - W U	DPT_Heat_Cool	0=Cool 1=Heat	0		-		Simplified Mode	0=Cool; 1=Heat
14	1 Bit	O	C T R - -	DPT_Switch	0/1	0 W		- W	√	Auto Mode (Status)	1=Auto Mode Enabled;0=Disabled
15	1 Bit	O	C T R - -	DPT_Switch	0/1	1 W		- W	√	Cool Mode (Status)	1=Cool Mode Enabled;0=Disabled
16	1 Bit	O	C T R - -	DPT_Switch	0/1	0 W		- W	√	Heat Mode (Status)	1=Heat Mode Enabled;0=Disabled
17	1 Bit	O	C T R - -	DPT_Switch	0/1	0 W		- W	√	Fan Mode (Status)	1=Fan Mode Enabled;0=Disabled
18	1 Bit	O	C T R - -	DPT_Switch	0/1	0 W		- W	√	Dry Mode (Status)	1=Dry Mode Enabled;0=Disabled
19	1 Bit	I	C - - W U	DPT_Step	0=Decrease 1=Increase	-		-		Fan [1 bit]	0=Down;1=Up
20	1 Byte	I	C - - W U	DPT_SceneControl	0-63	-		-		Scenes	Set Scene "Value"
21	1 Bit	I/O	C T R W U	DPT_Switch	0/1	- W		- W		Temperature Limitation	0=Disable;1=Enable
22	1 Bit	I	C - - W U	DPT_Switch	0/1	0		-		Auto-Off	0=Disable;1=Enable
23	1 Bit	O	C T R - -	DPT_Bool	0/1	0 W		0 W		Internal Error (Status)	0=No Error; 1=Error
24	1 Byte	O	C T R - -	-	1-4	0 W		0 W		Type of Internal Error (Status)	1=Recep.Err,2=Timeout,3=CRC...
25	1 Bit	O	C T R - -	DPT_Bool	0/1	0 W		0 W		External Error (Status)	0=No Error; 1=Error
26	1 Byte	O	C T R - -	-	1-239	0 W		0 W		Type of External Error (Status)	Check Error's Table
27	2 Bytes	O	C T R - -	DPT_Value_Temp	0ºC – 99ºC	0ºC		0		Internal Temperature (Status)	Machine Internal Temperature
28	2 Bytes	I	C - - W U	DPT_Value_Temp	0ºC – 99ºC	25ºC		25ºC		Reference Temperature	Reference Temperature
29	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 1	Binary Data Entry (0/1)
30	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 2	Binary Data Entry (0/1)
31	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 3	Binary Data Entry (0/1)
32	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 4	Binary Data Entry (0/1)
33	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 5	Binary Data Entry (0/1)
34	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 6	Binary Data Entry (0/1)
35	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 7	Binary Data Entry (0/1)
36	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 8	Binary Data Entry (0/1)
37	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 9	Binary Data Entry (0/1)
38	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 10	Binary Data Entry (0/1)
39	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 11	Binary Data Entry (0/1)

Number	Size	I/O	Flags	Data type (DPT)	Functional range	1st boot	P	Reboot	P	Name	Function
40	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 12	Binary Data Entry (0/1)
41	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 13	Binary Data Entry (0/1)
42	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 14	Binary Data Entry (0/1)
43	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 15	Binary Data Entry (0/1)
44	1 Bit	I	C - - W -	DPT_Bool	0/1	-		-		[LF] (1 bit) Data Entry 16	Binary Data Entry (0/1)
45	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 1	1 byte Data Entry (0-255)
46	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 2	1 byte Data Entry (0-255)
47	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 3	1 byte Data Entry (0-255)
48	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 4	1 byte Data Entry (0-255)
49	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 5	1 byte Data Entry (0-255)
50	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 6	1 byte Data Entry (0-255)
51	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 7	1 byte Data Entry (0-255)
52	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0-255	-		-		[LF] (1 byte) Data Entry 8	1 byte Data Entry (0-255)
53	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 1	2 bytes Data Entry
54	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 2	2 bytes Data Entry
55	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 3	2 bytes Data Entry
56	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 4	2 bytes Data Entry
57	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 5	2 bytes Data Entry
58	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 6	2 bytes Data Entry
59	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 7	2 bytes Data Entry
60	2 Bytes	I	C - - W -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] (2 bytes) Data Entry 8	2 bytes Data Entry
61	1 Bit	O	C T R - -	DPT_Bool	0/1	-		-		[LF] Function 1 RESULT (1 bit)	FUNCTION 1 Result
62	1 Bit	O	C T R - -	DPT_Bool	0/1	-		-		[LF] Function 2 RESULT (1 bit)	FUNCTION 2 Result
63	1 Bit	O	C T R - -	DPT_Bool	0/1	-		-		[LF] Function 3 RESULT (1 bit)	FUNCTION 3 Result
64	1 Bit	O	C T R - -	DPT_Bool	0/1	-		-		[LF] Function 4 RESULT (1 bit)	FUNCTION 4 Result
65	1 Bit	O	C T R - -	DPT_Bool	0/1	-		-		[LF] Function 5 RESULT (1 bit)	FUNCTION 5 Result
66	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0-255	-		-		[LF] Function 1 RESULT (1 byte)	FUNCTION 1 Result
67	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0-255	-		-		[LF] Function 2 RESULT (1 byte)	FUNCTION 2 Result
68	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0-255	-		-		[LF] Function 3 RESULT (1 byte)	FUNCTION 3 Result
69	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0-255	-		-		[LF] Function 4 RESULT (1 byte)	FUNCTION 4 Result
70	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0-255	-		-		[LF] Function 5 RESULT (1 byte)	FUNCTION 5 Result
71	2 Bytes	O	C T R - -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] Function 1 RESULT (2 bytes)	FUNCTION 1 Result
72	2 Bytes	O	C T R - -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] Function 2 RESULT (2 bytes)	FUNCTION 2 Result
73	2 Bytes	O	C T R - -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] Function 3 RESULT (2 bytes)	FUNCTION 3 Result
74	2 Bytes	O	C T R - -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] Function 4 RESULT (2 bytes)	FUNCTION 4 Result
75	2 Bytes	O	C T R - -	DPT_Value_2_Ucount	Acc. to param.	-		-		[LF] Function 5 RESULT (2 bytes)	FUNCTION 5 Result

ANNEX II: CORRESPONDENCE WITH A/C UNIT ERROR CODES

Correspondence between the error codes (in decimal form) sent to the KNX bus by KLIC-DI and the error codes of the A/C units themselves.

Bus	Code
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	0A
11	0H
12	0C
13	0J
14	0E
15	0F
16	A0
17	A1
18	A2
19	A3
20	A4
21	A5
22	A6
23	A7
24	A8
25	A9

Bus	Code
26	AA
27	AH
28	AC
29	AJ
30	AE
31	AF
32	C0
33	C1
34	C2
35	C3
36	C4
37	C5
38	C6
39	C7
40	C8
41	C9
42	CA
43	CH
44	CC
45	CJ
46	CE
47	CF
48	E0
49	E1
50	E2

Bus	Code
51	E3
52	E4
53	E5
54	E6
55	E7
56	E8
57	E9
58	EA
59	EH
60	EC
61	EJ
62	EE
63	EF
64	H0
65	H1
66	H2
67	H3
68	H4
69	H5
70	H6
71	H7
72	H8
73	H9
74	HA
75	HH

Bus	Code
76	HC
77	HJ
78	HE
79	HF
80	F0
81	F1
82	F2
83	F3
84	F4
85	F5
86	F6
87	F7
88	F8
89	F9
90	FA
91	FH
92	FC
93	FJ
94	FE
95	FF
96	J0
97	J1
98	J2
99	J3
100	J4

Bus	Code
101	J5
102	J6
103	J7
104	J8
105	J9
106	JA
107	JH
108	JC
109	JJ
110	JE
111	JF
112	L0
113	L1
114	L2
115	L3
116	L4
117	L5
118	L6
119	L7
120	L8
121	L9
122	LA
123	LH
124	LC
125	LJ

Bus	Code
126	LE
127	LF
128	P0
129	P1
130	P2
131	P3
132	P4
133	P5
134	P6
135	P7
136	P8
137	P9
138	PA
139	PH
140	PC
141	PJ
142	PE
143	PF
144	U0
145	U1
146	U2
147	U3
148	U4
149	U5
150	U6

Bus	Code
151	U7
152	U8
153	U9
154	UA
155	UH
156	UC
157	UJ
158	UE
159	UF
160	M0
161	M1
162	M2
163	M3
164	M4
165	M5
166	M6
167	M7
168	M8
169	M9
170	MA
171	MH
172	MC
173	MJ
174	ME
175	MF

Bus	Code
176	30
177	31
178	32
179	33
180	34
181	35
182	36
183	37
184	38
185	39
186	3A
187	3H
188	3C
189	3J
190	3E
191	3F
192	40
193	41
194	42
195	43
196	44
197	45
198	46
199	47
200	48

Bus	Code
201	49
202	4A
203	4H
204	4C
205	4J
206	4E
207	4F
208	50
209	51
210	52
211	53
212	54
213	55
214	56
215	57
216	58
217	59
218	5A
219	5H
220	5C
221	5J
222	5E
223	5F
224	60
225	61

Bus	Code
226	62
227	63
228	64
229	65
230	66
231	67
232	68
233	69
234	6A
235	6H
236	6C
237	6J
238	6E
239	6F

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http://zennioenglish.zendesk.com

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*