 **IntesisBox<sup>®</sup> KNX**  
MD-AC-KNX-1B/16/64 v1.0

User's Manual

r1.1 eng

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**Intesis** 

## Interface for integration of Midea air conditioners into KNX TP-1 (EIB) control systems.

Compatible with VRF air conditioners line commercialized by Midea.

Application's Program Version: 1.0

Order Code: **MD-AC-KNX-1B**  
**MD-AC-KNX-16**  
**MD-AC-KNX-64**

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## 1 Presentation



MD-AC-KNX-1B/16/64 allows a complete and natural integration of Midea air conditioners with KNX control systems.

Compatible with all models of VRF line of Midea air conditioners.

Main features:

- Reduced dimensions. Installation even inside the A.C. indoor unit.
- Quick and non visible installation.
- External power not required.
- Direct connection to the KNX EIB bus.
- Direct connection to the AC indoor unit.
- Fully KNX interoperable, configuration from ETS.
- Multiple objects for control (of different types: bit, byte, characters...).
- Special Modes available (Power, Economy, Additional Heating and Additional Cooling).
- Timeout for Open Window and Occupancy. Sleep function also available.
- Control of the AC unit based in the ambient temperature read by the own AC unit, or in the ambient temperature read by any KNX thermostat.
- Total Control and Monitoring of the AC unit from KNX, including monitoring of AC unit's state of internal variables, running hours counter (for filter maintenance control), and error indication and error code.
- AC unit can be controlled simultaneously by the IR remote control of the AC unit and by KNX.

## 2 Connection

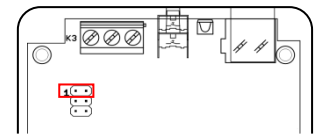
### Connection of the interface to the AC indoor unit:

Disconnect mains power from the AC unit. Open the front cover of the indoor unit in order to have access to the internal control board. In the control board locate the socket connector marked as XYE.

Using a 3 wire cable, connect the EXY connector from the MD-AC-KNX-1B/16/64 to the XYE connector of the AC unit's control board.

Fix the MD-AC-KNX-1B/16/64 inside or outside the AC indoor unit depending on your needs – remember that MD-AC-KNX-1B/16/64 must be also connected to the KNX bus. Close the AC indoor unit's front cover again.

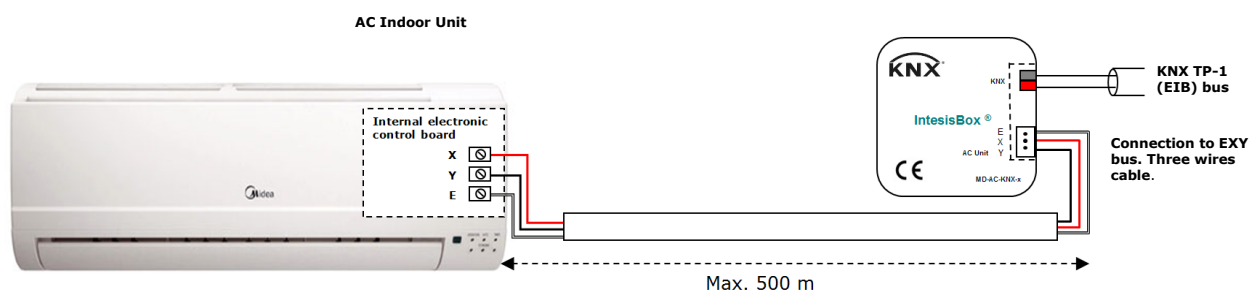
**IMPORTANT:** If the MD-AC-KNX-1B/16/64 gateway is **not** placed at one end of the EXY bus, the terminal resistor should be deactivated. Remove Jumper 1 to deactivate the 120  $\Omega$  terminal resistor.



### Connection of the interface to the KNX bus:

Disconnect power of the KNX bus. Connect the interface to the KNX TP-1 (EIB) bus using the KNX standard connector (red/grey) of the interface, respect polarity. Reconnect power of the KNX bus.

### Connections diagram:



**Figure 2.1** Default parameter configuration

### 3 Configuration and setup

This is a fully compatible KNX device which must be configured and setup using standard KNX tool ETS.

ETS project for this device can be downloaded from:

[http://www.intesis.com/down/eib/MD-AC-KNX-1B\\_16\\_64.zip](http://www.intesis.com/down/eib/MD-AC-KNX-1B_16_64.zip)

Please consult the README.txt file, located inside the downloaded zip file, to find instructions on how to install the database.

## 4 ETS Parameters

When imported to the ETS software for the first time, the gateway shows the following default parameter configuration:

Device: 1.1.1 MD-AC-KNX

Download latest database entry for this product and its User Manual from:	<input type="text" value="http://www.intesis.com"/>
Intesis Product	MD-AC-KNX-1B
Number of Indoor Units in ETS	1
First Status Update to KNX	ASAP
Enable object "Error Code [2byte]"	Disabled
Enable object "Error Text [14byte]" (2 ASCII-char Error Code)	Enabled

**Figure 4.1** Default parameter configuration

With this configuration it's possible to send On/Off (*Control\_ On/Off*), change the AC Mode (*Control\_ Mode*), the Fan Speed (*Control\_ Fan Speed*) and also the Setpoint Temperature (*Control\_ Setpoint Temperature*). The Status\_ objects, for the mentioned Control\_ objects, are also available to use if needed. Also objects *Status\_ AC Return Temp* and *Status\_ Error/Alarm* are shown.

Object ID	Object Name	Object Description
1	AC01 Control_ On/Off [DPT_1.001]	0-Off;1-On
3	AC01 Control_ Mode [DPT_20.105]	0-Aut;1-Hea;3-Coo;9-Fan;14-Dry
11	AC01 Control_ Fan Speed [DPT_5.001]	Thresholds: 75%    50% and 83%
17	AC01 Control_ Vanes U-D Swing [DPT_1.002]	0-Stop;1-Swing
18	AC01 Control_ Setpoint Temperature [DPT_9.001]	- °C
22	AC01 Status_ On/Off [DPT_1.001]	0-Off;1-On
24	AC01 Status_ Mode [DPT_20.105]	0-Aut;1-Hea;3-Coo;9-Fan;14-Dry
32	AC01 Status_ Fan Speed [DPT_5.001]	50% and 100%    33%, 66% and 100%
38	AC01 Status_ Vanes U-D Swing [DPT_1.002]	0-Stop;1-Swing
40	AC01 Status_ AC Setpoint Temperature [DPT_9.001]	- °C
41	AC01 Status_ AC Ambient Reference Temperature [DPT_9.001]	- °C
42	AC01 Status_ Error/Alarm [DPT_1.005]	0-No alarm;1-Alarm
44	AC01 Status_ Error Text [DPT_16.001]	Error Text

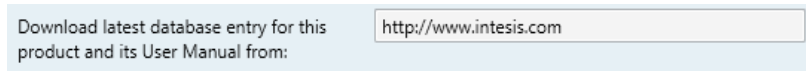
**Figure 4.2** Default communication objects



## 4.1 General configuration

Inside this parameter's dialog it is possible to activate or change the parameters shown in the **Figure 4.1**.

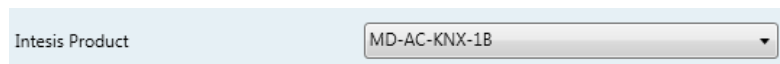
4.1.1 Download latest database entry for this product and its User Manual from:  
The first field shows the URL where to download the database and the user manual for the product.



**Figure 4.3** Parameter detail

### 4.1.2 Intesis Product

This parameter is used to check, before sending the programming, the maximum number of AC units your device supports.



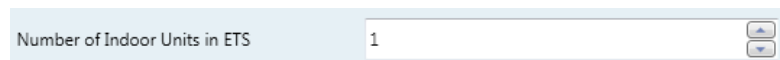
**Figure 4.4** Parameter detail

Select the version of the gateway that you have:

- MD-AC-KNX-1B, if you only want to control 1 AC unit.
- MD-AC-KNX-16, if you only want to control up to 16 AC units.
- MD-AC-KNX-1B, if you only want to control up to 64 AC units.

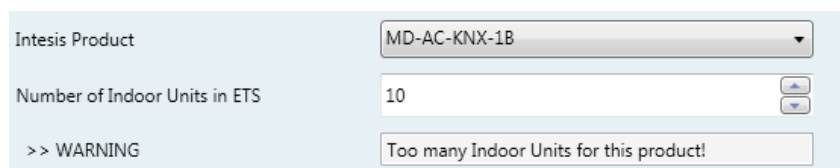
### 4.1.3 Number of Indoor Units in ETS

This parameter is used to hide/show communication object according to the number of AC units you need to configure. Value ranges go from 1 to 64.



**Figure 4.5** Parameter detail

In case you introduce a number higher than the maximum number of units allowed by your license, you will get a warning message. This is just for information and will not block the configuration process. Configurations with more indoor units configured than the ones allowed by the license will not be downloaded correctly.



**Figure 4.6** Parameter detail

#### 4.1.4 First Status Updated to KNX

This parameter defines how fast the status is updated to KNX. Depending on the value selected, more or less priority will be assigned to this action. As there are so many parameters available, it is important to consider carefully how to set this parameter.

- If set to **"ASAP"**, all status communication objects will send its value (if needed).
- If set to **"Slow"**, all status communication objects will send its value (if needed), but slower than in the previous option (ASAP).
- If set to **"Super Slow"**, all status communication objects will send its value (if needed), but slower than in the previous option (Slow).



**Figure 4.7** Parameter detail

#### 4.1.5 Enable object "Error Code [2byte]"

This parameter shows/hides the *Status\_ Error Code* communication object which shows the indoor unit errors, if occurred, in numeric format.



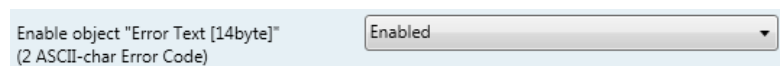
➡ 43: AC01 Status\_ Error Code [2-byte signed value] - Error Code

**Figure 4.8** Communication object and parameter detail

- If set to **"Disabled"** the object will not be shown.
- If set to **"Enabled"** the *Status\_ Error Code [2byte signed value]* object will appear.
  - This object can be read and also sends the indoor unit error, if occurred, in numeric format. If a **"0"** value is shown that means no error.

#### 4.1.6 Enable object "Error Text Code [14byte]"

This parameter shows/hides the *Status\_ Error Text Code* communication object which shows the indoor unit errors, if occurred, in text format.



➡ 63: AC01 Status\_ Error Text [DPT\_16.001] - Error Text

**Figure 4.9** Communication object and parameter detail

- If set to **"Disabled"** the object will not be shown.
- If set to **"Enabled"** the *Status\_ Error Text Code* object will appear.

- This object can be read and also sends the indoor unit error, if occurred, in text format. The errors shown have the same format as in the remote controller and in the error list from the indoor unit manufacturer. If the object's value is empty that means there is no error.

## 4.2 AC supported features

Figure 4.10 Parameter detail

### 4.2.1 Supported operating modes

This parameter determines all indoor units supported operating modes.

Figure 4.11 Parameter detail

- If set to **"All Indoor Units support same operating modes"** the supported operating modes will be applied to all indoor units.
- If set to **"Supported modes in each Indoor Unit might differ"**, you will need to select the supported operating modes for each indoor unit individually.

Figure 4.12 Parameter detail

### 4.2.2 Supported fan speeds

This parameter determines all indoor units supported fan speeds.



Figure 4.13 Parameter detail

- If set to **"All Indoor Units support same fan speeds"** the supported operating modes will be applied to all indoor units.
- If set to **"Supported fan speeds in each Indoor Unit might differ"**, you will need to select the supported fan speed for each indoor unit individually.

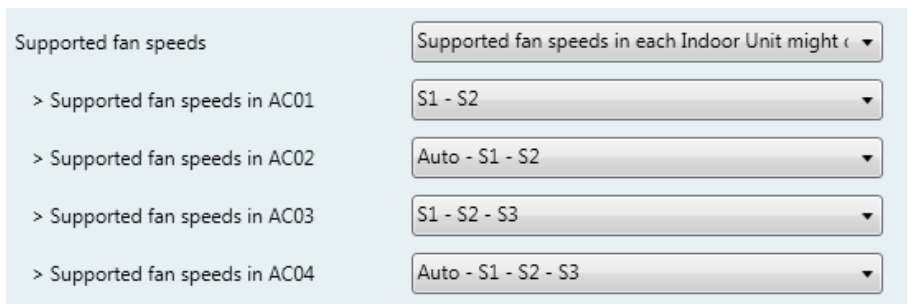


Figure 4.14 Parameter detail

## 4.3 Global mode configuration

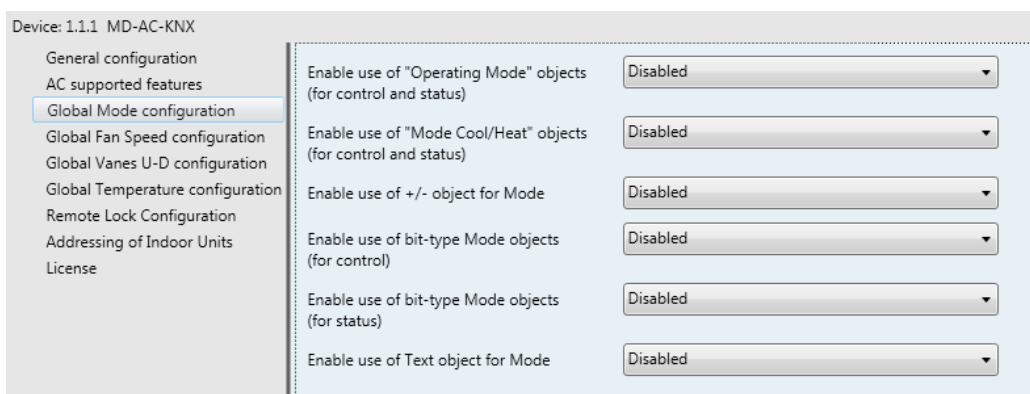


Figure 4.15 Default Mode Configuration dialog

All the parameters in this section are related with the different mode properties and communication objects.

- ➡ 3: Control\_Mode [DPT\_20.105 - 1byte] - 0-Aut;1-Hea;3-Coo;9-Fan;14-Dry
- ➡ 24: Status\_Mode [DPT\_20.105 - 1byte] - 0-Aut;1-Hea;3-Coo;9-Fan;14-Dry

The byte-type communication object for Mode works with the DTP\_20.105. Auto mode will be enabled with a "0" value, Heat mode with a "1" value, Cool mode with a "3" value, Fan mode with a "9" value and Dry mode with a "14" value.

#### 4.3.1 Enable use of "Operating Mode" objects

This parameter shows/hides the *Control\_* and *Status\_ Mode Operating Mode* communication objects.

- 2: Control\_Operating Mode [DPT\_20.102 - 1byte] - 0-Aut;1-Com;2-Stan;3-Eco;4-Pro
- 23: Status\_ Operating Mode [DPT\_20.102 - 1byte] - 0-Aut;1-Com;2-Stan;3-Eco;4-

#### 4.3.2 Enable use of Mode Heat / Cool bit obj

This parameter shows/hides the *Control\_* and *Status\_ Mode Cool/Heat* communication objects.

- 4: Control\_ Mode Cool/Heat [DPT\_1.100 - 1bit] - 0-Cool;1-Heat
- 25: Status\_ Mode Cool/Heat [DPT\_1.100 - 1bit] - 0-Cool;1-Heat

- If set to "Disabled" the objects will not be shown.
- If set to "Enabled" the *Control\_* and *Status\_ Mode Cool/Heat* objects will appear.
  - When a "1" value is sent to the *Control\_* communication object, **Heat mode** will be enabled in the indoor unit, and the *Status\_* object will return this value.
  - When a "0" value is sent to the *Control\_* communication object, **Cool mode** will be enabled in the indoor unit, and the *Status\_* object will return this value.

#### 4.3.3 Enable use of + / - object for Mode

This parameter shows/hides the *Control\_ Mode +/-* communication object which lets change the indoor unit mode by using two different datapoint types.

- 10: Control\_ Mode +/- [DPT\_1.008 - 1bit] - 0-Up;1-Down

- If set to "Disabled" the object will not be shown.
- If set to "Enabled" the *Control\_ Mode +/-* object and a new parameter will appear.

Enable use of +/- object for Mode	yes
> DPT type for +/- Mode Object	0-Up / 1-Down [DPT_1.008]

Figure 4.16 Parameter detail

#### ➤ DPT type for +/- Mode Object

This parameter lets choose between the datapoints **0-Up / 1-Down [DPT\_1.008]** and **0-Decrease / 1-Increase [DPT\_1.007]** for the *Control\_ Mode +/-* object.

The sequence followed when using this object is shown below:



- Up / Increase
- Down / Decrease

Keep in mind that depending on the indoor unit you have and the available features, Auto mode and Dry mode may not be present.

#### 4.3.4 Enable use of bit-type Mode objects (for control)

This parameter shows/hides the bit-type *Control\_ Mode* objects.

- ↕ 5: Control\_ Mode Auto [DPT\_1.002 - 1bit] - 1-Set AUTO operating mode
- ↕ 6: Control\_ Mode Heat [DPT\_1.002 - 1bit] - 1-Set HEAT operating mode
- ↕ 7: Control\_ Mode Cool [DPT\_1.002 - 1bit] - 1-Set COOL operating mode
- ↕ 8: Control\_ Mode Fan [DPT\_1.002 - 1bit] - 1-Set FAN operating mode
- ↕ 9: Control\_ Mode Dry [DPT\_1.002 - 1bit] - 1-Set DRY operating mode

- If set to **"no"** the objects will not be shown.
- If set to **"yes"** the *Control\_ Mode* objects for Auto, Heat, Cool, Fan and Dry will appear. To activate a mode by using these objects a **"1"** value has to be sent.

#### 4.3.5 Enable use of bit-type Mode objects (for status)

This parameter shows/hides the bit-type *Status\_ Mode* objects.

- ↕ 26: Status\_ Mode Auto [DPT\_1.002 - 1bit] - 1-AUTO is active
- ↕ 27: Status\_ Mode Heat [DPT\_1.002 - 1bit] - 1-HEAT is active
- ↕ 28: Status\_ Mode Cool [DPT\_1.002 - 1bit] - 1-COOL is active
- ↕ 29: Status\_ Mode Fan [DPT\_1.002 - 1bit] - 1-FAN is active
- ↕ 30: Status\_ Mode Dry [DPT\_1.002 - 1bit] - 1-DRY is active

- If set to **"no"** the objects will not be shown.
- If set to **"yes"** the *Status\_ Mode* objects for Auto, Heat, Cool, Fan and Dry will appear. When enabled, a mode will return a **"1"** through its bit-type object.

#### 4.3.6 Enable use of Text object for Mode

This parameter shows/hides the *Status\_ Mode Text* communication object.

- ↕ 31: Status\_ Mode Text [DPT\_16.001 - 14byte] - ASCII String

- If set to **"no"** the object will not be shown.
- If set to **"yes"** the *Status\_ Mode Text* object will appear. Also, in the parameters, will be shown five text fields, one for each mode, that will let modify the text string displayed by the *Status\_ Mode Text* when changing mode.

> String when mode is AUTO (if available)	AUTO
> String when mode is HEAT	HEAT
> String when mode is COOL	COOL
> String when mode is FAN	FAN
> String when mode is DRY (if available)	DRY

Figure 4.17 Parameter detail

## 4.4 Fan Speed Configuration dialog

Device: 1.1.1 MD-AC-KNX

- General configuration
- AC supported features
- Global Mode configuration
- Global Fan Speed configuration**
- Global Vanes U-D configuration
- Global Temperature configuration
- Remote Lock Configuration
- Addressing of Indoor Units
- License

DPT object type for fan speed	Scaling [DPT_5.001]
Enable use of "Fan Speed Man/Auto" objects (for control and status)	Disabled
Enable use of +/- object for Fan Speed	Disabled
Enable use of bit-type Fan Speed objects (for control)	Disabled
Enable use of bit-type Fan Speed objects (for status)	Disabled
Enable use of Text object for Fan Speed	Disabled

Figure 4.18 Default Fan Speed Configuration dialog

All the parameters in this section are related with the Fan Speed properties and communication objects.

### 4.4.1 DPT object type for fan speed

With this parameter is possible to change de DPT for the *Control\_ Fan Speed* and *Status\_ Fan Speed* byte-type communication objects. Datapoints Scaling (DPT\_5.001) and Enumerated (DPT\_5.010) can be selected.

**NOTE:** Remember that Fan Speeds are selected in the AC supported features tab (see section 4.2.2).

- When **"Enumerated [DPT 5.010]"** is selected, *Control\_ Fan Speed* and *Status\_ Fan Speed* communication objects for this DPT will appear. Also, depending on the number of fan speeds selected, these objects will be different.

11: Control\_ Fan Speed [DPT\_5.010] - Speed values: 1,2 || 1,2,3

32: Status\_ Fan Speed [DPT\_5.010] - Speed values: 1,2 || 1,2,3

If this DPT is selected with 2 fan speeds:

The first fan speed will be selected if a "1" is sent to the *Control\_* object. The second fan speed will be selected sending a "2".

The *Status\_* object will always return the value for the fan speed selected.

If this DPT is selected with 3 fan speeds:

The first fan speed will be selected if a "1" is sent to the *Control\_* object. The second one will be selected sending a "2", and the last one sending a "3".

The *Status\_* object will always return the value for the fan speed selected.

**⚠ Important:** In both cases if a "0" value is sent to the *Control\_* object, the minimum fan speed will be selected. If a value bigger than "2" (in case of 2 speeds) or bigger than "3" (in case of 3 fan speeds) is sent to the *Control\_* object, then the maximum fan speed will be selected.

- When "Scaling [DPT 5.001]" is selected, *Control\_ Fan Speed* and *Status\_ Fan Speed* communication objects for this DPT will appear. Also, depending on the number of fan speeds selected, these objects will be different.

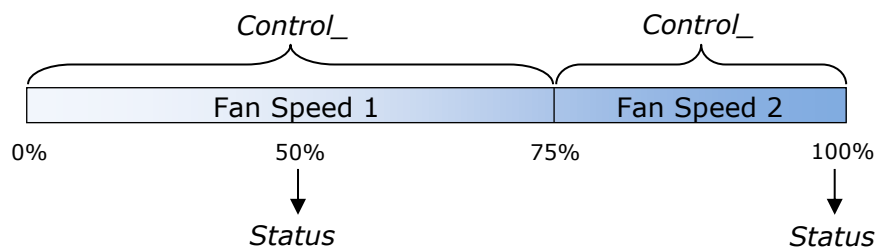
If this DPT is selected with 2 fan speeds:

- ➡ 11: *Control\_ Fan Speed [DPT\_5.001]* - Thresholds: 75% || 50% and 83%
- ➡ 32: *Status\_ Fan Speed [DPT\_5.001]* - 50% and 100% || 33%, 66% and 100%

When a value between **0%** and **74%** is sent to the *Control\_* object the first fan speed will be selected.

When a value between **75%** and **100%** is sent to the *Control\_* object, the second speed will be selected.

The *Status\_* object will return a **50%** for the first fan speed, and a **100%** for the second one.



If this DPT is selected with 3 fan speeds:

- ➡ 12: *Control\_ Fan Speed / 3 Speeds [DPT\_5.001 - 1byte]* - Thresholds: 50% and 83%
- ➡ 52: *Status\_ Fan Speed / 3 Speeds [DPT\_5.001 - 1byte]* - 33%, 66% and 100%

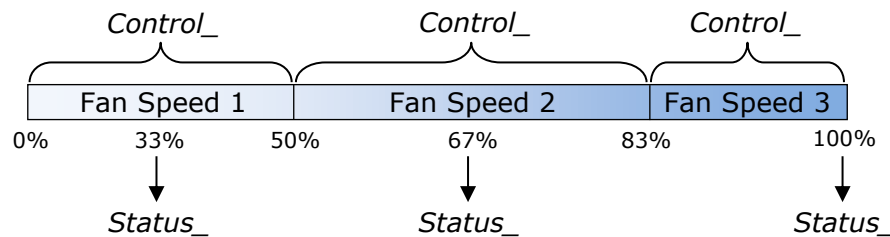


When a value between **0%** and **49%** is sent to the *Control\_* object the first fan speed will be selected.

When a value between **50%** and **83%** is sent to the *Control\_* object, the second speed will be selected.

When a value between **84%** and **100%** is sent to the *Control\_* object, the third speed will be selected.

The *Status\_* object will return a **33%** when the first speed is selected, a **67%** for the second one and a **100%** for the third one.



#### 4.4.2 Enable use of +/- object for Fan Speed

This parameter shows/hides the *Control\_ Fan Speed +/-* communication object which lets you increase/decrease the indoor unit fan speed by using two different datapoint types.

➡ 16: Control\_ Fan Speed +/- [DPT\_1.008 - 1bit] - 0-Up;1-Down

- If set to **"no"** the object will not be shown.
- If set to **"yes"** the *Control\_ Fan Speed +/-* object and a new parameter will appear.

Enable use of +/- object for Fan Speed	Enabled
> Fan speed +/- operation	0-Decrease / 1-Increase [DPT_1.007]
> Sequence for +/- object	Auto > S1 > S2 > ... > SN

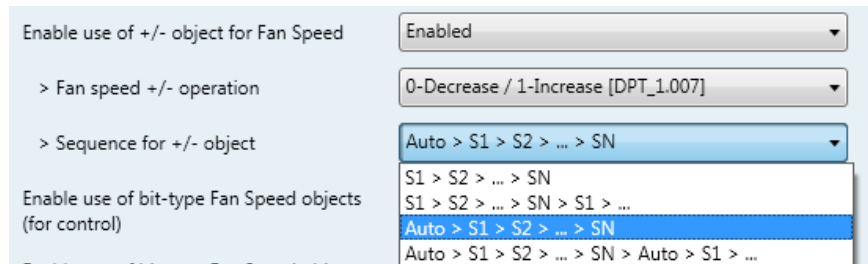
**Figure 4.19** Parameter detail

##### ➤ Fan speed +/- operation

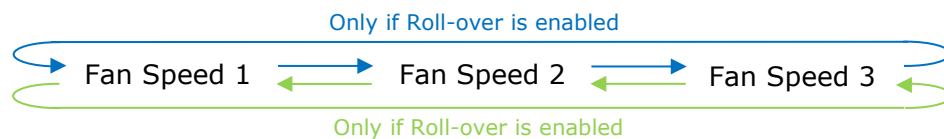
This parameter lets choose between the datapoints **0-Up / 1-Down [DPT\_1.008]** and **0-Decrease / 1-Increase [DPT\_1.007]** for the *Control\_ Fan Speed +/-* object.

##### ➤ Sequence for +/- object

This parameter lets choose between the different modes available:



- **S1>S2>....>SN**  
Select this option if you don't have Auto mode and you don't want roll-over to be enabled.
- **S1>S2>....>SN>S1>...**  
Select this option if you don't have Auto mode and you want roll-over to be enabled.
- **Auto>S1>S2>....>SN**  
Select this option if you have Auto mode and you don't want roll-over to be enabled.
- **Auto>S1>S2>....>SN>Auto>S1>...**  
Select this option if you have Auto mode and you want roll-over to be enabled.



- Up / Increase
- Down / Decrease

#### 4.4.3 Enable use of bit-type Fan Speed objects (for Control)

This parameter shows/hides the bit-type *Control\_ Fan Speed* objects.

- 13: Control\_ Fan Speed 1 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 1
- 14: Control\_ Fan Speed 2 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 2
- 15: Control\_ Fan Speed 3 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 3

- If set to **"no"** the objects will not be shown.
- If set to **"yes"** the *Control\_ Fan Speed* objects for Speed 1, Speed 2 and Speed 3 (if available) will appear. To activate a Fan Speed by using these objects a **"1"** value has to be sent.

#### 4.4.4 Enable use of bit-type Fan Speed objects (for Status)

This parameter shows/hides the bit-type *Status\_ Fan Speed* objects.

- 34: Status\_ Fan Speed 1 [DPT\_1.002 - 1bit] - 1-Fan in speed 1
- 35: Status\_ Fan Speed 2 [DPT\_1.002 - 1bit] - 1-Fan in speed 2
- 36: Status\_ Fan Speed 3 [DPT\_1.002 - 1bit] - 1-Fan in speed 3

- If set to **"no"** the objects will not be shown.
- If set to **"yes"** the *Status\_ Fan Speed* objects for Speed 1, Speed 2 and Speed 3 (if available) will appear. When a Fan Speed is enabled, a **"1"** value is returned through its bit-type object.

#### 4.4.5 Enable use of Text object for Fan Speed

This parameter shows/hides the *Status\_ Fan Speed Text* communication object.

- 37: Status\_ Fan Speed Text [DPT\_16.001 - 14byte] - ascii string

- If set to **"no"** the object will not be shown.
- If set to **"yes"** the *Status\_ Fan Speed Text* object will appear. Also, in the parameters, will be shown two (or three, depending on the number of fan speeds selected) text fields, one for each Fan Speed, that will let modify the text string displayed by the *Status\_ Fan Speed Text* when changing a fan speed.

> String when fan speed is AUTO (if available)	AUTO
> String when fan speed is 1	SPEED 1
> String when fan speed is 2	SPEED 2
> String when fan speed is 3 (if available)	SPEED 3

**Figure 4.20** Parameter detail

### 4.5 Global Vanes U-D configuration

Device: 1.1.1 MD-AC-KNX

- General configuration
- AC supported features
- Global Mode configuration
- Global Fan Speed configuration
- Global Vanes U-D configuration
- Global Temperature configuration
- Remote Lock Configuration
- Addressing of Indoor Units
- License

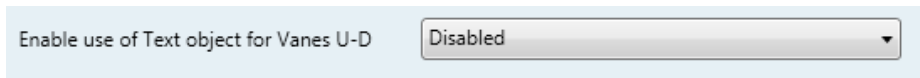
Enable use of Text object for Vanes U-D Disabled ▾

**Figure 4.21** Vane Up-Down configuration dialog

All the parameters in this section are related with the Vane Up-Down properties and communication objects.

### 4.5.1 Enable use of Text object for Vanes U-D

This parameter lets you choose if you want to use a Text object to determine the U-D vanes position.



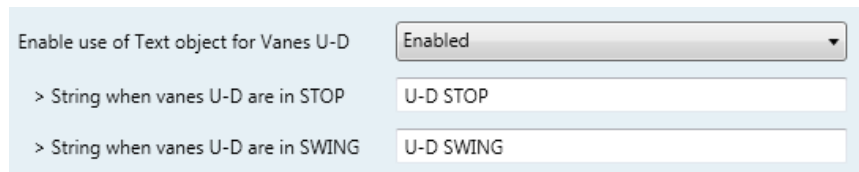
**Figure 4.22** Parameter detail

- If set to **“Disabled”** the only communication objects for the Up-Down Vanes shown will be

- 17: Control\_Vanes U-D Swing [DPT\_1.002 - 1bit] - 0-Off;1-Swing
- 38: . Status\_Vanes U-D Swing [DPT\_1.002] - 0-Stop;1-Swing

- If set to **“Enabled”** the parameters and communication objects (if enabled in the parameters dialog) for the Up-Down Vanes will be shown.

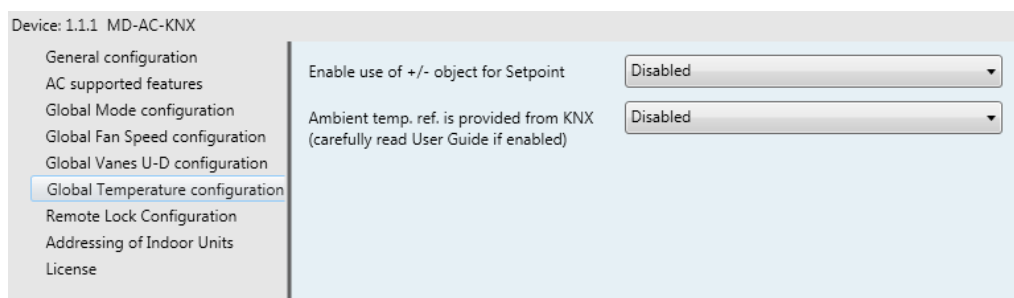
○



- 39: . Status\_Vanes U-D Text [DPT\_16.001] - Vanes Text

**⚠ Important:** Read the documentation of your indoor unit to check if Up-Down Vanes are available.

## 4.6 Global temperature configuration



**Figure 4.20** Default Temperature Configuration dialog

All the parameters in this section are related with the Temperature properties and communication objects.

### 4.6.1 Enable use of +/- obj for Setpoint

This parameter shows/hides the *Control\_Setpoint Temp +/-* communication object which lets you change the indoor unit setpoint temperature by using two different datapoint types.

➤ 19: Control\_Setpoint Temp +/- [DPT\_1.008 - 1bit] - 0-Up;1-Down





- If set to **"no"** the object will not be shown.
- If set to **"yes"** the *Control\_Setpoint Temp +/-* object and a new parameter will appear.

Enable use of +/- obj for Setp Temp	yes
> DPT type for +/- Setp Temp object	0-Up / 1-Down [DPT_1.008]

Figure 4.23 Parameter detail

#### ➤ DPT type for +/- Setp Temp object

This parameter lets choose between the datapoints **0-Up / 1-Down [DPT\_1.008]** and **0-Decrease / 1-Increase [DPT\_1.007]** for the *Control\_Setpoint Temp +/-* object.

(Lower limit) **16°C**  17°C  ...  31°C  **32°C** (Upper limit)

- Up / Increase
- Down / Decrease

### 4.6.2 Ambient Ref. Temp. is provided from KNX

This parameter shows/hides the *Control\_Ambient Temperature* communication object which lets you use an ambient temperature reference provided by a KNX device.

➤ 20: Control\_Ambient Temperature [DPT\_9.001 - 2byte] - °C

- If set to **"no"** the object will not be shown.
- If set to **"yes"** the *Control\_Ambient Temperature* object will appear. Meant to be enabled when you want the temperature provided by a KNX sensor to be the reference ambient temperature for the air conditioner. Then, the following formula applies for the calculation of real *Control\_Setpoint Temperature* sent of the AC unit:

"AC Setp. Temp" = "Ambient ref. Temp" - ("KNX Amb. Temp." - "KNX Setp Temp.")

- AC Setp. Temp: AC indoor unit setpoint temperature
- Ambient Ref. Temp: AC indoor unit return temperature
- KNX Amb. Temp.: Ambient temperature provided from KNX
- KNX Setp. Temp: Setpoint temperature provided from KNX

As an example, consider the following situation:

User wants: **19°C** ("KNX Setp. Temp.")

User sensor (a KNX sensor) reads: **21°C** ("KNX Amb Temp.")

Ambient temp. read by Midea system is: **24°C** ("Ambient Ref. Temp")

In this example, the final setpoint temperature that MD-AC-KNX-1B/16/64 will send out to the indoor unit (shown in "Setp. Temp.") will become  $24^{\circ}\text{C} - (21^{\circ}\text{C} - 19^{\circ}\text{C}) = 22^{\circ}\text{C}$ . This is the setpoint that will actually be requested to Midea unit.

This formula will be applied as soon as the *Control\_Setpoint Temperature* and *Control\_Ambient Temperature* objects are written at least once from the KNX installation. After that, they are kept always consistent.

Note that this formula will always drive the AC indoor unit demand in the *right* direction, regardless of the operation mode (Heat, Cool or Auto).

## 4.7 Remote Lock Configuration

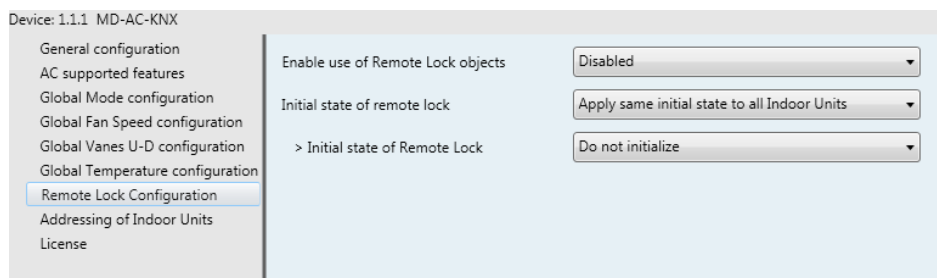


Figure 4.24 Parameter detail

All the parameters in this section are related to each AC unit and its Remote Control commands.

### 4.7.1 Enable Remote Lock Objects

This parameter is used to show or hide the remote lock objects related to each indoor unit.

- 21 AC01 Control\_Remote Lock On/Off [DPT\_1.003] - 0-Disable;1-Enable
- 45 AC01 Status\_Remote Lock On/Off [DPT\_1.003] - 0-Disable;1-Enable

Figure 4.24 Communication objects shown regarding Remote Lock Objects

### 4.7.2 Initial state of remote lock

This parameter determines the remote lock status when initializing the gateway.

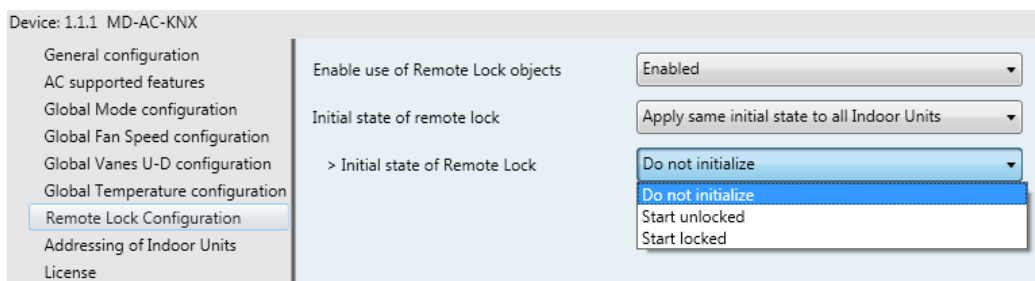


Figure 4.23 Parameter detail

- If set to **"Apply same initial state to all Indoor Units"**, the same initial status will be applied to all indoor units.

- If set to **“Initial state for each Indoor Unit might differ”**, different initial status may be defined for each indoor unit individually.

In both cases, there are 3 different initial statuses:

- Do not initialize: The MD-AC-KNX-1B/16/64 will not modify the current status after a gateway re-start.
- Start Unlocked: The MD-AC-KNX-1B/16/64 will set the remote lock to “unlocked” after a gateway re-start.
- Start Locked: The MD-AC-KNX-1B/16/64 will set the remote lock to “locked” after a gateway re-start.

## 4.8 Addressing of Indoor Units

The screenshot shows a configuration window for 'Device: 1.1.1 MD-AC-KNX'. On the left is a navigation menu with options: General configuration, AC supported features, Global Mode configuration, Global Fan Speed configuration, Global Vanes U-D configuration, Global Temperature configuration, Remote Lock Configuration, Addressing of Indoor Units (highlighted), and License. The main area displays a list of indoor units from AC01 to AC10. Each unit has a text label 'Address of AC01' through 'Address of AC10', a numeric input field with the value 0 through 9, and a small 'OK' button to the right of each field.

Figure 4.24 Parameter detail

In this section you will be able to modify the AC addressing for each AC unit present in the configuration.

## 4.9 License

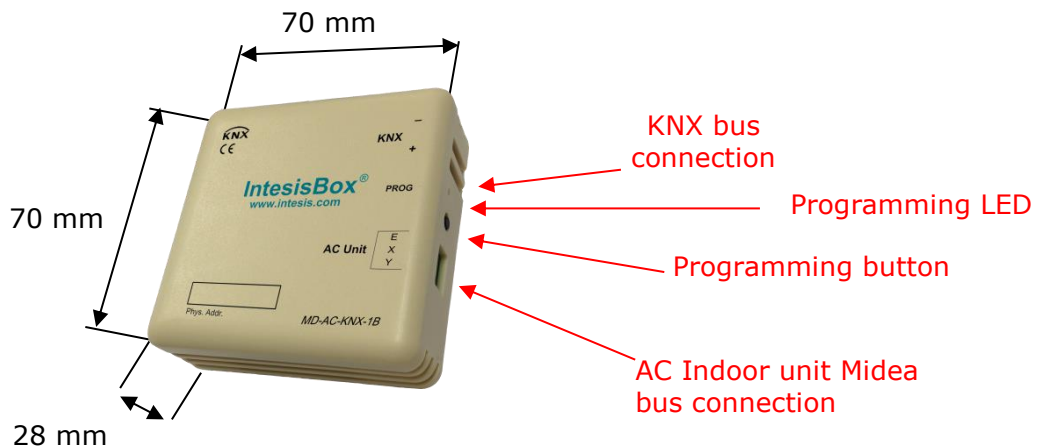
The screenshot shows a configuration window for 'Device: 1.1.1 MD-AC-KNX'. On the left is a navigation menu with options: General configuration, AC supported features, Global Mode configuration, Global Fan Speed configuration, Global Vanes U-D configuration, Global Temperature configuration, Remote Lock Configuration, Addressing of Indoor Units, and License (highlighted). The main area is titled 'Activation Code' and contains a single large text input field.

Figure 4.24 Parameter detail

Use this section to introduce the migration code in case you need to update your box from another version different from the factory default one.

## 5 Specifications

<b>Envelope</b>	ABS (UL 94 HB). 2,5 mm thickness
<b>Dimensions</b>	59 x 36 x 21 mm
<b>Weight</b>	42g
<b>Color</b>	Light grey
<b>Power supply</b>	29V DC, 7mA Supplied through KNX bus.
<b>LED indicators</b>	1 x KNX programming/bus.
<b>Push buttons</b>	1 x KNX programming.
<b>Configuration</b>	Configuration with ETS.
<b>Operating Temperature</b>	From 0°C to 40°C
<b>Storage Temperature</b>	From -40°C to 85°C
<b>Isolation Voltage</b>	4000V
<b>RoHS conformity</b>	Compliant with RoHS directive (2002/95/CE).
<b>Certifications</b>	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) EN 61000-6-2 EN 61000-6-3 EN 60950-1 EN 50491-3





## 6 AC Unit Types compatibility.

A list of Midea indoor unit model references compatible with MD-AC-KNX-1B/16/64 and their available features can be found in:

[http://intesis.com/pdf/IntesisBox\\_MD-AC-xxx-MIU\\_AC\\_Compatibility.pdf](http://intesis.com/pdf/IntesisBox_MD-AC-xxx-MIU_AC_Compatibility.pdf)

## 7 Error Codes

Error Code KNX Object	Error in Remote Controller	Error Name
1	E0	Phase error or error in the phase sequence
2	E1	Communication error
3	E2	T1 sensor error
4	E3	T2A sensor error
5	E4	T2B sensor error
6	E5	T3 temperature and T4 temperature Compressor discharge temperature sensors error
7	E6	Zero cross error detection
8	E7	EEPROM memory error
9	E8	Indoor fan speed out of control
10	E9	Communication error between the main panel and the visualization panel
11	EA	Compressor's current overload error (4 times)
12	EB	Inverter module protection
13	EC	Cooling error
14	ED	Outdoor unit fault protection
15	EE	Water level fault detection
16	EF	Other errors
101	P0	Vaporizer temperature protection
102	P1	Thawing or cold air protection
103	P2	Condenser high temperatures protection
104	P3	Compressor temperature protection
105	P4	Evacuation duct temperature protection
106	P5	Discharge high pressure protection
107	P6	Discharge low pressure protection
108	P7	Current overload or under load protection
109	P8	Compressor's current overload protection
110	P9	Reserved
111	PA	Reserved
112	PB	Reserved
113	PC	Reserved
114	PD	Reserved
115	PE	Reserved
116	PF	Other protection measures
-1	-	Communication error between MD-AC-KNX-1B/16/64 and Indoor Unit
-100	-	Licence error / Indoor units not supported by current license
-200	-	Overconsumption error in EXY bus

In case you detect an error code not listed, contact your nearest Midea technical support service for more information on the error meaning.

## Appendix A – Communication Objects Table

SECTION	OBJECT NUMBER	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
				DPT_NAME	DPT_ID	R	W	T	U	
On/Off	1	Control_ On/Off	1 bit	DPT_Switch	1.001		W	T		0 - Off; 1-On
Mode	2	Control_ Operating Mode	1 byte	DPT_HVACMode	20.102		W	T		0 - Auto; 1 - Com; 2 - Stan; 3 - Eco; 4 - Pro
	3	Control_ Mode	1 byte	DPT_HVACControl	20.105		W	T		0 - Auto; 1 - Heat; 3 - Cool; 9 - Fan; 14 - Dry
	4	Control_ Mode Cool/Heat	1 bit	DPT_Cool/Heat	1.100		W	T		0 - Cool; 1 - Heat
	5	Control_ Mode Auto	1 byte	DPT_Scaling	5.001		W	T		1 - Auto
	6	Control_ Mode Heat	1 byte	DPT_Scaling	5.001		W	T		1 - Heat
	7	Control_ Mode Cool	1 bit	DPT_Bool	1.002		W	T		1 - Cool
	8	Control_ Mode Fan	1 bit	DPT_Bool	1.002		W	T		1 - Dry
	9	Control_ Mode Dry	1 bit	DPT_Bool	1.002		W	T		1 - Fan
	10	Control_ Mode +/-	1 bit	DPT_Step	1.007		W			0 - Decrease; 1 - Increase
		Control_ Mode +/-	1 bit	DPT_UpDown	1.008		W			0 - Up; 1 - Down
Fan Speed	11	Control_ Fan Speed / 2 Speeds	1 byte	DPT_Scaling	5.001		W	T		0%-74% - Speed 1; 75%-100% - Speed 2
		Control_ Fan Speed / 3 Speeds	1 byte	DPT_Scaling	5.001		W	T		0%-49% - Speed 1; 50%-83% - Speed 2; 84%-100% Speed 3
		Control_ Fan Speed / 2 Speeds	1 byte	DPT_Enumerated	5.010		W	T		1 - Speed 1; 2 - Speed 2
		Control_ Fan Speed / 3 Speeds	1 byte	DPT_Enumerated	5.010		W	T		1 - Speed 1; 2 - Speed 2; 3 Speed 3
	12	Control_ Fan Speed Man/Auto	1 bit	DPT_Bool	1.002		W	T		0 - Manual; 1 - Auto
	13	Control_ Fan Speed 1	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 1

	<b>14</b>	Control_ Fan Speed 2	1 bit	DPT_Bool	1.002		W	T	1 - Fan Speed 2
	<b>15</b>	Control_ Fan Speed 3	1 bit	DPT_Bool	1.002		W	T	1 - Fan Speed 3
	<b>16</b>	Control_ Fan Speed +/-	1 bit	DPT_Step	1.007		W	T	0 - Decrease; 1 - Increase
		Control_ Fan Speed +/-	1 bit	DPT_UpDown	1.008		W	T	0 - Up; 1 - Down
<b>Vanes</b>	<b>17</b>	Control_ Vanes U-D Swing	1 bit	DPT_Bool	1.002		W	T	0 - Off; 1 - Swing
<b>Temperature</b>	<b>18</b>	Control_ Setpoint Temperature	2 byte	DPT_Value_Temp	9.001		W	T	17°C to 30°C
	<b>19</b>	Control_ Setpoint Temp +/-	1 bit	DPT_Step	1.007		W		0 - Decrease; 1 - Increase
		Control_ Setpoint Temp +/-	1 bit	DPT_UpDown	1.008		W		0 - Up; 1 - Down
	<b>20</b>	Control_ Ambient Temperature	2 byte	DPT_Value_Temp	9.001		W	T	°C value in EIS5 format
<b>Locking</b>	<b>21</b>	Control_ Control Remote Lock	1 bit	DPT_Bool	1.003		W	T	0 - Unlocked; 1 - Locked

<b>On/Off</b>	<b>22</b>	Status_ On/Off	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
<b>Mode</b>	<b>23</b>	Status_ Operating Mode	1 byte	DPT_HVACMode	20.102	R		T	0 - Auto; 1 - Com; 2 - Stan; 3 - Eco; 4 - Pro
	<b>24</b>	Status_ Mode	1 byte	DPT_HVACContrMode	20.105	R		T	0 - Auto; 1 - Heat; 3 - Cool; 9 - Fan; 14 - Dry
	<b>25</b>	Status_ Mode Cool/Heat	1 bit	DPT_Heat/Cool	1.100	R		T	0 - Cool; 1 - Heat
	<b>26</b>	Status_ Mode Auto	1 bit	DPT_Bool	1.002	R		T	1 - Auto
	<b>27</b>	Status_ Mode Heat	1 bit	DPT_Bool	1.002	R		T	1 - Heat
	<b>28</b>	Status_ Mode Cool	1 bit	DPT_Bool	1.002	R		T	1 - Cool
	<b>29</b>	Status_ Mode Fan	1 bit	DPT_Bool	1.002	R		T	1 - Fan
	<b>30</b>	Status_ Mode Dry	1 bit	DPT_Bool	1.002	R		T	1 - Dry
	<b>31</b>	Status_ Mode Text	14 byte	DPT_String_8859_1	16.001	R		T	ASCII String

Fan Speed	32	Status_ Fan Speed / 2 Speeds	1 byte	DPT_Scaling	5.001	R		T	50% - Speed 1; 100% - Speed 2
		Status_ Fan Speed / 3 Speeds	1 byte	DPT_Scaling	5.001	R		T	33% - Speed 1; 67% - Speed 2; 100% - Speed 3
		Status_ Fan Speed / 2 Speeds	1 byte	DPT_Enumerated	5.010	R		T	1 - Speed 1; 2 - Speed 2
		Status_ Fan Speed / 3 Speeds	1 byte	DPT_Enumerated	5.010	R		T	1 - Speed 1; 2 - Speed 2; 3 - Speed 3
	33	Status_ Fan Speed Man/Auto	1 bit	DPT_Bool	1.002	R		T	0 - Manual; 1 - Auto
	34	Status_ Fan Speed 1	1 bit	DPT_Bool	1.002	R		T	1 - Speed 1
	35	Status_ Fan Speed 2	1 bit	DPT_Bool	1.002	R		T	1 - Speed 2
Vanes	36	Status_ Fan Speed 3	1 bit	DPT_Bool	1.002	R		T	1 - Speed 3
	37	Status_ Fan Speed Text	14 byte	DPT_String_8859_1	16.001	R		T	ASCII String
Temperature	38	Status_ Vane U-D Swing	1 bit	DPT_Bool	1.002	R		T	0 - Stop; 1 - Swing
	39	Status_ Vane U-D Text	1 bit	DPT_Bool	1.002	R		T	ASCII String
Error	40	Status_ AC Setpoint Temp	2 byte	DPT_Value_Temp	9.001	R		T	16°C to 32°C
	41	Status_ AC Ambient Ref Temp	2 byte	DPT_Value_Temp	9.001	R		T	°C value in EIS5 format
	42	Status_ Error/Alarm	1 bit	DTP_Alarm	1.005	R		T	0 - No Alarm; 1 - Alarm
Remote Lock	43	Status_ Error Code	2 byte	Enumerated		R		T	0 - No Error; Any other see user's manual
	44	Status_ Error Text code	14 byte	DPT_String_8859_1	16.001	R		T	2 char MD Error; Empty - none
	45	Status_ Remote Lock	1 bit	DPT_Bool	1.003		W	T	0 - Unlocked; 1 - Locked