

# MITSUBISHI HEAVY INDUSTRIES VRF & FD SYSTEMS GATEWAY USER MANUAL



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**Product Code** : CR-CG-MHI-KNX-01

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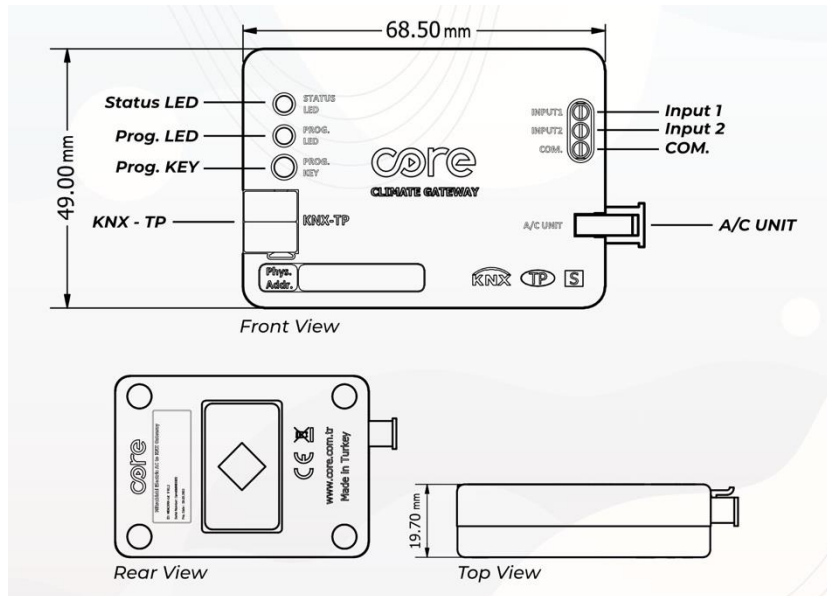
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## 1. PRESENTATION

Core KNX-MHI Gateway allows to monitor and control of Mitsubishi Heavy Industries air conditioners via KNX Systems. HVAC Compatibility List can be downloaded from:

<https://core.com.tr/ac-knx-gateways/>

## DIMENSIONS



## MAIN FEATURES

- Reduced dimensions of 68.5mm x 49mm x 19.7mm, it can easily fit inside the indoor units. With the cable that comes with the device, a quick and faultless installation can be done.
- Can be configured with the standard ETS application.
- With different KNX DPT (Bit, Byte) objects, it can work in harmony with most of the KNX thermostats in the market.
- Indoor unit's setpoint temperature, operation mode, fan speed, vane controls, ... functions can be controlled bidirectionally and their status can be monitored.
- A more efficient air conditioning can be achieved by sending the ambient temperature provided by product groups such as thermostats, switches, etc. containing ambient temperature sensors to the indoor unit.
- Error codes on the indoor unit can be reported.
- With the help of fixing apparatus and internal magnets that come with the device, precise installation can be done.
- To prevent wrong or faulty connections, industrial grade connector type is selected with pin-matching structure.

## 2. DEVICE CONNECTION AND CONFIGURATION

### 2.1. CONNECTION

The device comes with a cable for direct connection to the related terminals of the Air Conditioner Indoor Unit.

- ⚠ The device should not be connected to the air conditioner with any cable rather than the one that comes with it.

#### CONNECTION TO THE INDOOR UNIT:

- Disconnect the main power from the AC unit.
- Open the internal controller board.
- Find the **X,Y** terminals
- Connect **Yellow and Green** cables on the installation cable supplied with the device to X and Y terminals on the air conditioner (cables can be connected in any direction due to no polarity), and the black connector to the A/C Unit connector of the device.

- ⚠ Cutting the cable, shortening it or making any other physical modifications may cause the device not to work properly.

#### CONNECTION TO THE KNX BUS:

- Disconnect power of the KNX bus.
- Connect to the KNX TP-1 (EIB) Bus Line using the device's standard KNX connector (red/black), respect polarity.
- Reconnect power of the KNX bus.

#### CONNECTION DIAGRAM:



### 2.2. CONFIGURATION

Core KNX-DK Gateway is a fully compatible KNX device that must be configured and set up using the standard KNX configuration tool ETS. The ETS database for this device can be downloaded from:

<https://core.com.tr/ac-knx-gateways/>

### 3. ETS PARAMETERS

#### 3.1. INTRODUCTION

Following group objects are accessible by default when the device project is loaded into the ETS application, or the device is included in an existing project.

- 1.1.- CR-CG-MHI-KNX-01
  - ↕ 1: Control\_On/Off [DPT\_1.001 - 1bit] - 0-Off; 1-On
  - ↕ 3: Control\_Setpoint\_Temperature [DPT\_9.001 - 2byte] - (°C)
  - ↕ 2: Status\_On/Off [DPT\_1.001 - 1bit] - 0-Off; 1-On
  - ↕ 4: Status\_Setpoint\_Temperature [DPT\_9.001 - 2byte] - (°C)
  - ↕ 12: Status\_AC\_Return\_Temp [DPT\_9.001 - 2byte] - (°C)
  - ↕ 5: Control\_Mode [DPT\_20.105 - 1byte] - 0-Auto; 1-Heat; 3-Cool; 9-Fan; 14-Dry
  - ↕ 6: Status\_Mode [DPT\_20.105 - 1byte] - 0-Auto; 1-Heat; 3-Cool; 9-Fan; 14-Dry
  - ↕ 7: Control\_Fan\_Speed / 4 Speeds [DPT\_5.100 - 1byte] - Speed Values: 1,2,3,4
  - ↕ 8: Status\_Fan\_Speed / 4 Speeds [DPT\_5.100 - 1byte] - Speed Values: 1,2,3,4

With the default group objects and specified data types, basic functions such as on/off, control modes, fan speed, target temperature and ambient temperature of the indoor unit can be controlled, and their instantaneous values can be read.

#### 3.2. GENERAL

This tab contains the following parameter settings. ETS product file, installation and user manuals are accessible via the specified web address.

**1.1.- CR-CG-MHI-KNX-01 > General**

<p><b>General</b></p> <ul style="list-style-type: none"> <li>Mode Configuration</li> <li>Fan Configuration</li> <li>Vanes Up-Down Configuration</li> <li>Temperature Configuration</li> <li>Input Configuration</li> </ul>	<p>For more Information, User Manual &amp; Latest Database Entry <a href="http://www.core.com.tr">www.core.com.tr</a></p> <p>Core_MHI_AC_Int is configured as Master? <input checked="" type="radio"/> Yes <input type="radio"/> No</p> <p>Enable Object "Error Code [2Byte]" <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Enable Object "Error Code [1bit]" <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Alive Beacon <input type="radio"/> Yes <input checked="" type="radio"/> No</p>
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### 3.2.1 MASTER/SLAVE

With this parameter, it is selected whether Core KNX-MHI gateway or wired remote controller of air conditioner (if used) will be the master. If Core KNX-MHI gateway is selected as master, wired remote controller must be in slave mode. If wired remote controller will not be used, Core KNX-MHI gateway must be selected as master. By default, Core KNX-MHI gateway is selected as master.

### INSTALLATION WITH DAIKIN WIRED REMOTE CONTROLLERS

Connect Core KNX-MHI Gateway parallel with Mitsubishi Heavy Industries wired remote controllers. In this method, Mitsubishi Heavy Industries wired remote controller should be programmed as master, while Core KNX-MHI Gateway programmed as slave.

### INSTALLATION WITHOUT DAIKIN WIRED REMOTE CONTROLLERS

Connect Core KNX-MHI Gateway directly to the X,Y connectors of the Mitsubishi Heavy Industries indoor unit. In this scenario, Core KNX-MHI Gateway must be programmed as Master.

### 3.2.2 ENABLE OBJECT “ERROR CODE [2BYTE]”

Error conditions that may occur on the indoor unit can be read through this group object. It is disabled by default. When enabled,

```
13: Status_Error_Code [2byte] - 0-No Error / Any other see man.
```

Group object becomes available for use. A value of '0' means that there is no error. Possible error codes are given in Appendix-2.

### 3.2.3 ENABLE OBJECT “ERROR CODE [1BIT]”

Error conditions that may occur on the indoor unit can be read through this group object. It is disabled by default. When enabled,

```
39: Error_Code/Alarm [DPT_1.005 - 1bit] - 0-No Error
```

Group object becomes available for use. A value of '0' means that there is no error.

### 3.2.4 ALIVE BEACON

Parameter used to observe that the device and the application are running. It is disabled by default. When activated,

Alive Beacon  Yes  No

Alive Beacon Timer(ms)

Blue segment of the Programming LED will flash with the defined millisecond time interval.

### 3.3. MODE CONFIGURATION

Contains the parameters related to the operating modes of the indoor unit. Default parameter settings are as specified.

**1.1.- CR-CG-MHI-KNX-01 > Mode Configuration**

General	Indoor Unit has Fan mode?	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>Mode Configuration</b>	Enable Mode Cool/Heat Objects (Control&Status)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Fan Configuration	Enable Mode Bit-Type Objects (Control&Status)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Vanes Up-Down Configuration		
Temperature Configuration		
Input Configuration		

```

5: Control_Mode [DPT_20.105 -1byte] - 0-Aut;1-Heat;3-Coo;9-Fan;14-Dry
6: Status_Mode [DPT_20.105 -1byte] - 0-Aut;1-Heat;3-Coo;9-Fan;14-Dry
    
```

With the values written to DPT 20.105 Byte type Control\_Mode group object, '0' Auto, '1' Heating, '3' Cooling, '9' Fan and '14' Dry/Dehumidification mode can be activated. When the indoor unit switches to the specified operating mode, feedback will be sent via Status\_Mode group object. Operation mode info can also be obtained by reading the same group object.

#### 3.3.1 INDOOR UNIT HAS FAN MODE

If there is no 'FAN' mode among the operation modes of the indoor unit connected to the gateway device, this mode can be disabled with the specified parameter. By default, 'FAN' mode is marked as active.

 For detailed information about the operating modes of your indoor unit, please review your product manual.

#### 3.3.2 ENABLE MODE COOL/HEAT OBJECTS

With this parameter, group object that allows switching between Heating and Cooling modes can be activated. It is disabled by default. When enabled, following group objects become available.

```

14: Control_Mode_Cool/Heat [DPT_1.100 - 1bit] - 0-Cool; 1-Heat
15: Status_Mode_Cool/Heat [DPT_1.100 - 1bit] - 0-Cool; 1-Heat
    
```

Cooling mode can be activated with the value '0' written to the 1-Bit Control\_Mode group object. When the indoor unit switches to the specified operating mode, a feedback with the value '0' will be sent via the Status\_Mode object.

Heating mode can be activated with the '1' value written to the 1-Bit Control\_Mode group object. When the indoor unit switches to the specified operating mode, a feedback with the value '1' will be sent via the Status\_Mode object.

### 3.3.3 ENABLE MODE BIT-TYPE OBJECTS

With this parameter, 1-Bit group objects can be activated for each operating mode. It is disabled by default. When enabled, the specified group objects become available.

- ➡ 18: Control\_Mode\_Auto [DPT\_1.002 - 1bit] - 1-Set AUTO mode
- ➡ 19: Status\_Mode\_Auto [DPT\_1.002 - 1bit] - 1-AUTO mode is active
- ➡ 20: Control\_Mode\_Heat [DPT\_1.002 - 1bit] - 1-Set HEAT mode
- ➡ 21: Status\_Mode\_Heat [DPT\_1.002 - 1bit] - 1-HEAT mode is active
- ➡ 22: Control\_Mode\_Cool [DPT\_1.002 - 1bit] - 1-Set COOL mode
- ➡ 23: Status\_Mode\_Cool [DPT\_1.002 - 1bit] - 1-COOL mode is active
- ➡ 24: Control\_Mode\_Fan [DPT\_1.002 - 1bit] - 1-Set FAN mode
- ➡ 25: Status\_Mode\_Fan [DPT\_1.002 - 1bit] - 1-FAN mode is active
- ➡ 26: Control\_Mode\_Dry [DPT\_1.002 - 1bit] - 1-Set DRY mode
- ➡ 27: Status\_Mode\_Dry [DPT\_1.002 - 1bit] - 1-DRY mode is active

The specified operating mode can be activated with the value '1' written to the 1-Bit Control\_Mode group object which belongs to the relevant operating mode. When the indoor unit switches to the specified operation mode, a feedback with the value of '1' will be sent via the relevant Status\_Mode object.

## 3.4. FAN CONFIGURATION

This tab contains the parameters related to the Fan Speed controls of the indoor unit. Default parameter settings are as specified.

**1.1.- CR-CG-MHI-KNX-01 > Fan Configuration**

General	Fan is Accessible in Indoor Unit	<input checked="" type="radio"/> Yes <input type="radio"/> No
Mode Configuration	Indoor Unit has Auto Fan Speed?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<b>Fan Configuration</b>	Available Fan Speeds in Indoor Unit	<input style="width: 100%;" type="text" value="4"/>
Vanes Up-Down Configuration	Fan Speed DPT Object Type	<input checked="" type="radio"/> Enumerated <input type="radio"/> Scaling
Temperature Configuration	Enable use of Bit-type Fan Speed Objects (Control&Status)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Input Configuration	Enable +/- objects for Fan Speed	<input type="radio"/> Yes <input checked="" type="radio"/> No



### 3.4.1 FAN IS ACCESSIBLE IN INDOOR UNIT

This parameter lets choose if the indoor unit has Fan Speed controls available or not.

When disabled, all parameters and group objects related to Fan Speed controls will also be disabled. It is enabled by default and the specified group objects are available for use.

- ↕ 7: Control\_Fan\_Speed / 4 Speeds [DPT\_5.100 - 1byte] - Speed Values: 1,2,3,4
- ↕ 8: Status\_Fan\_Speed / 4 Speeds [DPT\_5.100 - 1byte] - Speed Values: 1,2,3,4

### 3.4.2 INDOOR UNIT HAS AUTO FAN SPEED

With this parameter, if there is an Automatic mode for the Fan Speed, it can be activated. It is disabled by default. When enabled, Automatic Fan Speed can be activated with the value '0' written to the 1-Byte Control\_Fan\_Speed group object of the relevant Fan Speed. When the indoor unit switches to Automatic Fan Speed, a feedback with the value '0' will be sent via the related Status\_Fan\_Speed object.

- ↕ 7: Control\_Fan\_Speed / 3 Speeds [DPT\_5.010 - 1byte] - Speed Values;0,1,2,3
- ↕ 8: Status\_Fan\_Speed / 3 Speeds [DPT\_5.010 - 1byte] - Speed Values;0,1,2,3

Or

- ↕ 7: Control\_Fan\_Speed / 3 Speeds [DPT\_5.001 -1byte] - 0-Auto; Threshold:50%,83%
- ↕ 8: Status\_Fan\_Speed / 3 Speeds [DPT\_5.001 -1byte] - 0-Auto; 33%,67%,100%

#### 3.4.2.1 ENABLE FAN SPEED MANUAL/AUTO OBJECTS

When activated, the specified group objects become available

- ↕ 32: Control\_Fan\_Speed\_Manual/Auto [DPT\_1.002 - 1bit] - 0-Manual;1-Auto
- ↕ 33: Status\_Fan\_Speed\_Manual/Auto [DPT\_1.002 - 1bit] - 0-Manual;1-Auto

Automatic Fan Speed can be activated with the value '1' written to the 1-Bit Control\_Fan\_Speed\_Manual/Auto group object of the relevant Fan Speed. When the indoor unit switches to Automatic Fan Speed, a feedback with the value '1' will be sent via the related Status\_Fan\_Speed\_Manula/Auto object.

### 3.4.3 AVAILABLE FAN SPEEDS IN INDOOR UNIT

Available Fan Speeds in Indoor Unit

Number of different available speed values defined for fan control can be selected via this parameter. The number of related group objects and their settings are updated according to this parameter.

For detailed information about Fan Speed values supported by your indoor unit, please review your product manual.

### 3.4.4 FAN SPEED DPT OBJECT TYPE

With this parameter, DPTs of Byte type group objects used in fan speed control can be changed. It is possible to switch between Scaling (DPT\_5.001) and Enumerated (DPT\_5.010) data types.

Since the Byte type group objects related to Fan Speed are the same, the values they accept will vary according to the selected fan speed steps and DPT. For example, when Fan Speed steps are selected as '4' and data type is selected as Enumerated (DPT\_5.010), values '1', '2', '3' or '4' will be accepted as Fan Speed. In the same scenario, when '0' is sent, the minimum Fan speed value will be treated as '1' (If Auto Fan Speed is not selected) and when a value greater than '4' is sent, the maximum Fan speed value will be treated as '4'.

When Scaling (DPT\_5.001) is selected as DPT, Byte type Control\_Fan\_Speed and Status\_Fan\_Speed objects will appear as specified depending on the selected Fan Speed steps.

- ↕ 7: Control\_Fan\_Speed / 4 Speeds [DPT\_5.001 - 1byte] - Threshold: 38%,63%,88%
- ↕ 8: Status\_Fan\_Speed / 4 Speeds [DPT\_5.001 - 1byte] - 25%,50%,75%,100%

Table containing the ranges that can be sent to the Control\_Fan\_Speed object for each Fan Speed of the Scaling (DPT\_5.001) data type and the return values of the Status\_Fan\_Speed object is given below.

	FAN Speed 1	FAN Speed 2	FAN Speed 3	FAN Speed 4
Control	0-74%	75-100%		
Status	50%	100%		
Control	0-49%	50-82%	83-100%	
Status	33%	67%	100%	
Control	0-37%	38-62%	63-87%	88-100%
Status	25%	50%	75%	100%

### 3.4.5 ENABLE USE OF BIT-TYPE FAN SPEED OBJECTS

With this parameter, 1-Bit group objects can be activated for each Fan Speed. It is disabled by default. When activated, the specified group objects become available according to the selected fan speed steps.

- ↕ 30: Control\_Fan\_Speed\_1 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 1
- ↕ 31: Status\_Fan\_Speed\_1 [DPT\_1.002 - 1bit] - 1-Fan Speed 1
- ↕ 32: Control\_Fan\_Speed\_2 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 2
- ↕ 33: Status\_Fan\_Speed\_2 [DPT\_1.002 - 1bit] - 1-Fan Speed 2
- ↕ 34: Control\_Fan\_Speed\_3 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 3
- ↕ 35: Status\_Fan\_Speed\_3 [DPT\_1.002 - 1bit] - 1-Fan Speed 3
- ↕ 36: Control\_Fan\_Speed\_4 [DPT\_1.002 - 1bit] - 1-Set Fan Speed 4
- ↕ 37: Status\_Fan\_Speed\_4 [DPT\_1.002 - 1bit] - 1-Fan Speed 4

Specified Fan Speed can be activated with the value of '1' written to the 1-Bit Control-Fan\_Speed group object of the relevant Fan Speed.

When the indoor unit switches to the selected Fan Speed, feedback with the value of '1' will be sent via the related Status\_Fan\_Speed object.

### 3.4.6 ENABLE +/- OBJECTS FOR FAN SPEED

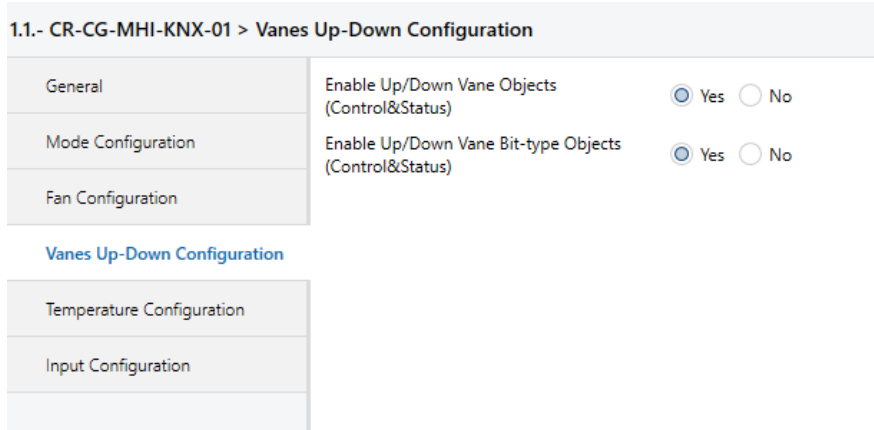
With this parameter, 1-Bit group object can be activated. It is disabled by default. When activated, the specified group object becomes available.

- ↕ 38: Control\_Fan\_Speed +/- [DPT\_1.008 - 1bit] - 0-Decrease; 1-Increase

Fan speed changes to next level with the value "1" and to previous level with the value "0" written to the 1-Bit Control\_Fan\_Speed +/- object. Fan speed level change continues cyclically according to each value written to the object. (For example, if indoor unit has 3 fan speed and auto speed, the changes of fan speed with each value "1" will be as follows: 0>1>2>3>4>0>1>...)

### 3.5. VANES UP-DOWN CONFIGURATION

Group objects that control the up and down position of the vanes of the indoor unit can be activated with this parameter. It is disabled by default, when enabled,



#### 3.5.1 ENABLE UP/DOWN VANE OBJECTS [ 2 BYTE ]

- ↕ 9: Control\_Vanes\_Up-Down [DPT\_5.010 - 1byte] - 1-Pos1; 2-Pos2; 3-Pos3; 4-Pos4; 5-Swing
- ↕ 10: Status\_Vanes\_Up-Down [DPT\_5.010 - 1byte] - 1-Pos1; 2-Pos2; 3-Pos3; 4-Pos4; 5-Swing

Group objects will become available. The '1', '2', '3' and '4' values sent to the Control\_ object determine the up-down position of the vanes, while the value '5' will cause these vanes to move periodically.

When the indoor unit switches to the corresponding control value, feedback will be sent via Status\_ object.

#### 3.5.2 ENABLE UP/DOWN VANE OBJECTS [ 1 BIT ]

With this parameter, 1-Bit group object can be activated. It is disabled by default. When activated, the specified group object becomes available.

- ↕ 40: Control\_Up/Down\_Vane\_Pos\_1 [DPT 1.002 - 1bit] - 1- Set Up/Down Vane Pos 1
- ↕ 41: Status\_Up/Down\_Vane\_Pos\_1 [DPT 1.002 - 1bit] - 1- Up/Down Vane Pos 1
- ↕ 42: Control\_Up/Down\_Vane\_Pos\_2 [DPT 1.002 - 1bit] - 1- Set Up/Down Vane Pos 2
- ↕ 43: Status\_Up/Down\_Vane\_Pos\_2 [DPT 1.002 - 1bit] - 1- Up/Down Vane Pos 2
- ↕ 44: Control\_Up/Down\_Vane\_Pos\_3 [DPT 1.002 - 1bit] - 1- Set Up/Down Vane Pos 3
- ↕ 45: Status\_Up/Down\_Vane\_Pos\_3 [DPT 1.002 - 1bit] - 1- Up/Down Vane Pos 3
- ↕ 46: Control\_Up/Down\_Vane\_Pos\_4 [DPT 1.002 - 1bit] - 1- Set Up/Down Vane Pos 4
- ↕ 47: Status\_Up/Down\_Vane\_Pos\_4 [DPT 1.002 - 1bit] - 1- Up/Down Vane Pos 4
- ↕ 48: Control\_Up/Down\_Vane\_Swing [DPT 1.002 - 1bit] - 0-Swing Off; 1-Swing On
- ↕ 49: Status\_Up/Down\_Vane\_Swing [DPT 1.002 - 1bit] - 0-Swing Off; 1-Swing On

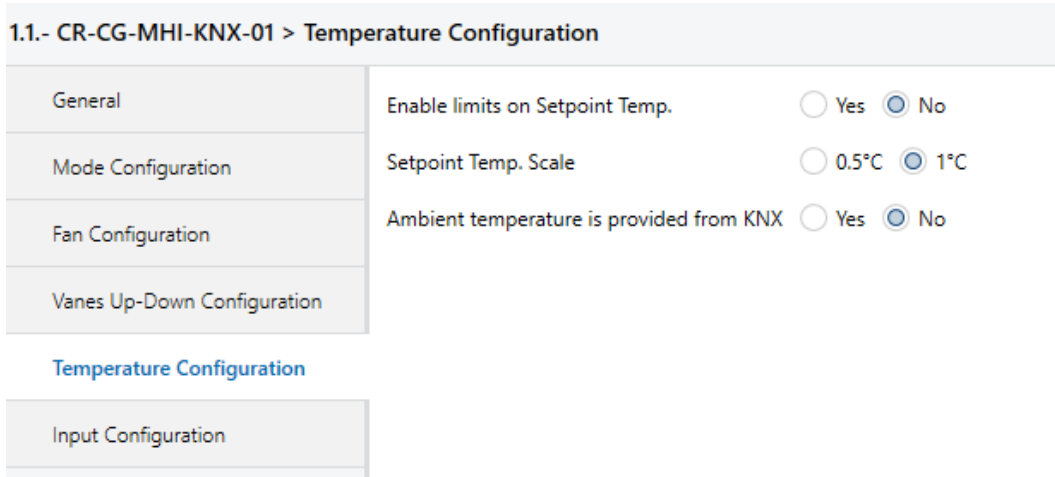
When the indoor unit switches to the corresponding control value, feedback will be sent via Status\_ object.



Please refer to your product manual for the availability of the up-down vanes in your indoor unit and the number of vane positions it supports.

### 3.6. TEMPERATURE CONFIGURATION

Contains controls related to Target Temperature and Ambient Temperature. By default, the Parameter tab appears as follows.




#### 3.6.1 ENABLE LIMITS ON SETPOINT TEMP.

The minimum and maximum Target Temperature values can be restricted with this parameter. It is disabled by default. When activated,


Lower limit(°C)	16
Upper limit(°C)	32

Minimum and maximum Target Temperature values can be selected. Every value that is below the determined minimum value will be considered as the minimum value and any value that is above the specified maximum value will also be processed as the maximum value.

 Please refer to your product manual for the minimum and maximum Target Temperature values supported by your indoor unit.

#### 3.6.2 SETPOINT TEMP. SCALE

Steps of the Target Temperature values are determined by this parameter. By default, the increment-decrement step is 1°C. For example, if this parameter is selected as 1°C and the Target Temperature value is sent as '23.5°C', Setpoint Temp. will be '24°C'; If 0.5°C is selected and '23.5°C' is sent, it will be processed as '23.5°C'.


 Please refer to your product manual for the Target Temperature increment-decrement steps supported by your indoor unit.

### 3.6.3 AMBIENT TEMPERATURE IS PROVIDED FROM KNX

It is the parameter that determines the source of the ambient temperature value processed by the indoor unit. It is disabled by default; in this case the indoor unit reads the ambient temperature through its internal sensor. When the parameter is selected as active, the specified group object becomes available,

```
12: Status_AC_Return_Temp [DPT_9.001 - 2byte] - (°C)
```

Ambient temperature data to be processed by the indoor unit can be written externally to this group object.

 Please review your product manual to determine if your indoor unit supports this feature.

## 3.7. INPUT CONFIGURATION



Tab contains the parameter settings of two dry contact inputs on the device.

**1.1.- CR-CG-MHI-KNX-01 > Input Configuration**

General	Enable Use of Digital Input 1	<input checked="" type="radio"/> Yes <input type="radio"/> No
Mode Configuration	Digital Input 1 Contact Type	<input checked="" type="radio"/> NO <input type="radio"/> NC
Fan Configuration	Enable Use of Digital Input 2	<input checked="" type="radio"/> Yes <input type="radio"/> No
Vanes Up-Down Configuration	Digital Input 2 Contact Type	<input checked="" type="radio"/> NO <input type="radio"/> NC
Temperature Configuration		

**Input Configuration**

By default, these inputs are disabled. When activated, the contact type of each input Normally Open (NO) and Normally Closed (NC) selection parameters are also displayed and the specified group objects become available for use,

-  16: Input\_1 [DPT\_1.001 -1bit] - 0-Off; 1-On
-  17: Input\_2 [DPT\_1.001 -1bit] - 0-Off; 1-On

Input 1. According to the contact type, when the input is activated, the red segment of the Status LED on the device will become active. Also, '0' or '1' information will be sent over the group object of this input in case of status changes.

Input 2. According to the contact type, when the input is activated, the green segment of the Status LED on the device will become active. Also, '0' or '1' information will be sent over the group object of this input in case of status changes.

## 4. APPENDIX 1 - COMMUNICATION OBJECTS TABLE

Topic	OBJ. NO	Name	Function	Length	Data Type	Flags				
						R	W	C	T	U
On/Off	1	Control_On/Off [DPT_1.001 - 1bit]	0-Off; 1-On	1 Bit	[1.1] DPT_Switch	R	W	C	-	U
	2	Status_On/Off [DPT_1.001 - 1bit]	0-Off; 1-On	1 Bit	[1.1] DPT_Switch	R	-	C	T	-
Setpoint Temperature	3	Control_Setpoint_Temperature [DPT_9.001 - 2byte]	(°C)	2 Bytes	[9.1] DPT_Value_Temp	R	W	C	-	U
	4	Status_Setpoint_Temperature [DPT_9.001 - 2byte]	(°C)	2 Bytes	[9.1] DPT_Value_Temp	R	-	C	T	-
Mode	5	Control_Mode [DPT_20.105 - 1byte]	0-Auto; 1-Heat; 3-Cool; 9-Fan; 14-Dry	1 Byte	[20.105] DPT_HVACContr Mode	R	W	C	-	U
	5	Control_Mode [DPT_20.105 - 1byte]	0-Auto; 1-Heat; 3-Cool; 14-Dry	1 Byte	[20.105] DPT_HVACContr Mode	R	W	C	-	U
	6	Status_Mode [DPT_20.105 - 1byte]	0-Auto; 1-Heat; 3-Cool; 9-Fan; 14-Dry	1 Byte	[20.105] DPT_HVACContr Mode	R	-	C	T	-
	6	Status_Mode [DPT_20.105 - 1byte]	0-Auto; 1-Heat; 3-Cool; 14-Dry	1 Byte	[20.105] DPT_HVACContr Mode	R	-	C	T	-
	14	Control_Mode_Cool/Heat [DPT_1.100 - 1bit]	0-Heat; 1-Cool	1 Bit	[1.100] DPT_Heat_Cool	R	W	C	-	U
	14	Control_Mode_Cool/Heat [DPT_1.100 - 1bit]	0-Cool; 1-Heat	1 Bit	[1.100] DPT_Heat_Cool	R	W	C	-	U
	15	Status_Mode_Cool/Heat [DPT_1.100 - 1bit]	0-Heat; 1-Cool	1 Bit	[1.100] DPT_Heat_Cool	R	-	C	T	-
	15	Status_Mode_Cool/Heat [DPT_1.100 - 1bit]	0-Cool; 1-Heat	1 Bit	[1.100] DPT_Heat_Cool	R	-	C	T	-
	18	Control_Mode_Auto [DPT_1.002 - 1bit]	1-Set AUTO mode	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	19	Status_Mode_Auto [DPT_1.002 - 1bit]	1-AUTO mode is active	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	20	Control_Mode_Heat [DPT_1.002 - 1bit]	1-Set HEAT mode	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	21	Status_Mode_Heat [DPT_1.002 - 1bit]	1-HEAT mode is active	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	22	Control_Mode_Cool [DPT_1.002 - 1bit]	1-Set COOL mode	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	23	Status_Mode_Cool [DPT_1.002 - 1bit]	1-COOL mode is active	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
24	Control_Mode_Fan [DPT_1.002 - 1bit]	1-Set FAN mode	1 Bit	[1.2] DPT_Bool	R	W	C	-	U	

	25	Status_Mode_Fan [DPT_1.002 - 1bit]	1-FAN mode is active	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	26	Control_Mode_Dry [DPT_1.002 - 1bit]	1-Set DRY mode	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	27	Status_Mode_Dry [DPT_1.002 - 1bit]	1-DRY mode is active	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
Fan Speed	7	Control_Fan_Speed / 3 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2,3	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 2 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 4 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2,3,4	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 3 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2,3	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 2 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 4 Speeds [DPT_5.001 - 1byte]	Threshold: 38%,63%,88%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	7	Control_Fan_Speed / 2 Speeds [DPT_5.001 - 1byte]	0-Auto; Threshold: 75%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	7	Control_Fan_Speed / 3 Speeds [DPT_5.001 - 1byte]	Threshold: 50%,83%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	7	Control_Fan_Speed / 2 Speeds [DPT_5.001 - 1byte]	Threshold: 75%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	7	Control_Fan_Speed / 4 Speeds [DPT_5.001 - 1byte]	0-Auto; Threshold: 38%,63%,88%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	7	Control_Fan_Speed / 4 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2,3,4	1 Byte	[5.100] DPT_FanStage	R	W	C	-	U
	7	Control_Fan_Speed / 3 Speeds [DPT_5.001 - 1byte]	0-Auto; Threshold: 50%,83%	1 Byte	[5.1] DPT_Scaling	R	W	C	-	U
	8	Status_Fan_Speed / 2 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-
	8	Status_Fan_Speed / 2 Speeds [DPT_5.001 - 1byte]	0-Auto; 50%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
	8	Status_Fan_Speed / 3 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2,3	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-



8	Status_Fan_Speed / 4 Speeds [DPT_5.001 - 1byte]	25%,50%,75%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
8	Status_Fan_Speed / 4 Speeds [DPT_5.100 - 1byte]	Speed Values: 1,2,3,4	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-
8	Status_Fan_Speed / 2 Speeds [DPT_5.001 - 1byte]	50%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
8	Status_Fan_Speed / 2 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-
8	Status_Fan_Speed / 3 Speeds [DPT_5.001 - 1byte]	33%,67%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
8	Status_Fan_Speed / 3 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2,3	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-
8	Status_Fan_Speed / 3 Speeds [DPT_5.001 - 1byte]	0-Auto; 33%,67%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
8	Status_Fan_Speed / 4 Speeds [DPT_5.001 - 1byte]	0-Auto; 25%,50%,75%,100%	1 Byte	[5.1] DPT_Scaling	R	-	C	T	-
8	Status_Fan_Speed / 4 Speeds [DPT_5.100 - 1byte]	Speed Values: 0,1,2,3,4	1 Byte	[5.100] DPT_FanStage	R	-	C	T	-
28	Control_Fan_Speed_Manual/ Auto [DPT_1.002 -1bit]	0-Manual; 1-Auto	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
29	Status_Fan_Speed_Manual/A uto [DPT_1.002 -1bit]	0-Manual; 1-Auto	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
30	Control_Fan_Speed_1 [DPT_1.002 - 1bit]	1-Set Fan Speed 1	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
31	Status_Fan_Speed_1 [DPT_1.002 - 1bit]	1-Fan Speed 1	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
32	Control_Fan_Speed_2 [DPT_1.002 - 1bit]	1-Set Fan Speed 2	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
33	Status_Fan_Speed_2 [DPT_1.002 - 1bit]	1-Fan Speed 2	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
34	Control_Fan_Speed_3 [DPT_1.002 - 1bit]	1-Set Fan Speed 3	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
35	Status_Fan_Speed_3 [DPT_1.002 - 1bit]	1-Fan Speed 3	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
36	Control_Fan_Speed_4 [DPT_1.002 - 1bit]	1-Set Fan Speed 4	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
37	Status_Fan_Speed_4 [DPT_1.002 - 1bit]	1-Fan Speed 4	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
38	Control_Fan_Speed -/+ [DPT_1.008 - 1bit]	0-Decrease; 1-Increase	1 Bit	[1.7] DPT_Step	R	W	C	-	U
38	Control_Fan_Speed -/+ [DPT_1.008 - 1bit]	0-Up; 1-Down	1 Bit	[1.8] DPT_UpDown	R	W	C	-	U

Van es Up- Dow n	9	Control_Vanes_Up-Down [DPT_5.010 - 1byte]	1-Pos1; 2-Pos2; 3- Pos3; 4-Pos4; 5-Swing	1 Byte	[5.10] DPT_Value_1_Uc ount	R	W	C	-	U
	10	Status_Vanes_Up-Down [DPT_5.010 - 1byte]	1-Pos1; 2-Pos2; 3- Pos3; 4-Pos4; 5-Swing	1 Byte	[5.10] DPT_Value_1_Uc ount	R	-	C	T	-
	40	Control_Up/Down_Vane_Pos _1 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 1	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	41	Status_Up/Down_Vane_Pos _1 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 1	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	42	Control_Up/Down_Vane_Pos _2 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 2	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	43	Status_Up/Down_Vane_Pos _2 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 2	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	44	Control_Up/Down_Vane_Pos _3 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 3	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	45	Status_Up/Down_Vane_Pos _3 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 3	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	46	Control_Up/Down_Vane_Pos _4 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 4	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	47	Status_Up/Down_Vane_Pos _4 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 4	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	48	Control_Up/Down_Vane Swing [DPT 1.002 - 1bit]	0-Swing Off; 1-Swing On	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	49	Status_Up/Down_Vane Swing [DPT 1.002 - 1bit]	0-Swing Off; 1-Swing On	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
	Amb ient Tem p.	11	Control_AC_Return_Temp [DPT_9.001 - 2byte]	(°C)	2 Bytes	[9.1] DPT_Value_Temp	R	W	C	-
12		Status_AC_Return_Temp [DPT_9.001 - 2byte]	(°C)	2 Bytes	[9.1] DPT_Value_Temp	R	-	C	T	-
Erro rs	13	Status_Error_Code [2byte]	0-No Error / Any other see man.	2 Bytes		R	-	C	T	-
	39	Error_Code/Alarm [DPT_1.005 - 1bit]	0-No Error	1 Bit	[1.5] DPT_Alarm	R	-	C	T	-
Inpu ts	16	Input_1 [DPT_1.001 -1bit]	0-Off; 1-On	1 Bit	[1.1] DPT_Switch	R	-	C	T	-
	17	Input_2 [DPT_1.001 -1bit]	0-Off; 1-On	1 Bit	[1.1] DPT_Switch	R	-	C	T	-
Ener gy Savi ng	50	Control_Energy_Saving_Funct ion [DPT 1.002 - 1bit]	0-Off; 1-On	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	51	Status_Energy_Saving_Functi on [DPT 1.002 - 1bit]	0-Off; 1-On	1 Bit	[1.2] DPT_Bool	R	-	C	T	-
Hom e Leav e	52	Control_Home_Leave_Functio n [DPT 1.002 - 1bit]	0-Off; 1-On	1 Bit	[1.2] DPT_Bool	R	W	C	-	U
	53	Status_Home_Leave_Function [DPT 1.002 - 1bit]	0-Off; 1-On	1 Bit	[1.2] DPT_Bool	R	-	C	T	-

## 5. APPENDIX 2 - TABLE OF ERROR CODES

ERROR CODE	DESCRIPTION OF FAULT
1	Remote controller communication error.
2	Duplicated indoor unit addressing more than 49 units connected.
3	Outdoor unit signal line error.
5	Communication error during operation.
6	Indoor heat exchanger temp. sensor anomaly (Thi-R).
7	Indoor return air temp. sensor anomaly (Thi-A).
9	Drain trouble.
10	Excessive number of indoor units by controlling one remote controller.
11	Address setting error (setting with remote controller).
12	Address setting error by mixed setting method.
16	Indoor fan motor anomaly.
18	Address setting error of master and slave indoor remote controller.
19	Indoor unit operation check, drain motor check mode anomaly.
20	Indoor fan motor rotation speed anomaly (FDT, FDTC, FDK, FDTW).
21	FDT Limit switch is not activated.
22	Wrong connection with Outdoor unit.
28	Remote controller temp. sensor anomaly (Thc).
30	Unmatch connection of indoor and outdoor unit.
31	Duplicated outdoor unit address No..
32	Open L3 phase on power supply at primary side.
36	1.Discharge pipe temp. sensor anomaly.
37	Outdoor heat exchanger temp. sensor (Tho-R) and subcooling coil temp. sensor (Tho-SC, -H) anomaly.
38	Outdoor air temp. sensor anomaly (Tho-A).
39	Discharge pipe temp. sensor anomaly (Tho-D1, D2).
40	High pressure anomaly (63H1-1,2 activated).
41	Power transistor overheat.
42	Current cut (CM1, CM2).
43	Excessive number of indoor units connected, excessive total capacity.
45	Communication error between inverter PCB and outdoor control PCB.
46	Mixed address setting methods coexistent in same network.
48	Outdoor DC fan motor anomaly.
49	Low pressure anomaly.
51	Inverter anomaly
53	Suction pipe temp. sensor anomaly (Tho-S).
54	High pressure sensor anomaly (PSH)/ Low pressure sensor anomaly (PSL).
55	Under-dome temp. sensor anomaly (Tho-C1, C2).
56	Power transistor temp. sensor anomaly (Tho-P1, P2).
58	Anomalous compressor by loss of synchronism.
59	Compressor startup failure (CM1, CM2).

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60	Rotor position detection failure (CM1, CM2).
61	Communication error between the master unit and slave units.
63	Emergency stop.
75	Central control communication error.