KNX – LG VRF GATEWAY

USER MANUAL

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Product Code: CR-CG-LG-KNX-01

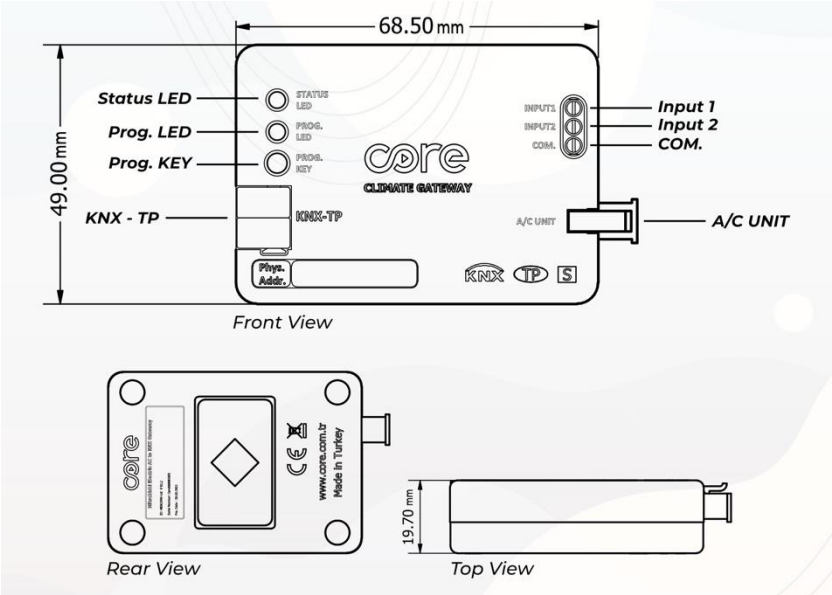
CONTENTS

1. PRESENTATION

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

https://core.com.tr/wp-content/uploads/2024/09/Core_KNX_LGVRF_Compatibility_List_v3.0.pdf

DIMENSIONS



MAIN FEATURES

- Reduced dimensions of 68.5mm x 49mm x 19.7mm, it can easily fits 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 Internal Electronic Board 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 front cover of the indoor unit to access the internal controller board.
- Locate the connector marked CN-REMO
- Connect the white connector on the installation cable supplied with the device to the CN-REMO connector on the air conditioner, 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:

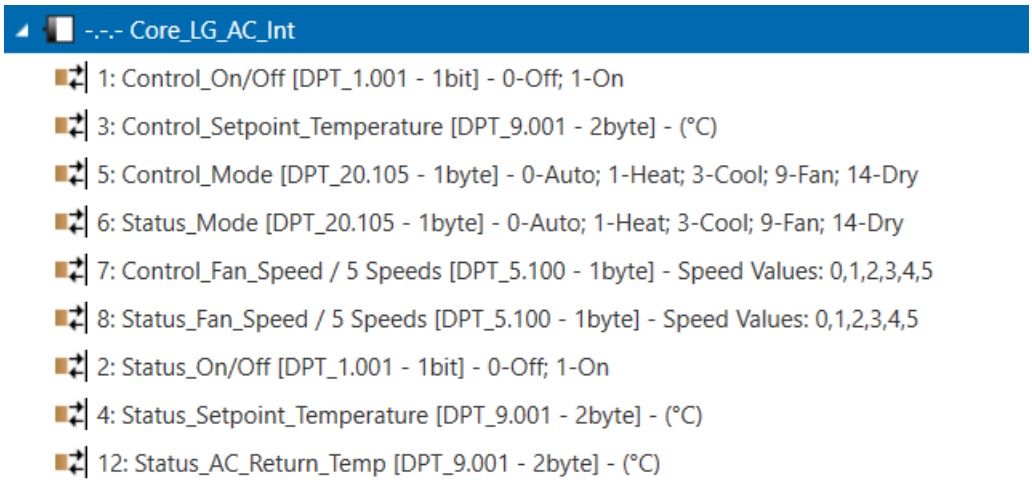
2.2. CONFIGURATION

Core KNX-ME 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 ETS online catalog.

3. ETS PARAMETERS

3.1. INTRODUCTION

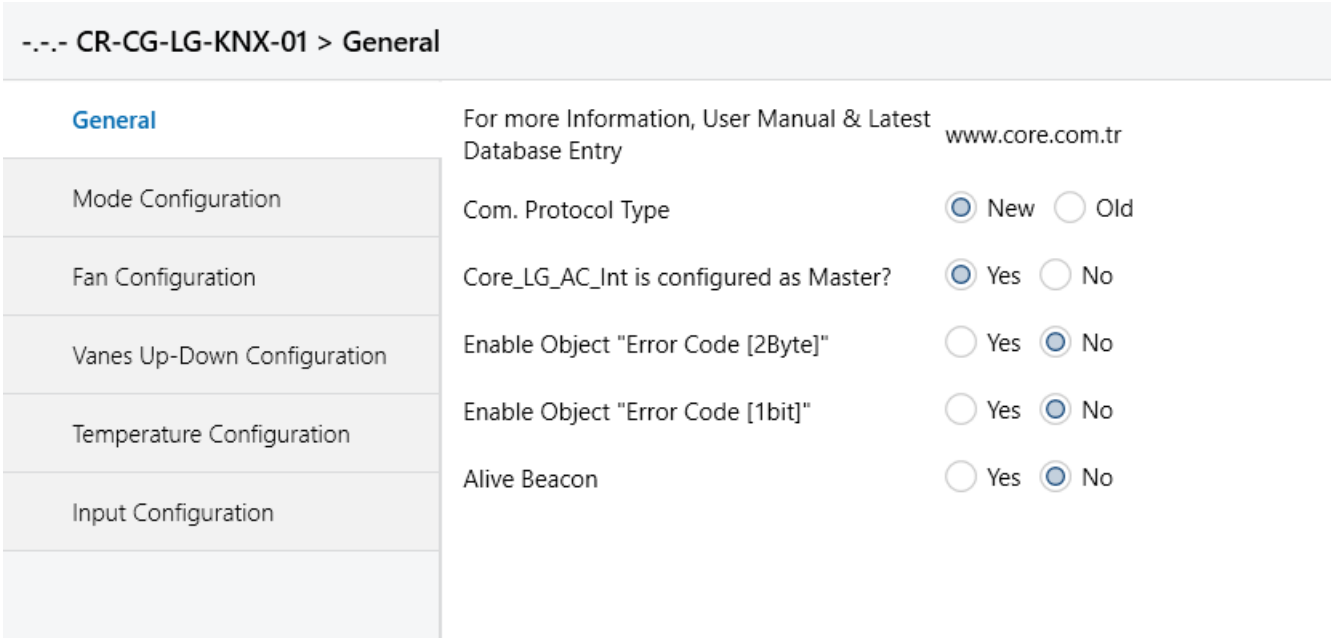
Following group objects are accessible by default when the device project is loaded into the ETS application, or the device is included in an existing project.



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.



3.2.1 COM. PROTOCOL TYPE

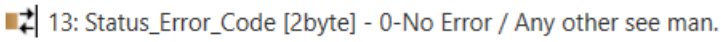
If the indoor unit manufactured in 2019 or later, it is needed to be selected "New" or in 2018 or earlier, be selected "Old"

3.2.2 CORE_LG_AC_INT IS CONFIGURED AS MASTER? (MASTER/SLAVE)

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

3.2.3 ENABLE OBJECT "ERROR CODE [2 BYTE]"

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



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

3.2.4 ENABLE OBJECT "ERROR CODE [1 BIT]"

This group object indicates whether there is an error or no error on the indoor unit. It is disabled by default. When enabled,

Group object becomes available for use. A value of '0' means that there is no error. A value of "1" means there is error.

3.2.5 CONTROL FROM REMOTE CONTROL DISABLE

With this parameter, changes from the remote controller can be enabled or disabled. If set to "Yes" all the actions performed through the remote controller will be disabled. If set to "No" the remote controller will work as usually.

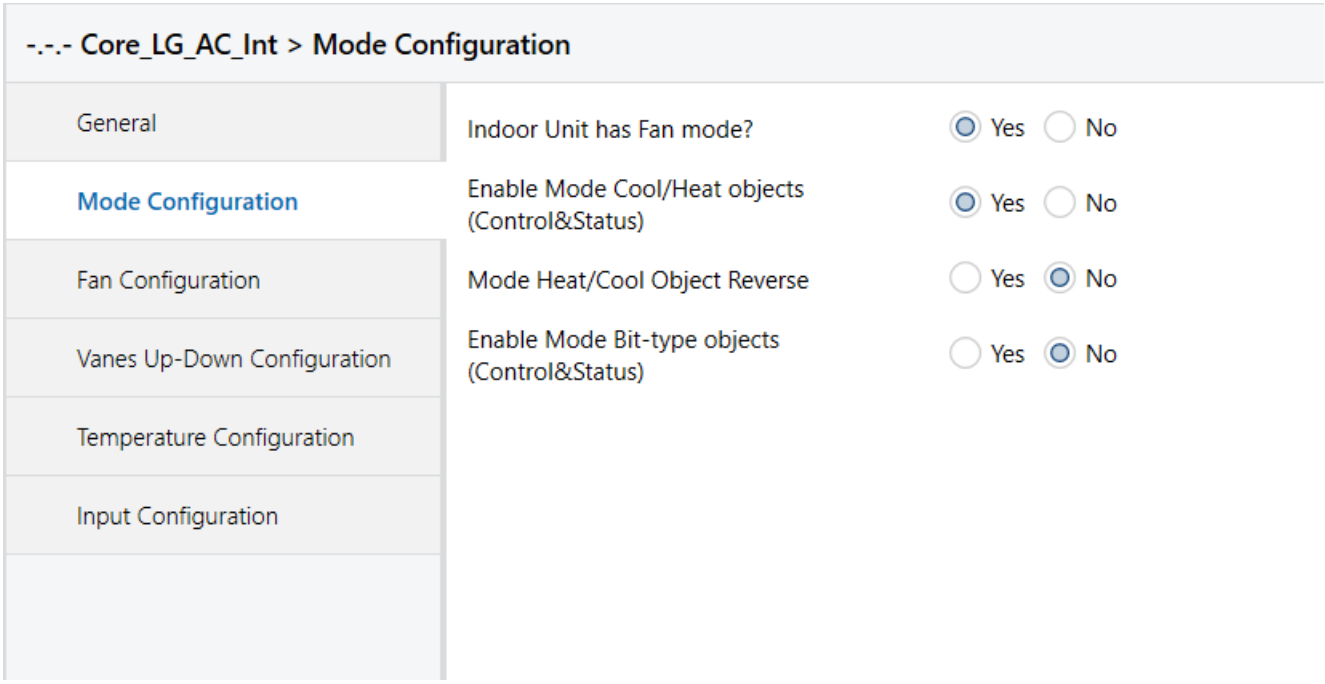
3.2.6 ALIVE BEACON

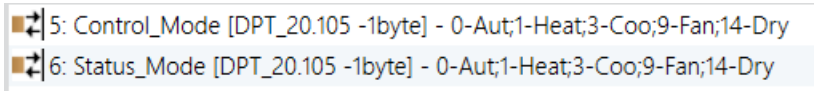
Parameter used to observe that the device and the application are running. It is disabled by default. When activated,

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.





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.

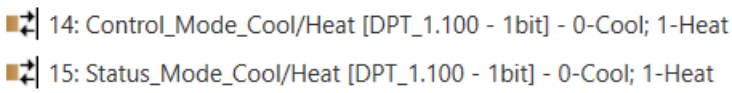
3.3.1 INDOOR UNIT HAS FAN MODE

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.



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.

3.3.2.1 ENABLE MODE COOL/HEAT OBJECT REVERSE

With this parameter, group object that allows switching between Heating and Cooling modes can be inverted.

14: Control_Mode_Heat/Cool [DPT_1.100 - 1bit] - 0-Heat; 1-Cool

15: Status_Mode_Heat/Cool [DPT_1.100 - 1bit] - 0-Heat; 1-Cool

Cooling mode can be activated with the value '1' 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.

Heating mode can be activated with the '0' 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 '0' 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

20: Control_Mode_Heat [DPT_1.002 - 1bit] - 1-Set HEAT mode

22: Control_Mode_Cool [DPT_1.002 - 1bit] - 1-Set COOL mode

24: Control_Mode_Fan [DPT_1.002 - 1bit] - 1-Set FAN mode

26: Control_Mode_Dry [DPT_1.002 - 1bit] - 1-Set DRY mode

19: Status_Mode_Auto [DPT_1.002 - 1bit] - 1-AUTO mode is active

21: Status_Mode_Heat [DPT_1.002 - 1bit] - 1-HEAT mode is active

23: Status_Mode_Cool [DPT_1.002 - 1bit] - 1-COOL mode is active

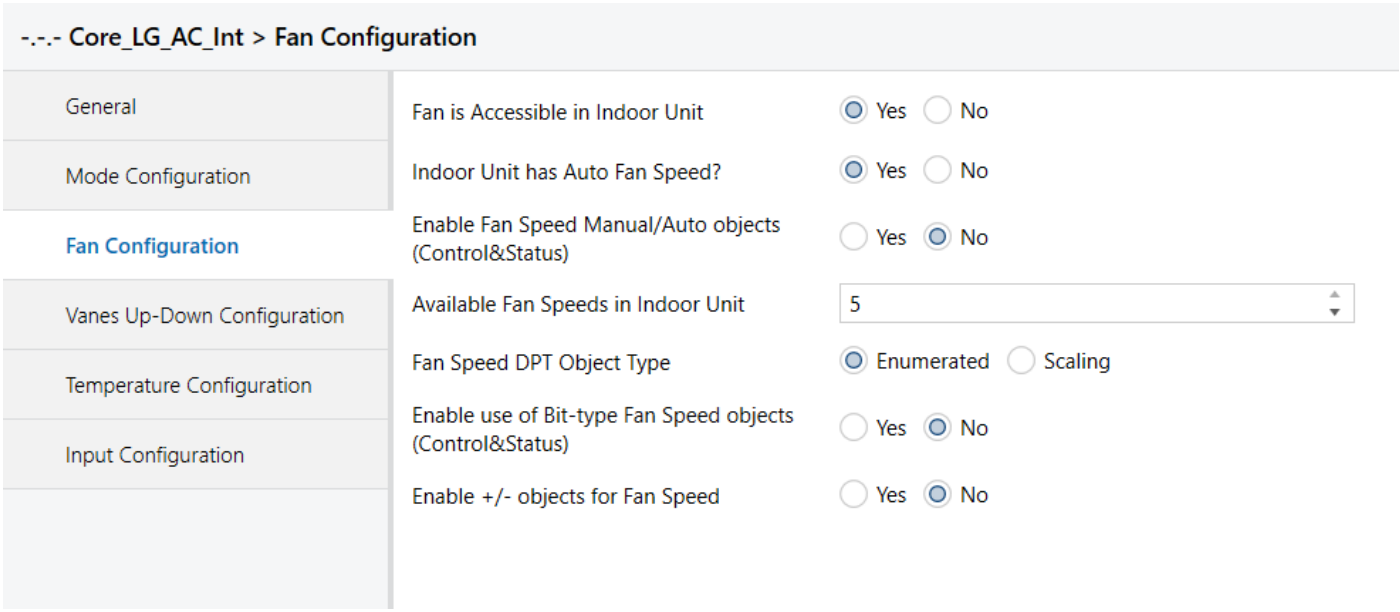
25: Status_Mode_Fan [DPT_1.002 - 1bit] - 1-FAN mode is active

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

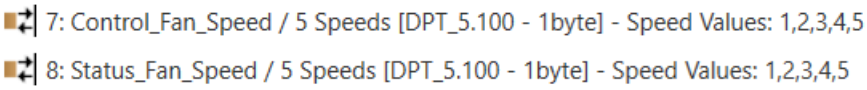
This tab contains the parameters related to the Fan Speed controls of the indoor unit. Default parameter settings are as specified.



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.



3.4.2 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.

If the indoor unit has the Power Cooling feature, this is equivalent to the last stage entered and this stage is active only in cooling mode. For example, in an indoor unit with 4 speeds and power cooling, the 5th speed value entered will activate the power cooling feature.

3.4.3 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 '3' and data type is selected as Enumerated (DPT_5.010), values '1', '2' or '3' 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 '3' is sent, the maximum Fan speed value will be treated as '3'.

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.

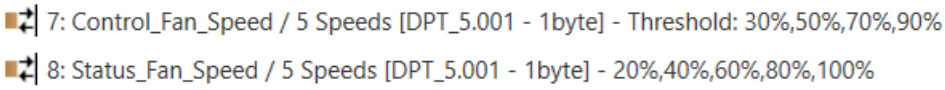


Table containing the ranges that can be sent to the Control_Fan_Speed object for each Fan Speed of the Scaling (DPT_5.001) data type and the return values of the Status_Fan_Speed object is given below.

	FAN Speed 1	*FAN Speed 2*	*FAN Speed 3*	*FAN Speed 4*	*FAN Speed 5*
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%*	
Control	*0-29%*	*30-49%*	*50-69%*	*70-89%*	*90-100%*
Status	*20%*	*40%*	*60%*	*80%*	*100%*

3.4.4 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
38: Control_Fan_Speed_5 [DPT_1.002 - 1bit] - 1-Set Fan Speed 5
39: Status_Fan_Speed_5 [DPT_1.002 - 1bit] - 1-Fan Speed 5

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.

3.4.5 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%

3.4.5.1 ENABLE FAN SPEED MANUAL/AUTO OBJECTS

When activated, the specified group objects become available

28: Control_Fan_Speed_Manual/Auto [DPT_1.002 -1bit] - 0-Manual; 1-Auto
29: 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.

3.4.6 ENABLE +/- OBJECTS FOR FAN SPEED

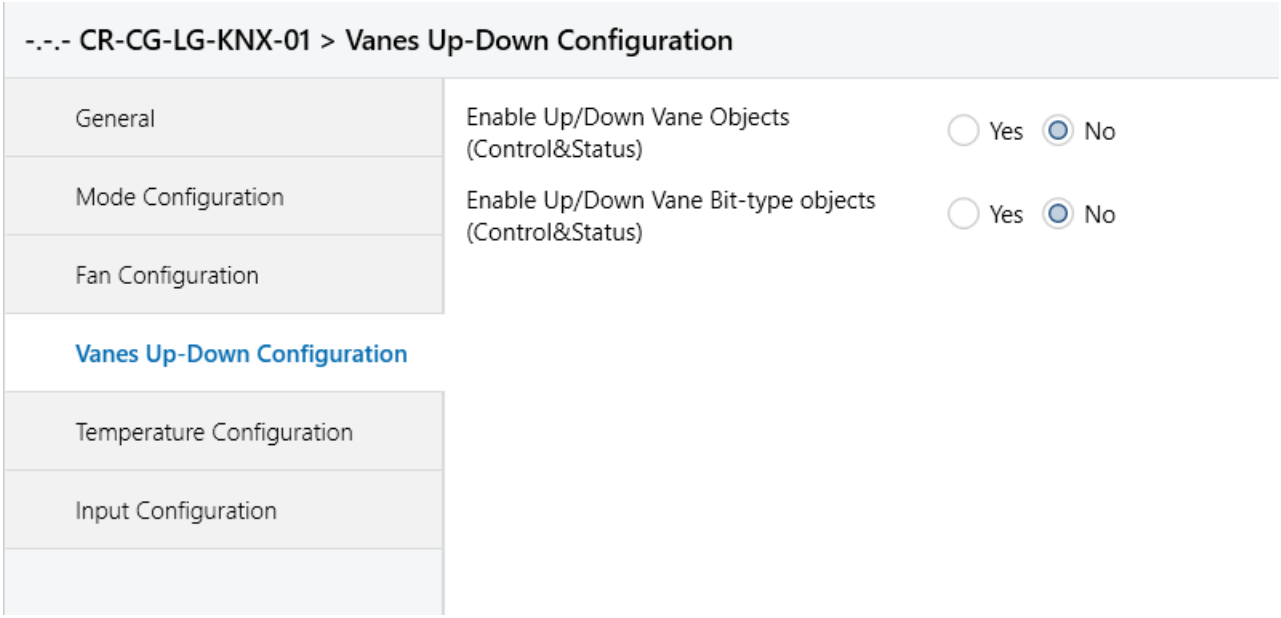
With this parameter, 1-Bit group object can be activated. It is disabled by default. When activated, the specified group object becomes available.

40: Control_Fan_Speed +/- [DPT_1.008 - 1bit] - 0-Up; 1-Down

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>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,

9: Control_Vanes_Up-Down [DPT_5.010 - 1byte] - 1-Pos1; 2-Pos2; 3-Pos3; 4-Pos4; 5-Pos5; 6-Pos6; 7-Swing; 8-Swirl

10: Status_Vanes_Up-Down [DPT_5.010 - 1byte] - 1-Pos1; 2-Pos2; 3-Pos3; 4-Pos4; 5-Pos5; 6-Pos6; 7-Swing; 8-Swirl

Group objects will become available. The '1', '2', '3', '4', '5' and '6' values sent to the Control_ object determine the up-down position of the vanes, while the value '7' will cause these vanes to move periodically (Swing), the value '8' will cause the diagonal two louvers are opened larger than the other louvers. After one minute, it is opposite (Swirl).

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

It is possible to enable 1 bit objects for each positions. When enabled,

42	Control_Up/Down_Vane_Pos_1 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 1
43	Status_Up/Down_Vane_Pos_1 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 1
44	Control_Up/Down_Vane_Pos_2 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 2
45	Status_Up/Down_Vane_Pos_2 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 2
46	Control_Up/Down_Vane_Pos_3 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 3
47	Status_Up/Down_Vane_Pos_3 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 3
48	Control_Up/Down_Vane_Pos_4 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 4
49	Status_Up/Down_Vane_Pos_4 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 4
50	Control_Up/Down_Vane_Pos_5 [DPT 1.002 - 1bit]	1- Set Up/Down Vane Pos 5
51	Status_Up/Down_Vane_Pos_5 [DPT 1.002 - 1bit]	1- Up/Down Vane Pos 5
52	Control_Up/Down_Vane Swing [DPT 1.002 - 1bit]	1- Set Up/Down Vane Swing
53	Status_Up/Down_Vane Swing [DPT 1.002 - 1bit]	1- Up/Down Vane Swing
54	Control_Up/Down_Vane_Swirl [DPT 1.002 - 1bit]	1- Set Up/Down Vane Swirl
55	Status_Up/Down_Vane_Swirl [DPT 1.002 - 1bit]	1- Up/Down Vane Swirl

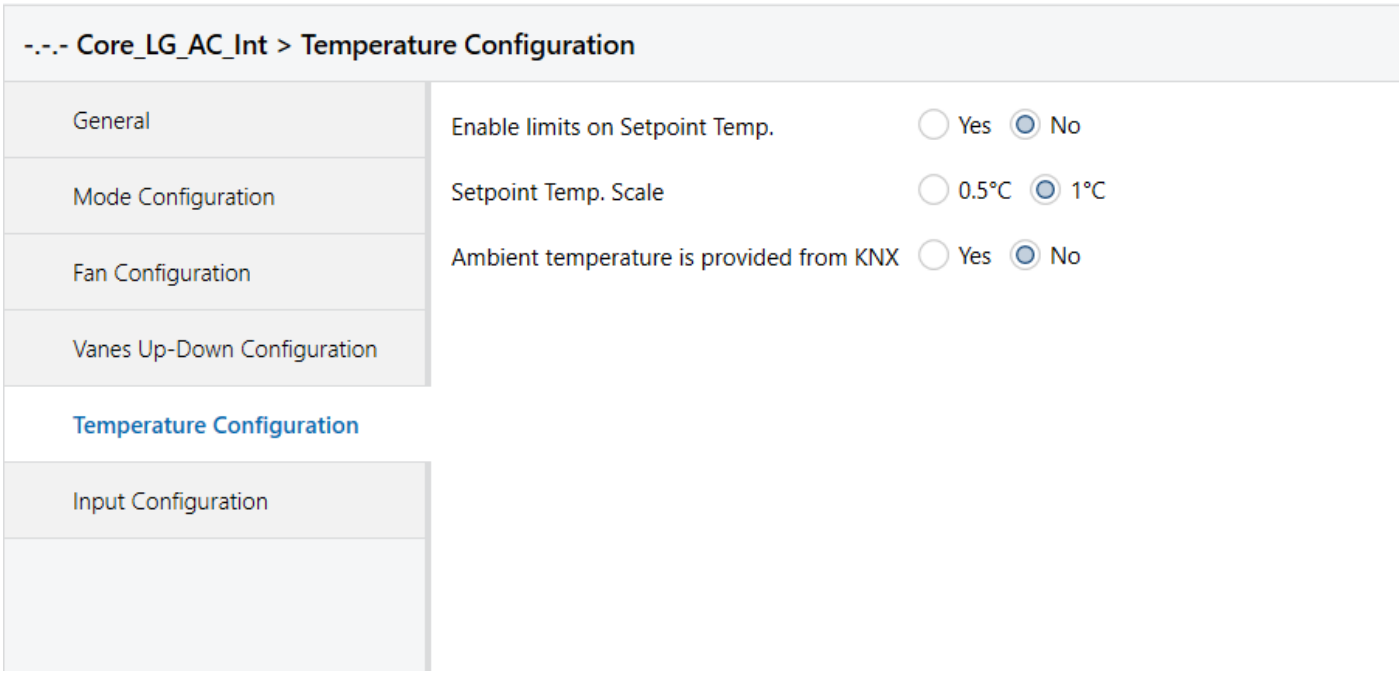
Specified vane position can be activated with the value of '1' written to the 1-Bit Control_Up/Down_Vane group object of the relevant vane position.

When the indoor unit switches to the selected vane position, feedback with the value of '1' will be sent via the related Status_Up/Down_Vane 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.



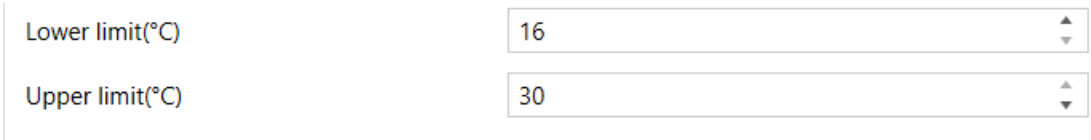
3.6.1 SETPOINT TEMP. SCALE

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.

3.6.2 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,

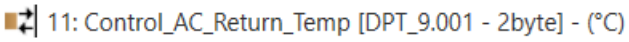


Minimum and maximum Target Temperature values can be selected. Every value that is below the determined minimum value will be considered as the minimum value and any value that is above the specified maximum value will also be processed as the maximum value.

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

3.6.3 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,

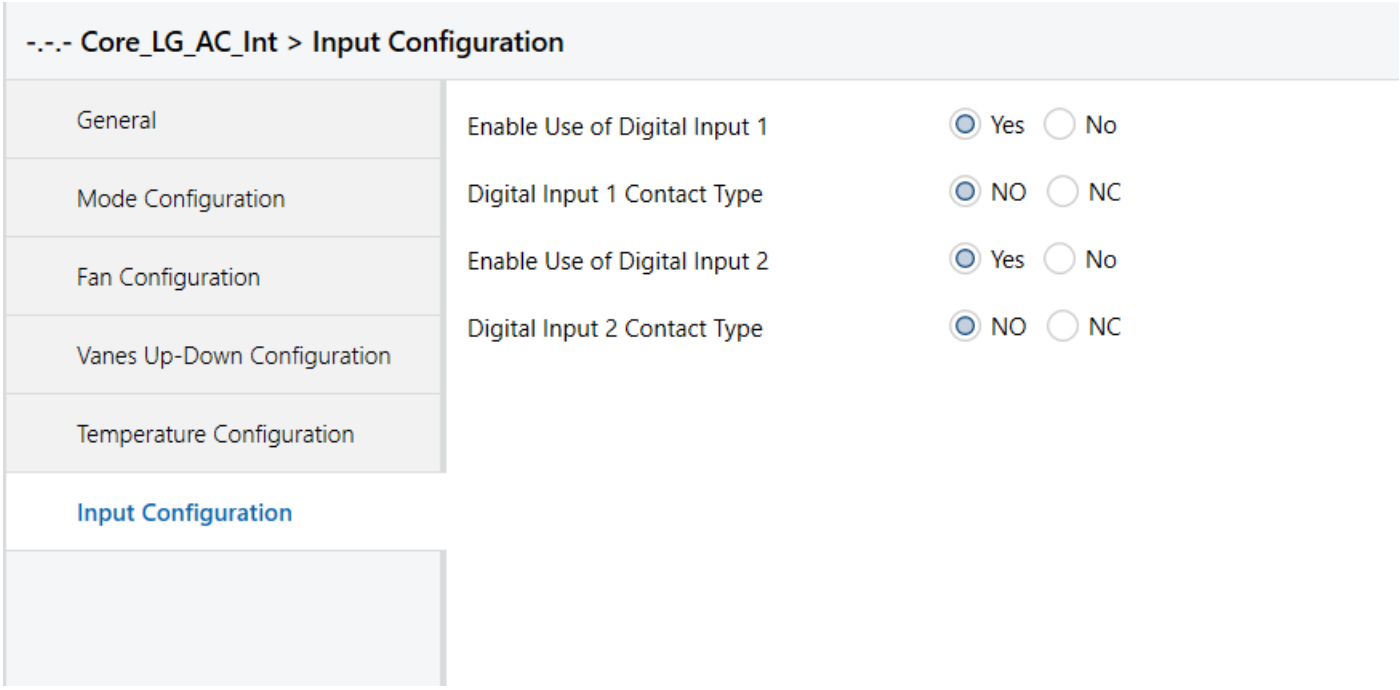


Ambient temperature data to be processed by the indoor unit can be written externally to this group object.

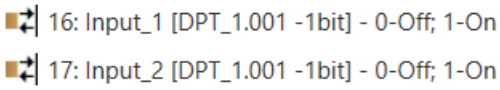
Please review your product manual to determine if your indoor unit supports this feature.

3.7. INPUT CONFIGURATION

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



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,



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	LENGTH	DATAPOINT TYPE		FLAGS					FUNCTION
				DPT NAME	DPT ID	C	R	W	T	U	
On/Off	1	Control_On/Off	1 Bit	DPT_Switch	1.001	C	R	W		U	0-Off; 1-On
	2	Status_On/Off	1 Bit	DPT_Switch	1.001	C	R		T		0-Off; 1-On
Setpoint Temp.	3	Control_Setpoint_Temperature	2 Byte	DPT_Value_Temp	9.001	C	R	W		U	(°C)
	4	Status_Setpoint_Temperature	2 Byte	DPT_Value_Temp	9.001	C	R		T		(°C)
Mode	5	Control_Mode	1 Byte	DPT_HVACContrMode	20.105	C	R	W		U	0-Aut;1-Heat;3-Coo;9-Fan;14-Dry
	6	Status_Mode	1 Byte	DPT_HVACContrMode	20.105	C	R		T		0-Aut;1-Heat;3-Coo;9-Fan;14-Dry
	14	Control_Mode_Cool/Heat	1 Bit	DPT_Heat/Cool	1.100	C	R	W		U	0-Cool;1-Heat
	14	Control_Mode_Cool/Heat	1 Bit	DPT_Heat/Cool	1.100	C	R	W		U	1-Cool;0-Heat
	15	Status_Mode_Cool/Heat	1 Bit	DPT_Heat/Cool	1.100	C	R		T		0-Cool;1-Heat
	15	Status_Mode_Cool/Heat	1 Bit	DPT_Heat/Cool	1.100	C	R		T		1-Cool;0-Heat
	18	Control_Mode_Auto	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set AUTO mode
	19	Status_Mode_Auto	1 Bit	DPT_Bool	1.002	C	R		T		1-AUTO mode is active
	20	Control_Mode_Heat	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set HEAT mode
	21	Status_Mode_Heat	1 Bit	DPT_Bool	1.002	C	R		T		1-HEAT mode is active
	22	Control_Mode_Cool	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set COOL mode
	23	Status_Mode_Cool	1 Bit	DPT_Bool	1.002	C	R		T		1-COOL mode is active
	24	Control_Mode_Fan	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set FAN mode
	25	Status_Mode_Fan	1 Bit	DPT_Bool	1.002	C	R		T		1-FAN mode is active
	26	Control_Mode_Dry	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set DRY mode

	27	Status_Mode_Dry	1 Bit	DPT_Bool	1.002	C	R		T		1-DRY mode is active
Fan Speed	7	Control_Fan_Speed / 3 Speeds	1 Byte	DPT_Enumerated	5.010	C	R	W		U	Speed Values;1,2,3
	7	Control_Fan_Speed / 3 Speeds	1 Byte	DPT_Scaling	5.001	C	R	W		U	Threshold:50%,83%
	7	Control_Fan_Speed / 4 Speeds	1 Byte	DPT_Enumerated	5.010	C	R	W		U	Speed Values;1,2,3,4
	7	Control_Fan_Speed / 4 Speeds	1 Byte	DPT_Scaling	5.001	C	R	W		U	Threshold:38%,63%,88%
	7	Control_Fan_Speed / 5 Speeds	1 Byte	DPT_Enumerated	5.010	C	R	W		U	Speed Values;1,2,3,4,5
	7	Control_Fan_Speed / 5 Speeds	1 Byte	DPT_Scaling	5.001	C	R	W		U	Threshold:30%,50%,70%,90%
	8	Status_Fan_Speed / 3 Speeds	1 Byte	DPT_Enumerated	5.010	C	R		T		Speed Values;1,2,3
	8	Status_Fan_Speed / 3 Speeds	1 Byte	DPT_Scaling	5.001	C	R		T		33%,67%,100%
	8	Status_Fan_Speed / 4 Speeds	1 Byte	DPT_Enumerated	5.010	C	R		T		Speed Values;1,2,3,4
	8	Status_Fan_Speed / 4 Speeds	1 Byte	DPT_Scaling	5.001	C	R		T		25%,50%,75%,100%
	8	Status_Fan_Speed / 5 Speeds	1 Byte	DPT_Enumerated	5.010	C	R		T		Speed Values;1,2,3,4,5
	8	Status_Fan_Speed / 5 Speeds	1 Byte	DPT_Scaling	5.001	C	R		T		20%,40%,60%,80%,100%
	28	Control_Fan_Speed_Manual/Auto	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Auto
	29	Status_Fan_Speed_Manual/Auto	1 Bit	DPT_Bool	1.002	C	R		T		1-Auto
	30	Control_Fan_Speed_1	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Fan Speed 1
	31	Status_Fan_Speed_1	1 Bit	DPT_Bool	1.002	C	R		T		1- Fan Speed 1
	32	Control_Fan_Speed_2	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Fan Speed 2

	33	Status_Fan_Speed_2	1 Bit	DPT_Bool	1.002	C	R		T		1- Fan Speed 2
	34	Control_Fan_Speed_3	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Fan Speed 3
	35	Status_Fan_Speed_3	1 Bit	DPT_Bool	1.002	C	R		T		1- Fan Speed 3
	36	Control_Fan_Speed_4	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Fan Speed 4
	37	Status_Fan_Speed_4	1 Bit	DPT_Bool	1.002	C	R		T		1- Fan Speed 4
	38	Control_Fan_Speed_5	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Fan Speed 5
	39	Status_Fan_Speed_5	1 Bit	DPT_Bool	1.002	C	R		T		1- Fan Speed 5
	40	Control_Fan_Speed +/-	1 Bit	DPT_Up/Down	1.008	C	R	W		U	0=Up,1=Down
	40	Control_Fan_Speed +/-	1 Bit	DPT_Step	1.007	C	R	W		U	0=Decrease,1=Increase
Vanes Up-Down	9	Control_Vanes Up-Down	1 Byte	DPT_Enumerated	5.010	C	R	W		U	1-Pos1;2-Pos2;3-Pos3;4-Pos4;5-Pos5;6-Pos6;7-Swing;8-Swirl
	10	Status_Vanes Up-Down	1 Byte	DPT_Enumerated	5.010	C	R		T		1-Pos1;2-Pos2;3-Pos3;4-Pos4;5-Pos5;6-Pos6;7-Swing;8-Swirl
	42	Control_Up/Down_Vane_Pos_1	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Pos 1
	43	Status_Up/Down_Vane_Pos_1	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Pos 1
	44	Control_Up/Down_Vane_Pos_2	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Pos 2
	45	Status_Up/Down_Vane_Pos_2	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Pos 2
	46	Control_Up/Down_Vane_Pos_3	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Pos 3
	47	Status_Up/Down_Vane_Pos_3	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Pos 3
	48	Control_Up/Down_Vane_Pos_4	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Pos 4
	49	Status_Up/Down_Vane_Pos_4	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Pos 4
	50	Control_Up/Down_Vane_Pos_5	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Pos 5
	51	Status_Up/Down_Vane_Pos_5	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Pos 5
	52	Control_Up/Down_Vane_Swing	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Swing
	53	Status_Up/Down_Vane_Swing	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Swing
	54	Control_Up/Down_Vane_Swirl	1 Bit	DPT_Bool	1.002	C	R	W		U	1-Set Up/Down Vane Swirl
	55	Status_Up/Down_Vane_Swirl	1 Bit	DPT_Bool	1.002	C	R		T		1-Up/Down Vane Swirl
Ambient Temp.	11	Control_AC_Return_Temp	2 Byte	DPT_Value_Temp	9.001	C	R	W		U	(°C)

	12	Status_AC_Return_Temp	2 Byte	DPT_Value_Temp	9.001	C	R		T		(°C)
Error	13	Status_Error_Code	2 Byte	Enumerated		C	R		T		0-No Error / Any other see man.
	41	Error_Code/Alarm	1 Bit	DPT_Alarm	1.005	C	R		T		0-No Error, 1-Error
Inputs	16	Input 1	1 Bit	DPT_Switch	1.001	C	R		T		0-Off;1-On
	17	Input 2	1 Bit	DPT_Switch	1.001	C	R		T		0-Off;1-On

5. APPENDIX 2 - TABLE OF ERROR CODES

Error Code			Description	Details
Indoor Unit	0	1	Indoor unit return air or optional remote wall tempera- ture sensor communications error.	Indoor unit air temperature sensor disconnected or shorted. (Check the wiring, connection on the indoor unit PCB, then check the thermistor.)
	0	2	Indoor unit inlet pipe temperature sensor communica- tion error.	Indoor unit inlet pipe temperature sensor is disconnected or shorted. (Check the connection on the indoor unit PCB, then check the therm- istor.)
	0	3	Communication error between zone controller and indoor unit.	Indoor unit PCB is not receiving communications signal from zone controller.
	0	4	Indoor unit drain overflow error.	Drain pump and/or float switch could be malfunctioning. Also check drain line for obstructions.
	0	5	Communication error between outdoor unit PCB and indoor unit PCB.	Indoor unit communications PCB is not receiving signal from outdoor unit communications PCB for more than 5 minutes. Check indoor unit PCB for issues.
	0	6	Indoor unit or hydro kit outlet pipe temperature sensor error.	• Indoor unit outlet pipe temperature sensor is disconnected or short- ed. (Check the connection on the indoor unit PCB, then check the thermistor.) • Hydro kit liquid side temperature sensor is disconnected or short- ed. Values read less than -43°C or greater than +96°C (less tha -45.4°F or greater than +204.8°F).
	0	7	Indoor units are not operating in the same mode. (Heat pump applications only)	Different operation mode between indoor units.
	0	8	Hydro kit hot water storage tank temperature sensor error.	Pipe temperature sensor disconnected, shorted, or opened.
	0	9	Indoor unit EEPROM error.	• Communication error between the indoor unit PCB board and its option card. (The option card is about 1' x 1' and is plugged into the indoor unit PCB board. Check connection between the two.) • Communication error between EEPROM on indoor unit main PCB. • Indoor unit EEPROM data is not available.

	Error Code			Description	Details
Indoor Unit	1	0	-	Indoor unit BLDC fan motor communications error.	• Fan motor has been removed or is defective. Refer to the resis- tance and voltage check charts in this service manual. • The system has detected the fan motor is not spinning. • On new installs, verify installation manual and paperwork were removed from fan discharge shroud during installation. • Check the wiring plug and connections (if applicable).
	1	1	-	Communication error between hydro kit and inverter compressor PCB.	Hydro kit is not receiving communications signal from inverter compressor PCB.
	1	2	-	Hydro kit inverter compressor PCB error.	Hydro kit inverter compressor PCB error.
	1	3	-	Hydro kit solar heat pipe temperature sensor error.	Solar heat pipe temperature sensor disconnected, shorted, or opened.
	1	4	-	Hydro kit flow switch error.	Flow switch failed to close.
	1	5	-	Hydro kit leaving water temperature has exceeded 185°F (85°C).	Temperature sensor is defective or there is hot water inflow.
	1	6	-	Hydro kit indoor unit water pipe temperature and ambi- ent temperature sensor communication error.	Water inlet and outlet pipe temperature sensor disconnected, shorted, or opened.
	1	7	-	• Hydro kit inlet pipe temperature sensor communica- tion error. • Outside air duct inlet pipe temperature sensor com- munication error.	• Water inlet temperature sensor disconnected or shorted. Values read less than -43°C or greater than +96°C (less than or greater than +204.8°F). -45.4°F • Temperature sensor disconnected, shorted, or opened.
	1	8	-	Hydro kit outlet pipe temperature sensor communica- tion error.	Outlet pipe temperature sensor disconnected, shorted, or opened.
	2	3	0	Refrigerant leak sensor error. Only displayed at the indoor unit and its wired remote controller.	• Refrigerant leak sensor error; sensor is malfunctioning. • Error will also be displayed if the function is enabled on the wired remote controller, and there is not a sensor installed. • Refrigerant leak is detected when >6,000 ppm. • Enable the function through the function code on the remote controller. 1. Operation stop. 2. Solenoid valve closes on the indoor unit side. 3. CH230 is displayed. If the communication baud is 1,200 bps, then only the zone controller can display the CH230; central controller cannot display the error due to lack of information. 4. Buzzer rings 2 long buzzes every 1 second. Ringing stops when there is an input from the controller. (If there is a hard lock, then only the controller can make the hard lock to stop buzzing. If leak sensor measures under 1.5V, then it is consid- ered normal and the buzzing stops. 5. To release the error, power needs reset.
	2	3	7	Communication error between outdoor unit PCB and indoor unit PCB. Only displayed at the indoor unit and its wired remote controller.	Indoor unit communications PCB is not receiving signal from out- door unit communications PCB for more than 3 minutes. Check RS-485 communications for issues.
	2	3	8	Communication error between outdoor unit PCB and indoor unit PCB. Displayed at the indoor unit and its wired remote controller.	Indoor unit communications PCB is not receiving signal from out- door unit communications PCB for more than 3 minutes. Check outdoor unit PCB for issues.