



Kbox MHVY User Manual

Version 1.0.1

Kbox

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1 DOCUMENT CONTENT

This document contains the features and functions of the Kbox-MHVV product. Kbox-MHVV is compatible with KNX switches and Mitsubishi Heavy indoor unit models.

2 INTRODUCTION

Kbox-MHVV is an interface that provides bidirectional communication between the KNX home and building automation system and air conditioners. Kbox-MHVV is used to monitor and control the functions of KNX and air conditioners. Thus, the air conditioning system can be controlled from the KNX home and building automation system.

It is compatible with Mitsubishi Heavy indoor units.

Kbox MHVV connects to Mitsubishi Heavy A/C units via the X/Y port.

Visit <https://gwfinder.kboxsolutions.com/> for the compatibility list.

3 BEFORE YOU START

First of all, it is important to understand how Kbox works.

Yellow LED Behavior

Once the Kbox starts receiving power from the KNX line, the Yellow LED flashes in an SOS pattern. This SOS flashing sequence continues for 20 seconds. After the SOS pattern ends, you can monitor the communication with the air conditioning unit through the status of this LED.

If you have configured the device correctly and communication with the air conditioner has begun, you should see the yellow LED blinking. If the yellow LED is not blinking:

- Make sure the air conditioner communication cable is connected properly. If the communication cable is faulty, Kbox will not be able to communicate with the AC.
- Make sure that the air conditioning units are energized. Make sure there is voltage on the cable running from the air conditioner to the Kbox.

When the yellow LED starts blinking, all Feedback objects assigned to a group address will send the current status of the air conditioner to the KNX Bus.

If you see the yellow LED staying on continuously, this means that Kbox was communicating with the air conditioner for a while, but is currently unable to communicate.

Important warning

If the yellow LED is blinking, you write a value to one of the set objects, and there is no feedback, this means that the written value is either not accepted by the air conditioner or is outside of the valid limits.

Example Scenario: None of the air conditioners compatible with Kbox accept a set temperature higher than 32°C. If you write 40°C to the "Setpoint Temperature" group address, this value will be completely ignored, and no response will be sent from the "Setpoint Temperature Feedback" object.

This behavior is the same for all Feedback objects.

4 FUNCTIONS

The most outstanding features of Kbox MHVY:

- Bidirectional control of HVAC units through their relevant ports.
- Control of the main functions of the A/C unit: On/Off, temperature, mode of operation, fan speed, up-down/left-right wing control, etc.
- Error management to handle specific error codes from the A/C unit itself as well as any communication issues that may arise.
- Three digital inputs.
- Alive notifications.

4.1 GENERAL

There are some general parameters that apply to each section. These:

4.1.1 Alive Notifications

Alive notification	☐ Disable ☒ Enable
Period	20 Seconds

This function plays a crucial role in determining whether the product is operational. By enabling this feature in the parameters, it is possible to check if the device is working. The "Enable" value is sent at a periodic interval defined in the period section via the "Alive Notification" object. Receiving this data periodically indicates that the device is up and running.

4.1.2 Remote Control Lock

Remote Controller Lock	☒ Disabled ☐ Enabled
------------------------	---

The remote control can be locked via the "Remote Control Lock" object. When the lock is in the "Enable" position, all commands from the air conditioner's remote control are blocked and ignored. However, this does not affect the control of the unit via KNX.

When the "Remote Control Lock" is activated, commands sent from the central controller connected to the outdoor unit are not transmitted to the indoor unit where Kbox MHVY is connected. Even if a change is momentarily observed on the central controller, the air conditioner's state will revert to its previous condition within a few seconds. The same applies to other controllers directly connected to the indoor unit.

4.1.3 Object Control Lock

Object control lock	☒ Disable ☐ Enable
---------------------	---

When the device lock is activated via the "**Object Control Lock**" object, the device becomes blocked and can no longer be controlled by any group object. Until the lock is deactivated, the device will not respond to any commands over the KNX bus. Even if the device receives a value during the locked state, it will retain its last status before the lock was applied once the lock is removed.

4.1.4 Error Status Feedback Period

Error Status Feedback Period	15	Seconds
------------------------------	---------------------------------	---------

This parameter defines the frequency at which an error detected in the air conditioning unit is reported to the KNX bus. The value is set in seconds, and the Kbox will transmit any active error codes to the KNX line at the specified interval.

4.1.5 Digital Input Functions

Digital Input Functions	☐
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This parameter enables the use of Digital Input Functions. Detailed explanations for each Digital Input Function are provided in the following sections of this document.

4.1.6 PARAMETER LIST

This section provides a summary list of the parameters under the "General" section.

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Alive notification	Period		Disable / Enable 5...65535 seconds	If "Alive Notification" Enabled	Allows the device to periodically send the value "true" while it is operating. This sub-parameter defines the frequency, in seconds, at which the "Alive Notification" (indicating that the device is running) will be sent.
Remote controller lock			Disable / Enable		Determines whether the use of the air conditioner's remote control can be locked through the lock object.
Error Status Feedback Period			0...65535 seconds		This parameter defines the frequency, in seconds, at which the "Error Status" (indicating that an error is detected in the unit) will be sent to the KNX bus.
Object control lock			Disable / Enable		Determines whether the device can be locked through the lock object.
Digital Input functions			Disable / Enable		Determines whether the "Digital Input Functions" parameter will be activated.

4.1.7 GROUP OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Alive Status	Alive Notification	1 bit	CRT
This object is only visible when the "Alive Notification" parameter is enabled. While Kbox MHVY is running, the value "true" is sent through the connected group address, indicating that the device is operational.			
Remote Controller Lock	1:Enabled / 0:Disabled	1 bit	CRWU
This object is only visible when the "Remote Controller Lock" parameter is enabled. With this object, control of the air conditioner via the remote control is blocked.			
Remote Controller Lock Feedback	1:Enabled / 0:Disabled	1 bit	CRT
This object is only visible when the "Remote Controller Lock" parameter is enabled. It provides feedback on whether the air conditioner's remote control is currently blocked or active.			
Object Control Lock	1:Enabled / 0:Disabled	1 bit	CRWU
This object is only visible when the "Object Control Lock" parameter is enabled. With this object, control of the air conditioner via KNX is blocked.			
Object Control Lock Feedback	1:Enabled / 0:Disabled	1 bit	CRT
This object is only visible when the "Object Control Lock" parameter is enabled. It provides feedback on whether the air conditioner's control via KNX is currently blocked or active.			
Error Status	ASCII	14 byte	CRT
This object is used to monitor the current operation health of the air conditioner. It provides a real-time and periodically notification to the KNX bus indicating whether the unit is functioning normally or if a specific error code has been triggered.			
Error Alarm		1 bit	CRT
This object is always visible. It reports the error status. If the connection with the air conditioner cannot be established or "Error Status" is carrying an error code, this group object takes the value 1. If everything is normal and operating correctly, it takes the value 0.			

4.2 AC GENERAL

- General - Settings - AC Gateway - General - Mode - Fan - Up/Down Wing - Temperature	Fan Control ☒ Up-Down Wing Control ☒ Slave Function ☒ Disabled ☐ Enabled
--	---

To see the parameters needed for basic air conditioner functions like fan and Wing(louver) control, they must be activated in the AC General section.

If the Kbox is to operate in parallel with a wired controller and is required to act as a slave, the **"Slave Function"** must be enabled.

4.2.1 PARAMETER LIST

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Fan control			Disable / Enable		Determines whether the parameter required for controlling the fan speed will be activated or not.
Up-Down Wing Control			Disable / Enable		Determines whether the parameter required for controlling the vane position will be activated or not.
Slave Function			Disable / Enable		This parameter allows the Kbox to operate as a "Slave" device when it is connected in parallel with a wired remote controller.

4.2.2 GROUP OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
On/Off	1:On / 0:Off	1 bit	CWU
This object is always visible. The air conditioning unit is controlled via the connected group address.			
On/Off Feedback	1:On / 0:Off	1 bit	CRT
This object is always visible. The status of the air conditioning unit is monitored through the connected group address.			

4.3 AC MODE

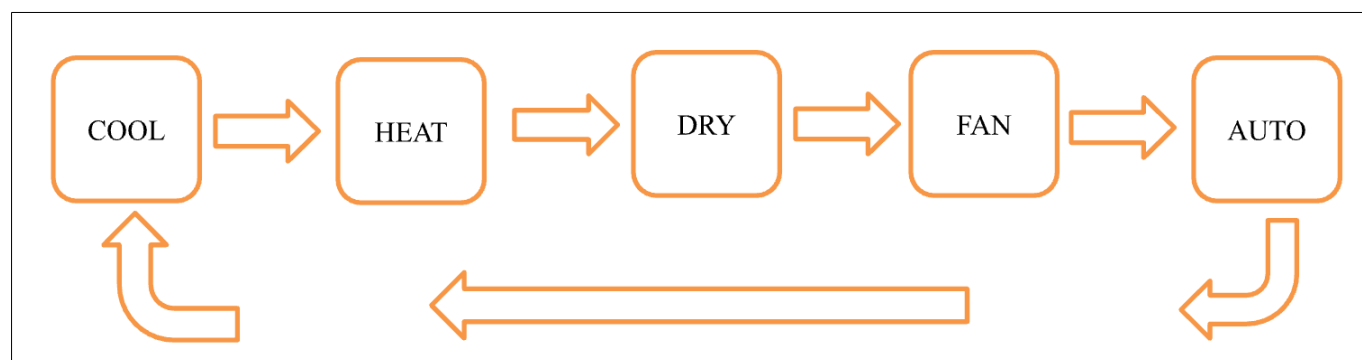
Cool mode	☐ Disable ☒ Enable
Heat mode	☐ Disable ☒ Enable
Dry mode	☐ Disable ☒ Enable
Fan mode	☐ Disable ☒ Enable
Auto mode	☐ Disable ☒ Enable

The modes that the indoor unit can operate in can be defined. Each desired mode can be enabled or disabled.

4.3.1 Mode +/- Object

Mode +/- object	☐ Disable ☒ Enable
-----------------	---

If this parameter is enabled, the Mode +/- group object (1: Increase / 0: Decrease) will be available. If the value 1 is written to this object, the mode transition sequence will be as follows:



4.3.2 Heat/Cool Mode Object

Heat/Cool Mode object	☐ Disable ☒ Enable
-----------------------	---

This parameter allows the air conditioner's mode to be set to either Heat or Cool using a 1-bit group object.

By writing 1 or 0 to the "Heat/Cool Mode Set" group object the air conditioner will be switched to Heat mode when a value of 1 and to Cool mode when a value of 0 is sent.

4.3.3 Mode Individual Object

Mode individual objects

☐ Disable ☒ Enable

The "Mode Individual Object" parameter, when enabled, allows each mode to be selected individually.

4.3.4 PARAMETER LIST

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Cool Mode			Disable / Enable		This parameter determines whether the Cool mode can be used.
Heat Mode			Disable / Enable		This parameter determines whether the Heat mode can be used.
Dry (Dehumidification) Mode			Disable / Enable		This parameter determines whether the Dry (Dehumidification) mode can be used.
Fan(Fan Only) Mode			Disable / Enable		This parameter determines whether the Fan(Fan Only) mode can be used.
Auto Mode			Disable / Enable		This parameter determines whether the Auto mode can be used.
Mode +/- object			Disable / Enable		This parameter is used for switching between air conditioning modes.
Heat/Cool Mode Object			Disable / Enable		This parameter allows the air conditioner's mode to be set to either Heat or Cool using a 1-bit group object.

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Mode individual objects			Disable / Enable		When this parameter is enabled, a 1-bit object is created for each mode. This allows the air conditioner's mode to be changed by simply sending a value of 1 to the corresponding object.

4.3.5 OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Mode	Cool-Heat-Dry(Dehumidification)-Fan(Fan Only)-Auto	1 byte	CWU
This object is always visible. Used to set the mode of the air conditioner. The mode can be changed using the following values: 0: Auto 1: Heat 3: Cool 9: Fan(Fan Only) 14: Dry(Dehumidification)			
Mode Feedback	Cool-Heat-Dry(Dehumidification)-Fan(Fan Only)-Auto	1 byte	CRT
Used to display the operating mode of the air conditioner. It shows one of the following values based on the air conditioner's active mode: 0: Auto 1: Heat 3: Cool 9: Fan(Fan Only) 14: Dry(Dehumidification)			
Mode +/-	1:Increase / 0:Decrease	1 bit	CWU
This object is only visible when the "Mode +/- Object" parameter is enabled. This object allows switching between operating modes in a +/- manner.			
Heat/Cool Mode Set	1:Heat/0:Cool	1 bit	CWU

OBJECT	FUNCTION	TYPE	FLAG
This object is only visible when the "Heat/Cool Mode Object" parameter is enabled. With the help of this group object, the heating and cooling modes of the air conditioner can be changed. A value of 1 should be used for heat mode, and 0 for cool mode.			
Cool Mode Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Mode Individual Object" parameter is selected. It allows switching to Cool Mode with an incoming 1-bit value.			
Heat Mode Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Mode Individual Object" parameter is selected. It allows switching to Heat Mode with an incoming 1-bit value.			
Dry(Dehumidification) Mode Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Mode Individual Object" parameter is selected. It allows switching to Dry(Dehumidification) Mode with an incoming 1-bit value.			
Fan(Fan Only) Mode Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Mode Individual Object" parameter is selected. It allows switching to Fan(Fan Only) Mode with an incoming 1-bit value.			
Auto Mode Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Mode Individual Object" parameter is selected. It allows switching to Auto Mode with an incoming 1-bit value.			
Heat Mode Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Mode Individual Object" parameter is selected. It allows monitoring the Heat Mode of the air conditioner.			
Cool Mode Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Mode Individual Object" parameter is selected. It allows monitoring the Cool Mode of the air conditioner.			
Dry(Dehumidification) Mode Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Mode Individual Object" parameter is selected. It allows monitoring the Dry(Dehumidification) Mode of the air conditioner.			
Fan(Fan Only) Mode Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Mode Individual Object" parameter is selected. It allows monitoring the Fan(Fan Only) Mode of the air conditioner.			
Auto Mode Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Mode Individual Object" parameter is selected. It allows monitoring the Auto Mode of the air conditioner.			

4.4 Fan

The parameters detailed below are used for controlling the air conditioner's fan levels. When selecting the fan level, the air conditioner's user manual should be referenced.

Important warning

If scaling is used to change fan values, please consider the following information:
Since Mitsubishi Heavy air conditioning units do not support the Auto fan mode, %0 is not used. Scaling values can be written in the range of 1–100.

We recommend entering the highest value of your selected fan levels as 100%.

Example scenario:

Let's assume the following values:

Fan 1: 10%

Fan 2: 50%

Fan 3: 70%

Fan 4: 100%

In this case:

If you send 5%, the fan will switch to Fan Level 1.

If you send 70%, the fan will switch to Fan Level 3.

If you send 75%, the fan will switch to Fan Level 4.

As shown in the example, you can switch to any target fan level by sending a value between the target level and the level below it.

Important warning

If you are using Scaling for Fan Level, the values you enter must not be lower than the previous level.

Correct example:

Fan 1 level limit: 5%

Fan 2 level limit: 30%

Fan 3 level limit: 50%

Fan 4 level limit: 70%

Fan 5 level limit: 100%

Incorrect example:

Fan 1 level limit: 5%

Fan 2 level limit: 30%

Fan 3 level limit: 50%

Fan 4 level limit: 45% // This value should be higher than the Fan 3 level limit

Fan 5 level limit: 100%

In summary: the values must follow this order:

Fan 1 < Fan 2 < Fan 3 < Fan 4 < Fan 5

4.4.1 Fan Value Type

To use the fan functions, the **"Fan Control"** parameter must first be enabled under AC Gateway -> General:

Fan Control



When "Fan Control" is enabled, the **"Fan Value Type"** parameter determines the data type used by the "Fan Level Set" and "Fan Level Feedback" objects. Two options can be selected: Enumerated or Scaling.

If the "Enumerated" option is selected, the following values should be entered in the Fan Level object:

- "1" for Fan-1 Level
- "2" for Fan-2 Level
- "3" for Fan-3 Level
- "4" for Fan-4 Level

If the "Scaling" option is selected, a percentage value can be assigned for each fan level.

Fan Value Type

☐ Enumerated ☒ Scaling



%0 is reserved for auto. The limit values can be any number between %1 and %100

Fan Level 1 Limit

25

%

Fan Level 2 Limit

50

%

Fan Level 3 Limit

75

%

Fan Level 4 Limit

100

%

The specified limit values are entered in the Fan Level object to set the fan level.

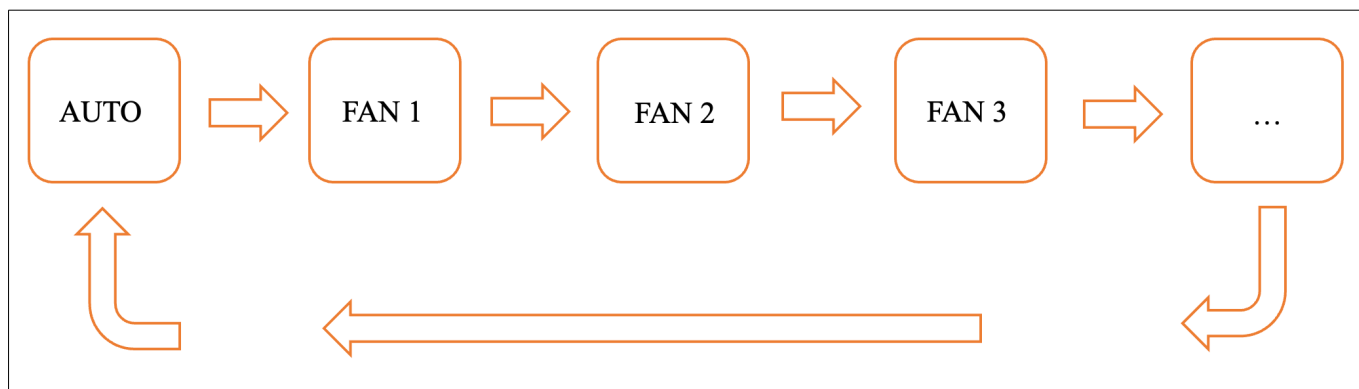
4.4.2 Fan Level +/- Object

Fan Level +/- Object

☒ Disabled ☐ Enabled

The Fan +/- Object parameter is used to switch between fan speeds. If this parameter is enabled, the "Fan Level +/- Set" group object (1: Increase / 0: Decrease) will be available.

If the value 1 is written to the related group address, the fan will switch to the next higher level. If the value 0 is written to the related group address, the fan will switch to the next lower level.



Note

The diagram above shows the complete transition sequence. The sequence follows the same order for every Kbox model, but only includes the fan features supported by your model; unsupported options (e.g. Auto) are skipped.

4.4.3 Fan Level Individual Objects

Fan Level Individual Objects

☒ Disabled ☐ Enabled

By activating the "Fan Level Individual Objects" parameter, a separate object for each fan speed becomes visible, and each fan speed can be adjusted individually.

4.4.4 PARAMETER LIST

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Fan Value Type			Enumerated Scaling	If "Fan Control" is enabled (AC Gateway -> General)	This parameter determines the type of value that will be used to set the fan level.
	Fan Level 1 Limit		1...100%	If "Fan Value Type" is set to "Scaling"	This sub-parameter selects the value to be assigned for Fan-1 level.
	Fan Level 2 Limit		1...100%	If "Fan Value Type" is set to "Scaling"	This sub-parameter selects the value to be assigned for Fan-2 level.

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
	Fan Level 3 Limit		1...100%	If "Fan Value Type" is set to "Scaling"	This sub-parameter selects the value to be assigned for Fan-3 level.
	Fan Level 4 Limit		1...100%	If "Fan Value Type" is set to "Scaling"	This sub-parameter selects the value to be assigned for Fan-4 level.
Fan level +/- object			Disable / Enable		This parameter allows the transition between fan speed levels using the +/- method.
Fan level individual objects			Disable / Enable		This parameter enables a separate object for each fan level, allowing each level to be selected individually.

4.4.5 OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Fan Level +/- Set	1:Increase / 0:Decrease	1 bit	CWU
This object is only visible when the "Fan Level +/- object" parameter is selected. This object is used to adjust the fan speed of the air conditioner in a +/- manner.			
Fan Level Set	Percentage (Scaling)	1 Byte	CWU
This object is only visible when the "Fan Control" parameter is enabled and "Fan Value Type" is set to "Scaling". The fan speed is determined by the percentage values assigned to each level in the parameters.			
Fan Level Feedback	Percentage (Scaling)	1 Byte	CRT
This object is only visible when the "Fan Control" parameter is enabled and "Fan Value Type" is set to "Scaling". It provides real-time feedback on the current fan speed as a percentage value.			
Fan Level Set	1...4 (Enumerated)	1 Byte	CWU
This object is only visible when the "Fan Control" parameter is enabled and "Fan Value Type" is set to "Enumerated". The values represent: "1": Level 1, "2": Level 2, "3": Level 3, "4": Level 4.			
Fan Level Feedback	1...4 (Enumerated)	1 Byte	CRT

OBJECT	FUNCTION	TYPE	FLAG
This object is only visible when the "Fan Control" parameter is enabled and "Fan Value Type" is set to "Enumerated". It provides feedback on the current fan speed using the following values: "1": Level 1, "2": Level 2, "3": Level 3, "4": Level 4.			
Fan Level-1 Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Fan level individual objects" parameter is selected. This object is used to set the fan speed to level 1.			
Fan Level-2 Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Fan level individual objects" parameter is selected. This object is used to set the fan speed to level 2.			
Fan Level-3 Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Fan level individual objects" parameter is selected. This object is used to set the fan speed to level 3.			
Fan Level-4 Set	1:Enable / 0:Disable	1 bit	CWU
This object is only visible when the "Fan level individual objects" parameter is selected. This object is used to set the fan speed to level 4.			
Fan Level-1 Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Fan level individual objects" parameter is selected. With this object, the fan level 1 is monitored.			
Fan Level-2 Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Fan level individual objects" parameter is selected. With this object, the fan level 2 is monitored.			
Fan Level-3 Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Fan level individual objects" parameter is selected. With this object, the fan level 3 is monitored.			
Fan Level-4 Feedback	1:Enable / 0:Disable	1 bit	CRT
This object is only visible when the "Fan level individual objects" parameter is selected. With this object, the fan level 4 is monitored.			

4.5 Up/Down Wing

The following parameters are used for controlling the Up/Down Wing positions of the air conditioner. When selecting a position, please refer to the air conditioner's user manual.

Important warning

If scaling is used to change Up-Down Wing values, please consider the following information: Writing 100% to the "Up-Down Wing Set" object sets the unit to Swing mode.

The 0% value is reserved for the "Auto" feature.

However, since Mitsubishi Heavy air conditioning units do not support the "Auto" function, 0% cannot be used. If a value of 0% is sent to the related object, the Kbox will not provide any response.

For this reason, scaling values should be configured within the range of 1–99%.

Example scenario:

Let's assume the following limit configurations:

Position 1 limit: 10%

Position 2 limit: 50%

Position 3 limit: 70%

Position 4 limit: 99%

In this case:

If you write 0% to the "Up-Down Wing Set" object, Kbox will not provide any response.

If you write 5%, the device will switch to Position 1.

If you write 70%, the device will switch to Position 3.

If you write 75%, the device will switch to Position 4.

If you write 100%, the device will switch to Swing mode.

As shown in the example, you can switch to any target position by sending a value between the target level and the level below it.

Important warning

When using Scaling for the Up-Down Wing position, the limit values must be strictly increasing. Each level must be higher than the previous one.

Correct example:

Position 1: 5% < Position 2: 30% < Position 3: 50% < Position 4: 70% < Position 5: 99%

Incorrect example:

Position 1: 5%

Position 2: 30%

Position 3: 50%

Position 4: 45% // ERROR: This value must be higher than the Position 3 limit.

In summary: The values must follow this order:

Position 1 < Position 2 < Position 3 < Position 4 < Position 5

4.5.1 Up Down Swing

Swing

☐ Disabled ☒ Enabled

The "Swing" parameter defines whether the "Swing" for the vane position is available or not. When enabled, Swing can be selected as a position value ("1" in Enumerated type, 100% in Scaling type).

4.5.2 Up-Down Positions

Swing	☐ Disabled ☒ Enabled
Position 1	☐ Disabled ☒ Enabled
Position 2	☐ Disabled ☒ Enabled
Position 3	☐ Disabled ☒ Enabled
Position 4	☐ Disabled ☒ Enabled

The supported positions can be configured in this section. Please refer to the air conditioner's user manual or remote controller to verify the available positions for your specific model.

4.5.3 Type: Enumerated / Scaling

Type	☒ Enumerated ☐ Scaling
------	---

The "Type" parameter determines how positions are controlled:

If the **"Enumerated"** option is selected, the following values should be sent to the "Up-Down Wing" object:

- Swing: "1"
- Position 1: "2"
- Position 2: "3"
- Position 3: "4"
- Position 4: "5"

If the **"Scaling"** option is selected, a specific percentage value can be assigned for each position level.

Type

☐ Enumerated
☒ Scaling

i %100 is reserved for Swing. The limit values can be any number between %1 and %99

Position 1 Limit

25

▲▼

Position 2 Limit

50

▲▼

Position 3 Limit

75

▲▼

Position 4 Limit

99

▲▼

4.5.4 Up-Down Wing +/- Object

Up-Down Wing +/- Object

☒ Disabled
☐ Enabled

If this parameter is enabled, the "Up-Down Wing +/- Set" group object (1: Increase / 0: Decrease) becomes available. Sending "1" will switch the wing to the next higher level, while sending "0" will switch it to the next lower level.

4.5.5 Up-Down Wing Individual Object

Up-Down Wing Individual Objects

☒ Disabled
☐ Enabled

By activating the "Up-Down Wing Individual Object" parameter, a separate group object is created for each position, allowing each level to be triggered independently.

4.5.6 PARAMETER LIST

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Swing			Disable / Enable		This parameter determines whether the "Swing" option is available for the Up-Down Wing position.

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Position 1			Disable / Enable		This parameter determines whether "Position 1" is available or not.
Position 2			Disable / Enable		This parameter determines whether "Position 2" is available or not.
Position 3			Disable / Enable		This parameter determines whether "Position 3" is available or not.
Position 4			Disable / Enable		This parameter determines whether "Position 4" is available or not.
Type			Enumerated Scaling		This sub-parameter determines the data type used to set the Up-Down Wing position.
		Position 1 limit		If "Type" is set to "Scaling"	Defines the assigned scaling value for Position 1.
		Position 2 limit		If "Type" is set to "Scaling"	Defines the assigned scaling value for Position 2.
		Position 3 limit		If "Type" is set to "Scaling"	Defines the assigned scaling value for Position 3.
		Position 4 limit		If "Type" is set to "Scaling"	Defines the assigned scaling value for Position 4.
Up-Down Wing +/- object			Disable / Enable		This parameter enables sequential switching between positions using a single object (Increase/Decrease).

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Up-Down Wing Individual objects			Disable / Enable		This parameter enables a separate group object for each position, allowing direct individual selection.

4.5.7 OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Up-Down Position Swing Set	1:Enabled / 0:Disabled	1 bit	CWU
This object is only visible when the "Swing" parameter is enabled. It is used to activate or deactivate the swing motion of the air conditioner.			
Up-Down Position Swing Feedback	1:Enabled / 0:Disabled	1 bit	CRT
This object is only visible when the "Swing" parameter is enabled. It provides real-time feedback indicating whether the swing motion is active or stopped.			
Up-Down Wing Set	Percentage (Scaling)	1 byte	CWU
This object is only visible when the "Up-Down Wing Control" parameter is enabled and the Type is set to "Scaling". The position is determined by the percentage values assigned to each level in the parameters.			
Up-Down Wing Feedback	Percentage (Scaling)	1 byte	CRT
This object is only visible when the "Up-Down Wing Control" parameter is enabled and the Type is set to "Scaling". It provides feedback on the current position as a percentage value.			
Up-Down Wing Set	1...5 (Enumerated)	1 byte	CWU
This object is only visible when the "Up-Down Wing Control" parameter is enabled and the Type is set to "Enumerated". The values represent: "1": Swing, "2": Position 1, "3": Position 2, "4": Position 3, "5": Position 4.			
Up-Down Wing Feedback	1...5 (Enumerated)	1 byte	CRT
This object provides feedback for the current position using enumerated values: "1": Swing, "2": Position 1, "3": Position 2, "4": Position 3, "5": Position 4.			
Up-Down Wing +/- Set	1:Increase / 0:Decrease	1 bit	CWU
This object is only visible when the "Up-Down Wing +/- Object" parameter is enabled. It allows switching between positions sequentially.			
Up-Down Wing Position 1 Set	1:Set Position 1 / 0:NA	1 bit	CWU
Visible when "Up-Down Wing Individual Objects" is enabled. Used to directly trigger Position 1.			
Up-Down Wing Position 2 Set	1:Set Position 2 / 0:NA	1 bit	CWU
Visible when "Up-Down Wing Individual Objects" is enabled. Used to directly trigger Position 2.			
Up-Down Wing Position 3 Set	1:Set Position 3 / 0:NA	1 bit	CWU
Visible when "Up-Down Wing Individual Objects" is enabled. Used to directly trigger Position 3.			
Up-Down Wing Position 4 Set	1:Set Position 4 / 0:NA	1 bit	CWU

OBJECT	FUNCTION	TYPE	FLAG
Visible when "Up-Down Wing Individual Objects" is enabled. Used to directly trigger Position 4.			
Up-Down Wing Position 1 Feedback	1:Active / 0:Inactive	1 bit	CRT
Visible when "Up-Down Wing Individual Objects" is enabled. Used to monitor if Position 1 is active.			
Up-Down Wing Position 2 Feedback	1:Active / 0:Inactive	1 bit	CRT
Visible when "Up-Down Wing Individual Objects" is enabled. Used to monitor if Position 2 is active.			
Up-Down Wing Position 3 Feedback	1:Active / 0:Inactive	1 bit	CRT
Visible when "Up-Down Wing Individual Objects" is enabled. Used to monitor if Position 3 is active.			
Up-Down Wing Position 4 Feedback	1:Active / 0:Inactive	1 bit	CRT
Visible when "Up-Down Wing Individual Objects" is enabled. Used to monitor if Position 4 is active.			

4.6 AC Temperature

The air conditioner set temperature and ambient temperature are adjusted using the following parameters.

Enable Set Temperature Feedback
☐ Disabled ☒ Enabled

Set Temperature Feedback Behaviour
On change or on request ▼

Set Temperature +/- Object
☐ Disabled ☒ Enabled

Set Temperature Limiting
☒ Disabled ☐ Enabled

Enable Ambient Temperature Feedback
☐ Disabled ☒ Enabled

Ambient Temperature Feedback Behaviour
On change or on request ▼

4.6.1 Setpoint Temperature Feedback

The set temperature information can be monitored by activating the **"Enable Set Temperature Feedback"** parameter. This parameter can be activated in three ways:

Set Temperature Feedback Behaviour On request ▼

The "Setpoint Temperature Feedback" parameter is activated with "On Request" mode, allowing the set temperature to be monitored when requested.

Set Temperature Feedback Behaviour On change or on request ▼

The "Setpoint Temperature Feedback" parameter is activated with "On Change or On Request" mode, allowing the set temperature to be monitored either when it changes or upon request.

Set Temperature Feedback Behaviour Cyclical or on request ▼

Period 15 Seconds

The "Setpoint Temperature Feedback" parameter is activated with the "Cyclical or On Request" option, allowing the set temperature to be monitored either at a specified interval or upon request. The monitoring interval can be adjusted using the "Period" sub-parameter.

4.6.2 Setpoint Temperature +/- Object

Set Temperature +/- Object

☐ Disabled ☒ Enabled

If this parameter is enabled, the "Setpoint Temperature +/-" group object (1: Increase / 0: Decrease) will be available.

If the value "1" is written to the related group address, the set temperature will increase by "+1".

If the value "0" is written to the related group address, the set temperature will decrease by "-1".

4.6.3 Setpoint Temperature Limiting

Set Temperature Limiting ☐ Disabled ☒ Enabled

 Make sure the minimum values are not higher than maximum values.

Cool Mode Maximum	30
Cool Mode Minimum	18
Heat Mode Maximum	30
Heat Mode Minimum	16

This parameter allows setting the highest and lowest set temperatures for **"Cool Mode"** and **"Heat Mode."**

4.6.4 Ambient Temperature

Important warning

Kbox accepts a minimum of 8 °C and a maximum of 39 °C for Ambient Temperature. If these limits are exceeded, the closest value within the allowed range will be used.

The **"Ambient Temperature"** group object is used to transmit the room temperature measured by a KNX sensor (e.g. a thermostat) to the indoor unit. This object is only visible when the **"Slave Function"** parameter is set to "Disabled" and the **"Ambient Temperature Source"** parameter is set to "From Bus".

4.6.5 Ambient Temperature Source

Ambient Temperature Source ☒ From Bus ☐ From AC

The **"Ambient Temperature Source"** parameter determines which temperature source the air conditioner uses as the ambient temperature:

- **From Bus (default):** The ambient temperature received from the KNX line (e.g. from a KNX thermostat or sensor) is transmitted to the air conditioner. In this case, the 2-byte "Ambient Temperature" group object is visible and usable.

- **From AC:** The "Ambient Temperature" group object is not visible and cannot be used. Since no temperature value can be received from the KNX line in this case, the air conditioner operates using its own suction (return air) temperature.

4.6.6 Ambient Temperature Feedback

Enable Ambient Temperature Feedback ☐ Disabled ☒ Enabled

By enabling the **"Ambient Temperature Feedback"** parameter, the Kbox is configured to broadcast ambient temperature values onto the KNX line. The ambient temperature information can be monitored by activating this parameter in three different ways:

Ambient Temperature Feedback Behaviour On request ▼

The **"Ambient Temperature Feedback"** parameter can be activated with the **"on request"** option, allowing the ambient temperature to be monitored whenever requested.

Ambient Temperature Feedback Behaviour On change or on request ▼

"on change or on request" – The ambient temperature monitoring is activated when there is a change in the environment temperature or upon request.

Ambient Temperature Feedback Behaviour Cyclical or on request ▼
 Period 15 ▼ Seconds

"cyclical or on request" – It is activated to monitor either at a specific period or upon request. The desired interval for monitoring the ambient temperature is set in the **"Period"** sub-parameter.

4.6.7 PARAMETER LIST

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
Enable Setpoint tempera- ture feedback	Period		Disable On request On change or on request Cyclical or on request 5...65535 seconds	if selected "Setpoint temperature feedback" parameter as "Cyclical or on request"	This parameter is selected to monitor the air conditioner's "set temperature". This sub-parameter adjusts the time period for monitoring the set temperature.
Setpoint tempera- ture +/- Object			Disable / Enable		This parameter allows to change the set temperature step by step.
Setpoint Tempera- ture Limiting	Cool Mode Maximum Cool Mode Minimum		Disable / Enable 18...30 18...30		This parameter sets the set temperature limits. This sub-parameter determines the maximum "set temperature" value in cooling mode. This sub-parameter sets the minimum set temperature value in cooling mode.

Parameter	Sub Par. 1	Sub Par. 2	Values	Conditions	Details
	Heat Mode Maximum		16...30	If "Setpoint temperature Limiting" parameter is enabled.	This sub-parameter determines the maximum set temperature value in heating mode.
	Heat Mode Minimum		16...30		This sub-parameter sets the minimum set temperature value in heating mode.
Ambient Temperature Source			From Bus From AC		This parameter determines whether the ambient temperature is received from the KNX bus ("From Bus") or from the air conditioner's suction air sensor ("From AC").
Enable Ambient temperature feedback	Period		Disable On request On change or on request Cyclical or on request	If "Ambient temperature feedback" parameter is set to "Cyclical or onrequest"	This parameter is selected to monitor the ambient temperature.
			5...65535 seconds		This sub-parameter sets the monitoring period for the ambient temperature.

4.6.8 OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Set Point Temperature	Temperature (Celsius)	2 Bytes	CWU
This object is always active. The desired "set temperature" value can be controlled via the linked group address.			
Set Point Temperature Feedback	Temperature (Celsius)	2 Bytes	CRT
This object is always active. The "set temperature" value is monitored via the linked group address.			
Set Point Temperature +/-	1:Increase / 0:Decrease	1 Bit	CWU
This object only appears when the "Setpoint temperature +/- object" parameter is enabled. This object adjusts the AC's "set temperature" in +/- increments.			
Ambient Temperature	Temperature (Celsius) Min:8 Celsius, Max:39 Celsius	2 Bytes	CWU
This object is only visible when the "Slave Function" parameter is set to "Disabled" and the "Ambient Temperature Source" parameter is set to "From Bus". This object transmits ambient temperature data to the indoor unit.			
Ambient Temperature Feedback	Temperature (Celsius)	2 Bytes	CRT
This object is only visible when the "Enable Ambient Temperature Feedback" parameter is set to "Enabled". Ambient temperature data is monitored through this object.			

4.7 Digital Inputs

The Kbox features three digital inputs that can be used to trigger specific air conditioning actions based on external signals. All three inputs have identical configuration parameters; therefore, this section describes the settings for "Digital Input 1" as a reference for all.

4.7.1 Enabling Digital Inputs

Digital Input Functions


By default, all digital inputs are disabled. To use a digital input, it must first be set to **"Enable"** in the "Digital Input Functions" in General -> Settings.

4.7.2 Trigger Source (Trigger From)

Digital Input 1
☐ Disabled
☒ Enabled

Trigger From
☒ Bus Input
☐ Binary Input(From Hardware)

This parameter determines how the input signal is received:

- **Bus Input:** The input is triggered via a KNX group object (Digital Input x). This is useful for virtual logic or signals coming from other KNX devices.
- **Binary Input (From Hardware):** The input is triggered via the physical dry contact terminals on the Kbox hardware.

4.7.3 Binary Input Type

Trigger From	☐ Bus Input ☒ Binary Input(From Hardware)
Binary Input Type	☒ Normally Open ☐ Normally Close

If the trigger source is set to "Binary Input (From Hardware)" (physical dry contact), the contact type must be defined with the "Binary Input Type" parameter:

- **Normally Open (NO):** The input is considered "Active" when the circuit is closed.
- **Normally Close (NC):** The input is considered "Active" when the circuit is opened.

4.7.4 Input Actions (Active / Passive)

Input Active	No Action
Input Passive	No Action  AC On AC Off

The Kbox can perform specific actions based on the state of the input. Both "**Input Active Action**" and "**Input Passive Action**" can be independently configured with the following options:

- **No Action:** No change is made to the AC state.
- **AC On:** The air conditioner is switched on.
- **AC Off:** The air conditioner is switched off.

4.7.5 PARAMETER LIST

Parameter	Sub Par. 1	Values	Conditions	Details
Digital Input 1/2/3		Disable / Enable		Enables or disables the respective digital input channel.

Parameter	Sub Par. 1	Values	Conditions	Details
	Trigger From	Bus Input / Binary Input(From Hardware)	If Enabled	Selects whether the trigger comes from the KNX bus or physical hardware.
	Binary Input Type	Normally Open / Normally Close	If Trigger From = Binary Input(From Hardware)	Defines the physical contact logic of the dry contact input.
	Input Active Action	No Action / AC On / AC Off	If Enabled	Defines the action to be performed when the input becomes active.
	Input Passive Action	No Action / AC On / AC Off	If Enabled	Defines the action to be performed when the input becomes passive.

4.7.6 OBJECT LIST

OBJECT	FUNCTION	TYPE	FLAG
Digital Input 1	1:Active / 0:Passive	1 bit	CWU
Digital Input 2	1:Active / 0:Passive	1 bit	CWU
Digital Input 3	1:Active / 0:Passive	1 bit	CWU
These objects are only visible when the "Trigger From" parameter is set to "Bus" for the respective input. They allow triggering the predefined actions via the KNX bus.			

5 Main Technical Features

Device	Kbox MHVY
Power Supply	EIB Power Supply
Power Consumption	10mA
Inputs	3 dry contact inputs
Button	1 x KNX programming button
LED	1 x KNX programming LED
Operating Mode	S-Mod
Protection Type	IP 20
Temperature	Working (-10°C...70°C) Storing (-25°C...90°C)
Maximum Humidity	<90RH
Flammability	Non-flammable material
Color	Black
Dimensions	44.5x19.8x44.5 mm (WxHxD)
Configuration	With ETS

6 Wiring Diagram

The Kbox MHVY is connected to the indoor unit of the air conditioner as shown below.

