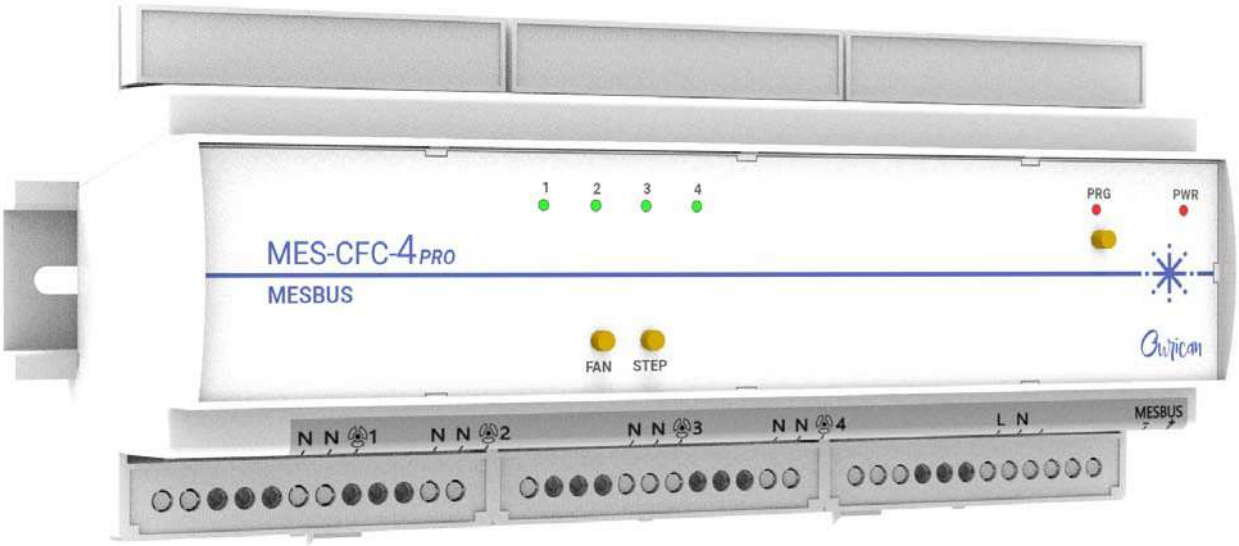
MES-CFC-4 Pro KNX / MESBUS powered 4 channel ceiling fan controller



User Manual

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1. Introduction

1.1. Features

MES-CFC-4 Pro is a 4 channel ceiling fan controller. Designed to operate on the KNX /MESBUS bus, the device has the following features:

- Control of 4 ceiling fans.
- 5 speed control of individual ceiling fans.
- Powered and addressed using the KNX or MESBUS bus without needing an external power supply.
- Provided with push buttons and LED indicators for selecting 1 of the 4 channels and its speed control.
- Ability to run 10 scenes per output.
- Efficient fan motor speed control without humming noise.
- Programmed via ETS software.
- Saving of total data on failure of bus.
- Programming button with an LED indicator.
- Mounting on a 35 mm DIN rail.
- CE marked.

1.2. Application

MES-CFC-4 Pro can control up to 5 speeds of 4 ceiling fans for the home automation.

Do not use MES-CFC-4 Pro for the control of other fans such as exhaust fans, BLDC fans, pedestal fans and table fans.

1.3. Appearance and features

MES-CFC-4 Pro is housed in an ABS plastic enclosure of 213 mm width X 91 mm height X 62 mm depth. This enclosure is mounted on a 35 mm DIN rail, secured by 2 spring loaded retention clips. The enclosure has terminals on the lower edge, with wire entry from the bottom.

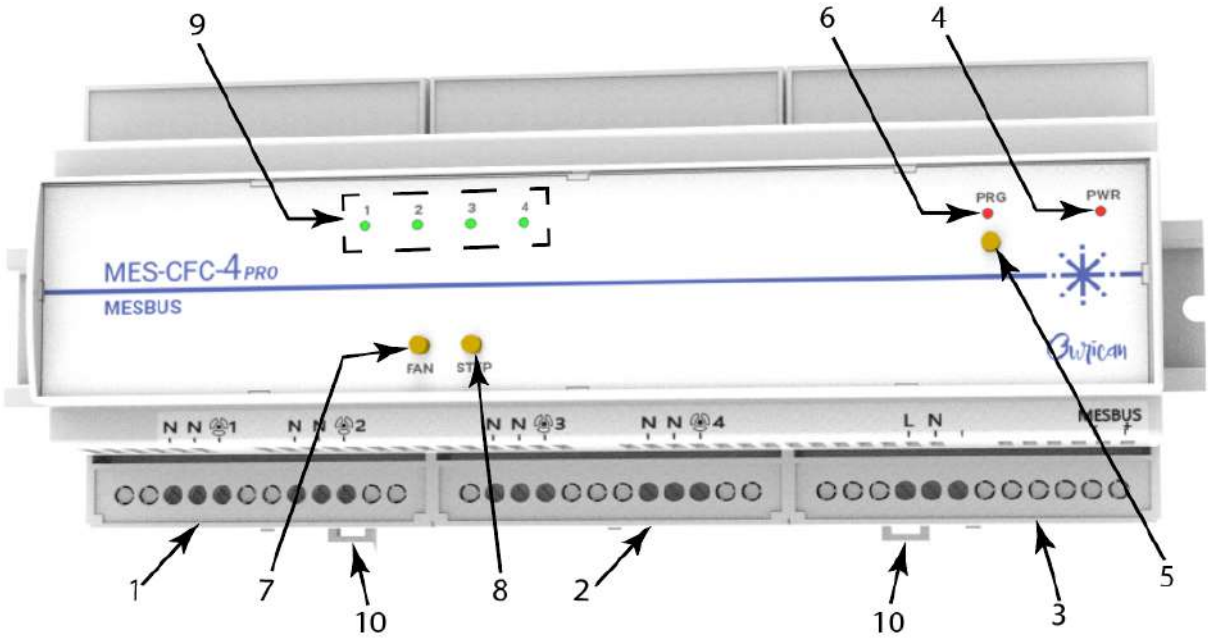

Figure 1-1: MES-CFC-4 Pro

No.	Part	Function
1.	Connector 1	Connector for fan 1 and fan 2.
2.	Connector 2	Connector for fan 3 and fan 4.
3.	Connector 3	Connectors for mains supply and the KNX /MESBUS bus.
4.	Power LED	Red LED illuminates when power is supplied to the device.
5.	Programming button	Push button for initializing the programming mode.
6.	Programming LED	Red LED illuminates when the device is in the programing mode.
7.	Fan push button	Push button for selecting 1 of the 4 fans.
8.	Step push button	Push button for setting the selected fan's speed.
9.	Indication LEDs	Green LEDs that show various parameters like the selected fan and its set speed.
10.	Retention clips	Secures the MES-CFC-4 Pro on the DIN rail.

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1.4. Installation on the DIN rail

Note

Install the MES-CFC-4 Pro in an suitable electrical panel that protects the device from dust, dripping liquids, condensation, and vermin.

1. Engage the slots at the rear of the MES-CFC-4 Pro into the upper edge of the DIN rail **1**. *See "Installing on the DIN rail" on page 7.*
2. Use flat screwdrivers to pull down the 2 numbers of spring-loaded retention clips **2** and position the MES-CFC-4 Pro device parallel to the DIN rail.
3. Release spring-loaded retention clips to secure the MES-CFC-4 Pro device on the DIN rail. *See "Securing the device on the DIN rail" on page 8.*
4. To remove the MES-CFC-4 Pro device from the DIN rail **1**, reverse the above steps.

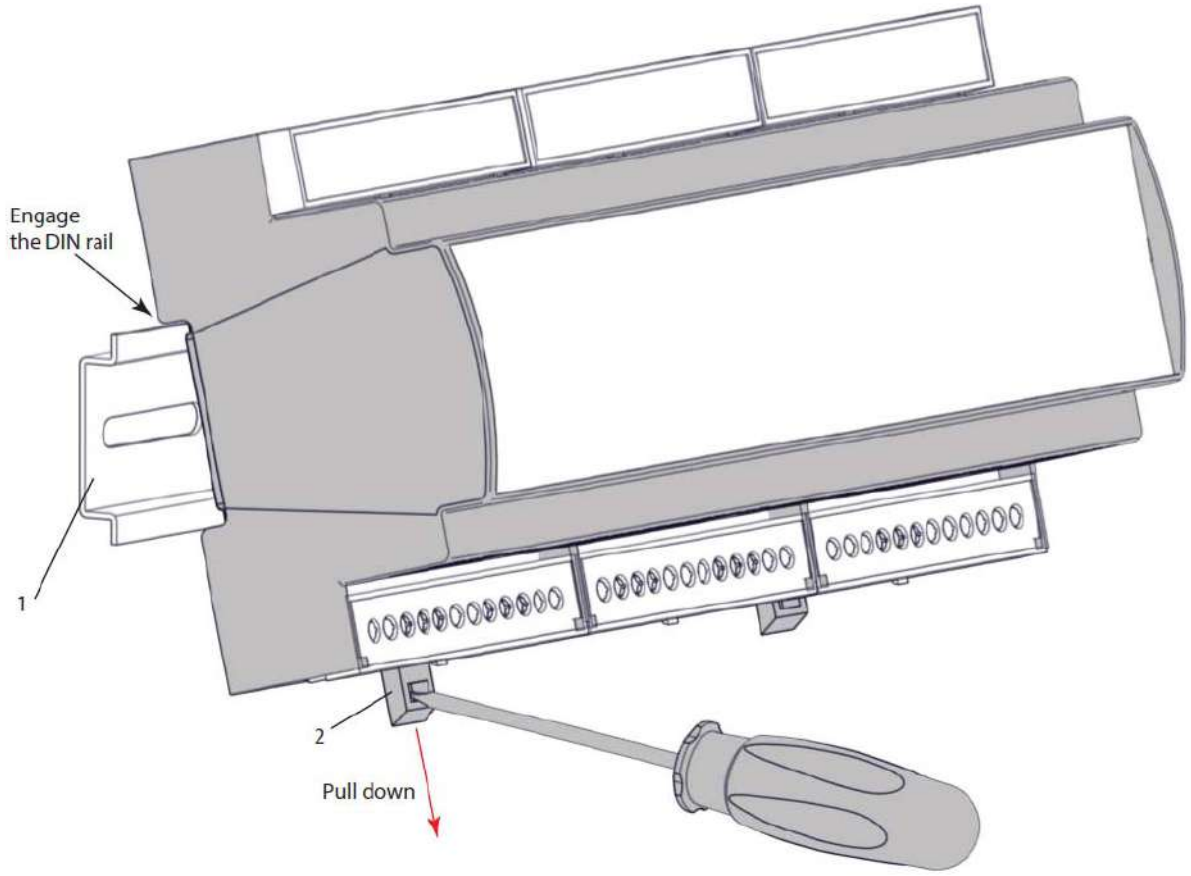

Figure 1-2: Installing on the DIN rail

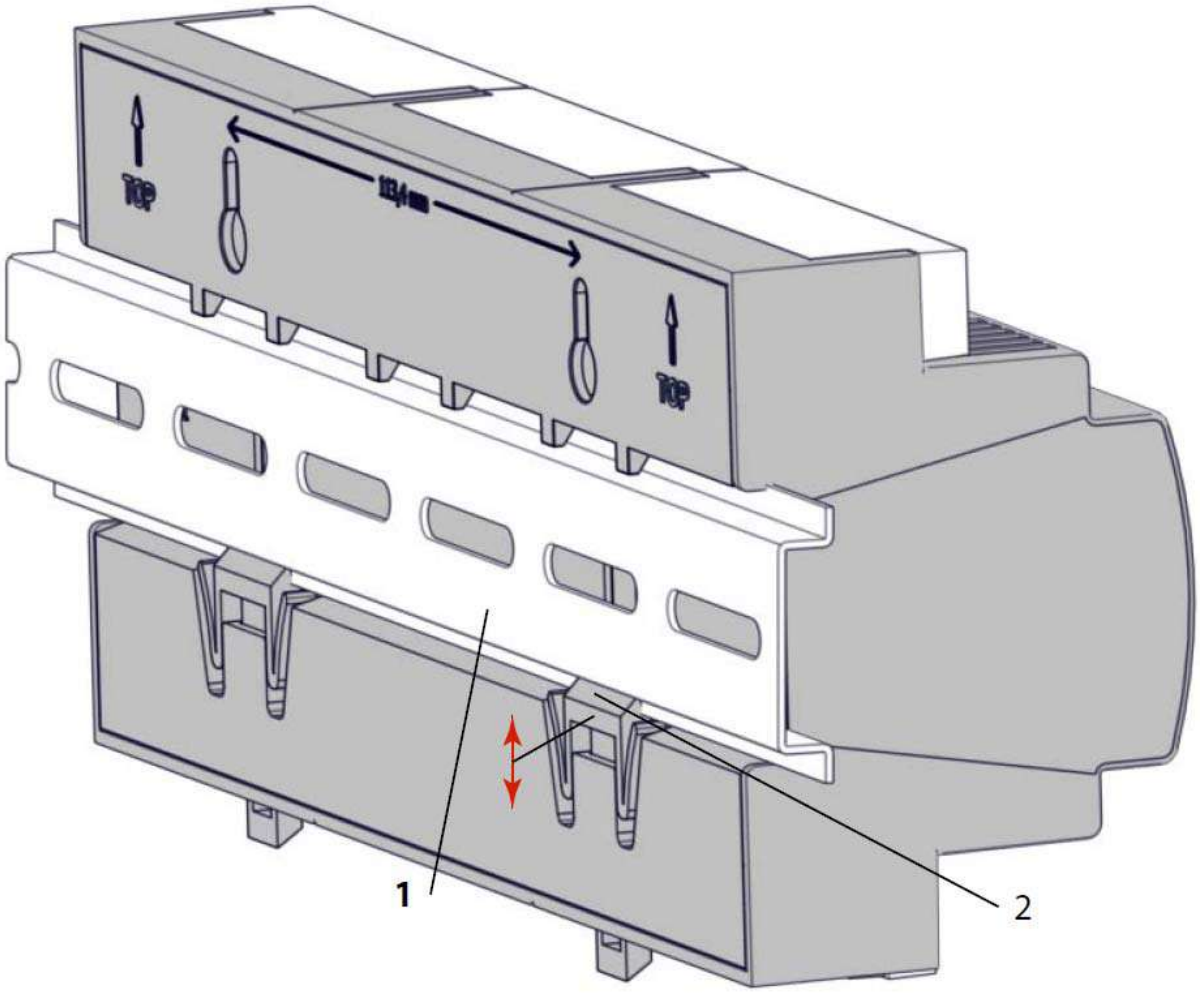

Figure 1-3: Securing the device on the DIN rail

1.5. Connections

- MES-CFC-4 Pro uses the standard KNX connector for connecting to the KNX / MESBUS bus.
- MES-CFC-4 Pro is powered through the KNX / MESBUS bus. The device does not need a separate power supply. Ensure adequate wire thickness for connecting the load.

Caution

Connect the bus cable only to the KNX terminals and to no other power supply or potential, or non-KNX / MESBUS compliant devices.

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⚠ Caution

Do not connect the mains voltage nor any other external voltage to any point of the KNX bus/MESBUS connector as it represents a risk for the entire system. The facility must have enough insulation between the mains voltage, the KNX bus/MESBUS and the wires of other accessories that may be installed.

⚠ Caution

The device outputs may be connected to high external potential even if the MES-CFC-4 Pro device is off. Isolate the load supply from source, before commencing work on connections.

⚠ Caution

Only trained and qualified personnel should do the electrical wiring.

1.5.1. Connection procedure

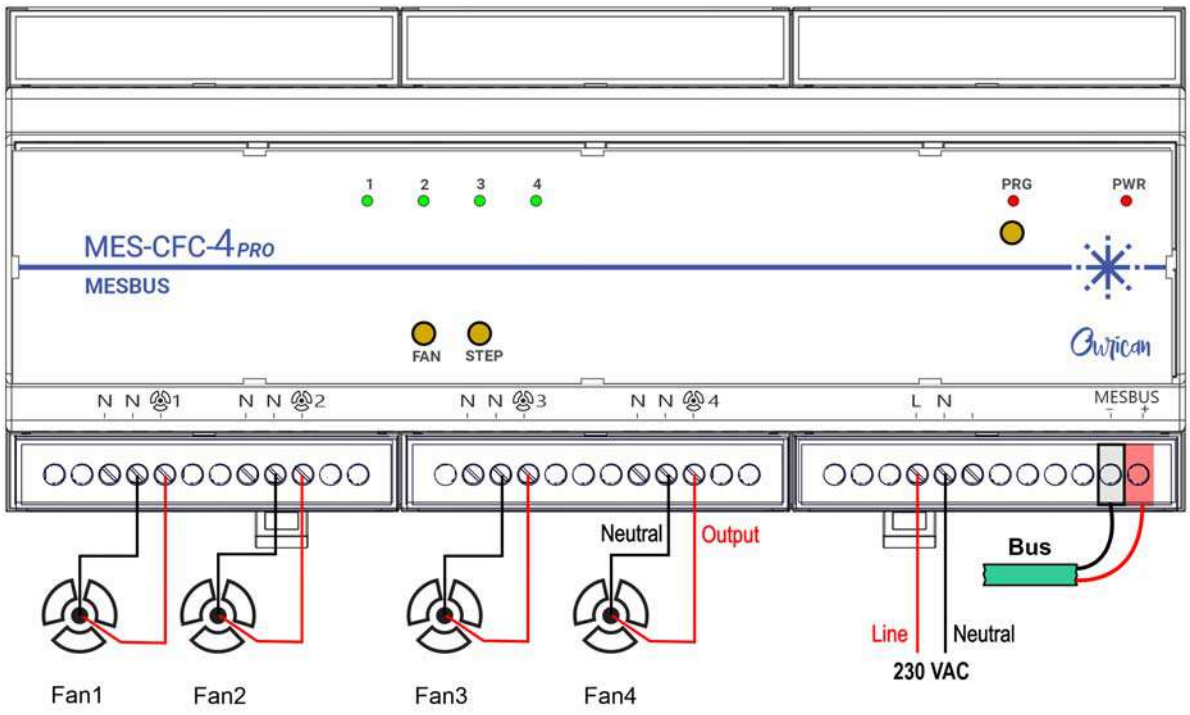

Figure 1-4: Typical connection diagram of MES-CFC-4 Pro

Caution

Connect wires only after physically isolating all the supply wires from the source or ensure that the source is switched off.

1. Connect the KNX bus cables as per polarity indicated in connection diagram.
2. Connect the **Black wire** to the **Black terminal**, and the **Red wire** to the **Red terminal**.
   - Reversing the connection does not result in any damage.
   - The MES-CFC 4 Pro will not operate with a reversed bus connection.
3. Connect the 230 VAC single phase supply wires L [Line] and N [Neutral] terminals.
4. Connect each fan supply wires to the individual 4 channel output terminals.
5. Connect the output to the  terminal. Connect the fan neutral to one of the two **N** terminals provided in each channel's output.
6. You may use other neutral terminal for looping.

Caution

Connect fan neutral to the neutral terminal of the device.

Caution

Connect the neutral wire of the device (load and supply) to the neutral link in the distribution box.

1.6. Start-up and power-loss

1.6.1. During start-up

- The red PWR LED illuminates when KNX / MESBUS supply is available.
- The green LEDs for individual outputs illuminate as per the status prior to the bus failure.
- The relays will retain or change their state as per configured in ETS.

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1.6.2. During power-loss

- The PWR LED switches off.
- The fan speed setting retain their state.

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2. Manual operation

MES-CFC-4 Pro drives 4 ceiling fans with 5 speeds.

See paragraph Figure 1-4: "Typical connection diagram of MES-CFC-4 Pro" on page 9.

During manual operation, the MES-CFC-4 Pro changes the individual fan speeds in 5 steps, from zero (off) to 5th speed by pressing the **Step** button repeatedly. Pressing the **Step** button once again switches off the fan.

2.1. Select the fan

1. Initially, short-pressing the **Fan** button on the fascia of MES-CFC-4 Pro selects the 1st fan.
   > *The 1st LED rapidly flashes thrice to confirm selection of Fan 1.*
2. Subsequent short-presses of **Fan** button selects the next fan number, rotating back to the 1st fan after the 5th push of the button.
   > *The respective LEDs rapidly flashes to confirm selection of the 1 out of 4 fans.*
3. If the **Fan** button is not pressed anymore, the device selects the last selected fan for setting the fan speed.
   > *The LED associated with the fan rapidly flashes thrice to confirm its selection and then switches off.*

2.2. Select the fan speed

1. With a fan selected, short-pressing the **Step** button will increase the speed of that fan.
   > *Speed value is indicated on the LEDs.* *See paragraph Table 2.1: "Status of LEDs for various fan speeds" on page 14*
2. Short-pressing the **Step** button when the fan is at zero speed will increase the speed by 1 step. After the 6th press of **Step** button, the fan will go back to 0 speed.
3. The LED illuminate as per the following table to indicate the various fan speeds. See *"Status of LEDs for various fan speeds" on page 14*.
4. The LEDs show speed indication for about 5 seconds, after which the LEDs will switch off.

Table 2.1: Status of LEDs for various fan speeds

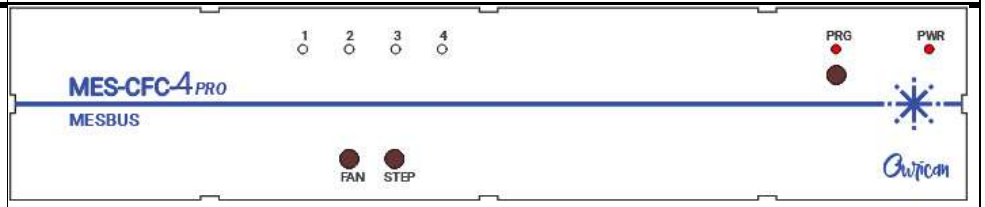
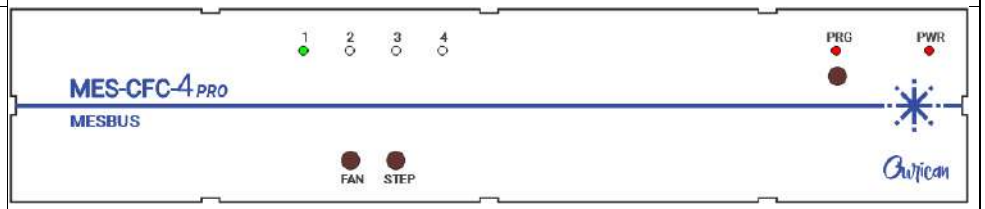
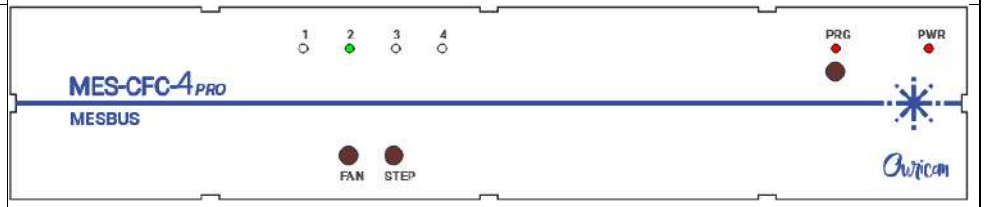
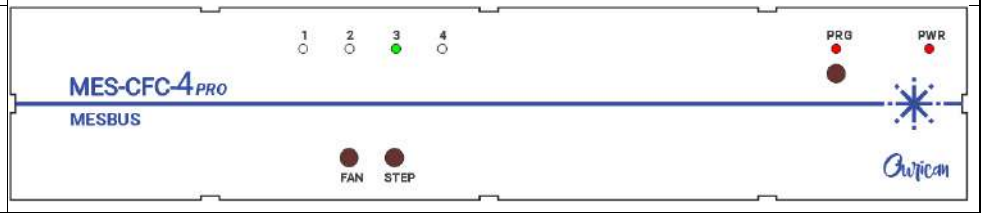
Fan speed	Short-press the Step button	LEDs
0 = Fan off	Starting condition	
1	Once	
2	Twice	
3	Thrice	

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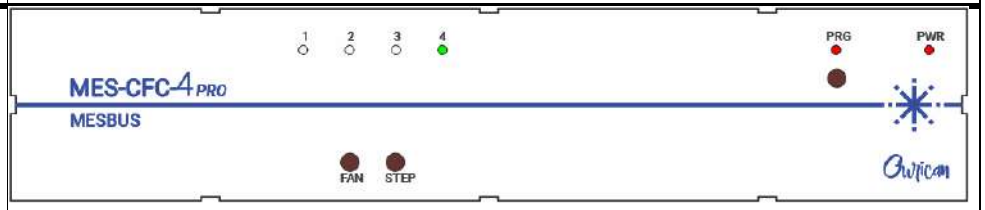
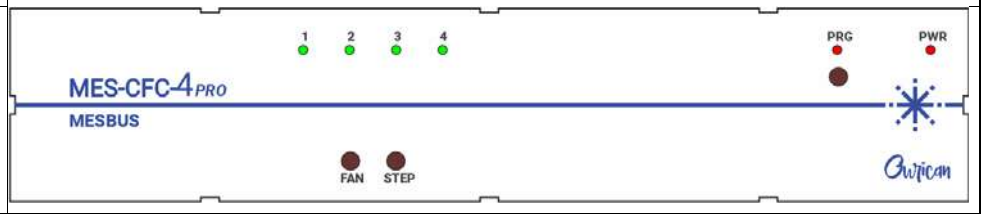
Table 2.1: Status of LEDs for various fan speeds

Fan speed	Short-press the Step button	LEDs
4	Four times	
5	Five times. On the 6th short-press, the fan speed will be zero.	

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3. Configuring the MES-CFC-4 Pro

3.1. Configuring the channels

This section shows configuration of the MES-CFC-4 Pro device using the ETS software.

3.1.1. Enable the channels

Note

The following section shows only 1 channel. However the steps are identical for all the other channels. Set each channel independently.

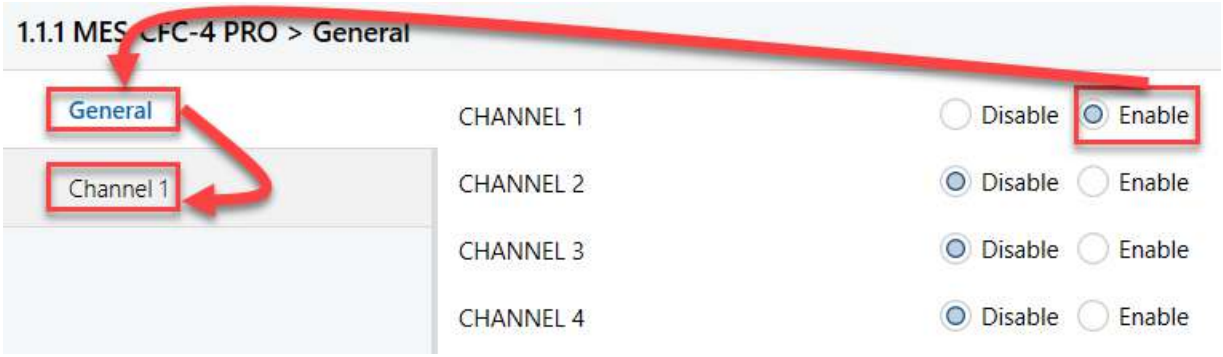

Figure 3-1: Enable the channels

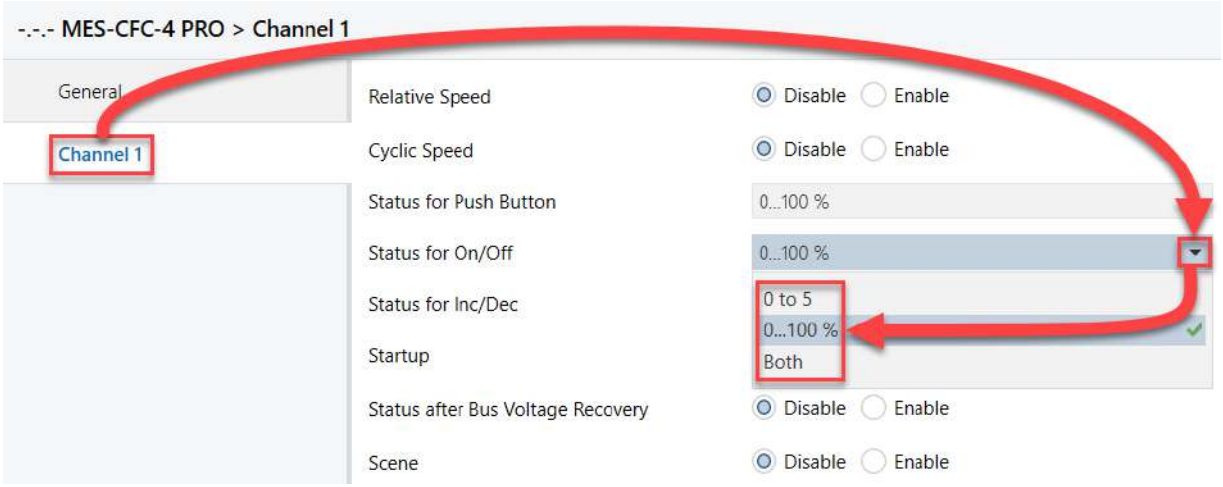

Figure 3-2: Setting the Parameters

1. Navigate to the **Parameters** tab and select **Enable** for the required channels.

> *A new **+** sign shows near the General text.*

3.1.2. Parameter Description

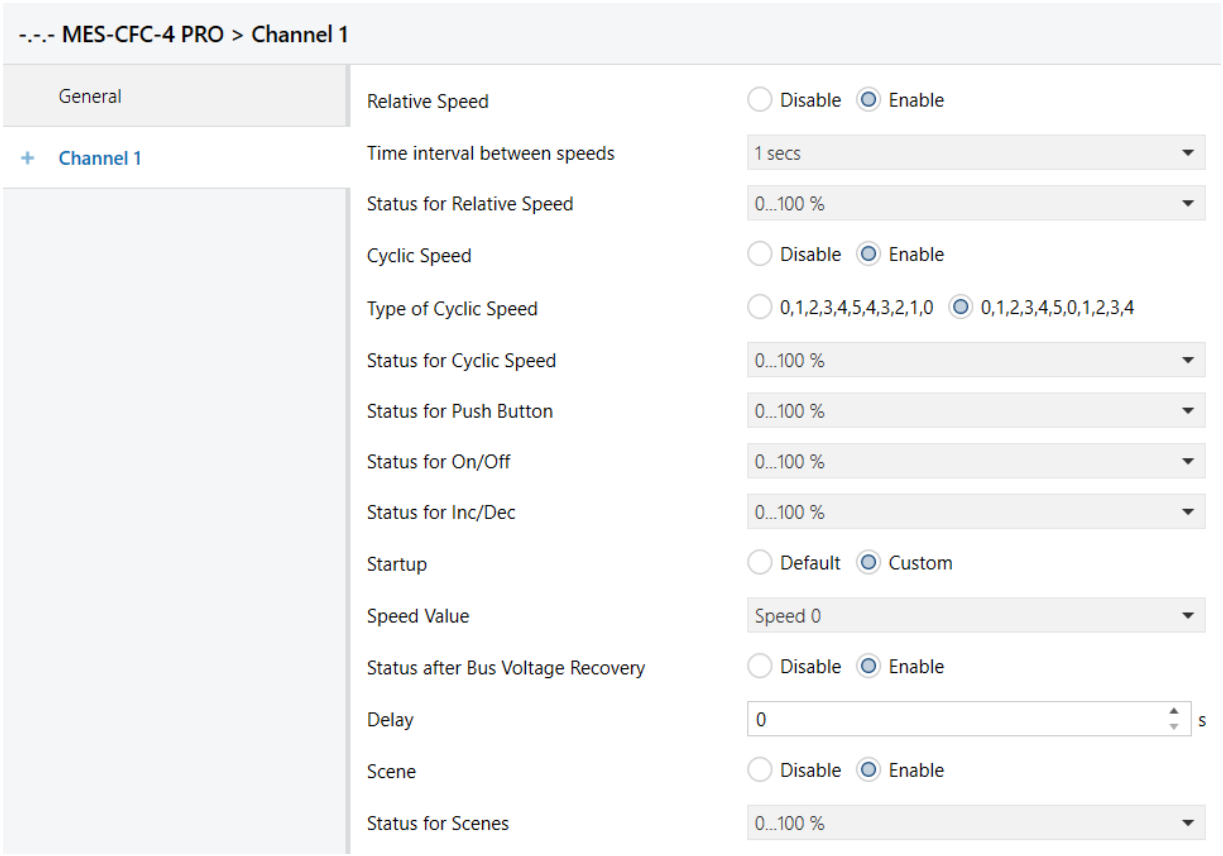

Figure 3-3: Parameter options for Channel 1

Table 3.1: Description of parameters

Parameter	Options	Description
Relative Speed - Enables the relative speed group object and decides the status type when relative speed is used for changing fan speed. Enabling the relative speed group shows an additional setting of Time interval between speeds.[1]	Enable	Shows Time interval between speeds, Status for Relative Speed settings and Relative Speed Group Objects.
	Disable	Hides Time interval between speeds, Status for Relative Speed settings and Relative Speed Group Objects.

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Table 3.1: Description of parameters (Continued)

Parameter	Options	Description
Time interval between speeds	0 to 5	Speed status will be between 0 to 5. The status will be sent as per the period defined in Time interval between speeds.
	0 to 100%	Speed status will be between 0 to 100%. The status will be sent as per the period defined in Time interval between speeds.
	Both	Speed status will be between 0 to 5 seconds and 0 to 100%. The status will be sent as per period defined in Time interval between speeds.
Status for relative speed	0 to 5	Feedback for the relative speed in between 0 to 5.
	0 to 100%	Feedback for the relative speed between 0 to 100%.
	Both	Feedback for relative status will be between 0 to 5 and 0 t0 100%.
Cyclic Speed - Enables the cyclic speed feature	Enable	Enables the cyclic speed feature.
	Disable	Disables the cyclic speed feature.
Types of Cyclic Speed - Allows selection of any one type of cyclic speed.	0,1,2,3,4,5,4,3,2,1,0	Speed increases from 0 to 5 and then decreases from 5 to 0.
	0.1,2,3,4,5,0,1,2,3,4	Speed value increases from 0 to 5. After the 5th speed, repeat the 0 to 5 cycle.

Table 3.1: Description of parameters (Continued)

Parameter	Options	Description
Status for Cyclic Speed - Decides the status type when cyclic speed group object is used for changing the fan speed value.	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.
Status for Push Button - Decides the status type when operated using push buttons)	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.
Status for On/Off - Decides the status type when On/Off group object is used for switching on or off ceiling fan.	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.

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Table 3.1: Description of parameters (Continued)

Parameter	Options	Description
Status for On/Off - Decides the status type when On/Off group object is used for switching on or off ceiling fan.	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.
Status for Inc/Dec - Decides the status type when Inc/Dec group object is used for increasing or decreasing the fan speed.	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.
Startup - Decides whether to perform Default or Custom action during device start up.	Default	Selecting this option sets the fan speed value to 0 and prevents sending of status on the bus after downloading the ETS. After the bus voltage recovery, the fan speed value will also recover.
	Custom	Selecting this option sets the fan speed value as per configuration and sends the status on the bus after downloading the ETS. After bus voltage recovery, the fan speed value will change as per configuration in ETS.

Table 3.1: Description of parameters (Continued)

Parameter	Options	Description
Status after Bus Voltage Recovery	Enable	Enables the delay time, which is the time duration after which status will be sent on the bus after the bus voltage recovery.
	Disable	Disables the delay time.
Delay	0 to 50	Time duration in seconds after which the status will be sent on the bus.
Scene	Enable	Shows Status for Scene and Scene Group Object.
	Disable	Hides Status for Scene and Scene Group Object.
Status for Scenes - Decides the status type when scenes are used.	0 to 5	Speed status will be 0 to 5.
	0 to 100%	Speed status will be 0 to 100%.
	Both	Speed status will be 0 to 5 and 0 to 100%.

1. Time interval between speeds defines the period between the consecutive speeds. For example, if this parameter is set to 1 second, then the fan speed will change from speed 1 to speed 2 after a 1 second period.

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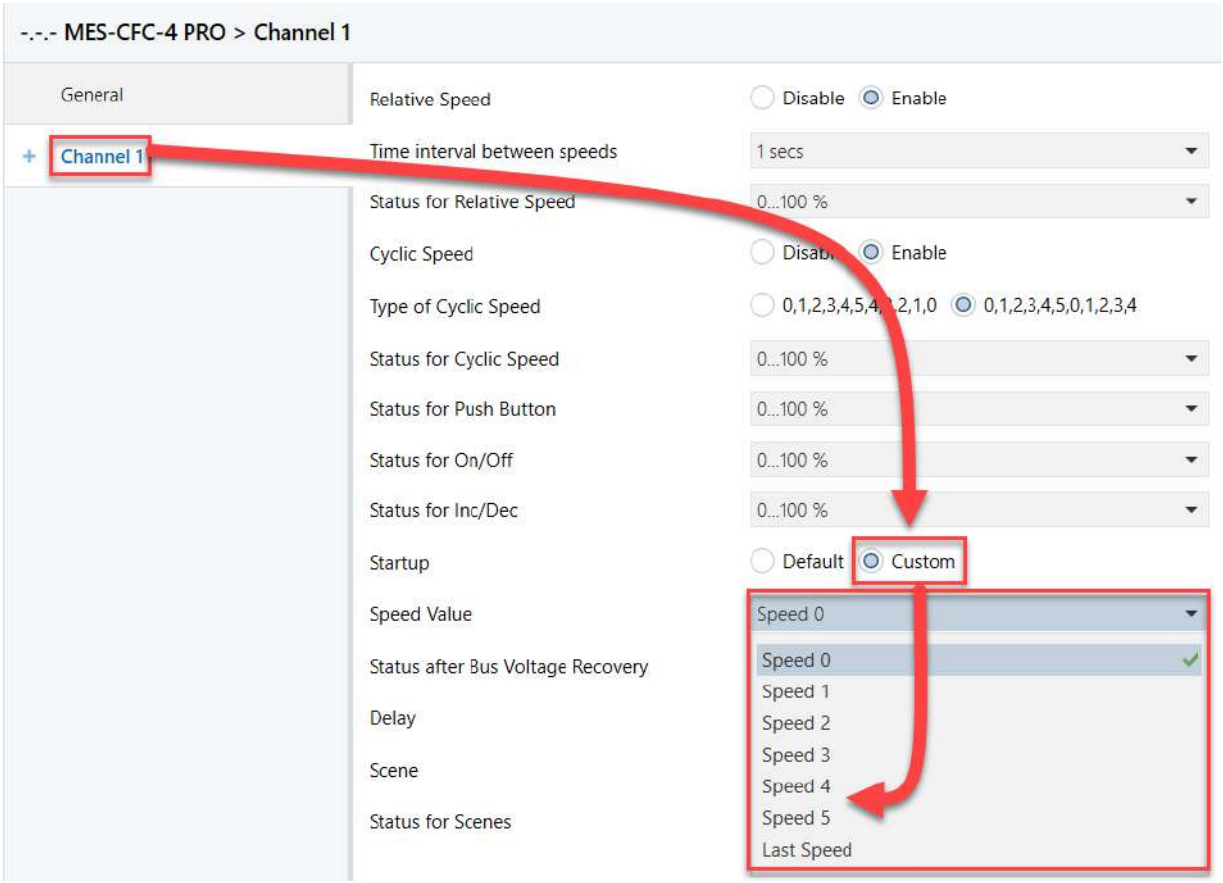

Figure 3-4: Startup > Custom selection showing the Speed after Bus Voltage Recovery options

Note

On/Off Status as well as **Speed Value Status** are observed for all group objects like **Increment/Decrement**, **Cyclic Speed** etc.

3.1.3. Viewing Group Objects

Note

Following group objects have dependency on each other: **Increment/Decrement**, **On/Off** and **Relative Speed**.

Note

The speed set by the **Cyclic Speed** and **Scenes** is independent of the speed set by all other group objects like **On/Off, Relative Speed, Increment/Decrement** or **Speed after Bus Voltage Recovery.**

Table 3.2: Available Group Objects

Name	Value Range	Description
Fan 1 On/Off	0 or 1, where 0 = Off, 1 = On	Switch on or off ceiling fan
Fan 1 On/Off Status	0 or 1, where 0 = Off, 1 = On	Status for on/off
Fan 1 Speed Value (Percentage)	0%, 20%, 40%, 60%, 80%, 100%	Receives direct fan speed value in percentage
Fan 1 Speed Status (Percentage)	0%, 20%, 40%, 60%, 80%, 100%	Fan speed value status in percentage
Fan 1 Inc/Dec	0 = Dec, 1 = Inc	0= Decrement the fan speed value 1 = Increment the fan speed value
Fan 1 Cyclic Speed	0 or 1	Speed sequence can be 0>1>2>3>4>5>4>3>2>1>0 or 0>1>2>3>4>5>0>1>2>3>4>5 (irrespective of 0 or 1 received)
Fan 1 Speed Value (0 to 5)	0 to 5	Receives direct fan speed value in 0 to 5
Fan 1 Speed Status (0 to 5)	0 to 5	Fan speed value status in 0 to 5
Fan 1 Relative Speed	0 to 100%	Changing the fan speed value using 4-bit group object

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Number	Name	Object Function	Descr	Group A	Length	C	R	W	T	U	Data Type	Priority
1	FAN 1 ON/OFF	0 = OFF, 1 = ON			1 bit	C	-	W	T	-	switch	Low
2	FAN 1 ON/OFF STATUS	0 = OFF, 1 = ON			1 bit	C	R	-	T	-	switch	Low
3	FAN 1 SPEED VALUE (PERCENTAGE)	0, 20%, 40%, 60...			1 byte	C	-	W	T	-	percentage (0..100%)	Low
4	FAN 1 SPEED STATUS (PERCENTAGE)	0, 20%, 40%, 60...			1 byte	C	R	-	T	-	percentage (0..100%)	Low
5	FAN 1 INC/DEC	0 = DEC, 1 = INC			1 bit	C	-	W	T	-	step	Low
22	FAN 1 CYCLIC SPEED	0 / 1 = CYCLIC S...			1 bit	C	-	W	T	-	trigger	Low
26	FAN 1 SPEED VALUE (0 to 5)	0 TO 5 SPEED			1 byte	C	-	W	T	-	fan stage (0..255)	Low
27	FAN 1 SPEED VALUE STATUS (0 to 5)	0 TO 5 SPEED			1 byte	C	R	-	T	-	fan stage (0..255)	Low
34	FAN 1 RELATIVE SPEED VALUE	4-BIT VALUE			4 bit	C	-	W	T	-	dimming control	Low
38	FAN 1 SCENES	SCENES			1 byte	C	-	W	T	-	scene number	Low

Figure 3-5: Group Objects

Note

Group objects of **Speed Value** (percent) and **Speed Value** (0 to 5) cannot be used at the same time. Changing the **Speed Value** (percent) will change the **Speed Status** (percent) but the **Speed Value** (0 to 5) will not update.

3.2. Configuring the Scenes

- Each scene can have a Scene Number between 1 to 64 (0 = Disabled).
- Each scene can control the Fan Speed Value between Speed 0 (fan off) to Speed 5 (full speed).
- MES-CFC-4 Pro allows 10 individual scenes for each of the channels.
- Each channel has individual group object for scenes.

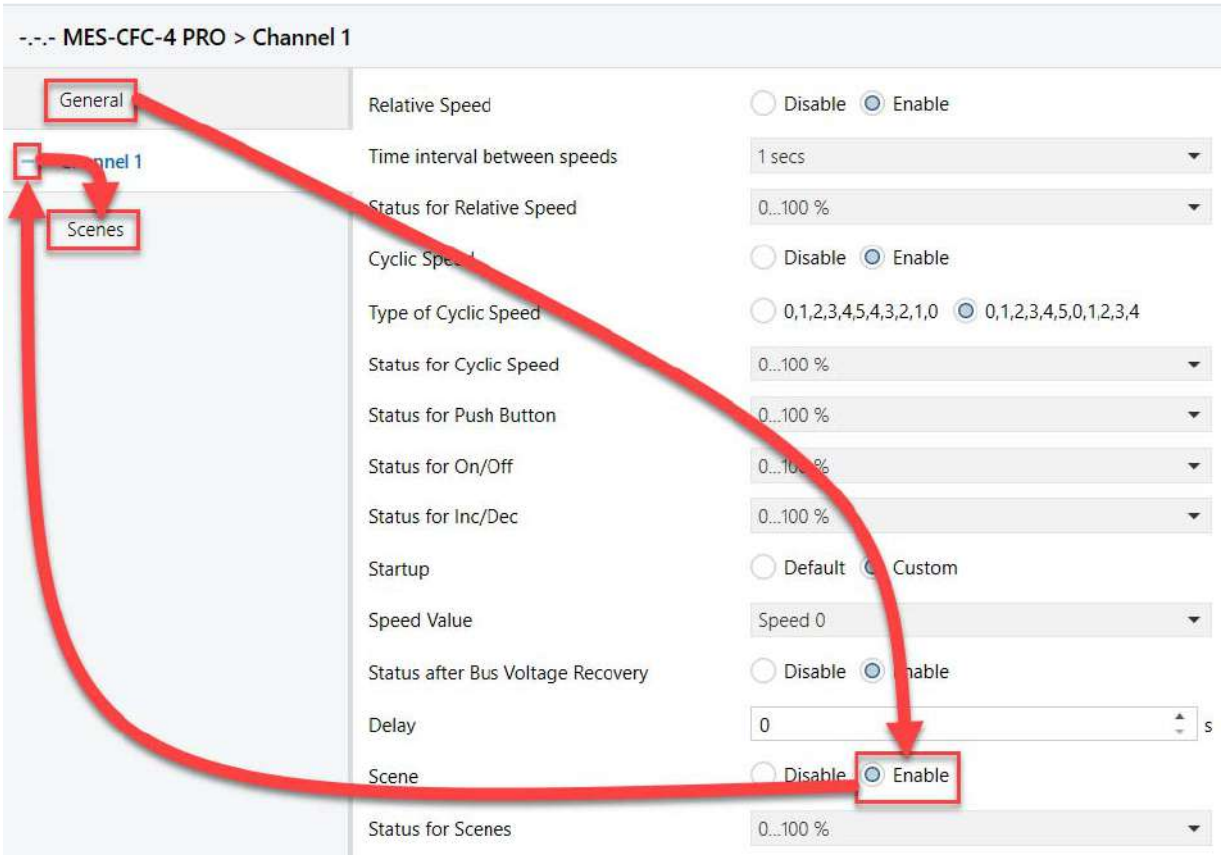

Figure 3-6: Enable the Scenes

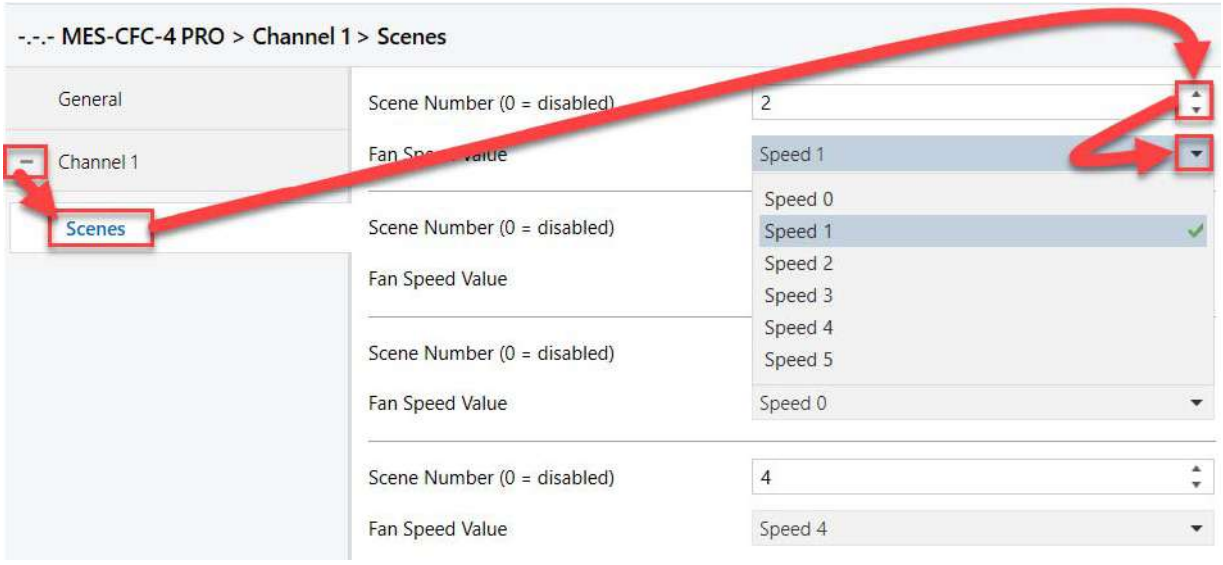

Figure 3-7: Setting the scenes

1. Navigate to the Parameters tab and select Enable for the Scenes option.
   > *A new* **+** *sign shows near the* ***Channel*** *(number) text.*
2. Click the **+** sign to expand the **Channel** (number) menu.

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> *The **Scenes** subtab shows.*

3. Click the **Scenes** subtab.

> *The **Scenes** menu shows.*

4. Set the Scene Number between 1 to 64 for that particular fan channel. Type the scene number directly in the text box or click on the ▲▼ symbols to increment / decrement the number. Set 0 to disable the channel.
5. Click the ▼symbol in the **Fan Speed Value** to select the required fan speed.

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4. Annexure - Communication objects

4.1. Table of communication objects

Table 4.1: Communication objects

Number	Size	I/O	Flags	Data type (DPT)	Functional	Description	Function
1, 6, 11, 16	1 Bit	I	C-WT	1.001 switch	0/1	ON/OFF	0 = Off, 1 = On
2, 7, 12, 17	1 Bit	O	CR-T	1.001 switch	0/1	ON/OFF STATUS	0 = Off, 1 = On
3, 8, 13, 18	1 Byte	I	C-WT	5.001 percentage	0 to 100	SPEED VALUE (PERCENTAGE)	0 to 100 %
4, 9, 14, 19	1 Byte	O	CR-T	5.001 percentage	0 to 100	SPEED STATUS (PERCENTAGE)	0 to 100 %
5, 10, 15, 20	1 Bit	I	C-WT	1.007 step	0/1	INC/DEC	0 = Dec, 1 = Inc
22, 23, 24, 25	1 Bit	I	C-WT	1.017 trigger	0/1	CYCLIC SPEED	Select any one type of cyclic speed
26, 28, 30, 32	1 Byte	I	C-WT	5.100 fan stage	0 to 5	SPEED VALUE (0 to 5)	0 to 5 Speed value

Table 4.1: Communication objects (Continued)

Number	Size	I/O	Flags	Data type (DPT)	Functional	Description	Function
27, 29, 31, 33	1 Byte	I	CR-T	5.100 fan stage	0 to 5	SPEED STATUS (0 to 5)	0 to 5 Speed status
34, 35, 36, 37	4 Bit	I	C-WT	3.007 dimming control	0 to 100	RELATIVE SPEED VALUE	0 to 100 %
38, 39, 40, 41	1 Byte	I	C-WT	17.001 scene number	1 to 64	FAN SCENES	1 to 64

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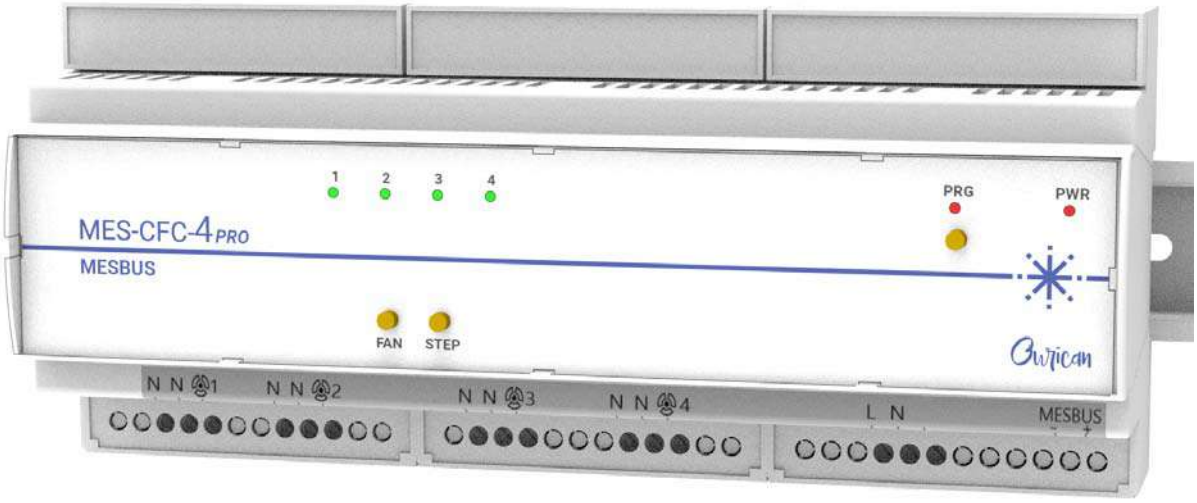
MES-CFC-4 Pro

KNX / MESBUS powered 4 channel ceiling fan controller



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