ComfoConnect KNX C

Manual

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best climate

Heating | Cooling | Fresh Air | Clean Air



Foreword

Read this document carefully before use.

With this document you can install, commission and perform maintenance on the ComfoConnect KNX in a safe and optimal manner. In this document the ComfoConnect KNX will be referred to as “the unit”. The unit is subject to continuous development and improvement. Thus the unit may be slightly different from the given descriptions.

The next pictograms are used in the Zehnder documents:

Symbol	Meaning
☞	Point of interest.
⚙	Risk of compromised performance or damage of the ventilation system.
⚠	Risk of personal injury.

Questions

Speak to your supplier when you have any questions or would like to order a new document. The contact details of the manufacturer can be found on the back page of this document.

The unit is CE approved and manufactured by:

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CE

Electrical dangers

There is a risk of electric shock during installation or maintenance. Always comply with the safety regulations in this manual. Personal injury or damage to the unit can arise from non-compliance with the safety regulations, warnings, comments and instructions in this manual. Disconnect the power supply to the ComfoAir Q, Comfort Vent Q or AERISnext (hereinafter referred to as the “ventilation unit”) before connecting up or removing something from the unit.

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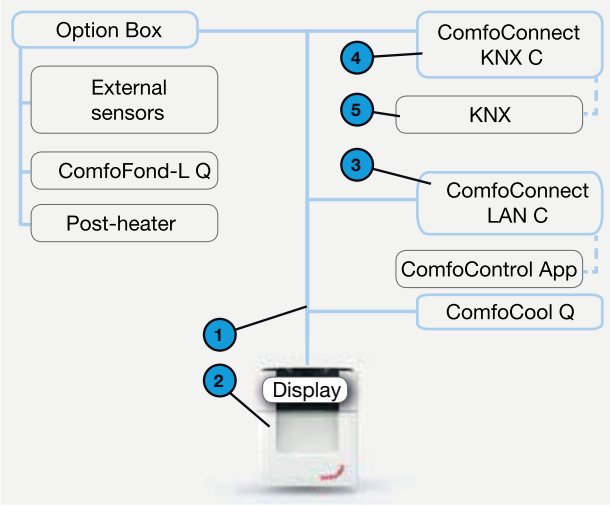
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1 Introduction

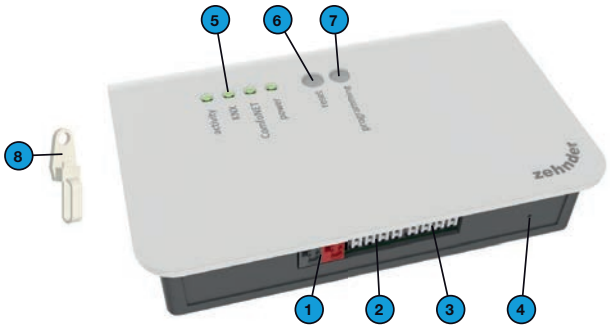
The unit provides the connection between the home ventilation unit and the KNX building automation infrastructure. The unit can be combined with the home ventilation unit ComfoAir Q, Comfort Vent Q or the AERISnext. As a result, one ventilation unit can be controlled and monitored by KNX devices via the unit. Additionally, the unit allows basic control over an optionally connected ComfoCool and ComfoHood.

The unit can be wall mounted, with the power supply coming from the ventilation unit via the 4-core ComfoNet cable.



#	Description
1	ComfoNet Protocol over a combined serial bus with a +12V DC power supply.
2	Ventilation unit Supplies +12V to ComfoNet and all its connected nodes.
3	ComfoConnect LAN C Connects ComfoNet to the Internet and the ComfoControl App, for monitoring the ventilation unit and firmware updates of the ventilation unit and ComfoConnect KNX C. **The ventilation unit cannot be operated simultaneously via KNX and the ComfoControl App.**
4	ComfoConnect KNX C There can only be one ComfoConnect KNX C connected to ComfoNet.
5	The KNX setup

2 Using the ComfoConnect KNX C



#	Description
1	KNX-TP bus connector
2	Primary* connection to ComfoNet, including +12V DC
3	Secondary* connection to ComfoNet, including +12V DC.
4	Factory reset button to revert all unit settings back to factory default. The button is only accessible by inserting a pin or paperclip into the little hole.
5	Status indicator LEDs
6	Reset button to power-cycle the unit
7	Programming mode button for downloading the KNX application
8	Cable lead-through and pull relief including wall fixture

* The two connections can be used as so-called 'feed-through/ chain' connection to connect multiple nodes to ComfoNet.

2.1 LED behaviour during normal use

LED	State	Description
activity	off	There is no ventilation unit detected on ComfoNet.
	on	The unit successfully established a connection to the ventilation unit.
	flashing	There is communication between KNX and the ventilation unit. When the power LED is blinking too, this indicates that the firmware is currently being updated.
	blinking once per second	There is an error in the setup of ComfoNet.
KNX	Off	The KNX bus is not connected or the application cannot be loaded successfully.
	On	KNX is operational.
	blinking once per second	The programming mode button has been pressed, and the unit is now in programming mode (to be used by ETS).
	blinking eight times per second	The unit is programmed by ETS or factory default settings are restored.
ComfoNet	Off	ComfoNet is disconnected.
	On	ComfoNet is operational.
	blinking once per second	ComfoNet is initialising.
	blinking eight times per second	A communication error has been detected on ComfoNet.
Power	off	The unit has no power or cannot boot the firmware.
	on	The unit has power.
	blinking once per second	The unit is in firmware update mode.

2.2 Reset

To reboot the unit, press and release the reset button. The unit restarts, initialises ComfoNet and KNX, and tries to discover and connect to the ventilation unit. This process takes around 15 seconds. After successful initialisation, all LEDs should be on (the activity LED may flash).

2.3 Factory Reset

To revert the KNX configuration of the unit back to factory defaults, press and hold the factory reset button till the KNX LED starts blinking fast. Release the factory reset button. The settings are restored and the unit will reboot.

After performing a factory reset, the unit must be re-configured using ETS.

2.4 Firmware update

A firmware update can be done by connecting a ComfoConnect LAN C and using the ‘Zehnder ComfoControl’ App from the Apple App Store or Google Play Store. Follow the instructions on the App to update the ComfoConnect KNX C. The firmware cannot be updated via KNX.

A ComfoConnect Installer Account is required to perform a firmware update.

After the firmware update the device must be reconfigured using ETS.

3 Guarantee

The unit is covered by the manufacturers warranty for a period of 24 months following installation, and up to a maximum of 30 months following the date of manufacture.

The warranty is rendered invalid if:

- installation of the unit was not carried out in accordance with the proper instructions;
- defects have occurred due to incorrect connection, incompetent use or contamination of the system;
- spare parts used that were not originally supplied by the manufacturer, or repairs done by unauthorised persons.

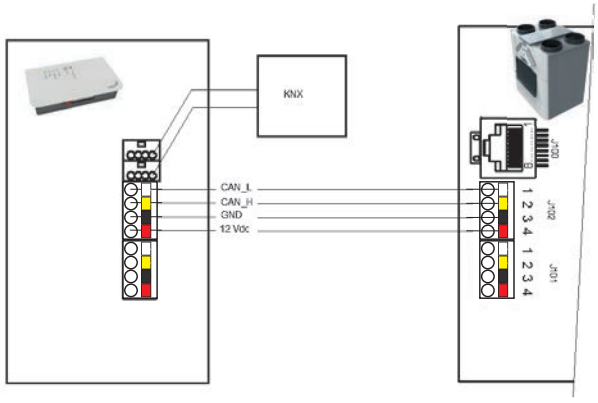
The costs associated with dismantling and reinstalling at the location are not covered by the warranty. This also applies to normal wear and tear. The manufacturer retains the right to change and/or reconfigure its products at any time without any obligation to alter previously delivered products.

4 Technical Specifications

Electrical	
Nominal input voltage	+12 V DC
Input voltage range	+12 V DC ± 20%
Nominal input current	0.02 A
Electrical separation	1500 V AC (60 sec)
Nominal power consumption (ComfoNet)	0.25 W
Maximum power consumption (ComfoNet)	0.5 W
Maximum loop-through current	3.20 A
Nominal KNX bus current	12 mA
Environmental	
Operating temperature	-20 °C to +60 °C
Storage and transportation temperature	-40 °C to +80 °C
Humidity	< 95% (non-condensing)
Level of protection	IP classification 30 Contamination level PD3 (boiler room)
Flammability rating of connectors	UL 94 V0
Flammability rating of housing	UL 94 HB (< 20 J)
Flammability rating of PCB	UL 94 V0
Housing material	ABS
Weight	83 g
Standards	
Safety	NEN-EN-IEC 62368-1
Electromagnetic Compatibility (EMC)	EN 55022 EN 61000-6-3 EN 61000-6-1 EN 50491-5-1 EN 50491-5-2
KNX	ISO/IEC 14543-3-10 KNX Certified
Environmental and surroundings requirements	RoHS REACH WEEE
KNX	
Medium	Twisted-pair (TP)
Device model	System B
Supported configuration mode	S-Mode
Supported ETS version	5

5 Installation

1. Disconnect the power from the ventilation unit before installing equipment. Always observe the local safety regulations.
2. Mount the ComfoConnect KNX C on the wall, preferably near the ventilation unit.
3. Connect KNX according to the +/- indication on the housing.
4. Connect the 4-wire ComfoNet cable to one of the ComfoNet connectors according to the indicated wire colouring. The ComfoNet cable has to comply to the following requirements:
   - Maximum length: 50 m;
   - Number of wires: 2x2 (twisted pair);
   - Not shielded;
   - Core: rigid (solid) wire for insertion elements;
   - Colours: preferably compatible with the connectors;
   - Minimum ø: 0.2 mm^2
   - Optimum: DIN VDE 0281: J-Y(St)Y 2x2x0.6;
   - Maximum ø: 1.5 mm^2
5. Optionally, connect a second ComfoNet cable to the other ComfoNet connector for combining other ComfoNet devices.
6. Mount the pull relief to the wall and use it as a cable opening for all cables to and from the unit. This prevents the cables from being pulled out of the equipment.
7. Connect (one of) the ComfoNet cable(s) to the ventilation unit.
8. Turn on power on the KNX bus, if it is not turned on already.
9. Turn on the power of the ventilation unit, which will in turn supply power to ComfoNet and the unit.



6 Commissioning

1. Download and install ETS5 from www.knx.org.
2. Download the Zehnder KNX library from your country website. See back page.
3. Complete commissioning of the ventilation unit as described in its manual.
4. Install the unit as defined in the previous chapter. Make sure that the ventilation unit (and therefore ComfoNet) has been powered on and the ComfoNet LED is lit. The activity LED should be on or flashing once in a while, but not steadily blinking once per second.
5. The factory default settings do not include a KNX configuration. Hence, the unit will not have a KNX device address or group object configuration upon first configuration. Use ETS5 to define a KNX project. See the object list in the chapter “Group Objects” for a description of the interface of the unit. You have the option to decide whether…
   a. …the ventilation unit is a slave to KNX, in which a KNX device determines and communicates e.g. the ventilation preset and temperature setpoint to the ventilation unit (Manual mode). The internal scheduler of the ventilation unit is disabled. This is the typical usage scenario.
   b. …the ventilation unit has to run its own schedule, and KNX observes the state (Auto mode, see chapter “Group Objects’). In this case, e.g. the ventilation preset and temperature setpoint are determined by the ventilation unit. Refer to the manual of the ventilation unit how to configure its schedule.

   The choice between the two modes depends on how the ventilation unit is to be integrated in the KNX setup. See chapter “Auto mode” for the exact difference of using Auto or Manual mode.
6. In order to download the application, as defined in ETS, press the programming mode button. The KNX LED will start blinking slowly. During download, the KNX LED blinks quickly. After download, or when the programming mode button is pressed again, the unit exits programming mode.
7. Verify correct behaviour of the configured KNX setup.

6.1 Group Objects

The group objects that are indicated with '(set)' are write-only objects to control the ComfoConnect KNX C and/or the ventilation unit. All other objects (without '(set)') are read-only objects to retrieve the current value. The default flags of the write-only objects are C-WTUI and the default flags for read-only objects are CR-T--.

When the I (Read On Init) flag is set, also set the T (Transmit) flag.

Object	Description	Type[2]
Ventilation Preset[1]	■ 0: Lowest ventilation preset; implies that Away function is enabled; ■ 1, 2, 3: Ventilation preset; implies that Away function is disabled.	5.010
Ventilation Preset[1] (set)		
Ventilation Preset Away	Enabled/triggered when Ventilation Preset is (set to) 0.	1.001 1.017
Ventilation Preset 1	Enabled/triggered when Ventilation Preset is (set to) 1.	
Ventilation Preset 2	Enabled/triggered when Ventilation Preset is (set to) 2.	
Ventilation Preset 3	Enabled/triggered when Ventilation Preset is (set to) 3.	
Ventilation Preset Away (set)	Sets Ventilation Preset to 0.	1.001 1.017
Ventilation Preset 1 (set)	Sets Ventilation Preset to 1.	
Ventilation Preset 2 (set)	Sets Ventilation Preset to 2.	
Ventilation Preset 3 (set)	Sets Ventilation Preset to 3.	
Auto mode Auto mode (set)	■ Disable: Manual Mode. The KNX system determines the ventilation speed; ■ Enable: Auto Mode. KNX is only monitoring, the ventilation unit speed follows the internal ventilation schedule set. **The Auto Mode or Manual Mode is intended as a permanent setting. Switching to Auto Mode while the ventilation speed is 0 or the Away mode is active should be avoided.**	1.003
Temperature profile mode[1] Temperature profile mode[1] (set)	■ 0: adaptive[1]; ■ 1: fixed[1]; ■ 2: use the External setpoint object to control the temperature setpoint of the ventilation unit, instead of using the Temperature profile.	5.010
Temperature profile[1] Temperature profile[1] (set)	■ 0: normal profile; ■ 1: cool profile; ■ 2: warm profile. Setting the Temperature profile only has effect when Temperature profile mode is set to 0 or 1.	5.010
External setpoint External setpoint (set)	Temperature setpoint of the air within the building (=the temperature of the extract air or the value measured by a room temperature sensor if available). The ventilation unit may preheat or temper the air in order to reach the specified setpoint. Setting the External setpoint only has effect when Temperature profile mode is set to 2.	5.001 9.001 9.002 9.027
Boost[1]	■ Off: normal; ■ On: boost enabled (implies that Ventilation Preset is 3).	1.001
Boost[1] (set)	When triggered, Boost is enabled for the time specified by Boost time.	1.017
Boost time Boost time (set)	Boost time in seconds. The value 65535 s (about 18.2 hours) is interpreted as 24 hours. This object is only used to configure the Boost upon triggering; it does not indicate the remaining time Boost is on.	7.005
Away function[1] Away function[1] (set)	■ Off: implies a Ventilation preset of 1 or higher; ■ On: implies a Ventilation preset of 0, and ComfoCool is off.	1.001
ComfoCool[1] ComfoCool[1] (set)	Off: the ComfoCool is always off, regardless of the required temperature setpoint; On: let the ventilation unit decide whether the ComfoCool has to be enabled.	1.001
Standby	Off: normal operation; On: the ventilation unit is in service mode; ventilation may be suspended.	1.001
ComfoHood[1]	Current state of the ComfoHood.	1.001
Airflow[1]	Reflects the supply air fan of the ventilation unit. (FAN_SUP)	5.001 9.025 13.002

[1] Refer to the manual of the ventilation unit for a description of this functionality.
[2] When multiple types are indicated, the actual type can be configured by a parameter. See chapter 'Parameters'.

Object	Description	Type[2]
Room temperature[1]	Reflects the room temperature sensor which is connected to the ventilation unit (if available)	5.001 9.001 9.002 9.027
Extract temperature[1]	Reflects the extract air sensor of the ventilation unit (SENSOR_ETA).	
Exhaust temperature[1]	Reflects the exhaust air sensor of the ventilation unit. (SENSOR_EHA)	
Outdoor temperature[1]	Reflects the outdoor air sensor of the ventilation unit.(SENSOR_ODA)	
Supply temperature[1]	Reflects the supply air sensor of the ventilation unit. (SENSOR_SUP)	
Room humidity[1]	Reflects the room humidity sensor which is connected to the ventilation unit (if available)	5.001 5.004 9.007
Extract humidity[1]	Reflects the extract air sensor of the ventilation unit (HUMID_ETA).	
Exhaust humidity[1]	Reflects the exhaust air sensor of the ventilation unit. (HUMID_EHA)	
Outdoor humidity[1]	Reflects the outdoor air sensor of the ventilation unit.(HUMID_ODA)	
Supply humidity[1]	Reflects the supply air sensor of the ventilation unit. (HUMID_SUP)	
CO_2 sensor bedroom (up to 8 rooms) CO_2 sensor bedroom (set) (up to 8 rooms)	External CO_2 sensor input. This object has to be connected to a KNX sensor that is mounted in a bedroom. Depending on the measured CO_2 level, the ComfoConnect KNX C forces the ventilation unit to run at a minimum ventilation preset. ■ less than 800 ppm: set to ventilation preset 1 at least; ■ from 800 ppm: set to ventilation preset 2 at least.	9.008
CO_2 sensor room[3] (up to 8 rooms) CO_2 sensor room[3] (set) (up to 8 rooms)	External CO_2 sensor input. This object has to be connected to a KNX sensor that is mounted in another room other than a bedroom. Depending on the measured CO_2 level, the ComfoConnect KNX C forces the ventilation unit to run at a minimum ventilation preset. ■ less than 800 ppm: set to ventilation preset 1 at least; ■ from 800 and up to 1200 ppm: set to ventilation preset 2 at least; ■ from 1200 ppm: set to ventilation preset 3 at least.	
Humidity sensor bathroom[4] (up to 8 rooms) Humidity sensor bathroom[4] (set) (up to 8 rooms)	External humidity sensor input. This object has to be connected to a KNX sensor that is mounted in a bathroom. Depending on the measured humidity level, the ComfoConnect KNX C forces the ventilation unit to run at a minimum ventilation preset. ■ less than 35%: set to ventilation preset 1 at least; ■ from 35%: set to ventilation preset 2 at least.	5.001 5.004 9.007
Error[1]	■ False: all systems are operational; ■ True: the ventilation unit reported an error. Manual inspection and/or intervention is required. Check the error that is indicated on the display of the ventilation unit.	1.002
Filter replace[1]	Hours till the ventilation units filter needs replacement.	7.007
Filter dirty[1]	■ False: the ventilation units filters do not need replacing at this moment; ■ True: the ventilation units filters need replacing.	1.002
State	State/error of the unit: ■ 0: a connection with the ventilation unit has been established, no error; ■ 30: another unit is detected; this unit is not connected to the ventilation unit; ■ 40: incompatible ventilation unit version detected; cannot connect to the ventilation unit; ■ 50: no ventilation unit detected. For safety, when the state of the unit has any other value than 0, the Error object is set to True and Standby is set to On.	5.001

[1] Refer to the manual of the ventilation unit for a description of this functionality.
[2] When multiple types are indicated, the actual type can be configured by a parameter. See chapter 'Parameters'.
[3] When using KNX CO2 sensors, the ventilation speed cannot be set to 0 or Away.
[4] When using KNX humidity sensors, the ventilation speed can neither be set to 0 or Away nor to position 1, so long as the humidity is higher than 35%.

6.2 Parameters

Category	Parameter	Description
Status/Control	Type of Ventilation Preset objects	This parameter enables either the switch or trigger Ventilation Preset group objects. Choose either type that matches your KNX application.
	Limit of sending to Group Addresses (default: 600 telegrams per minute)	To prevent bus overload, this parameter sets the number of updates per minute to group addresses using an average transmission rate. If the value is increased, the ComfoConnect KNX C (and therefore the ventilation unit) may have a lower latency in updating group objects, but may overload the bus when there is already high traffic. When the value is lowered, bus traffic by the unit is kept low, at the expense of possibly higher latencies.
Sensors	Unit of Temperature sensor/setpoint data	This parameter sets the unit used for the temperature: °C, °F, K or a raw value format.
	Unit of Airflow sensor data	This parameter sets the unit used for the air flow: l/h, m3/h or a raw value format.
	Unit of Humidity sensor data	This parameter sets the unit used for the humidity.
	Number of bedrooms	Enables the given number of CO_2 level bedroom sensor objects.
	Number of (habitable) rooms	Enables the given number of CO_2 level room sensor objects.
	Number of bathrooms	Enables the given number of humidity level bathroom sensor objects.

6.3 Auto/Manual mode

In the most common scenario in which the KNX system determines the ventilation speed, the Manual Mode must be selected (Auto Mode: off). It is also possible to use the KNX system to monitor the ventilation unit. In this case the Auto Mode must be activated. Enabling or disabling Auto mode influences other group objects as specified in the table below. Group objects that are not mentioned in the table below, behave identically regardless whether Auto mode is set or not. Whether Auto mode is enabled or not, cannot be configured on the ventilation unit; the setting in KNX determines the operation of the device.

Object	Auto mode disabled (KNX has full control)	Auto mode enabled
Ventilation Preset (set)	The Ventilation Preset of the ventilation unit is determined by KNX.	Setting the Ventilation Preset has no effect. KNX is only monitoring, while the airflow follows the programmed ventilation schedule.
Ventilation Preset Away (set)		
Ventilation Preset 1 (set)		
Ventilation Preset 2 (set)		
Ventilation Preset 3 (set)		
Boost	When Boost is turned on by the ventilation unit, but it was not requested by KNX, the ComfoConnect KNX C will force it off again. However, when KNX triggered Boost, the ventilation unit decides when to turn off Boost again (usually when the Boost time expires).	Boost can be turned on and off by the ventilation unit.
Boost time	When the Boost time is changed by the ventilation unit, the ComfoConnect KNX C resets it to the value given by KNX.	The Boost time can be set on/by the ventilation unit. When it is set, it communicates to KNX.
Away function	The Away function is determined by KNX.	The ventilation unit may switch on or off the Away function by itself, depending on its schedule, for example.
ComfoCool	The ComfoCool setting is determined by KNX.	The ventilation unit may switch on or off the ComfoCool by itself, depending on its schedule, for example.
ComfoHood	When Away mode is disabled, Boost is triggered when the ComfoHood is on. The Boost time is taken into account when the ComfoHood is turned off.	Let the ventilation unit decide how to handle the ComfoHood with respect to Boost.

7 Maintenance

Remove dust regularly from the ComfoConnect KNX C with a dry duster.

8 Troubleshooting

The ComfoNet LED blinks quickly.
This indicates an electrical (connection) problem with ComfoNet. Check the ComfoNet cabling, connections, and connected nodes. When the problem is resolved, the unit will automatically reconnect to ComfoNet to continue normal operation.

The KNX LED remains off.
This indicates a disconnected or unpowered KNX bus. Check the KNX cabling, connections, and KNX bus supply power. This is not related to configuration by ETS.

After a firmware update, the ComfoConnect KNX C does not behave properly.
When an error in the firmware prevents further firmware updates, you can force the ComfoConnect KNX C into update mode. For this, press and hold the programming mode button and press and release the reset button. The ComfoConnect KNX C reboots to update mode. Retry to update the firmware.

After a firmware update, all LEDs of the ComfoConnect KNX C remain off.
Make sure the ComfoConnect KNX C has power. If the problem still persists, a full factory reset can be performed. For this, press and hold both the factory reset button and the programming mode button. Press and release the reset button. Release all other buttons. The firmware and settings are erased, and the ComfoConnect KNX C reboots to update mode. Afterwards, a firmware update and KNX configuration by ETS is required (refer to Chapter 2.4).

The Activity LED blinks once per second.
The unit has encountered an error. Use ETS to read the State object to get the error code. Try to resolve the issue accordingly.

KNX devices cannot change the Ventilation Preset of the ventilation unit.
Try the following steps:

- Check if all LEDs are lit. Only the Activity LED may flash once in a while. If this is not the case, check the cabling and ComfoNet configuration.
- Check if the unit has been configured using ETS. Check that the group objects are assigned to the correct groups and that they have the correct C/R/W/T/U flags. Based on the LED behaviour, you cannot determine whether the KNX configuration is correct, as this depends on the needs and requirements of the KNX installation.
- Check if the other KNX devices are also assigned to the proper group addresses.
- Check whether the Auto Mode is disabled.

The ventilation unit does not respond to settings, and the State object has the value 40.
An incompatible ventilation unit firmware version has been detected. Check online for an update of either the ComfoConnect KNX or the ventilation unit. Update one of the devices in order to match the correct firmware version.

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