MEE400H

Meeting Board

Specifications

Change History

Document Version	Release Date	Description
V1.2.1	2021-09-24	Modified the product specifications.
V1.2.0	2021-05-13	• Changed the product appearance. • Changed the USB module appearance.
V1.1.0	2021-01-05	• Added the power on delay function for the relay. • Updated the product packing list. • Optimized the document content.
V1.0.0	2020-09-05	First release

Introduction

The MEE400H is a meeting board that is specially designed by NovaStar for the application of LED display in a meeting room and integrates the Android system and sending card functions into one unit. It allows any third-party app to run on it and features powerful interaction and playback capabilities. The MEE400H supports wireless screen mirroring from Windows, macOS, iOS and Android, and allows you to mirror up to 4 terminals simultaneously to the LED display. For different meeting applications, it provides 4 modes to let the document presentation, video playback and remote meetings have the optimal display effect.

The MEE400H supports the image quality improvement technologies of NovaStar. Working with the specified models of NovaStar receiving cards, it can enable the fine-pitch indoor LED display to have outstanding grayscale and color performance.

Thanks to its small size and modular design, the MEE400H can be easily integrated into the LED display. It can be mainly used in various LED display applications for business meetings in governments and companies in many industries, such as design, health care and education.

Features

- Capable of loading an LED display up to 3840×2160@60Hz (pixel-to-pixel display)
- 5x HDMI 2.0 inputs (one for OPS computer connection and one for sending mode only)
  - Android input connectors: Support video sources of up to 3840×2160@30Hz.
  - Sending input connector: Support video sources of up to 3840×2160@60Hz.
- 1x Mini-HDMI 2.0 output
- 1x HDMI 2.0 output
- 6x USB ports for multimedia playback and function extension
  - 5x USB 2.0 (2 ports reserved)
  - 1x USB 3.0
- 2x type-C outputs to connect two Ethernet modules
  The two Ethernet modules support 16 Gigabit Ethernet outputs in total.
- 2x 3.5-mm audio outputs for internal and external audio equipment connections
- Output image scaling
  Min.: 104×104 pixels; Max.: 4096×2160 pixels

- Android-based desktop UI system, supporting third-party apps
- Wireless screen mirroring from multiple platforms
  Mirror from Windows, macOS, iOS and Android. Mirror up to 4 terminals simultaneously to the LED display.
- Working with the terminal app to control the wireless screen mirroring
  - Secondary mirror: The speaker can reversely control the LED display via the terminal.
  - Wireless snapshot: Take snapshots wirelessly via the terminal at any time to record meeting details.
  - Wireless speech: The participants can speak directly via the terminal microphone and the voice is transmitted wirelessly to the sound system of the LED display.
- Playback of local and online high-definition videos
  Support decoding of 4K UHD videos in the HEVC, H.265, H.264 and other industry-standard coding formats.
- Dual Wi-Fi modes

Allow for Wi-Fi and wireless hotspot connections at the same time.

- Image quality effect adjustment

  Provide the standard, soft, cinema and video modes, and allow you to adjust the brightness, saturation, contrast, etc.

- Eye comfort mode

- Screen drawing and commenting

- Bluetooth 4.0

  Can connect to the Bluetooth remote, Bluetooth mouse, Bluetooth keyboard, Bluetooth sound system and other common peripherals.

- 4x relays for convenient power management of LED display

- 1x reserved OPS control port to control power on/off of the OPS computer

- Compatible with the peripherals commonly used in a meeting, such as camera, sound system and laser pointer

- 3D function

  Work with the 3D emitter and 3D glasses to allow for 3D display effects.

- HDR function

Work with the A8s or A10 Plus receiving card to support HDR10-Optima and HLG. The original brightness range and color space of the video source can be reproduced, allowing for a more lifelike image.

- Support for the Image Booster Engine

  Work with the A8s or A10s Plus receiving card to improve the display effect from the following 3 dimensions (The actual effect depends on the driver IC).

  - Color Management: Manage the color gamut of the screen to enable more accurate colors on the screen.

  - Precise Grayscale (individual correction of 65,536 levels of grayscale): Individually correct the 65,536 levels of grayscale (16bit) of the driver IC to fix the display problems at low grayscale conditions, such as brightness spikes, brightness dips, color cast and mottling, allowing for a smoother and uniform image.

  - 22bit+: Improve the LED display grayscale by 64 times to avoid grayscale loss due to low brightness and allow for more details in dark areas and a smoother image.

Appearance
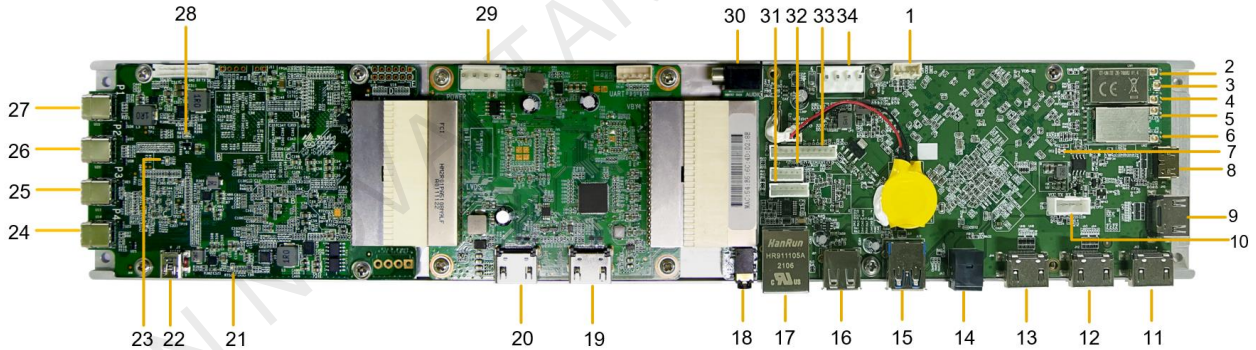
All product pictures shown in this document are for illustration purpose only. Actual product may vary.

Table 1-1 Connectors

Type	No.	Connector	Description
Input	9	HDMI 2.0	Connect to the HDMI output of the OPS computer to allow for dual-system functions.
	11/12/13	HDMI 2.0	3x HDMI 2.0 Android input connectors • Input resolutions up to 3840×2160@30Hz • HDCP 1.4 and HDCP 2.2 compliant • Do NOT support interlaced signal input.

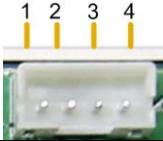| Type	No.	Connector	Description
	15/16	USB 3.0/USB 2.0	USB 3.0 and USB 2.0 input ports to support a mouse, keyboard, USB drive and other common USB devices ● Supported image formats: *.jpg, *.bmp, *.png ● Supported video formats: *.avi, *.mpg, *.vob, *.mov, *.mkv, *.rmvb, *.mp4, *.ts, *.flv **Note:** For details on the supported video encoding formats, see *Media Specifications*.
	20	HDMI 2.0	1x HDMI 2.0 sending input connector ● Input resolutions up to 3840×2160@60Hz ● Connect to the sending card directly to set up a 3D solution (To use the 3D function, connect the 3D video source to this connector). ● Turning on 3D function halves the device output capacity. ● HDCP 1.4 and HDCP 2.2 compliant ● Do NOT support interlaced signal input.
Output	8	Mini-HDMI 2.0	Android output connector, HDMI 2.0 compliant
	14	SPDIF	For digital fiber optic audio output
	18	AUDIO	3.5-mm external audio connector (prior to the internal audio connector) **Note:** Support the 3-pole headphone plug only. This connector is used to connect the audio equipment.
	19	HDMI 2.0	1x HDMI 2.0 output connector ● Fixed output resolution: 3840×2160@60Hz (8bit) ● Connect to a 4K LCD monitor for debugging and monitoring only.
	24/25	Type-C	Reserved ports
	26/27	Type-C	Connect to the two Ethernet modules that come with the MEE400H as standard. For details, see Ethernet Module. ● 16x RJ45 (1Gps) outputs 　− Connector 27 connects to Ethernet ports 1–8. 　− Connector 26 connects to Ethernet ports 9–16. ● Total resolutions of 16 outputs in pixel-to-pixel display mode up to 3840×2160@60Hz 　Max. width: 4096 pixels; Max. height: 2160 pixels ● Support backup between Ethernet ports. Do NOT support backup between devices. **Note:** ● Users must use the Type-C To Type-C cables supplied with this product to connect these connectors to the Ethernet modules, and the side with a "T" mark must face upwards. ● The MEE400H comes with two Ethernet modules (16 Ethernet outputs) as standard. If you need 32 Ethernet outputs, please place another order to purchase two Ethernet modules and connect them to Connector 25 (Ethernet ports 17–24) and Connector 24 (Ethernet ports 25–32). ● For 32 Ethernet outputs, the loading capacity of the MEE400H remains unchanged.

Type	No.	Connector	Description
	30	AUDIO	3.5-mm internal audio connector 📄 **Note:** Support the 3-pole headphone plug only. This connector is used to connect the audio equipment.
Control	1	OPS computer connector	Detect and control power on/off of the OPS computer. Pins of this connector are defined as follows: • 1: OPS-PWE • 2: OPS-STATE • 3: OPS-DET • 4: GND
	10	Android system debugging connector	For online debugging of the Android system
	17	Fast Ethernet port	Connect to the network or to the NovaLCT software on the control computer. Support switching between the two connections on the Android system.
	22	Mini USB port	Connect to the NovaLCT software on the control computer.
Antenna	2/4	WIFI/STA	Connect to the Wi-Fi antenna.
	3	BT	Connect to the Bluetooth antenna.
	5/6	WIFI/AP	Connect to the Wi-Fi antenna.
Accessory	31	Relay module connector	Connect to the relay module for cabinet power management.
	32	Button module connector	Connect to the button module for volume adjustment, brightness adjustment, input source switching and power on/off.
	33	USB module connector	Connect to the USB module for convenient USB port arrangement.
Power	34	Reserved port	
	29	DC 4.4 V to 5.2 V	

Table 1-2 Indicator status

Indicator	No.	Status	Description
Android on-board indicator (Green)	7	Flash once every 1s	The Android system is functioning normally.
Status indicator (Red)	21	Always on	The power supply is normal.
		Off	The power is not supplied, or the power supply is abnormal.

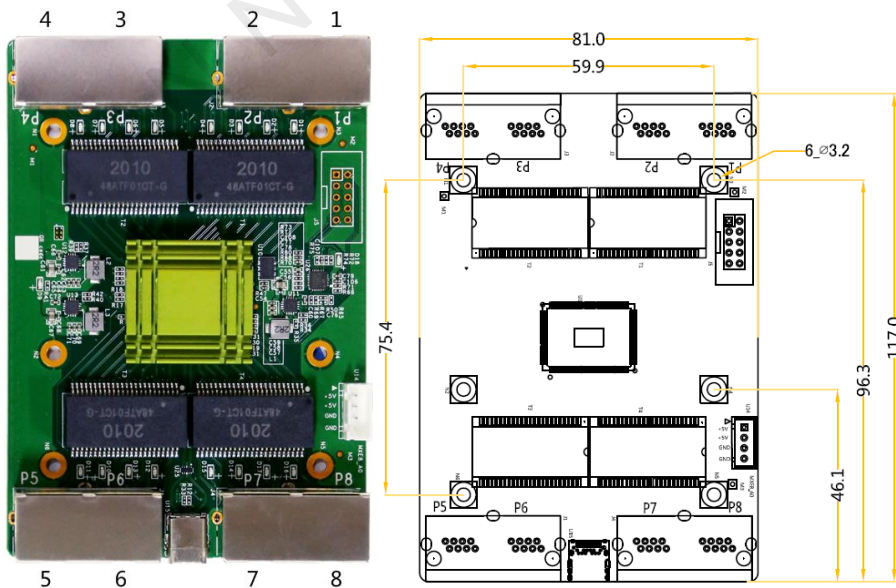| Indicator	No.	Status	Description
MCU indicator (Green)	23	Flash once every 1s	The MCU is functioning normally.
		Flash 4 times every 1s	The firmware is being updated.
FPGA indicator (Green)	28	Flash 4 times every 1s	The video input is available.
		Flash once every 1s	The video input is unavailable.

Dimensions
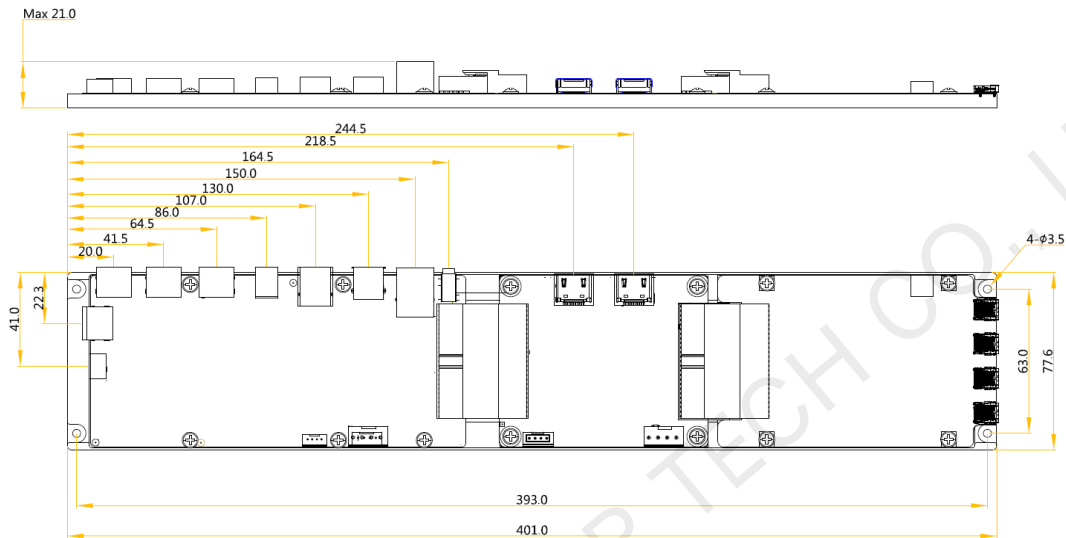
Tolerance: ±0.3   Unit: mm

Accessories

Ethernet Module

A MEE400H is equipped with two Ethernet modules that have 16 Gigabit Ethernet ports.

Tolerance: ±0.3   Unit: mm

Relay Module

A relay module is connected for convenient power management of the LED display.

The relay module supports the power on delay function, which can effectively protect the circuitry.

The delay interval is 250 ms and the delay sequence is 1--->2--->3--->4, as shown in the figure below.


Tolerance: ±0.3   Unit: mm
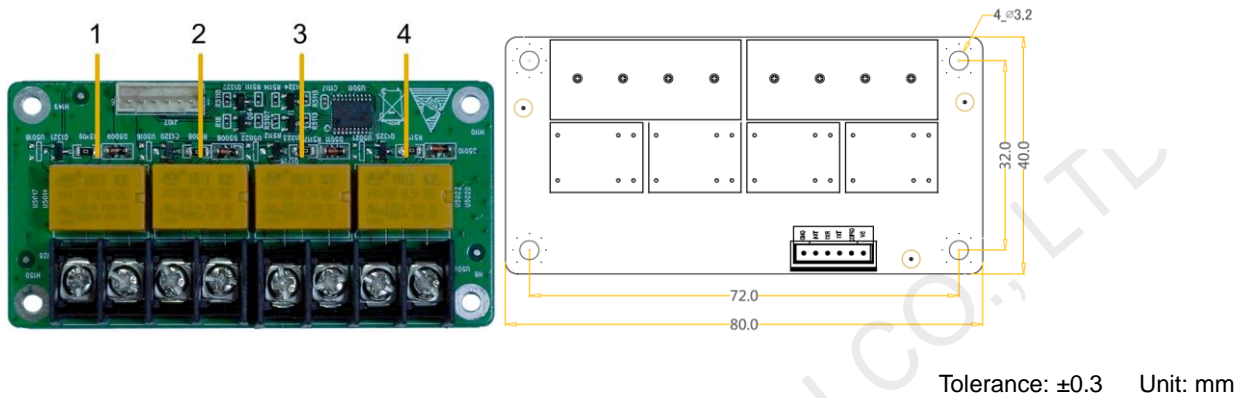
Note:

The delay function is enabled by default. You can enable or disable it on the **General** page in the MeetUs system. For details, see *MeetUs Meeting Room Display System User Manual*.

Button Module

A button module is used to control the MeetUs system via hardware, such as brightness adjustment, volume adjustment, and power on/off.


Tolerance: ±0.3   Unit: mm
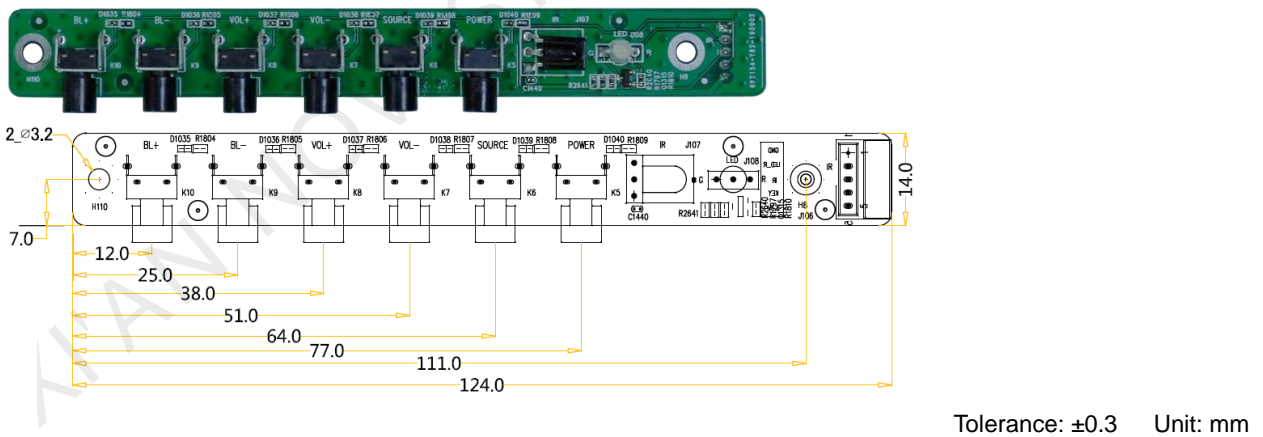
Name	BL+	BL-	VOL+	VOL-	SOURCE	POWER	Status LED	
Description	Brightness up	Brightness down	Volume up	Volume down	Input source switching	Power on/off	Always on in blue after power on	Always on in red in standby mode

USB Module

A USB module has four USB 2.0 ports (two of which are reserved in the form of pin). For the USB module connector description, see Table 1-1.

Tolerance: ±0.3   Unit: mm
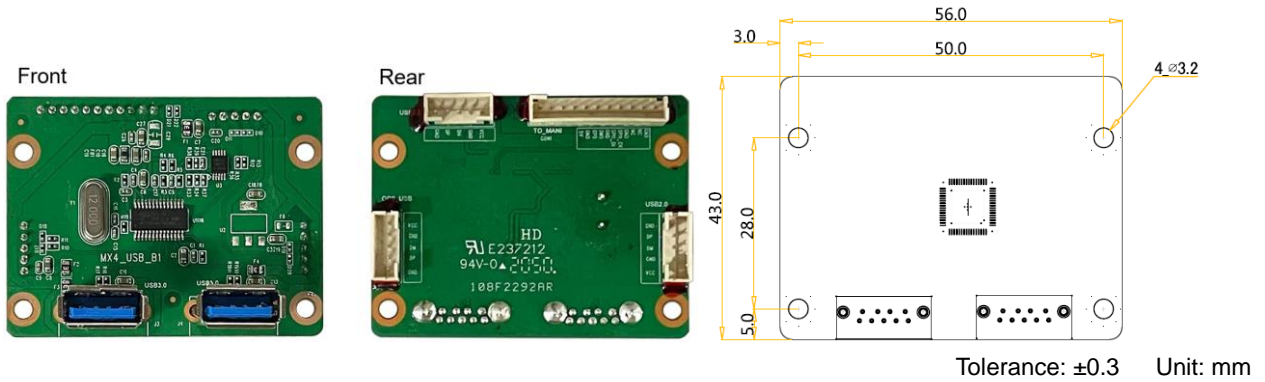
Applications
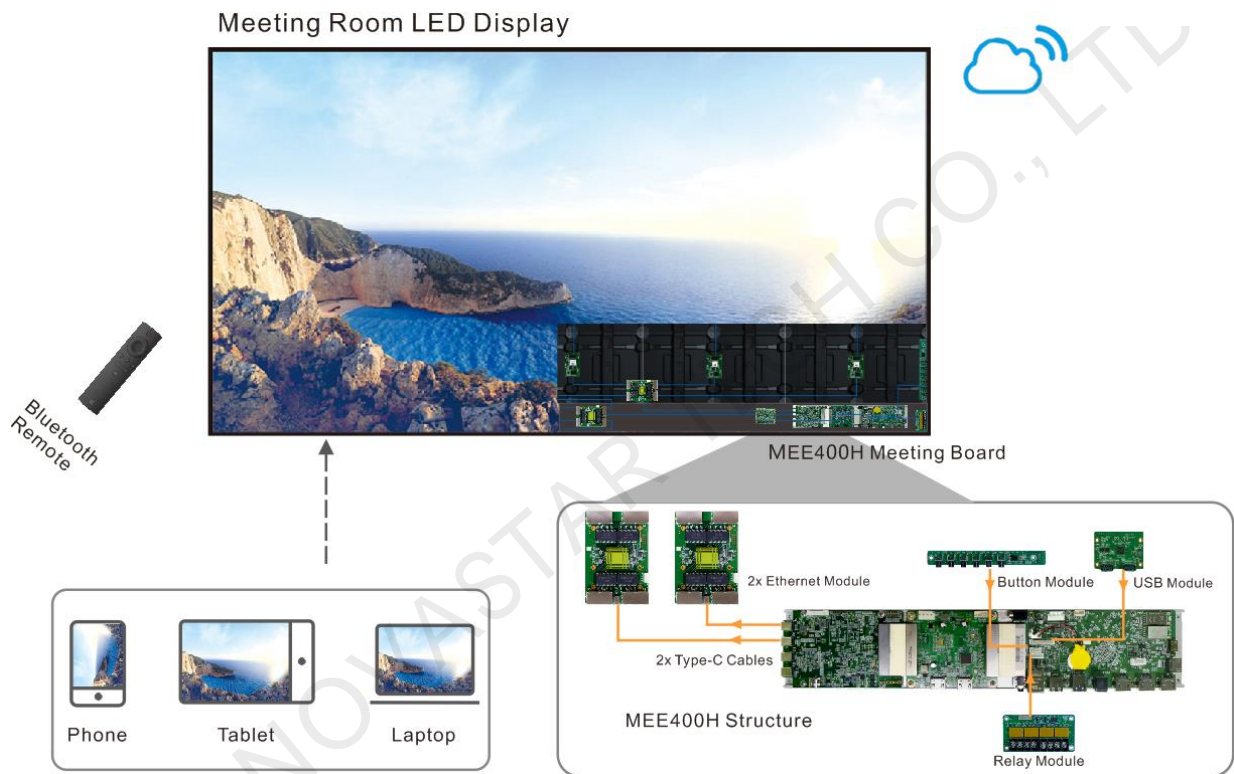
📄 **Note:**

• The MEE400H product package in this diagram is described in the packaging list in the specifications table.

• The Bluetooth remote (MX-BVR) is not included in the MEE400H product package. Customers can place another order to purchase the Bluetooth remote.

Specifications

Hardware Configuration	CPU	64-bit quad-core 1.7 GHz CPU, 2*A73+2*A53
	RAM	DDR4-4GB
	GPU	Mail G51 GPU
	ROM	16GB eMMC5.1 (Standard)
Electrical Specifications	Input voltage	DC 4.4 V to 5.2 V
	Maximum transient current	12 A

	Peak power consumption	60 W
		Note:
		• A switched-mode power supply of 200 W is recommended.
		• The peak power consumption depends on the dynamic load of the Android SoC.
Operating Environment	Temperature	−20°C to +60°C
		(An aluminum cooling plate must be installed on the chassis housing for long-term high-temperature operations.)
	Humidity	10% RH to 75% RH, non-condensing
Storage Environment	Temperature	−25°C to +125°C
Physical Specifications	Motherboard dimensions (L×W×H)	401.0 mm × 77.6 mm × 21.0 mm
	Motherboard net weight	0.47 kg
Packing Information	Packing box dimensions (L×W×H)	455 mm × 265 mm × 80 mm
	List	• 1x MEE400H
		• 2x Ethernet modules, 1x Relay module, 1x Button module, 1x USB module
		• 2x Type-C To Type-C cables (1 m), 1x Mini USB-A cable (158 cm)
		• 3x Glue stick antennas, 3x Antenna feeders (50 cm)
		• 1x 6-pin flat cable (30 cm), 1x 5-pin flat cable (30 cm), 1x 11-pin flat cable (30 cm)
		• 1x Certificate of Approval

Note:

The current and power consumption are measured under the following conditions. The data may vary depending on the product settings, usage environment and measuring status.

- The AC 220V power is output to the 200W (5V/40A) switched-mode power supply first, then to the boost module and at last to the MEE400H.
- An HDMI video source is used (The default Android startup image is used by default and it does not change upon startup).
- Four Ethernet modules are connected to the MEE400H and the 32 Ethernet ports form a loop via short Ethernet cables. A USB drive containing a video that can be played is connected. Three glue stick antennas are connected and Wi-Fi is connected. The hotspot for screen mirroring is turned on.

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