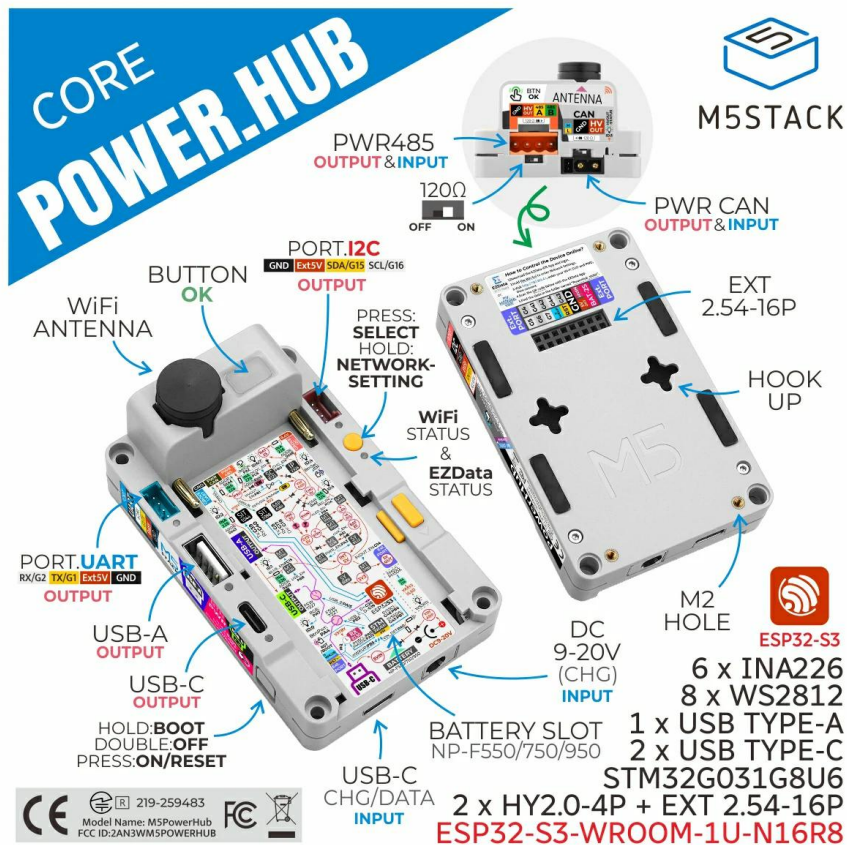


POWERHUB PMIC(STM32)

USER MANUAL



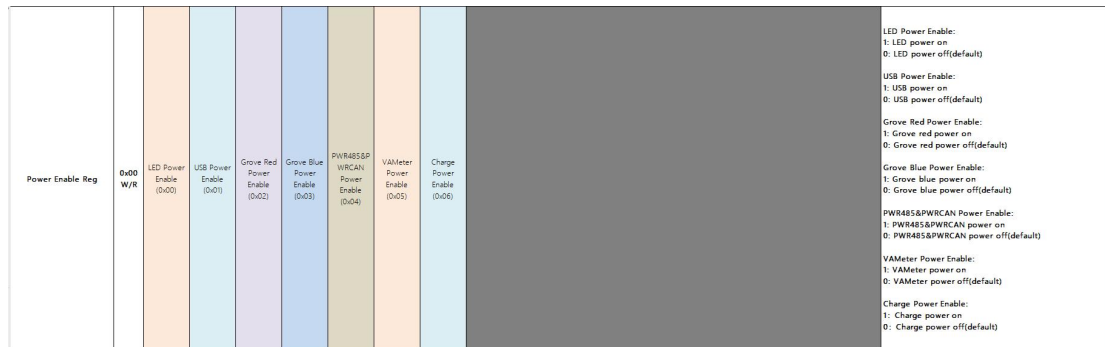
DATE	CONTENT	VERSION
2025-02-27	Firmware update	2.0
2025-10-16	Adds input detection.	2.1

Table of Contents

I、Power Enable Reg	2
1. LED Power Enable	2
2. USB Power Enable	2
3. Grove Red Power Enable	2
4. Grove Blue Power Enable	2
5. PWR485&PWRCAN Power Enable	3
6. VAMeter Power Enable	3
7. Charge Power Enable	3
II、USB Mode	3
III、PWR485&PWRCAN Config	3
1. Voltage（LSB&MSB）	4
2. Current Limit Value	4
3. Power Output Control	4
4. Power Direction Control	4
IV、Voltage&Current Monitor	4
V、Detect Status	5
VI、LED Color	5
VII、LED Brightness	5
VIII、Button	6
IX、Wakeup Source	6
1. nSTBY_WKUP	6
2. VIN_DET	6
3. VUSB_DET	6
X、RTC Time	7
XI、RTC Alarm	7
XII、Bootloader Version	7
XIII、Firmware Version	8
XIV、I2C Address	8

I、 Power Enable Reg

Address	0x00 - 0x06
Access	W/R
Function	Enables or disables the LED power, USB power, Grove Red port power, Grove Blue port power, PWR485 & PWRCAN power, voltage/current meter power, and charging power.



1. LED Power Enable

Controls the power enable of the RGB LED. Write 1 to turn on, write 0 to turn off. The default state is off.

2. USB Power Enable

Controls the power enable of the USB port. Write 1 to turn on, write 0 to turn off. The default state is off.

3. Grove Red Power Enable

Controls the power enable of the Grove Red port. Write 1 to turn on, write 0 to turn off. The default state is off.

4. Grove Blue Power Enable

Controls the power enable of the Grove Blue port. Write 1 to turn on, write 0 to turn off. The default state is off.

5. PWR485&PWRCAN Power Enable

Controls the power enable of the PWR485 & PWRCAN port. Write 1 to turn on, write 0 to turn off. The default state is off.

6. VAMeter Power Enable

Controls the power enable of the voltage/current meter. Write 1 to turn on, write 0 to turn off. The default state is off.

7. Charge Power Enable

Controls the charging enable. Write 1 to turn on, write 0 to turn off. The default state is off.

II、 USB Mode

Address	0x10
Access	W/R
Function	Controls the USB port mode, switching between device mode and host mode.

USB Mode	0x10 W/R	USB Mode (0x10)	USB Mode: 0: Slave mode, USB->ESP32(default) 1: Host mode(USB TypeA), ESP32->USB TypeA device 2: Host mode(USB TypeC), ESP32->USB TypeC device
----------	-------------	--------------------	---

- 0: Slave mode, USB->ESP32(default)
- 1: Host mode(USB TypeA), ESP32->USB TypeA device
- 2: Host mode(USB TypeC), ESP32->USB TypeC device

III、 PWR485&PWRCAN Config

Address	0x20 - 0x24
Access	W/R
Function	Controls the SC8721 voltage, maximum current, power switch (physical switch), and power direction (output or input).

PWR485&PWRCAN Config	0x20 W/R	Voltage LSB (0x20)	Voltage MSB (0x21)	Current Limit Value (0x22)	Power Output Control (0x23)	Power Direction Control (0x24)	Voltage: Range 3000mV~20000mV, step 20mv Current Limit Value: 0~232 Iout limit(mA) = (Current Limit Value+1)*5/0.62 Power Output Control: 1: Power output enable(default) 0: Power output disable Power Direction Control: 1: Power output direction 0: Power input direction(default)
-------------------------	-------------	-----------------------	-----------------------	-------------------------------------	--------------------------------------	---	--

1. Voltage（LSB&MSB）

Configures the output voltage of the SC8721, range 3000 mV to 20000 mV, with a step size of 20 mV.

2. Current Limit Value

Calculation formula: Iout limit (mA) = (Current Limit Value + 1) * 8 / 0.62
Example: To set the current limit to 1000 mA, Current Limit Value = 1000 * 0.62 / 8 - 1 = 76

Note: The total output power must not exceed 20 W. If the output voltage is set high, the output current register will be limited to a lower value.

3. Power Output Control

Configures the SC8721 output using a MOSFET for physical switching. Write 1 to turn on the power output, write 0 to turn off. The default state is off. (Note: When the power direction is set to output, it will be automatically turned on.)

4. Power Direction Control

Configures the input/output direction of the SC8721. Write 1 to set the direction to output, write 0 to set the direction to input. The default state is input.

IV、 Voltage&Current Monitor

Address	0x30 - 0x47
Access	R
Function	Retrieves the voltage and current from the INA226 on each channel.

Voltage&Current Monitor	0x30 R	V_BAT_LSB (0x30)	V_BAT_MSB (0x31)	I_BAT_LSB (0x32)	I_BAT_MSB (0x33)	V_PWRCAN_LSB (0x34)	V_PWRCAN_MSB (0x35)	I_PWRCAN_LSB (0x36)	I_PWRCAN_MSB (0x37)	V_PWR485_LSB (0x38)	V_PWR485_MSB (0x39)	I_PWR485_LSB (0x3A)	I_PWR485_MSB (0x3B)	V_USB_LSB (0x3C)	V_USB_MSB (0x3D)	I_USB_LSB (0x3E)	I_USB_MSB (0x3F)	V_BAT: 0~36000mV I_BAT: -8000mA~8000mA V_PWRCAN: 0~36000mV I_PWRCAN: -8000mA~8000mA V_PWR485: 0~36000mV I_PWR485: -8000mA~8000mA V_USB: 0~36000mV I_USB: -8000mA~8000mA
	0x40 R	V_GROVE_RED_LSB (0x40)	V_GROVE_RED_MSB (0x41)	I_GROVE_RED_LSB (0x42)	I_GROVE_RED_MSB (0x43)	V_GROVE_BLUE_LSB (0x44)	V_GROVE_BLUE_MSB (0x45)	I_GROVE_BLUE_LSB (0x46)	I_GROVE_BLUE_MSB (0x47)									V_GROVE_RED: 0~36000mV I_GROVE_RED: -8000mA~8000mA V_GROVE_BLUE: 0~36000mV I_GROVE_BLUE: -8000mA~8000mA

V、Detect Status

Address	0x50~0x51
Access	R
Function	Retrieves the charging status and power input status.

Detect Status	0x50 R	Charge Status (0x50)	VIN Status (0x51)		Charge Status: 0: no charge 1: charging 2: error VIN Status: 0: no input 1: input present
---------------	-----------	----------------------------	-------------------------	--	---

1、Charge Status

0: no charge

1: charging

2: error

2、VIN Status

0: no input

1: input present

VI、LED Color

Address	0x60 - 0x7F
Access	W/R
Function	Controls the color of 8 LEDs.

LED Color	0x60 W/R	USB TypeC B (0x60)	USB TypeC G (0x61)	USB TypeC R (0x62)	Dummy Byte (0x63)	USB TypeA B (0x64)	USB TypeA G (0x65)	USB TypeA R (0x66)	Dummy Byte (0x67)	Grove Blue B (0x68)	Grove Blue G (0x69)	Grove Blue R (0x6A)	Dummy Byte (0x6B)	RS485/CAN B (0x6C)	RS485/CAN G (0x6D)	RS485/CAN R (0x6E)	Dummy Byte (0x6F)	LED Color
	0x70 W/R	Grove Red B (0x70)	Grove Red G (0x71)	Grove Red R (0x72)	Dummy Byte (0x73)	BAT Charge B (0x74)	BAT Charge G (0x75)	BAT Charge R (0x76)	Dummy Byte (0x77)	Power.L B (0x78)	Power.L G (0x79)	Power.L R (0x7A)	Dummy Byte (0x7B)	Power.R B (0x7C)	Power.R G (0x7D)	Power.R R (0x7E)	Dummy Byte (0x7F)	

Updates the color of the corresponding LED by writing the corresponding RGB values.

VII、LED Brightness

Address	0x80 - 0x87
Access	W/R
Function	Controls the brightness of 8 LEDs.

LED Brightness	0x80 W/R	USB TypeC Brightness (0x80)	USB TypeC Brightness (0x81)	Grove Blue Brightness (0x82)	RS485/CAN Brightness (0x83)	Grove Red Brightness (0x84)	BAT Charge Brightness (0x85)	Power.L Brightness (0x86)	Power.R Brightness (0x87)									Brightness: 0-100
----------------	-------------	-----------------------------------	-----------------------------------	------------------------------------	-----------------------------------	-----------------------------------	------------------------------------	---------------------------------	---------------------------------	--	--	--	--	--	--	--	--	-------------------

Updates the brightness of the corresponding LED by writing the corresponding RGB values.

VIII、 Button

Address	0xA0
Access	R
Function	Retrieves the button status.



0:press;
1:no press

IX、 Wakeup Source

Address	0xB0 - 0xB2
Access	W/R
Function	Configures the wake-up source.



1. nSTBY_WKUP

Configures whether to enable RTC clock wake-up. Write 0 to disable, write 1 to enable. The default state is enabled.

2. VIN_DET

Configures whether to enable VIN insertion wake-up. Write 0 to disable, write 1 to enable. The default state is enabled.

3. VUSB_DET

Configures whether to enable VUSB insertion wake-up. Write 0 to disable, write 1 to enable. The default state is enabled.

Note: At least one of the three wake-up sources must be enabled. If all three wake-up sources are disabled, sleep will not be allowed.

X、 RTC Time

Address	0xC0 - 0xC6
Access	W/R
Function	Configures the RTC clock.



Sec: 0-59

Minute: 0-59

Hour: 0-23

Day: 1-31

Month: 1-12

Year: 0-168

Week Day: 0x01, Sunday; 0x02, Monday; 0x04, Tuesday; 0x08, Wednesday;

0x10: Thursday; 0x20: Friday; 0x40: Saturday; 0x80: Sunday

XI、 RTC Alarm

Address	0xD0 - 0xD3
Access	W/R
Function	Configures the RTC alarm.



Minute: 0-59

Hour: 0-23

Day: 1-31

Alarm Enable: 1: Alarm Enable; 0: Alarm Disable

XII、 Bootloader Version

Address	0xFC
Access	R
Function	Retrieves the bootloader version number.



XIII、Firmware Version

Address	0xFE
Access	R
Function	Retrieves the firmware version number.

Firmware Version	0xF0 R	Version (0xFE)	Version: firmware version number
------------------	-----------	-------------------	----------------------------------

XIV、I2C Address

Address	0xFF
Access	W/R
Function	Sets the I2C address.

I2C Address	0xF0 R/W	Address (0xFF)	Address: 1-127
-------------	-------------	-------------------	----------------