



M5STACK

PowerHub STM32

Built-in Firmware Communication Protocol

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I. Power Enable Register

Register address	0x00 - 0x06
Read/Write permission	W/R
Function	0x00: LED power enable 0x01: USB Power enable 0x02: Red Grove port power enable 0x03: Blue Grove port power enable 0x04: Power enable for PWR485 & PWRCAN 0x05: Voltage and current meter power supply enable 0x06: Charging power enable

REG MAP (Addr:0X50)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Power Enable Reg	0x00 W/R	LED Power Enable (0x00)	USB Power Enable (0x01)	Grove Red Power Enable (0x02)	Grove Blue Power Enable (0x03)	PWR485&PWRCAN Power Enable (0x04)	VAMeter Power Enable (0x05)	Charge Power Enable (0x06)									LED Power Enable: 1: LED power on 0: LED power off(default) USB Power Enable: 1: USB power on 0: USB power off(default) Grove Red Power Enable: 1: Grove red power on 0: Grove red power off(default) Grove Blue Power Enable: 1: Grove blue power on 0: Grove blue power off(default) PWR485&PWRCAN Power Enable: 1: PWR485&PWRCAN power on 0: PWR485&PWRCAN power off(default) VAMeter Power Enable: 1: VAMeter power on 0: VAMeter power off(default) Charge Power Enable: 1: Charge power on 0: Charge power off(default)

1 LED Power Enable

Controls the power enable of the RGB LED light. Write 1 to enable, write 0 to disable, and the default state is disabled.

2 USB Power Enable

Controls the power enable of the USB port. Write 1 to enable, write 0 to disable, and the default state is disabled.

3 Grove Red Power Enable

Controls the power enable of the red Grove port. Write 1 to enable, write 0 to disable, and the default state is disabled.

4 Grove Blue Power Enable

Controls the power enable of the blue Grove port. Write 1 to enable, write 0 to disable, and the default state is disabled.

5 PWR485 & PWRCAN Power Enable

Controls the power enable of the PWR485 & PWRCAN ports. Write 1 to enable, write 0 to disable, and the default state is disabled.

6 VAMeter Power Enable

Controls the power enable of the voltmeter and ammeter. Write 1 to enable, write 0 to disable, and the default state is disabled.

7 Charge Power Enable

Controls charging enable; write 1 to enable, write 0 to disable, and the default state is disabled.

II. USB Mode Register

Register address	0x10
Read/Write permission	W/R
Function	Control the USB port mode, switching between slave and host modes.

REG MAP (Addr:0X50)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
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 Register

Register address	0x20 – 0x24
Read/Write permission	W/R
Function	Controls the voltage , maximum current , power switch (physical switch) , and power direction (output or input) of the SC8721.

REG MAP (Addr:0X50)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
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)*8/0.62 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)

Configure the output voltage of SC8721 in the range of 3000mV - 20000mV, with a step of 20mV .

2 Current Limit Value

Calculation formula: Iout limit(mA) = (Current Limit Value + 1) * 8 / 0.62

For example, if the current limit is set to 1000mA, the Current Limit Value = 1000 * 0.62 / 8 - 1 = 76

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

3 Power Output Control

Configure the output of SC8721 using MOSFETs for physical switching. Write 1 to enable the power output and write 0 to disable the power output. The default is to disable the power output .

Note: Once the power direction is set to output, it will automatically be turned on .

4 Power Direction Control

Configure the input/output direction of the SC8721. Write 1 for output and 0 for input. The default is input .

IV. Voltage & Current Monitor Register

Register address	0x30 – 0x47
Read/Write permission	R
Function	Voltage and current of INA226 on each channel .

REG MAP (Addr:0X50)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note	
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: 0-3600mV I_BAT: -8000mA-8000mA V_PWRCAN: 0-3600mV I_PWRCAN: -8000mA-8000mA V_PWR485: 0-3600mV I_PWR485: -8000mA-8000mA V_USB: 0-3600mV 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: 0-3600mV I_GROVE_RED: -8000mA-8000mA V_GROVE_BLUE: 0-3600mV I_GROVE_BLUE: -8000mA-8000mA



V. Status Register

Register address	0x50 – 0x51
Read/Write permission	R
Function	Get charging status and power input status

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
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 Stations

0: no charge

1: charging

2: error

2 VIN Status

0: no input

1: Input present

VI. LED Color Register

Register address	0x60 – 0x7F
Read/Write permission	W/R
Function	Control the brightness of 8 LEDs

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
LED Brightness	0x60 W/R	USB TypeC Brightness (0x60)	USB TypeA Brightness (0x61)	Grove Blue Brightness (0x62)	RS485&CAN Brightness (0x63)	Grove Red Brightness (0x64)	BAT Charge Brightness (0x65)	Power_L Brightness (0x66)	Power_R Brightness (0x67)									Brightness: 0-100

Set by writing the corresponding RGB value .

VII. LED brightness register

Register address	0x80 – 0x87
Read/Write permission	W/R
Function	Control the color of 8 LEDs

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
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)	

The color of the corresponding light is updated by writing the corresponding RGB value .

VIII. Key Register

Register address	0xA0
Read/Write permission	R
Function	Get button state

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Button	0xA0 R	Button (0xA0)																bit0: 0:button 1 press; 1:button 1 no press

0: press 1: no press



IX. Wake-up Source Register

Register address	0xB0 – 0xB2
Read/Write permission	W/R
Function	Configure wake-up source

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Wakeup Source	0xB0 R	nSTBY_WKUP (0xB0)	VIN_DET (0xB1)	nButton2_WKUP (0xB2)													nSTBY_WKUP: 0,disable; 1,enable(default) VIN_DET: 0,disable; 1,enable(default) nButton2_WKUP: 0,disable; 1,enable(default)	

1 nSTBY_WKUP

Configure whether to enable RTC clock wake-up: 0 disables, 1 enables, and it is enabled by default.

2 VIN_DET

Configure whether to enable VIN insertion wake-up; 0 disables, 1 enables, and it is enabled by default.

3 VUSB_DET

Configure whether to enable VUSB plug-in wake-up; 0 disables, 1 enables, and it is enabled by default.

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

X. RTC Clock Register

Register address	0xC0 – 0xC6
Read/Write permission	W/R
Function	Configure RTC clock

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note	
RTC Time	0xC0 W/R	Sec (0xC0)	Minute (0xC1)	Hour (0xC2)	Day (0xC3)	Month (0xC4)	Year (0xC5)	Week Day (0xC6)											Sec: 0-59 Minute: 0-59 Hour: 0-23 Day: 1-31 Month: 1-12 Year: 0-99 Week Day: 0x01: Sunday; 0x02: Monday; 0x04: Tuesday; 0x08: Wednesday; 0x10: Thursday; 0x20: Friday; 0x40: Saturday; 0x80: Sunday

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 Register

Register address	0xD0 – 0xD3
Read/Write permission	W/R
Function	Configure RTC alarm clock

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
RTC Alarm	0xD0 W/R	Minute (0xD0)	Hour (0xD1)	Day (0xD2)	Alarm Enable (0xD3)													Minute: 0-59 Hour: 0-23 Day: 1-31 Alarm Enable: 1: Alarm Enable; 0: Alarm Disable

Minute: 0-59

Hour: 0-23

Day: 1-31

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



XII. System Register

Register address	0xE0 – 0xE2
Read/Write permission	W
Function	Power off, download, reset

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
System Command	0xE0 W	Power Off (0xE0)	Reset (0xE1)	Download Mode (0xE2)													Write 1 to trigger	

Write 1 to trigger.

XIII. Bootloader Version

Register address	0xFC
Read/Write permission	R
Function	Get bootloader version number

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Bootloader Version	0xFC R													Version (0xFC)		Version: bootloader version number		

XIV. Firmware Version

Register address	0xFE
Read/Write permission	R
Function	Get firmware version number

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Firmware Version	0xFE R													Version (0xFE)		Version: firmware version number		

XV. I2C Address

Register address	0xFF
Read/Write permission	W/R
Function	I2C address settings

REG MAP (Addr:0X50)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
I2C Address	0xFF R													Address (0xFF)		Address: 1-127		



Appendix

Revision History		
Version	date	Change Description
1.0	10/16/2025	Initial version