POWERTIP TECH. CORP.

Command Table for N32926

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1. Common Command

CLS

Function: Clear Full Screen

COMMAND: 1 byte=04(hex), LEN: 1byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x04	0x00	0xC3

SET_FG_COLOR

Function: Set Foreground Color

COMMAND: 1 byte=02(hex), LEN: 1 byte=03(hex), DATA: 3 byte

Header	Command	Length	Data0	Data1	Data2	Frame End
0xAA	0x02	0x03	Blue[7:0]	Green[7:0]	Red[7:0]	0xC3

SET_BG_COLOR

Function: Set Background Color

COMMAND: 1 byte=03(hex), LEN: 1 byte=03(hex), DATA: 3 byte

Header	Command	Length	Data0	Data1	Data2	Frame End
0xAA	0x03	0x03	Blue[7:0]	Green[7:0]	Red[7:0]	0xC3

SET_X,Y_POS

Function: Set X,Y location

COMMAND: 1 byte=01(hex), LEN: 1 byte=04(hex), DATA: 4 bytes

Header	Command	Length	Data0	Data1	Data2	Data3	Frame End
0xAA	0x01	0x04	X[15:8]	X[7:0]	Y[15:8]	Y[7:0]	0xC3

DRAW_TEXT

Function: Print text string from XY location

COMMAND: 1 byte=0D(hex), LEN: 1 byte=01~FF(hex),

DATA: N bytes n=1~255(dec)

Header	Command	Length	Data0..LEN	Frame End
0xAA	0x0D	LEN[7:0]	Data n[7:0]	0xC3

SET_TEXT Font

Function: Set current text font

COMMAND: 1 byte=16(hex), LEN: 1 byte=01(hex), DATA: 1 bytes 00~13(hex)

Header	Command	Length	Data0	Frame End
0xAA	0x16	0x01	Font Type[7:0]	0xC3

SET Font Mode:

Function: Set display mode of text font

COMMAND: 1 byte=17(hex), LEN: 1 byte=01(hex), DATA: 1 bytes

Header	Command	Length	Data0	Frame End
0xAA	0x17	0x01	Font Mode[7:0]	0xC3

0: normal mode / 1: reverse mode / 2: transparent mode /
3: XOR mode / 4: transparent reversed mode

SET_TEXT Cursor Inc

Function: Set cursor increment

COMMAND: 1 byte=05(hex), LEN: 1 byte=01(hex), DATA: 1 bytes Off=00,On=01

Header	Command	Length	Data0	Frame End
0xAA	0x05	0x01	On / Off	0xC3

2. Graphics Command

SET_PEN_SIZE

Function: Set Pen size

COMMAND: 1 byte=06(hex), LEN: 1 byte=01(hex), DATA: 1 bytes SIZE=1~50(dec)

Header	Command	Length	Data0	Frame End
0xAA	0x06	0x01	SIZE[7:0]	0xC3

SET_LINE_STYLE

Function: Set Line style

COMMAND: 1 byte=07(hex), LEN: 1 byte=01(hex), DATA: 1 bytes

Header	Command	Length	Data0	Frame End
0xAA	0x07	0x01	STYLE[7:0]	0xC3

STYLE[7:0] = 0 Solid / = 1 Dash / = 2 Dot

DRAW_LINE

Function: Draw a Line from (Xa, Ya) to (Xb, Yb)

COMMAND: 1 byte=08(hex), LEN: 1 byte=08(hex), DATA: 8 bytes

Header	Command	Length	Data0	Data1	Data2
0xAA	0x08	0x08	Xa[15:8]	Xa[7:0]	Ya[15:8]

Data3	Data4	Data5	Data6	Data7	Frame End
Ya[7:0]	Xb[15:8]	Xb[7:0]	Yb[15:8]	Yb[7:0]	0xC3

DRAW_BOX

Function: Draw a Box from (Xa, Ya) to (Xb, Yb)

COMMAND: 1 byte=0A(hex), LEN: 1 byte=08(hex), DATA: 8 bytes

Header	Command	Length	Data0	Data1	Data2
0xAA	0x0A	0x08	Xa[15:8]	Xa[7:0]	Ya[15:8]

Data3	Data4	Data5	Data6	Data7)	Frame End
Ya[7:0]	Xb[15:8]	Xb[7:0]	Yb[15:8]	Yb[7:0]	0xC3

DRAW_BOX_FILL

Function: Draw a box from (Xa, Ya) to (Xb, Yb) and fill foreground color

COMMAND: 1 byte=0C(hex), LEN: 1 byte=08(hex), DATA: 8 bytes

Header	Command	Length	Data0	Data1	Data2
0xAA	0x0C	0x08	Xa[15:8]	Xa[7:0]	Ya[15:8]

Data3	Data4	Data5	Data6	Data7	Frame End
Ya[7:0]	Xb[15:8]	Xb[7:0]	Yb[15:8]	Yb[7:0]	0xC3

DRAW_CIRCLE

Function: Draw a CIRCLE from center XY and R pixels radius

COMMAND: 1 byte=11(hex), LEN: 1 byte=05(hex), DATA: 5 bytes R=1-50(dec)

Header	Command	Length	Data0	Data1
0xAA	0x11	0x05	X[15:8]	X[7:0]
	Data2	Data3	Data4	Frame End
	Y[15:8]	Y[7:0]	R[7:0]	0xC3

DRAW_CIRCLE_FILL

Function: Draw a CIRCLE from center XY and R pixels radius and fill foreground color

COMMAND: 1 byte=12(hex), LEN: 1 byte=05(hex), DATA: 5 bytes R=1 ~ 50(dec)

Header	Command	Length	Data0	Data1
0xAA	0x12	0x05	X[15:8]	X[7:0]
	Data2	Data3	Data4	Frame End
	Y[15:8]	Y[7:0]	R[7:0]	0xC3

Display Picture ID

Function: Display Picture ID

COMMAND: 1 byte=1A(hex), LEN: 1 byte=06(hex), DATA: 6 bytes, ID:0000~ffff(hex)

Header	Command	Length	Data0	Data1	
0XAA	0x1A	0x06	ID[15:8]	ID[7:0]	
	Data2	Data3	Data4	Data5	Frame End
	X[15:8]	X[7:0]	Y[15:8]	Y[7:0]	0xC3

3. Hardware Command

Backlight PWM control

Function: Adjust backlight brightness

COMMAND: 1 byte=13(hex), LEN: 1 byte=01(hex), DATA: 1 bytes n=0~ff(hex)

Header	Command	Length	Data0	Frame End
0xAA	0x13	0x01	n [7:0]	0xC3

Backlight ON

Function: Turn on backlight

COMMAND: 1 byte=14(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x14	0x00	0xC3

Backlight OFF

Function: Turn off backlight

COMMAND: 1 byte=15(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x15	0x00	0xC3

TP Report Rate

Function: Change the TP Report Rate

COMMAND: 1 byte=1C(hex), LEN: 1 byte=01(hex),

DATA: 1 byte, Report=01~0A (100ms~1000ms)

Header	Command	Length	Data0	Frame End
0xAA	0x1C	0x01	Report Rate	0xC3

TP Output set

Function: Change the TP Function

COMMAND: 1 byte=2B(hex), LEN: 1 byte=01(hex), DATA: 1 byte Off=00,On=01

Header	Command	Length	Data0	Frame End
0xAA	0x2B	0x01	On / Off	0xC3

Buzzer On

Function: Turn on buzzer

COMMAND: 1 byte=1D(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x1D	0x00	0xC3

Buzzer off

Function: Turn off buzzer

COMMAND: 1 byte=1E(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x1E	0x00	0xC3

RTC Set Time

Function: Set the time of RTC

COMMAND: 1 byte=21(hex), LEN: 1 byte=07(hex), DATA: 7 bytes

Header	Command	Length	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Frame End
0xAA	0x21	0x07	Year(H)	Year(L)	Month	Day	Hour	Minute	Second	0xC3

Ex: 2019/12/16 00:00:00 " AA 21 07 07 E3 0C 10 00 00 00 C3 "

RTC Get Time

Function: Get the time of RTC to Host

COMMAND: 1 byte=22(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x22	0x00	0xC3

Ex: Firmware TX: " 20 07 E3 0C 10 00 00 00 " = 2019/12/16 00:00:00

RTC Display On

Function: Display RTC time string on LCD

COMMAND: 1 byte=23(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x23	0x00	0xC3

RTC Display Off

Function: Stop RTC time string on LCD

COMMAND: 1 byte=24(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x24	0x00	0xC3

SET_RTC_FG_COLOR

Function: Set Foreground Color of RTC time string

COMMAND: 1 byte=25(hex), LEN: 1 byte=03(hex), DATA: 3byte

Header	Command	Length	Data0	Data1	Data2	Frame End
0xAA	0x25	0x03	Blue[7:0]	Green[7:0]	Red[7:0]	0xC3

SET_RTC_BG_COLOR

Function: Set Background Color of RTC time string

COMMAND: 1 byte=26(hex), LEN: 1 byte=03(hex), DATA: 3byte

Header	Command	Length	Data0	Data1	Data2	Frame End
0xAA	0x26	0x03	Blue[7:0]	Green[7:0]	Red[7:0]	0xC3

SET_RTC_XY_POS

Function: Set XY Location of RTC time string

COMMAND: 1 byte=27(hex), LEN: 1 byte=04(hex), DATA: 4byte

Header	Command	Length	Data0	Data1	Data2	Data3	Frame End
0xAA	0x27	0x04	X[15:8]	X[7:0]	Y[15:8]	Y[7:0]	0xC3

SET RTC_TEXT

Function: Set font style of RTC time string

COMMAND: 1 byte=28(hex), LEN: 1 byte=01(hex), DATA: 1byte Font 00~13(hex)

Header	Command	Length	Data0	Frame End
0xAA	0x28	0x01	Font Type[7:0]	0xC3

SET RTC Font Mode

Function: Set display mode of RTC time string

COMMAND: 1 byte=29(hex), LEN: 1 byte=01(hex), DATA: 1byte

Header	Command	Length	Data0	Frame End
0xAA	0x29	0x01	Font Mode[7:0]	0xC3

0: normal mode 1: reverse mode 2: transparent mode

3: XOR mode 4: transparent reversed mode

4. FRAME Command

SHOW FRAME ID

Function: Frame Display

COMMAND: 1 byte=30(hex), LEN: 1 byte=02(hex), DATA: 3byte ID=0000~ffff(hex)

Header	Command	Length	Data 0	Data 1	Frame End
0xAA	0x30	0x02	ID[15:8]	ID[7:0]	0xC3

SET_ROTATION_OBJ

Function: Set angle for Rotation object

COMMAND: 1 byte=31(hex), LEN: 1 byte=04(hex), DATA: 4byte ID=0000~ffff(hex) / Angle: 0~359 (dec)

Header	Command	Length	Data 0	Data 1	Data 2	Data 3	Frame End
0xAA	0x31	0x04	ID[15:8]	ID[7:0]	Angle [15:8]	Angle [7:0]	0xC3

SET_ROTATION_OBJ with FRAME

Function: Set angle for Rotation object with Frame

COMMAND: 1 byte=31(hex), LEN: 1 byte=06(hex), DATA: 6 bytes ID=0000~ffff (hex) / Angle: 0~359 (dec) / F ID:0000~ffff(hex)

Header	Command	Length	Data 0	Data 1	
0XAA	0x31	0x06	ID[15:8]	ID[7:0]	
	Data 2	Data 3	Data 4	Data 5	Frame End
	Angle[15:8]	Angle[7:0]	F ID[15:8]	F ID[7:0]	0xC3

SET_SYMBOL_OBJ

Function: Set on/off for Symbol object

COMMAND: 1 byte=32(hex), LEN: 1 byte=03(hex), DATA: 3byte ID=0000~ffff (hex) / Off=00,On=01

Header	Command	Length	Data 0	Data 1	Data 2	Frame End
0xAA	0x32	0x03	ID[15:8]	ID[7:0]	On / Off	0xC3

SET_SYMBOL_OBJ with Frame

Function: Set on/off for Symbol object with Frame

COMMAND: 1 byte=32(hex), LEN: 1 byte=05(hex), DATA: 5byte ID=0000~ffff(hex) / Off=00,On=01 / F ID:0000~ffff(hex)

Header	Command	Length	Data 0	Data 1
0xAA	0x32	0x05	ID[15:8]	ID[7:0]
	Data 2	Data 3	Data 4	Frame End
	On / Off	F ID[15:8]	F ID[7:0]	0xC3

SET_COUNTER_OBJ

Function: Set Counter Value

COMMAND: 1 byte=33(hex), LEN: 1 byte=06(hex), DATA: 6 bytes

ID=0000~ffff (hex) / Data:00000000~ffffffff(hex)

Header	Command	Length	Data 0	Data 1	
0XAA	0x33	0x06	ID[15:8]	ID[7:0]	
	Data 2	Data 3	Data 4	Data 5	Frame End
	Data03	Data02	Data01	Data00	0xC3

SET_COUNTER_OBJ with Frame

Function: Set Counter Value with Frame

COMMAND: 1 byte=33(hex), LEN: 1 byte=08(hex), DATA: 8 bytes

ID=0000~ffff (hex) / Data:00000000~ffffffff(hex) / F ID:0000~ffff(hex)

Header	Command	Length	Data0	Data1	Data2		
0xAA	0x33	0x08	ID[15:8]	ID[7:0]	Data03		
	Data3	Data4	Data5	Data6	Data7	Frame End	
	Data02	Data01	Data00	F ID[15:8]	F ID[7:0]	0xC3	

SET_COUNTER_OBJ Font Color

Function: Set Counter Value and Font Foreground Color and Background color

COMMAND: 1 byte=33(hex), LEN: 1 byte=0C(hex), DATA: 12 bytes

ID=0000~ffff (hex) / Data:00000000~ffffffff(hex) / Foreground Color: FB FG FR / Background Color: BB BG BR

Header	Command	Length	Data0	Data1	Data2	Data3	Data4	
0xAA	0x33	0x0C	ID[15:8]	ID[7:0]	Data3	Data2	Data1	
	Data5	Data6	Data7	Data8	Data9	Data10	Data11	Frame End
	Data0	FB[7:0]	FG[7:0]	FR[7:0]	BB[7:0]	BG[7:0]	BR[7:0]	0xC3

SET_COUNTER_OBJ Font Color with Frame

Function: Set Counter Value and Font Foreground Color and Background color with Frame

COMMAND: 1 byte=33(hex), LEN: 1 byte=0E(hex), DATA: 14 bytes

ID=0000~ffff (hex) / Data:00000000~ffffffff(hex) / Foreground Color: FB FG FR / Background Color: BB BG BR / F ID:0000~ffff(hex)

Header	Command	Length	Data0	Data1	Data2	Data3	Data4	Data5	
0xAA	0x33	0x0E	ID[15:8]	ID[7:0]	Data3	Data2	Data1	Data0	
	Data6	Data7	Data8	Data9	Data10	Data11	Data12	Data13	Frame End
	FB[7:0]	FG[7:0]	FR[7:0]	BB[7:0]	BG[7:0]	BR[7:0]	F ID[15:8]	F ID[7:0]	0xC3

SET_GPIO_VALUE

Function: Set GPIO Pin Value

COMMAND: 1 byte=0F(hex), LEN: 2 byte=02(hex), DATA: 2 byte

GPIO / Off=00,On=01

Header	Command	Length	Data0	Data1	Frame End
0xAA	0x0F	0x02	GPIO	On / Off	0xC3

GET_GPIO_VALUE

Function: Get GPIO Pin Value

COMMAND: 1 byte=0E(hex), LEN: 1 byte=01(hex), DATA: 1 bytes

Header	Command	Length	Data0	Frame End
0xAA	0x0E	0x01	GPIO	0xC3

5. System Command

Software Reset

Function: Reset

COMMAND: 1 byte=00(hex), LEN: 1byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x00	0x00	0xC3

COMMAND_ACK:

Function: SET HMI acknowledgement

COMMAND: 1 byte=20(hex), LEN: 1 byte=01(hex), ACK EN: 1 bytes Off=00,On=01

Header	Command	Length	ACK EN	Frame End
0xAA	0x20	0x01	On / Off	0xC3

RTC Calibration

Function: Calibration Time of RTC

COMMAND: 1 byte=2C(hex), LEN: 1byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x2C	0x00	0xC3

Mass Storage (SD / eMMC) Open

Function: Open Mass Storage with USB to PC

COMMAND: 1 byte=58(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x58	0x00	0xC3

Update Firmware

Function: Update Firmware From SD/eMMC

COMMAND: 1 byte=5A(hex), LEN: 1 byte=00(hex),DATA: None

Header	Command	Length	Frame End
0xAA	0x5A	0x00	0xC3

Firmware version confirmation

Function: Firmware version check

COMMAND: 1 byte=5C(hex), LEN: 1 byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x5C	0x00	0xC3

SD / eMMC Format command

Function: SD / eMMC Format (FAT32)

COMMAND: 1 byte=5F(hex), LEN: 1byte=00(hex), DATA: None

Header	Command	Length	Frame End
0xAA	0x5F	0x00	0xC3

SET CMD TIMEOUT

Function: Set time out(second) of Command input packet

COMMAND: 1 byte=2A(hex), LEN: 1 byte=02(hex), DATA: 3byte 0000~ffff(hex)

Header	Command	Length	Data 0	Data 1	Frame End
0xAA	0x2A	0x02	TIMEOUT [15:8]	TIMEOUT [7:0]	0xC3

Font list

ID	Text Size	Start Character	End Character
0x00	4x6	0x00	0xFF
0x01	4x7	0x00	0xFF
0x02	5x8	0x00	0xFF
0x03	6x8	0x00	0xFF
0x04	7x9	0x00	0xFF
0x05	8x8	0x00	0xFF
0x06	9x8	0x00	0xFF
0x07	5x12	0x00	0xFF
0x08	8x16	0x00	0xFF
0x09	9x16	0x00	0xFF
0x0A	12x16	0x00	0xFF
0x0B	10x20	0x00	0xFF
0x0C	12x23	0x00	0xFF
0x0D	12x24	0x00	0xFF
0x0E	12x27	0x00	0xFF
0x0F	14x30	0x00	0xFF
0x10	16x32	0x00	0xFF
0x11	24x32	0x20	0x7E
0x12	16x37	0x00	0xFF
0x13	25x57	0x00	0xFF

6. Packet Format For System

Byte 0	Byte 1
Header	SYS_START
0x10	0x01

Transfer notice of " System start " when the system power on and in working mode

Byte 0	Byte 1
Header	CMD EXEC
0x10	0x02

Transfer notice of " Command execute correctly " to HOST when COMMAND_ACK command (0x20) is enable

Byte 0	Byte 1
Header	CMD FAIL
0x10	0x03

Transfer notice of " Command execute fail " to HOST when COMMAND_ACK command (0x20) is enable

Byte 0	Byte 1	Byte 2
Header	Data 0	Data 1
0x30	ID[15:8]	ID[7:0]

Transfer notice of " Button Normal Mode " to HOST, ID=0000~ffff (hex)

Byte 0	Byte 1	Byte 2	Byte 3
Header	Data 0	Data 1	Data 3
0x30	ID[15:8]	ID[7:0]	On / Off

Transfer notice of " Button Normal Switch Mode " to HOST, ID=0000~ffff (hex) / Off=00,On=01

Byte 0	Byte 1	Byte 2
Header	Data 0	Data 1
0x31	F ID[15:8]	F ID[7:0]

Transfer notice of " Button Jump Frame Mode " to HOST, F ID=0000~ffff (hex)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
0xC0	0x56	0x31	0x2E	0x30	0x5F
Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
0x32	0x30	0x31	0x39	0x2D	0x30
Byte 12	Byte 13	Byte 14	Byte 15	Byte 16	Byte 17
0x37	0x2D	0x30	0x39	0x5F	0x31
Byte 18	Byte 19	Byte 20	Byte 21		
0x39	0x3A	0x34	0x39		

Firmware version format:

Example: ÀV1.0_2019-07-09_19:49

Byte 0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte 6	Byte 7
Header	Year[H]	Year[L]	Month	Day	Hour	Minute	Second
0x20	Data0	Data1	Data2	Data3	Data4	Data5	Data6

RTC Packet Format For RTC

Example:

Header	2013		09	24	15	15	15
0x20	0x07	0x0D	0x09	0x18	0x0F	0x0F	0x0F

Packet Format For Touch Point

Touch Point Output Packet

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Header	Status & Touch ID	Position[XH]	Position[XL]	Position[YH]	Position[YL]
0x70	Status & Touch ID	XH[15:8]	XL[7:0]	YH[15:8]	YL[7:0]

This packet output the touch point to host.

Symbol	Name	bit 7	bit 6	bit 5	bit 4
Byte 0	Header	0	1	1	1
		bit 3	bit 2	bit 1	bit 0
		0	0	0	0

Symbol	Name	bit 7	bit 6	bit 5	Bit 4
Byte 1	Status & Touch ID	Touch Status[1:0]		X	X
		bit 3	bit 2	bit 1	bit 0
		Touch ID[3:0]			

Touch Status[1:0]	00b	Touch is Put Down
	01b	Touch is Put Up
	10b	Touch Contact
	11b	Reserved
Touch ID[3:0]	[3:0]	Touch ID Number