



**POWER & INTERFACE BOARD
FOR E INK 13.3" COLOR & MONOCHROME DISPLAY**

Model: EPM-050C

Part number : 4160256xx-3 or up

INSTRUCTIONS

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It is essential that these instructions are read and understood before connecting or powering up this controller.

Introduction

Designed for E Ink 13.3" color & monochrome display applications, the EPM-050C is a feature-rich interface controller for :

- Support E Ink 13.3" Kaleido color (EC133UJ1)
- Support E Ink 13.3" 3 color, black, white, red (EL133UR1)
- Support E Ink 13.3" Monochrome (ED133UT3)
- Micro USB for data transfer
- Image rotation: 180 degrees
- Image mirror (horizontal flip)
- Built-in temperature sensor

The EPM-050C board is designed to enable E Ink 13.3" display systems. The EPM-050C board can be used as a power interface board between a media source, for example, the Digital View STM-100 or a Raspberry Pi, or as a main board using the optional on-board MCU. Please refer to separate user guides for content upload.

Ordering Information :

Controller	Part number	Ordering part number
EPM-050C	P/N 41602561x-3	P/N 4160256xx-3

HOW TO PROCEED

- Ensure you have all parts & that they are correct, refer to:
 - Connection diagram

Controller Solution Generator

Full web resource matching controllers & panels with **connection diagrams** for download.
See at : <http://www.digitalview.com/csg>

- Connector reference (in the following section)
 - Connect the parts
 - Understand the operation & functions

IMPORTANT USAGE NOTE

This equipment is for use by developers and integrators, the manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other user of this product to:

- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- **Verify the power settings for all components before making connections.**

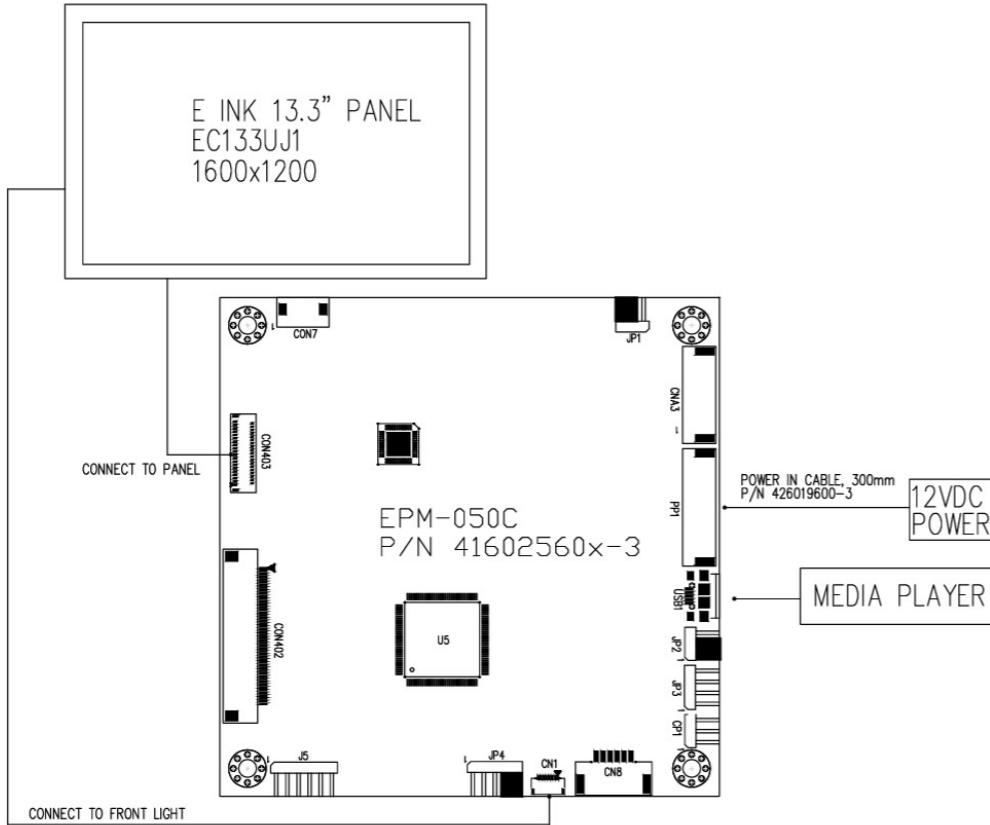
DISCLAIMER

There is no implied or expressed warranty regarding this material.

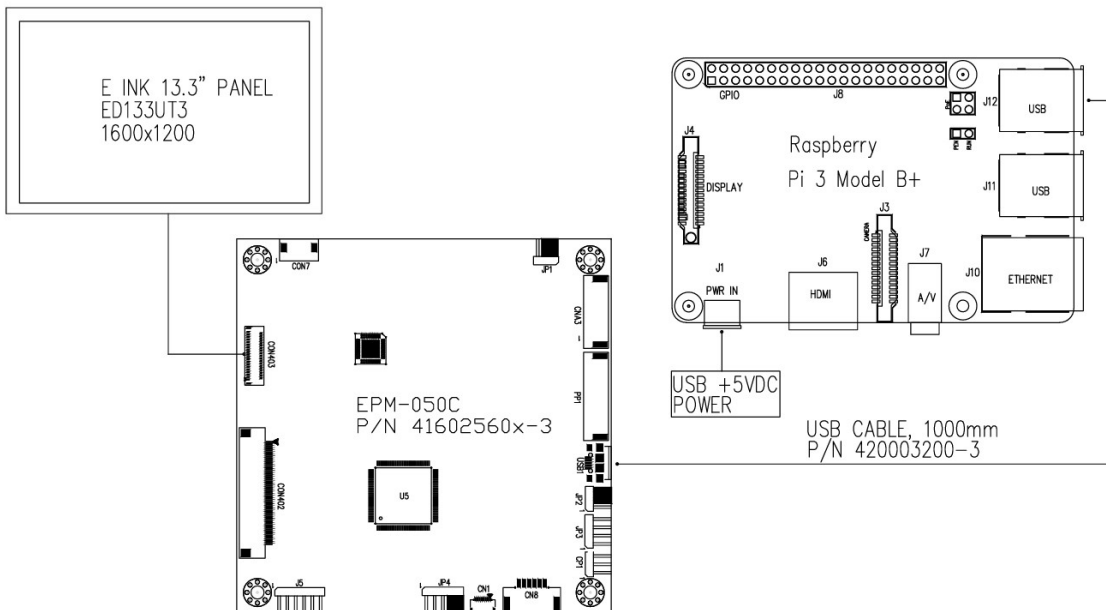
SYSTEM DESIGN

A typical E Ink 13.3" display system utilizing the EPM-050C is likely to comprise the following:

E Ink 13.3" Kaleido panel with front light for 12VDC power input :



E Ink 13.3" mono display for 5VDC input.

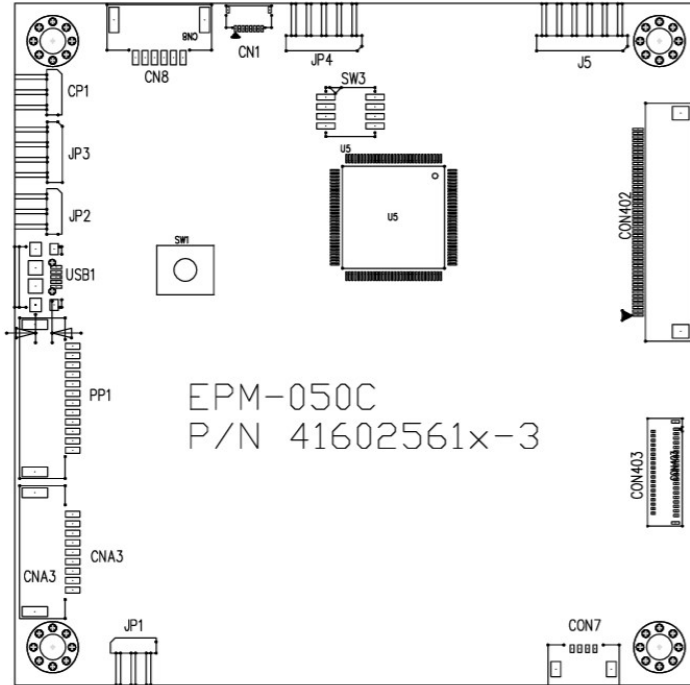


FEATURES

1. Panel Support: E Ink 13.3" color (EC133UJ1), EL133UR1 (Black, White, Red), 13.3" mono (ED133UT3)
2. Supports resolution: 1600x1200 (for 13.3")
3. Image rotation: 180 degree
4. Supports image mirror (Horizontal flip)
5. 1x Micro USB connector
6. Built-in temperature sensor
7. On board LED driver circuitry to control the on/off and dimming of the Front lights LED of EC133UJ1.
8. Supports Bitmap file format
9. Reserve RS-232 command to control +5V output power on/off for power saving purpose for 12V input only.
10. Reserve +5V output supply for external device such as Raspberry Pi etc for 12V input only.
11. Input voltage : 5V (default, not support front light driver) / 12V (Jumper selectable)
12. Output voltage: DC 5V for 12V input only (for STM-100, Raspberry Pi etc)
13. Supports Raspberry Pi, Arduino, Android, SBC
14. Board size : 90 x 90 mm
15. Operating temperature : -15°C to +65°C (based on chamber temperature tests)
16. Power consumption for Standby (as measured)
 - 12VDC input : 13.3" color panel (EC133UJ1, front light off) + EPM-050C = 0.5W
 - 13.3" color panel (EC133UJ1, front light on) + EPM-050C = 2.8W
 - 5VDC input : 13.3" mono panel + EPM-050C = 0.26W
17. Power consumption during image write to panel (as measured)
 - 12VDC input : 13.3" color panel (EC133UJ1, front light off) + EPM-050C = 3.2W
 - 13.3" color panel (EC133UJ1, front light on) + EPM-050C = 5.4W
 - 5VDC input : 13.3" mono panel + EPM-050C = 0.78W

CONNECTORS, PINOUTS & JUMPERS

The various connectors are:



Summary: Connectors

Ref	Purpose	Description
CON402	Reserved	Hirose FH28-50S-0.5SH connector
CON403	Panel output signal for E Ink 13.3" panel	JST 39FXRH-SM1-GAN-TF (Matching type : Copper foil 0.3mm pitch)
CON7	External temperature sensor connector	FPC 4 way 1mm pitch bottom contact connector
CN1	For E Ink EC133UJ1 Front light connector	Hirose FH34SRJ-8S-0.5SH connector (Matching type : 8 ways 0.5mm pitch FPC)
CN8	RS-232 serial control	12513WR-06 or compatible (Matching type : Molex 51146-0600 or compatible) (Matching RS-232 extend cable P/N 426092400-3 (100mm))
CNA3	+5VDC power output (applied when input 12VDC via PP1)	12513WR-09 or compatible (Matching type : Molex 51146-0900 or compatible)
PP1	+12VDC Power input	12513WR-12 or compatible (Matching type : Molex 51146-1200 or compatible) (Matching power extend cable P/N 426019600-3 (300mm))
USB1	+5V power input & Data	Micro USB connector (Matching USB cable P/N 420003200-3 (1000mm))

Summary: Jumpers setting

Ref	Purpose	Note
J5	SPI Slave Interface Connector (Optional)	Pin 1 = Host I/F Ready Pin 2 = SPI Host I/F Data Output Pin 3 = SPI Host I/F Data Input Pin 4 = SPI Host I/F Data Clock Pin 5 = SPI Host I/F Chip Select Pin 6 = Ground
JP1	Selection of on board +5VDC power control	1-2 = Always On 2-3 = Command control power On/Off
JP2	Selection of +5VDC or +12VDC input	1-2 = +12VDC input via PP1 2-3 = +5VDC input via USB1
JP3	Selection of RS-232 input or UART input for on board +5VDC power control	1-2 & 3-4 open = RS-232 input 1-2 & 3-4 closed = UART input
JP4	Front lights control and DC12V detect	Pin 1 = Voltage detect Pin 2 = Ground Pin 3 = Front Lights On/Off Pin 4 = Ground Pin 5 = Front Lights PWM dimming
CP1	U3 Programming Port	Pin 1 = +5V Pin 2 = Ground Pin 3 = Data

Connector pin assignment :

CON403 – Panel output signal for Eink 13.3" panel : JST 39FXRH-SM1-GAN-TF (Matching type : : Copper foil 0.3mm pitch)

PIN	SYMBOL	DESCRIPTION
1	VNEG	Negative power supply source driver
2	VPOS	Positive power supply source driver
3	VSS	Ground
4	VDD	Digital power supply drivers
5	XCL	Clock source driver
6	XLE	Latch enable source driver
7	XOE	Output enable source driver
8	VSS	Ground
9	VSS	Ground
10	NC	No Connection
11	XSTL	Start pulse source driver
12	D0	Data signal source driver
13	D1	Data signal source driver
14	D2	Data signal source driver
15	D3	Data signal source driver
16	D4	Data signal source driver
17	D5	Data signal source driver
18	D6	Data signal source driver
19	D7	Data signal source driver
20	VSS	Ground
21	NC	No Connection
22	VCOM	Common connection
23	VGH	Positive power supply gate driver
24	VGL	Negative power supply gate driver
25	NC	No Connection
26	NC	No Connection
27	NC	No Connection
28	MODE1	Output mode selection gate driver
29	VSS	Ground
30	VSS	Ground
31	VSS	Ground
32	SPV	Start pulse gate driver
33	CKV	Clock gate driver
34	BORDER	Border connection
35	VSS	Ground
36	VSS	Ground
37	VSS	Ground
38	VSS	Ground
39	VSS	Ground

CN7- Connect to external temperature sensor board (Optional)

PIN	SYMBOL	DESCRIPTION
1	I2C_SCL	I2C Clock
2	I2C_SDA	I2C Data
3	GND	Ground
4	PMIC_3P3V	+3.3V

CN8 – RS-232 serial control: YEONHO 12513WR-06 compatible (Matching type : Molex 51146-0600 or compatible)

PIN	SYMBOL	DESCRIPTION
1	PI_TX	UART Tx data
2	PI_RX	UART Rx data
3	VCC	+5V
4	TX0IN	RS-232 Tx data
5	GND	Ground
6	RX0IN	RS-232 Rx data

CNA3 - +5VDC power output : YEOHO 12513WR-09 or compatible (applied when input 12VDC via PP1)
(Matching type : Molex 51146-0900 or compatible)

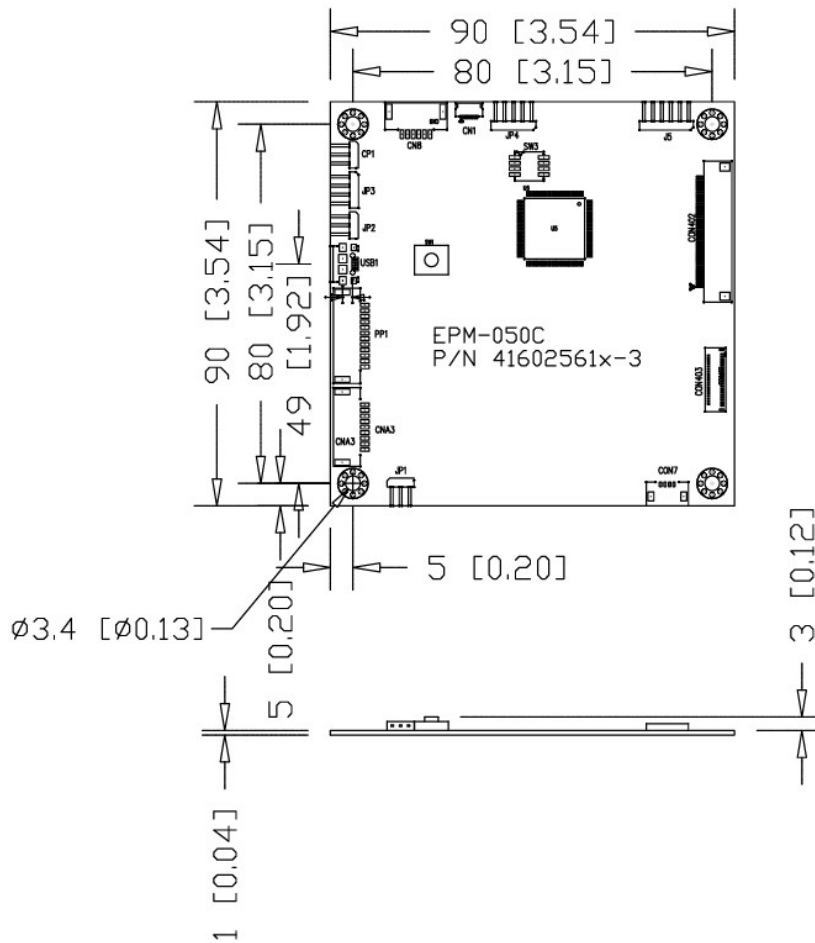
PIN	SYMBOL	DESCRIPTION
1	+12VDC	+12VDC out (Reserved)
2	+12VDC	+12VDC out (Reserved)
3	+12VDC	+12VDC out (Reserved)
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	+5VDC	+5VDC out
8	+5VDC	+5VDC out
9	+5VDC	+5VDC out

PP1 - +12VDC Power input : 12513WR-12 or compatible (Matching type : Molex 51146-1200 or compatible)

PIN	SYMBOL	DESCRIPTION
1	VDD (+12V)	+12V in
2	VDD (+12V)	+12V in
3	VDD (+12V)	+12V in
4	VDD (+12V)	+12V in
5	VDD (+12V)	+12V in
6	VDD (+12V)	+12V in
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	GND	Ground

* All connectors used may use the compatible type.

CONTROLLER DIMENSIONS



Scale : mm [inch]

Ready-made 3D Pro-E (SLDPRT) drawing files - Save time and effort for your system volumetric analysis design. Includes jpg file previews. Please go to download at <https://www.digitalview.com/controllers/epm-050c-driver.html>

CAUTION: Ensure adequate insulation is provided for all areas of the PCB with special attention to high voltage parts.

WARRANTY

The products are warranted against defects in workmanship and material for a period of three (3) year from the date of purchase provided no modifications are made to it and it is operated under normal conditions and in compliance with the instruction manual.

The warranty does not apply to:

- Product that has been installed incorrectly, this specifically includes but is not limited to cases where electrical short circuit is caused.
- Product that has been altered or repaired except by the manufacturer (or with the manufacturer's consent).
- Product that has subjected to misuse, accidents, abuse, negligence or unusual stress whether physical or electrical.
- Ordinary wear and tear.

Except for the above express warranties, the manufacturer disclaims all warranties on products furnished hereunder, including all implied warranties of merchantability and fitness for a particular application or purpose. The stated express warranties are in lieu of all obligations or liabilities on the part of the manufacturer for damages, including but not limited to special, indirect consequential damages arising out of or in connection with the use of or performance of the products.

CAUTION

Whilst care has been taken to provide as much detail as possible for use of this product it cannot be relied upon as an exhaustive source of information. This product is for use by suitably qualified persons who understand the nature of the work they are doing and are able to take suitable precautions and design and produce a product that is safe and meets regulatory requirements.

LIMITATION OF LIABILITY

The manufacturer's liability for damages to customer or others resulting from the use of any product supplied hereunder shall in no event exceed the purchase price of said product.

TRADEMARKS

The following are trademarks of Digital View Ltd:

- Digital View
- EPM-050C

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For technical support, including contact details, please visit our website.

Revision History

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26 Aug 2024	1.00	All	First issued