EastRising and Buydisplay SPI configuration and wiring

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max mc costa edited this page 4 hours ago · 16 revisions

Buydisplay offer to send the display already configured for use with SPI but if you need to do yourself here's. (this for 480x272 but should be almost the same for others)
ADDITION from 14-3-2015.
If you buy a eastrising fome BuyDisplay already setup for SPI you probably have to modify yourself to fix SPI compatibility with other devices! This actually *not needed* if you plan to isolate RA8875 with a 74HC125 or you plan to use the display standalone.
If you want to procede (**at your risk**) you just need to desolder some SMD component (you must be careful since you can damage PCB) *but if you are not able to do that better ask to someone that have soldering experience!* The display use tiny pcb tracks and too much heat can damage line and your display will be un-usable. Without those modifications the unit it's not compatible with other SPI devices on the same line and can stressing out your MCU pin (the one working at 3V3).
If you want proceed, look at **resistor settings**
ADDITION 01/06/2015
The **ER-TFTM050-3** has jumper J8 but must be closed since this display doesn't have the internal regulator from 5V to 3V3, this mean yuo are forced to supply 3V3 only!

About Supply:
Large display means average high current because the large background area!
Working at 3v3 needs more current so it will never work with Teensy LC, some display works with Teensy 3.1 and 3.0 but you are in the very dangerous zone and you can damage the internal regulator of Teensy CPU. Due has stronger regulator so can prolly work, UNO works either, probably only Yun cannot support all that current because it have to feed the wifi module.
The 7" consume quite a lot of current! Please, DO NOT use your USB with this display, even seems working in the best case you will get voltage drops that causes unpredictable results!
The best way isuse an external supply and connect ground between your CPU and the new regulator (they have to share the same ground!), apply also a decoupler capacitor near the supply legs (from 1uF to 10uF max) jut to prevent oscillations...

Jumper settings:

- J1: closed
- J2: closed
- J3: closed

- J4: closed
- J5: closed
- J6: closed
- J7: open
- J8: closed (3V3, leave OPEN for 5V!) The **ER-TFTM050-3 (5" 800x480) not works at 5V!** This jumper must leaved closed and you need to supply 3V3 only,leaved open will break internal power and your display will not work.
- J9: open
- J10: closed
- J11: open
- J12: closed
- J13: open
- J14: closed
- J15: open
- J16: closed

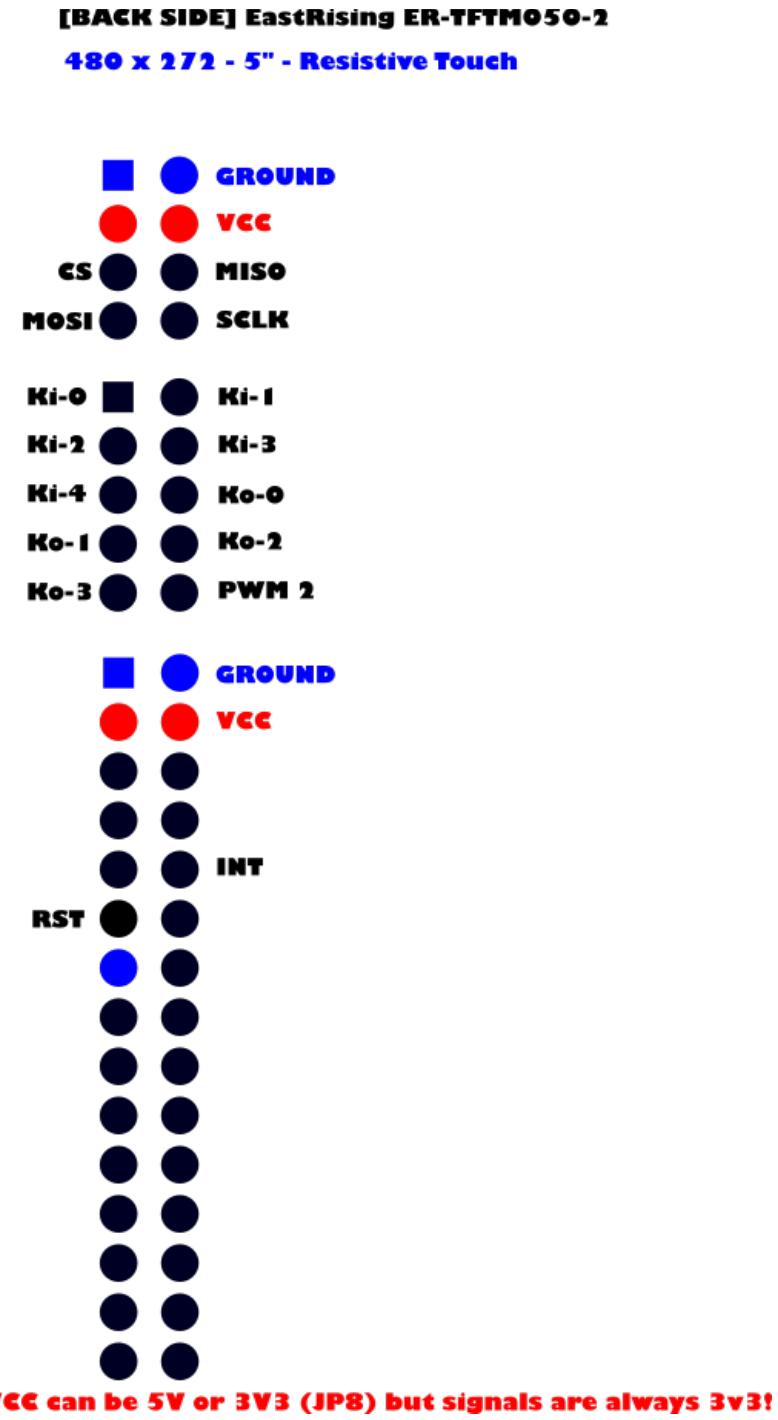
Resistor settings:

In standard card you will find 3 x 0Ohm resistors (jumpers) in R1,R2 and R3. ~~To use SPI you will need to replace all 3 resistors with 3 x 10K (accordly Eastrising datasheet). This is quite trick since space it's really small and you will need a tiny solder and if you have shacking hands forget it. I don't have 3 SMD resistors so I managed to use 3 small 10K passtrough hole resistors (picture pretty soon).~~
UPDATE MARCH 2015. I just discovered that R1/R2/R3 are pullup resistors that affect MOSI,MISO and SCLK lines (probably because this display uses SPImode3), this cause troubles with other SPI devices and since it's easy to add those resistors on the display pins I raccomand to **desolder R1,R2,R3 and also C1 and C2!!! (that causes excessive waveform distortion at high speed)** In many MCU's like Arduino or Teensy the SCLK have a 1K resistor plus a LED, the additional pullup can be too much for that pin, infact I got one Teensy 3.1 with an unusable pin 13 for that reason. *Please remember that this is NOT really needed if you isolate the RA8875 with a 74HC125 circuit (as described in wiki) and you must proceed ONLY if you are able to do this or you can damage your display!*

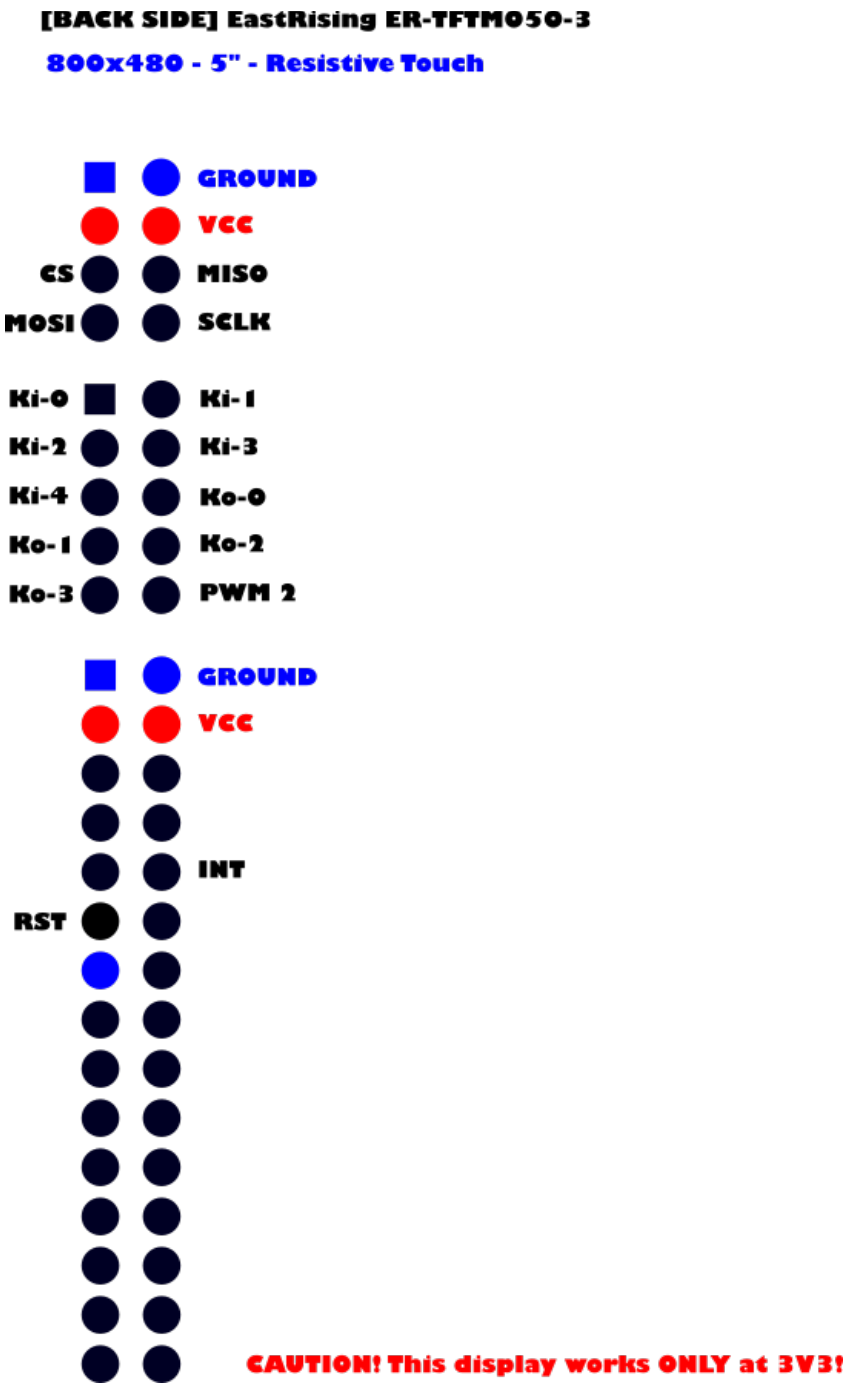
The resistor from R4 to R8 should be mounted if you will plan to use the keyboard matrix feature of the RA8875 (100K).

Connections:

ER-TFTM050-2

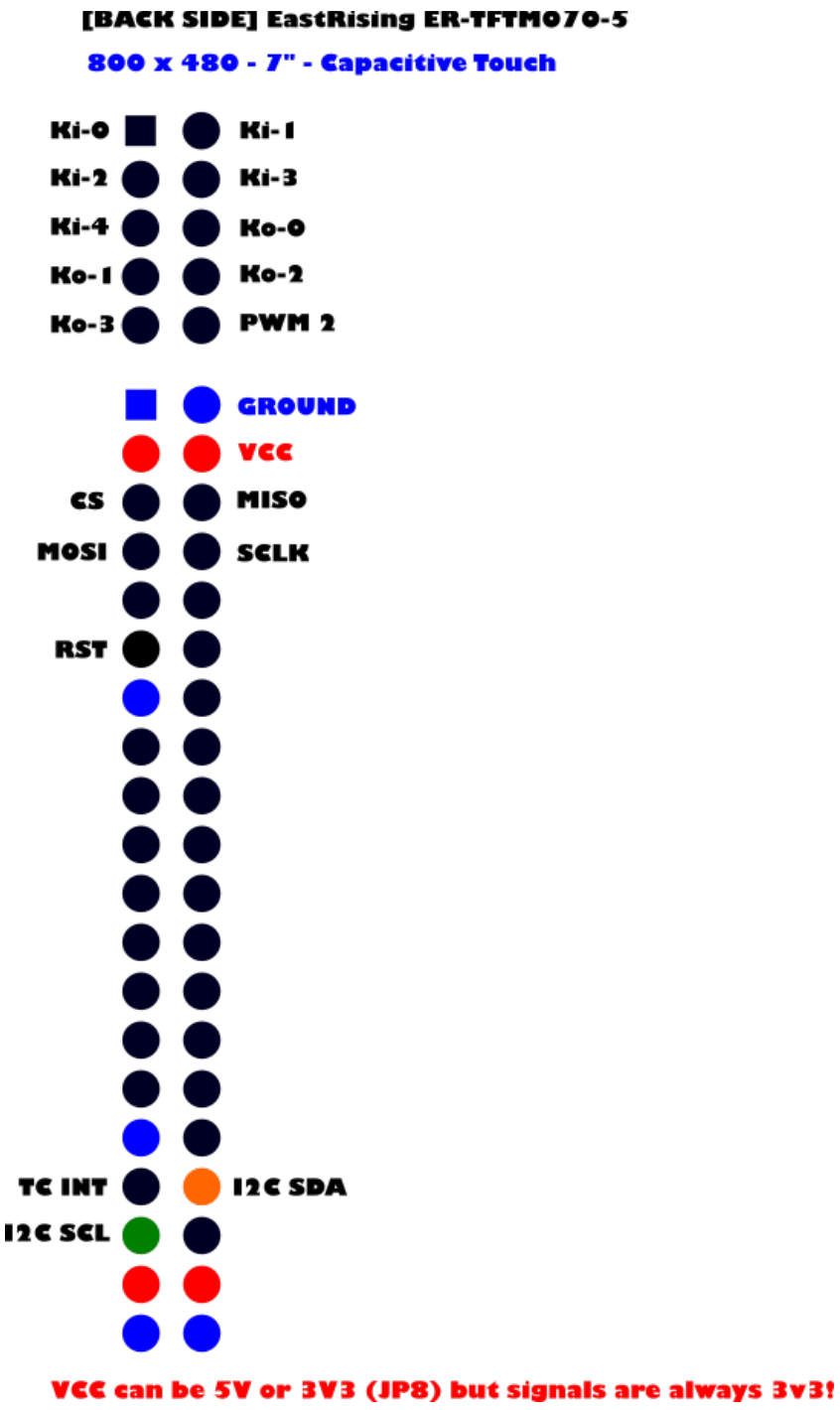

[BACK SIDE] EastRising ER-TFTM050-2
480 x 272 - 5" - Resistive Touch
GROUND
VCC
CS
MISO
MOSI
SCLK
Ki-0
Ki-1
Ki-2
Ki-3
Ki-4
Ko-0
Ko-1
Ko-2
Ko-3
PWM 2
GROUND
VCC
INT
RST
VCC can be 5V or 3V3 (JP8) but signals are always 3v3!

ER-TFTM050-3



ER-TFTM070-5

This display needs a solid power supply, the backlight consume quite a lot of current and using the USB it's not a good idea, in the best case the voltage will drop down and you will never get working properly!



Once you have setup for SPI you can finally connect it. For SPI you will need to populate connector **JP1** but if you plan to use internal resistive touch screen you will need at list a pin from connector **JP2** as well!

JP1

- 1: GND
- 2: GND

- 3: +5V or 3V3 (check JP8! open=5V, closed=3V3) **ER-TFTM050-3 only 3V3**
- 4: +5V or 3V3 (check JP8! open=5V, closed=3V3) **ER-TFTM050-3 only 3V3**
- 5: CS
- 6: MISO
- 7: MOSI
- 8: SCLK

JP2

- 10: INT pin (detect when touch screen has been touched!, apply only for resistive touch displays)
- 11: RESET It's optional, you can use or not, I'm actually using it.

JP4

NOTE: This SD holder has useless resistors and capacitors, it will not work with fast CPU and can create problems with SPI bus due capacitors, i STRONGLY suggest you forget it!!!!

- 1: -NC-
- 2: CS
- 3: MOSI
- 4: SCLK
- 5: GROUND
- 6: MISO
- 7: -NC-
- 8: Card Detection (optional)