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History:

Version	Changes	Date	Author
1.0	First edition	28.10.2016	J. Tian
2.0	Added i.MX 7	31.03.2017	A. Horstman / Y.Astein
3.0	Added requirements for the new EDT display (AC158)	28.07.2017	J.Tian / M.Graßmann
4.0	Added phyBOARD-Mira i.MX 6 Android support for AC158	24.10.2017	J.Tian

Connecting the Capacitive 7" EDT Display phyBOARD Upgrade Kit [KPEB-AV-02-xxx]

Content

1	Introduction	2
2	Requirements.....	2
3	Getting Started	4
	3.1 phyBOARD-Zeta i.MX 7 Specific Booting Instructions.....	8

1 Introduction

This Application Note provides a guide for how to connect the 7" EDT display to Phyttec phyBOARD SBCs using the PEB-AV-02 Display Adapter. As of printing of this manual suitable phyBOARDS are phyBOARD-Wega AM335x, phyBOARD-Segin i.MX 6UL/ULL, phyBOARD-Mira i.MX 6 and phyBOARD-Zeta i.MX 7.

In this Application Note the phyBOARD-Segin i.MX 6UL/ULL is used as an example to describe all steps necessary to connect the 7" EDT display and to enable the display configuration in *barebox*, as well as to operate the software implemented in the phyBOARD.

2 Requirements

The following system requirements are necessary to successfully complete this Application Note. Deviations from these requirements may suffice, or may have other workarounds.

Hardware:

- phyBOARD-Segin i.MX 6UL/ULL Kit(PB-02013) (or another suitable phyBOARD Kit)
- PEB-AV-02 display adapter for GLYN displays from the TFT-family concept
- 40 Pins FFC flex flat cable (WF061)
- 7" EDT display (AC104 or AC158)
- Power supply either 5 V DC¹, or 12 V – 24 V DC¹



Be sure to select the appropriate power supply for your phyBOARD. phyBOARDS delivered with the PEB-POW-01 (Power Module) require a 12 V – 24 V DC (min. 1 A)¹ power supply connected to the 2-pole Phoenix Contact MINI COMBICON base strip on the PEB-POW-01. phyBOARDS without the Power Module require a 5 V DC power supply (min. 1.5 A)¹ connected to the 2-pole Phoenix Contact MINI COMBICON base strip on the phyBOARD. For details please refer to the QuickStart Guide of your phyBOARD Kit.

Software:

- phyBOARD-Segin i.MX 6UL/ULL – PD17.1.0 or newer (for AC158)

¹: The supply current required depends on the phyBOARD you are using and additional expansion boards or displays connected to it, and thus, might be lower or higher than the specified value. E.g. if only the display adapter is connected to the phyBOARD-Segin, the current consumption is about 100 mA at 24 V via the PEB-POW-01 (Power Module), and about 400 mA at 5 V connected directly to the 2-pole Phoenix Contact MINI COMBICON on the phyBOARD.



Please use one of the following BSPs, if you are using another phyBOARD:

- phyBOARD-Mira i.MX 6: PD16.1.0 (for AC104 and AC158)
- phyBOARD-Mira i.MX 6: lower than PD16.1.0 (**only** AC104)
- phyBOARD-Mira i.MX 6: Android ALPHA1 (default active, **only** AC158)
- phyBOARD-Wega AM335x: PD17.1.0 or newer (for AC104 and AC158)
- phyBOARD-Wega AM335x: lower than PD17.1.0 (**only** AC104)

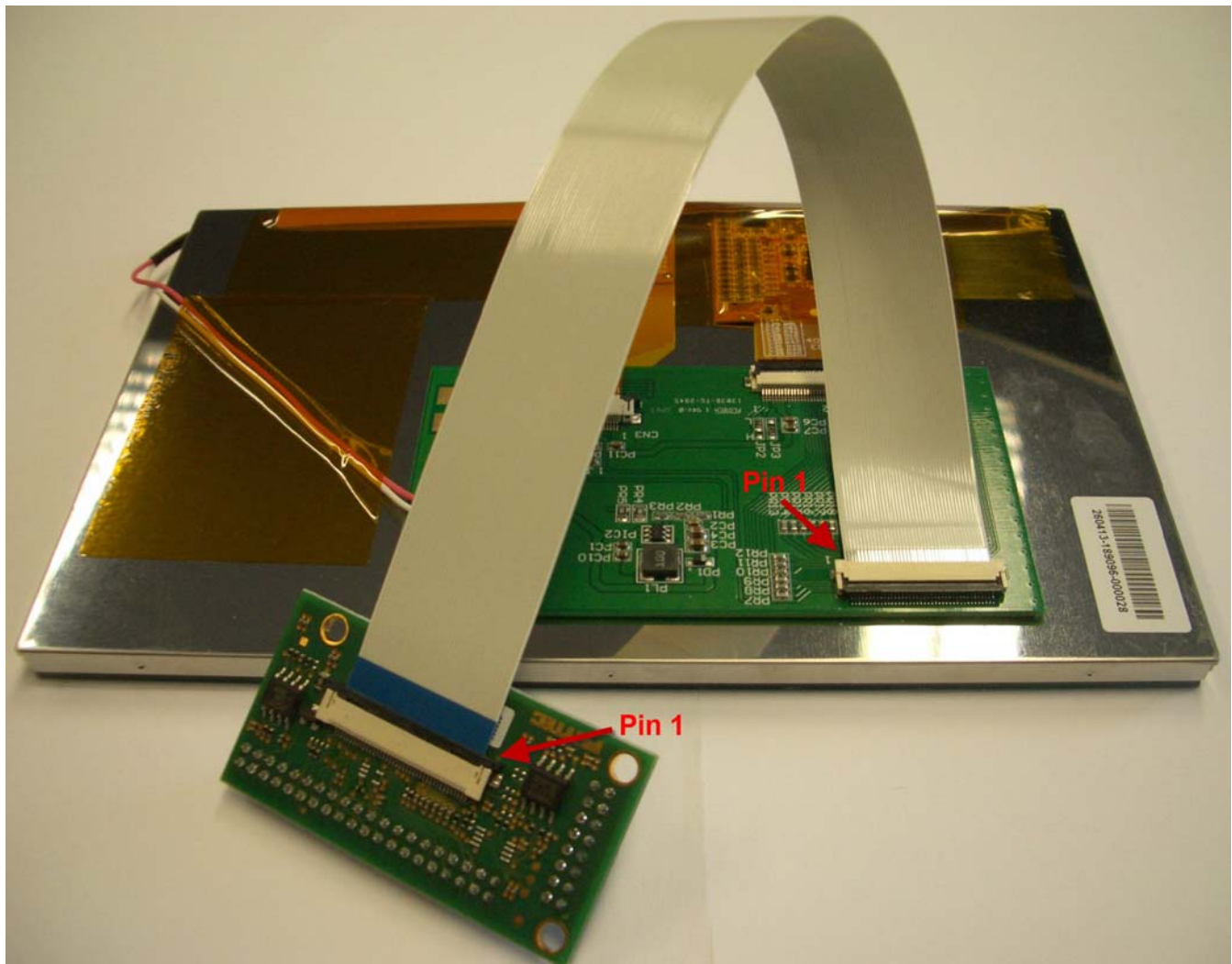
3 Getting Started

- Connect one end of the FFC flex flat cable to the underside of the 7'' EDT display (AC104 or AC158). There is a delicate clamp you need to pull up slightly before sliding the cable in.

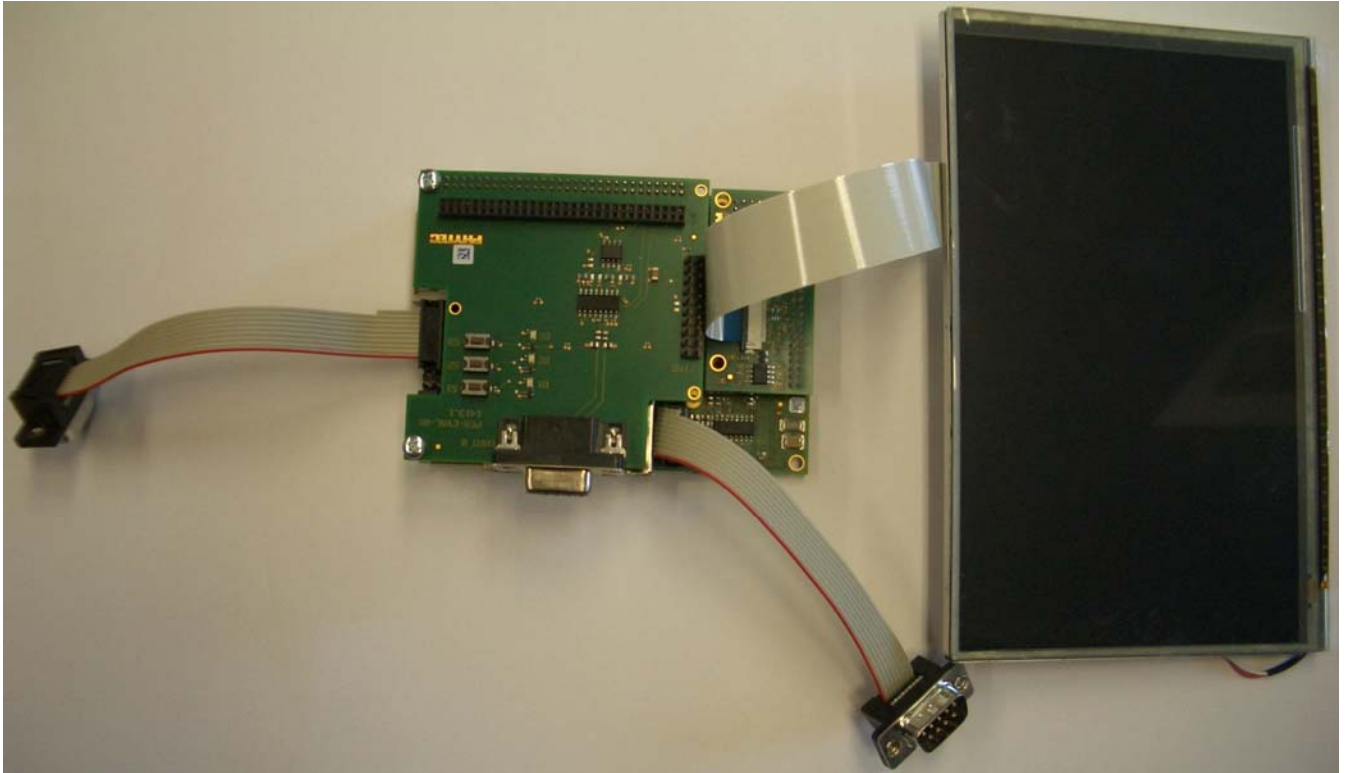


Be very careful when inserting the cable into the display connector, this kind of display connectors are easy to break if you use force!

- Turn the display over, and connect the other end of FFC flex flat cable to PEB-AV-02 display adapter. Again, first pull the clamp out before pushing the cable in.

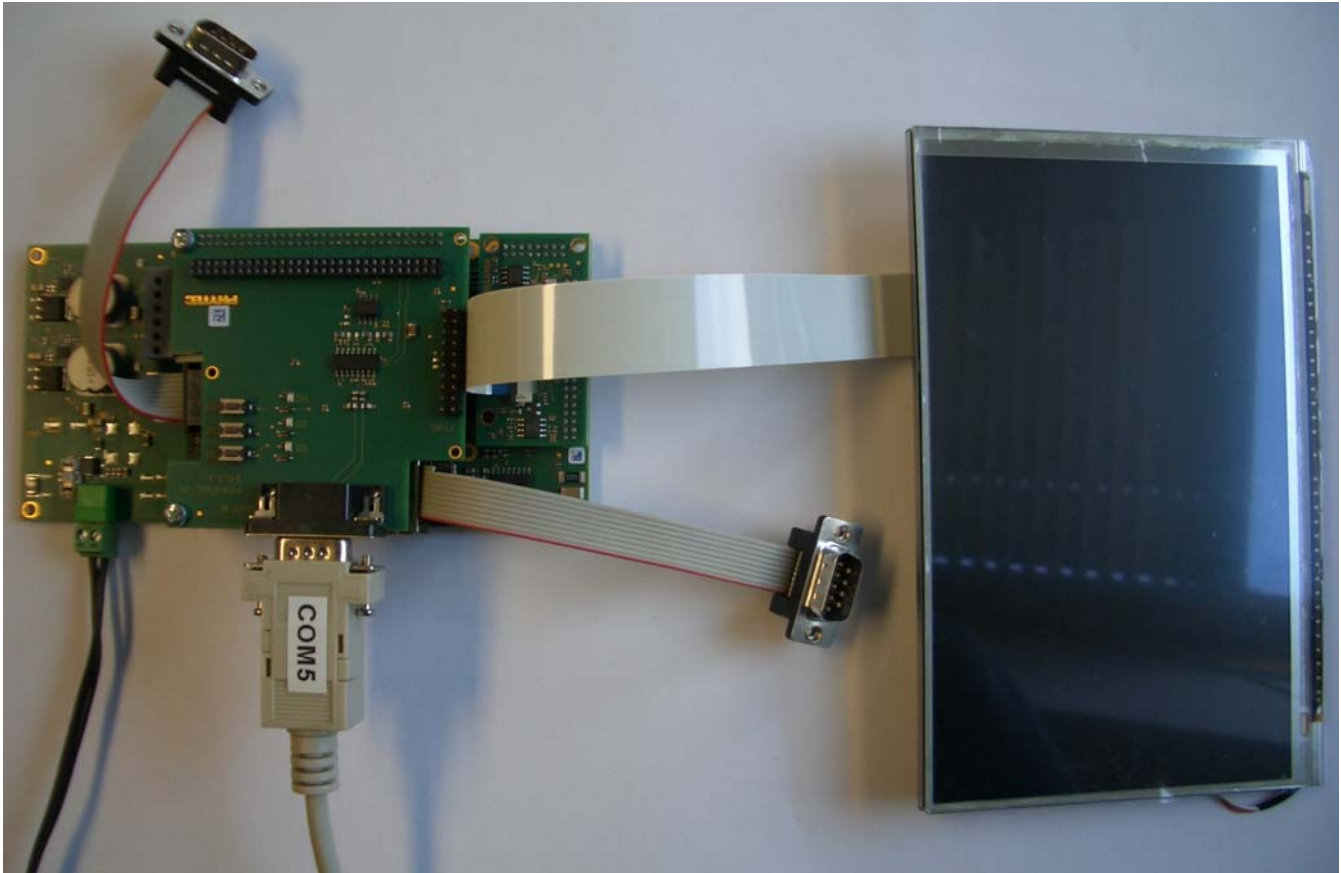


- Plug the PEB-AV-02 display adapter onto the phyBOARD-Segin i.MX 6UL/ULL. Turn the display so it is face up. It should look like the following.



If you are using a phyBOARD-Mira i.MX 6 (PB-01501-xxxx) the display adapter needs to be plugged into the carrier board from the opposite side (from the bottom)!

- Connect the RS-232 cable between your host PC and the phyBOARD-Segin debug adapter as shown below.



- Start your favorite terminal software (e.g. *Minicom*, or *Tera Term*) on your host PC and configure it for 115200 baud, 8 data bits, no parity, 1 stop bit (8n1) and no handshake.
- Connect the power supply to the power connector.



The following instructions for enabling the display in barebox are NOT applicable to the phyBOARD-Zeta i.MX 7. The i.MX 7 BSP uses *U-Boot* instead of barebox, and has the 7" EDT display (AC104) enabled already. Continue with [section 3.1](#) for i.MX 7 specific boot instructions.

The BSP has already been configured to support the display but it must be enabled as an expansion by editing the file *config-expansions* in the *barebox* environment. Please refer to the Yocto phyBOARD-Segin BSP Manual (L-844) for more information.

- Open file *config-expansions* with:
`bootloader$ edit /env/config-expansions`
- Uncomment the following 2 lines by removing the `#` at the beginning of the line.
`. /env/expansions/im6ul-phytec-segin-peb-av-02
of_display_timings -S /soc/aips-
bus@021100000/lcdif@021c8000/display@di0/display`
- Save and exit the configuration file using **CTRL+D** and save the environment:
`bootloader$ saveenv`
- Restart the board, and watch the boot. The login prompt will be shown at the end of the booting process:

```
Yogurt Vendor (Phytec Vendor Distribution) BSP-Yocto-Vendor-phyBOARD-Segin-PD17.1.0  
phyboard-segin-imx6ul-2 ttymxc0  
phyboard-segin-imx6ul-2 login:
```



The default login account is *root* with an empty password.



Please note, that AC104 and AC158 have inverted pixel clocks to each other. It is necessary to change the *barebox* environment when you switch from one display to the other.

3.1 phyBOARD-Zeta i.MX 7 Specific Booting Instructions

- The BSP for the phyBOARD-Zeta i.MX 7 has the display configured and enabled by default, so after applying power to the board, let the board boot until the login prompt:

```
Freescale i.MX Release Distro 4.1.15-2.0.1 imx7d-phyboard-zeta /dev/ttyMXC4  
imx7d-phyboard-zeta login:
```

- A demo will automatically start on the display. You may be asked to calibrate the touchscreen as shown in the picture below:



The default login account is *root* with an empty password.

Please contact our technical support, if you need additional information, or if you have any questions.

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