

# BSP-Yocto-TISDK-AM57xx-PD18.1.0 Release Notes

Operating System	Linux
BSP Release Status	RELEASED
Release Date	16 Jan 2018
Repository	<a href="#">PHYTEC Public Repos</a>
Binaries	<a href="#">BSP-Yocto-TISDK-AM57xx-PD18.1.0</a>
Source Archive	
Release Notes	<a href="#">Click Here</a>

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## Introduction

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This BSP provides a basis for development, deployment and execution of Linux based applications on the phyCORE-AM57x System on Module (SOM). For detailed information on the various software components included in the release and how to use them, please refer to the [Quickstart](#).

## Versioning

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### Software

Linux Kernel	4.9.41 (Based on TI SDK 04.01)
U-boot	2017.01 (Based on TI SDK 04.01)
Yocto	2.2 (Morty) (Based on TI SDK 04.01)
Host OS	Tested on 64-bit Ubuntu 16.04 LTS
Qt	5.7.1
OpenCL	1.1.14

OpenCV	3.1
Wayland	1.11
Gstreamer	1.8.3

## Yocto Machine Configuration Table

This BSP releases supports the phyCORE-AM572x Rapid Development Kit (RDK) and also allows configuration options for different SOMs to be used with the RDK carrier board (PCM-948). By default, only the standard kit configuration will be in the table. If you have a different SOM, use the filters below to search by the SOM part number. The U-Boot defconfig and kernel device tree file names are important when creating custom U-Boot and Linux kernel images outside of Yocto development, or modifying Yocto source for further use.

Yocto Machine Config	Kit Part Number	SOM Part Number ( <a href="#">Click Here for description</a> )	Modules	U-Boot defconfig	Kernel Device Tree File
am572x-phycore-rdk	KPCM-057-L, KPCM-057-SYS	PCM-057-41300111I	LCD-018-070-KAP  PCM-949  PCM-957  VM-009-M12	am572x_phycore_rdk_defconfig  am572x_phycore_rdk_256M16_x2_defconfig  am572x_phycore_rdk_256M16_x4_defconfig  am572x_phycore_rdk_512M16_x4_defconfig	am572x-phycore-rdk.dtb  am572x-phycore-rdk-41300111i.dtb
am5728-phycore-rdk	KPCM-057-L, KPCM-057-SYS	PCM-057-10200110I, PCM-057-40200110C, PCM-057-41300111I, PCM-057-50500111I,	LCD-018-070-KAP  PCM-949  PCM-957  VM-009-M12	am572x_phycore_rdk_defconfig  am572x_phycore_rdk_256M16_x2_defconfig  am572x_phycore_rdk_256M16_x4_defconfig  am572x_phycore_rdk_512M16_x4_defconfig	am572x-phycore-rdk.dtb  am572x-phycore-rdk-10200110i.dtb  am572x-phycore-rdk-40200110c.dtb  am572x-phycore-rdk-41300111i.dtb  am572x-phycore-rdk-50500111i.dtb

## Linux Device Tree Summary

Hardware Target	Device Tree File Descriptions	Filename
phyCORE-AM572x RDK	Default dts Build Target	am572x-phycore-rdk.dts
	SOM ( <i>superset</i> ) - enables all SOM features	am572x-phycore-som.dtsi
	SOM Variant - excludes features not supported by the BOM population options for PCM-057-41300111I	am572x-pcm-057-41300111i.dtsi
	Carrier Board	am572x-pcm-948.dtsi
	LCD-018 display - 7" display with capacitive touch	am57xx-phytec-lcd-018.dtsi
	WiLink8 WiFi Module	am57xx-phytec-wlan-wilink8.dtsi
	VM-009 Camera Module	am57xx-phytec-vm-0xx.dtsi

## Compatible Hardware

## Supported Hardware Versions

Hardware Description	Part Number	Configuration Details (DDR3 / DDR ECC / eMMC or NAND / QSPI NOR / Controller / EEPROM / Ethernet PHY / RTC / Temp)	PCB Version
phyCORE-AM572x SOM	PCM-057-413001111.A1	2GB (2 banks) / Yes / 8GB eMMC / No / AM5728 / Yes / Yes / Yes / Industrial	1428.3
	PCM-057-505001111.A0	4GB (2 banks) / No / 32GB eMMC / No / AM5728 / Yes / Yes / Yes / Industrial	1428.3
phyCORE-AM572x Carrier Board	PCM-948.A3		1435.2
	PCM-948.A4		1435.2

## Compatible Expansion Boards and Accessories

Module Name	Part Number	PCB Version	Description
<a href="#">7" Display with Capacitive Touch</a>	LCD-018-070-KAP	1365.1	EDT ETM0700G0DH6 TTL 7" display with capacitive touch
<a href="#">Expansion Bus Prototyping Board</a>	PCM-957	1351.0	Expansion Bus Breakout and Prototype Board
<a href="#">WiFi/Bluetooth Module</a>	PCM-949	1418.0	TI WiLink8 Module
Camera Module	VM-009-M12	1339.0	ON Semi MT9M131 Module

## BSP Download

Prebuilt images of BSP-Yocto-TISDK-AM57xx-PD18.1.0 can be downloaded from the link below:

[BSP-Yocto-TISDK-AM57xx-PD18.1.0 Release](#)

## Quickstart

Quickstarts for BSP-Yocto-TISDK-AM57xx-PD18.1.0:

### Content by label

There is no content with the specified labels

## BSP Features

Interface	Detail	Implemented	Tested	Status in Device tree	Notes
UART	uart3	Yes	Yes	Okay	Connector X18 (default serial console)
	uart4	Yes	No	Disabled <sup>1</sup>	
	uart5	Yes	Yes	Okay	Connector X17
	uart6	Yes	No	Disabled <sup>1</sup>	
	uart7	Yes	No	Disabled <sup>1</sup>	
	uart8	Yes	No	Disabled <sup>1</sup>	
	uart9	Yes	No	Disabled <sup>1</sup>	

	uart10	Yes	No	Disabled <sup>1</sup>	
I2C	i2c1	Yes	Yes	Okay	Available on expansion Connector X28
	i2c2	Yes	Yes	Okay	Connected to HDMI1_DDC
	i2c3	Yes	No	Disabled <sup>1</sup>	
	i2c4	Yes	Yes	Okay	Used for Audio Codec - available on expansion Connector X28
	i2c5	Yes	No	Disabled <sup>1</sup>	
Ethernet	cpsw_emac0 (RGMII0 on SoM)	Yes	Yes	Okay	RGMII0 - KSZ9031RNX SoM PHY Connector X7
	cpsw_emac1 (RGMII1 on CarrierBoard)	Yes	Yes	Okay	RGMII1 - KSZ9031RNX Connector X8
Display and Touch	Analog Touch Control 1	Yes	Yes	Okay	Capacitive: ETM-FT5x06 (on LCD-018), I2C4
	Analog Touch Control 2	No	No	Disabled	Resistive: STMPE811 (on CB), I2C4
	PWM Backlight	Yes	Yes	Okay	ehrpwm0 (EHRPWM1A on CB)
	24-bit LCD Interface	Yes	see Known Issues	Okay	LVDS Connector X25 requires LCD-018
	HDMI	Yes	see Known Issues	Okay	hdmi1_ddc Connector X24 (encoder TPD12S on carrier board)
McASP	mcasp1	Yes	Yes	Okay	
	mcasp2	Yes	No	Disabled <sup>1</sup>	
	mcasp5	Yes	No	Disabled <sup>1</sup>	
	mcasp6	Yes	No	Disabled <sup>1</sup>	
	mcasp7	Yes	No	Disabled <sup>1</sup>	
	mcasp8	Yes	No	Disabled <sup>1</sup>	
eMMC/SD /SDIO	mmc1	Yes	Yes	Okay	Connector X2
	mmc2	Yes	Yes	Okay	eMMC on SOM
	mmc3	Yes	Yes	Okay	Connector X26 (WiFi/BT connector)
USB	usb1	Yes	Yes	Okay	USB 3.0 Standard-A Connector X30 (Host only)
	usb2	Yes	Yes	Okay	USB 2.0 Mini-AB Connector X9 (device default); signals may also be routed to X19 (Standard-A)
CAN	can1	Yes	Yes	Okay	DB9 Connector X6
	can2	Yes	Yes	Okay	Pin Header Connector X5
MCSPI	spi1	Yes	Yes	Okay	Connector X28 (Expansion connector) enabled using spidev on X_SPI1_nCS0
	spi2	Yes	No	Disabled <sup>1</sup>	
	spi3	Yes	No	Disabled <sup>1</sup>	
	spi4	Yes	No	Disabled <sup>1</sup>	
QSPI	qspi1	Yes	see Known Issues	Okay	NOR Serial Flash on SOM
SATA	sata1	Yes	Yes	Okay	Connector X11 (SATA) and X12 (power connector)
PCIe	pcie1	Yes	Yes	Okay	Connector X27 (PI6C557 4x PCIe connector)
IPU	ipu1	Yes	Yes	Okay	
	ipu2	Yes	Yes	Okay	
DSP	dsp1	Yes	Yes	Okay	
	dsp2	Yes	Yes	Okay	
GPIO	User Buttons and LEDs	Yes	Yes	Okay	
Memory	EEPROM	Yes	Yes	Okay	M24C32 on I2C1
	NAND (8/16 bit)	Yes	No	Disabled	No NAND populated

	QSPI NOR Flash	Yes	see <a href="#">Known Issues</a>	Okay	N25Q128A connected to QSPI1_CS2
	eMMC	Yes	Yes	Okay	mmc2 on SOM
RTC	Internal AM57xx	Yes	Yes	Okay	Internal to processor
	PMIC TPS659037	Yes	Yes	Okay	TPS659037 I2C1
	External RTC	Yes	Yes	Okay	RV-4162-C7 on I2C1
Audio	Stereo Codec on CarrierBoard	Yes	Yes	Okay	TLV320AIC3007 codec; connected to McASP1 and I2C4
Communication	<a href="#">TIWi-BLE</a> WiFi	No	No	Disabled	Connector X26
	<a href="#">TIWi-BLE</a> Bluetooth	No	No	Disabled	Connector X26
	WiLink8 WiFi	Yes	Yes	Okay	Connector X26
Parallel Camera	VIN3 on i2c3	Yes	Yes	Okay	VM-009 at Connector X23 (phyCAM-P connector)
Hardware Acceleration	Graphics (PowerVR SGX544)	Yes	Yes	Okay	

[1] It may be possible to change the software configuration to utilize this interface even if it is not being set in the board's default configuration.

## New In This Release

- **General**
  - **Support for additional SOM Variants:**
    - PCM-057-10200110I.A0
    - PCM-057-40200110C.A0
- **Yocto**
  - **SDK:** Ported to TI's Processor SDK v04.01
  - **MACHINE:** Additional machine targets for specific SOM configurations
    - am572x-pcm-057-10200110i
    - am572x-pcm-057-40200110c
    - am572x-pcm-057-40201111i
    - am572x-pcm-057-41201111i
    - am572x-pcm-057-41300111i
    - am572x-pcm-057-50201111i
    - am572x-pcm-057-50500111i
- **Kernel**
  - **Version:** Migrated from Linux Kernel v4.4.32 to v4.9.41
  - **Devicetree:** Support for additional SOMs and dtb targets for them in conjunction the phyCORE-AM572x carrier board (PCM-948)
    - am572x-pcm-057-10200110i.dtsi am572x-phycore-rdk-10200110i.dtb
    - am572x-pcm-057-40200110c.dtsi am572x-phycore-rdk-40200110c.dtb
- **U-Boot**
  - **Version:** Migrated from U-Boot v2016.05 to v2017.01
  - **DDR:** Support for 1 GiB (2x MT41K256M16HA-125) configurations
    - Additional CONFIG\_PCM\_057\_256M16\_x2\_DDR to build for 1 GiB configurations
  - **Build:**
    - New defconfig option that includes the CONFIG\_PCM\_057\_256M16\_x2\_DDR option by default
      - *am572x\_phycore\_rdk\_256M16\_x2\_defconfig*: PCM-057-1xxxxxxx SOM variants (1GiB)
    - Moving towards a driver model for u-boot akin to Linux, and utilizing more dts nodes for configuration to enable and control interfaces. This began with PD17.1.0 and the infrastructure will continue to evolve as both TI and u-boot move fully towards this model.
  - **Devicetree:**
    - New method for detecting the proper board configuration based on an EEPROM-based kit option string, and an option to override this if wanted, or necessary (e.g. the EEPROM is either not populated or does not contain the appropriate information).
      - See [\[application note coming soon\]](#)
    - **FIT:** Support for additional SOMs and dtb targets for them in conjunction the phyCORE-AM572x carrier board (PCM-948)
      - am572x-pcm-057-10200110i.dtsi am572x-phycore-rdk-10200110i.dtb
      - am572x-pcm-057-40200110c.dtsi am572x-phycore-rdk-40200110c.dtb

## Fixed In This Release

- **Yocto**
  - Package ccs6 fetch fails due to TI export approval requirement. ccs6 is no longer included in the TISDK build by default and can be downloaded and utilized separately.
  - -dirty is no longer appended when u-boot or kernel sources are built with uncommitted changes due to the addition of additional version information.
  - Gstreamer encoding pipelines fail. New multimedia firmware for both the IPU and DSPs, along with additional support for the codec-engine and libdce, have been added for the appropriate phyCORE-AM57x build targets.

- **Kernel**
  - ETH1 fails to transfer large files (200MB)
  - MCASP2\_AXR0\_OUT IOdelay configuration targeting wrong CFG register

## Known Issues

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- **Yocto**
  - **AM5726:** All MACHINE targets for the AM5726-based SOMs are incompatible with building for the *arago-core-tisdk-image* image target.
    - Workaround: use the *phytec-tisdk-image* image target instead.
  - **Chromium:** Although enabled in the TISDK, Chromium has been disabled for all phyCORE-AM572x builds due to the large amount of swap memory required for linking, and the time required to successfully build it.
    - Workaround to build Chromium (for am5728-based SOMs only):
      - Pay close attention to the information provided in the [Chromium developer's guide prerequisites section](#) and adjust your system accordingly.
      - Remove the line 'MULTIMEDIA\_remove = "chromium-wayland"' from \${YOCTO\_DIR}/sources/meta-phytec/conf/machine/include/am572x-phytec.inc before building.
- **Kernel**
  - **Display:** TI's Matrix-GUI demo only outputs to a single display. If both HDMI and a parallel display are connected, it will display on the parallel display, but the resolution may not be correct—behavior is inconsistent.
    - Workaround: only connect the one display that will be used, or do not use the matrix-gui demo.
  - **QSPI:** Possible read failures on flash devices with HOLD function (Erratum i916). A software workaround has been implemented to limit QSPI to DIO-SPI mode. The hardware workaround is to disable internal pull-ups and add 10k pull-ups on X\_QSPI1\_D2 & X\_QSPI1\_D3.
- **U-Boot**
  - When building for any MACHINE target beside am572x-phycore-rdk, unless the SOM EEPROM is loaded with valid identification information, it will attempt and fail to load the am572x-phycore-rdk.dtb from <rootfs>/boot/.
    - Workaround: write the proper information to the EEPROM or set the override\_board u-boot environment variable. See *[applicati on note coming soon]*

### Texas Instruments Known Issues (Kernel)

### Texas Instruments Known Issues (U-Boot)

## Technical Support

For further support please visit [PHYTEC's Support Portal](#)