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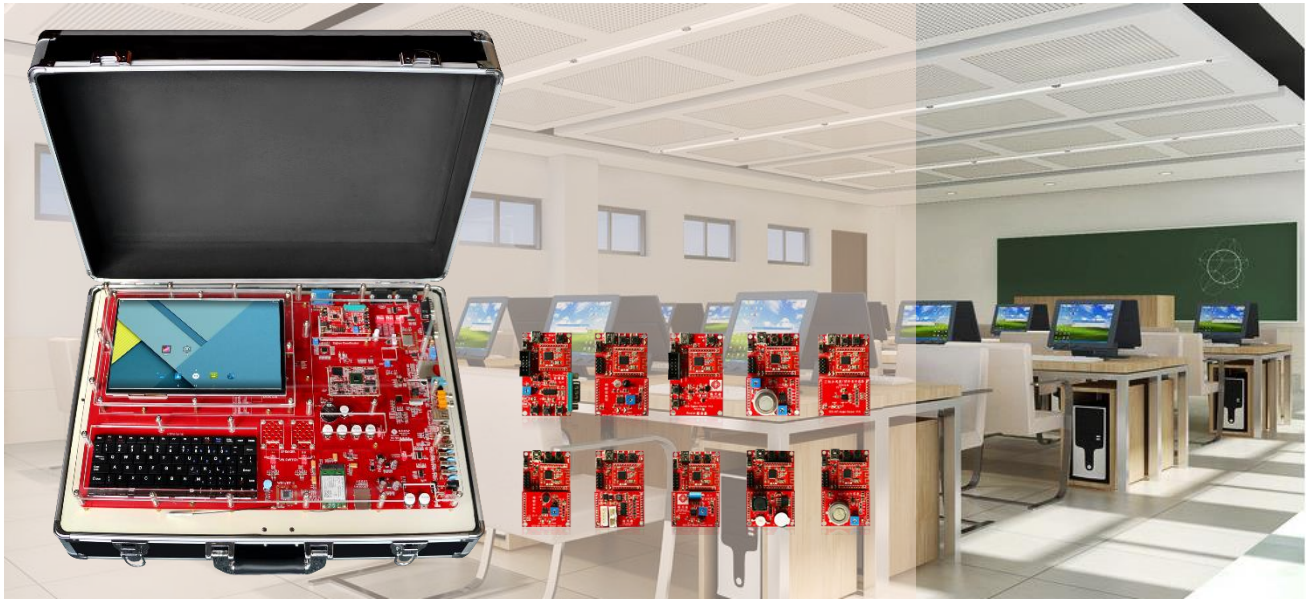
CES-EDU6818

Product Manual

Cortex-A53 Teaching Experimental Platform

Rev. V1.0

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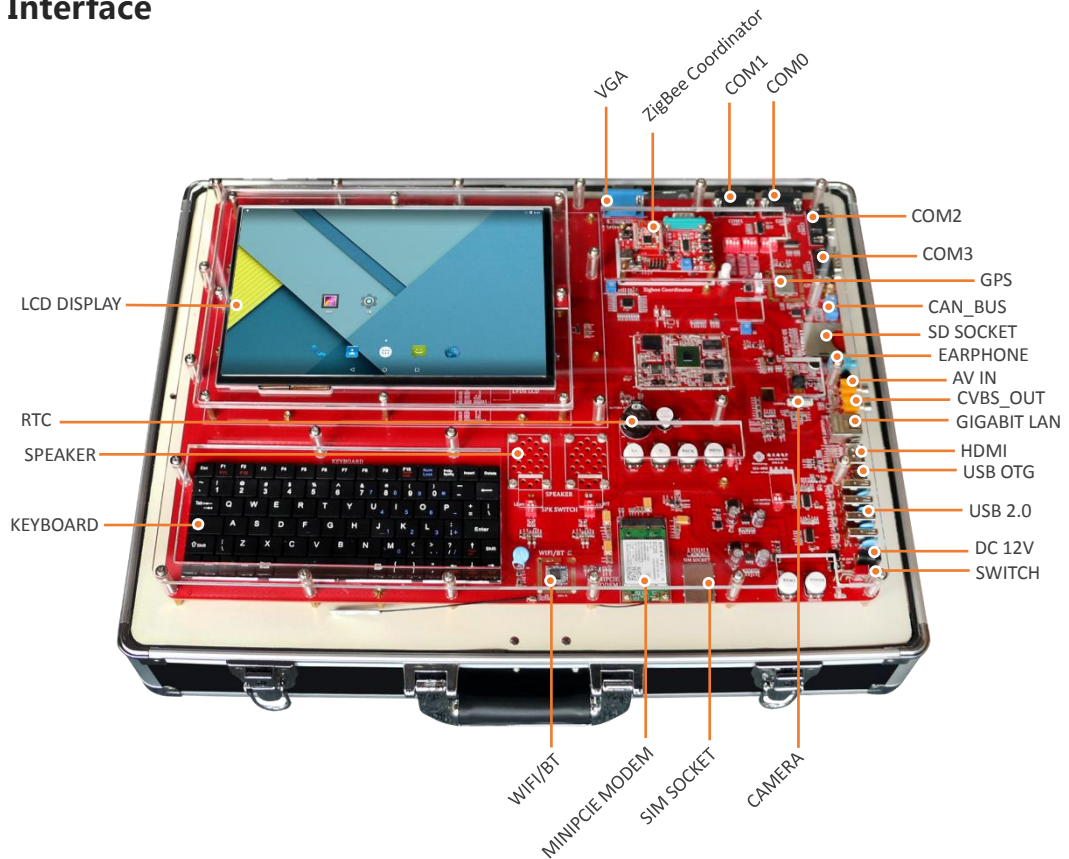
Introduction

CES-EDU6818 teaching platform using Samsung Cortex-A53 S5P6818 as processor, running Android 5.1.1 Lollipop and Linux3.4 embedded operating system, integrating LAN, 4G, WiFi, GPS and other communication modules, opening UART, USB, LCD. CES-EDU6818 teaching platform, equipped with detailed Android application experiment, Android driver experiment, Linux application experiment and Linux-driven experiment for embedded teaching. From the upper application to the bottom of the driven, students may know and understand the entire embedded system step by step. Through the study of the CES-EDU6818 teaching platform, students can learn how to write embedded application, how to control the underlying hardware through the application, especially for college teaching and personal learning.

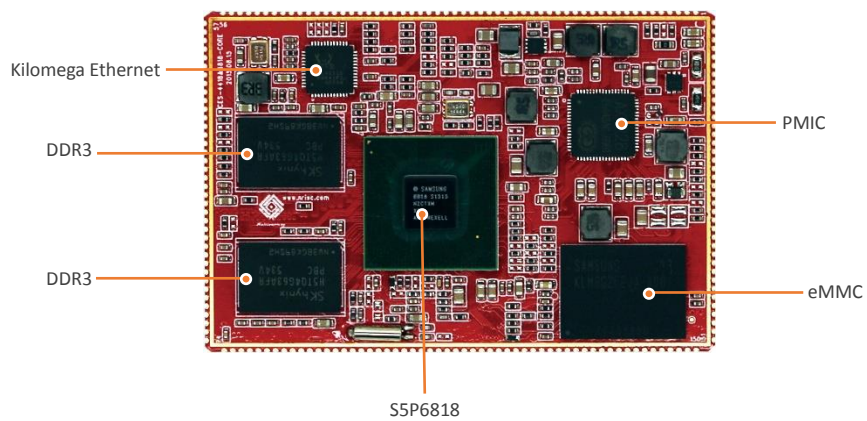
Platform Features

- ◆ Samsung ARM Cortex-A53 S5P6818 Octa-core Processor
- ◆ Configured 10.1-inch high-definition capacitive touch screen, resolution 1280*800px
- ◆ Configured 4G (all Netcom), WiFi, BT, GPS, Camera, Gigabit Ethernet and other modules
- ◆ Support Android5.1.1 Lollipop、Linux3.4 Operating System
- ◆ Android Studio 2.2 experimental application integrated development environment
- ◆ Provide supporting experimental guidance tutorial, a wealth of project examples, detailed code + complete annotation
- ◆ Up to 45 sensors for optional

Function Interface



Core Board



45 Optional Modules

Infrared sensor, vibration sensor, magnetic field sensor, air pressure sensor, light intensity sensor, smoke sensor, infrared sensor, temperature and humidity sensor, raindrop detection sensor, ultrasonic distance measurement sensor, sound sensor, alcohol sensor, ultraviolet sensor, high-precision 6-axis inertial navigation module, photosensitive sensor, thermal sensor, soil moisture detection sensor, load cell sensor, Hall sensor, infrared reflection sensor, color recognition sensor, obstacle avoidance sensor, reed sensor, triaxial acceleration / tilt angle sensor , methane / natural gas sensor, combustible gas sensor, liquefied gas / butane / propane sensor, hydrogen sensor, carbon monoxide sensor, carbon monoxide / methane / liquefied petroleum gas sensor, air quality sensor, ozone sensor, hydrogen sulfide sensor, ammonia gas sensor, formaldehyde sensor, freon sensor, sulfur dioxide sensor, toluene sensor, acetylene sensor, carbon dioxide sensor, flame sensor, capacitive touch sensor, current sensor, junction Sensor, infrared sensor.

Hardware Parameters

CPU	Samsung Cortex-A53 S5P6818 , 64 bit Octa-core Processor, 1.4 ~ 1.6GHz frequency , with 2 * 512KB L2 cache
Memory Capacity	1GB DDR3 , 800MHz frequency
eMMC	8GB eMMC
GPU	Equipped with 3D image acceleration engine , ARM Mali-400 MP
Power	AXP228 , support dynamic FM, colon and so on
LCD	Default support 10.1-inch LVDS interface, high-definition capacitive touch screen, a resolution of 1280 * 800px, optional 10.1-inch 1024 * 600px LVDS interface capacitive touch screen and 1920 * 1200px MIPI interface capacitive touch screen
4G	MiNi-PCIE interface , with SIM card slot , model NO. QUECTEL EC20
WiFi/Bluetooth	Support 802.11b / g / n full standard, support for Bluetooth communication
GPS	Tracking sensitivity -165dBm, capture sensitivity -148dBm
Camera	1 x 24Pin camera interface, 3 million pixels
USB OTG 2.0	1 x USB slave device interface
USB HOST 2.0	4 x USB host devices
SD/MMC	1
Serial	4 x COM0-COM4 UART Serial port , Baud rate 115200bps
HDMI	1 x HDMI 1.4 (1080P/60Hz) HD interface

CVBS	1 x CVBS Video output interface
AV IN	1 x AV IN Video input interface
LAN	1 x Gigabit Ethernet slot, using the RTL8211E Gigabit Ethernet PHY network chip
Audio	ES8316/IIS interface , support recording and broadcasting function, onboard 1 x MIC, 1 x headphone jack, 2 x speakers
Accelerometer	Onboard acceleration sensor 3-axis 2g/4g/8g 10bit , I2C interface
VGA	1 x standard VGA output interface, support a variety of VGA LCD display
Function Button	Including power button, reset button, 4 x interrupt buttons and so on
Keyboard	7 inch QWERTY keyboard , USB interface
CAN	1 channel
RS485	2 channels
ADC	1 x ADC
Infrared sensor	1 x IRDA , using serial communication
Buzzer	1 x MMBT3904/SOT buzzer
LED	2 x GPIO controlled LED
Battery	Onboard 1 button lithium battery for RTC use
ZigBee	Reserved power interface, can connect a variety of ZigBee sensor modules
Power Supply	12V/5A DC power supply, with power switch and indicator light

Software Parameters——Android 5.1.1 Lollipop

Operating System	Android 5.1.1 Lollipop
Kernel	Linux 3.4.39
Bootloader	U-boot2014.07
Terminal	Minicom Terminal
Cross Compiler	Arm-eabi-4.8 (gcc4.8)

File System	Ext4
GUI	Android 5.1.1 Lollipop
4G	To achieve 4G Internet access and receive / send information function
Wireless WiFi	Support 802.11b / g / n wireless protocol, to achieve WiFi wireless Internet access
CMOS Camera	To achieve image preview, camera and video functions
GPS	To achieve the positioning of data collection and reception
BT	Support Bluetooth protocol stack, Bluetooth data communication
G-SENSOR	Support system interface rotation function
LAN Driver	Gigabit wired Ethernet
HDMI Driver	Support HDMI audio, video output
AUDIO Driver	To achieve audio playback
LCD Driver	Support 10.1-inch LCD screen, support backlight adjustment function
TOUCH Driver	Support capacitive multi-touch driver
VGA Driver	Support VGA display function
USB HOST Driver	Support USB mouse, USB keyboard, U disk read function
USB OTG Driver	Support ADB and MTP functions
Keypad Driver	Supports 4 GPIO key functions
SD/MMC Driver	Support 32GB high-capacity SD card read and write operations
UART Driver	Support RS232 and RS485 serial communication functions
RTC Driver	Supports RTC function
MFC Driver	Support H.264, MPEG4, H.263, MJPEG format's encoding and decoding functions
PPM Driver	Support infrared receiver function
BEEP Driver	Support the control function of beep
LED Driver	Support the control function of the indicator light



ADC Driver	Supports the read function of ADC value
USB Driver	Support USB camera's preview and camera functions
CAN Driver	Support CAN bus communication function
G3D Driver	3D Graphics acceleration

Software Parameters——Linux3.4

Operating System	Linux3.4
Kernel	Linux 3.4.39
Bootloader	U-boot2014.07
Terminal	Minicom Terminal
Cross Compiler	Arm-eabi-4.8
File System	Ext4
GUI	QT5.5
Video Player	MPlayer
Wireless WiFi	Supports 802.11b / g / n wireless protocol
LAN Driver	Gigabit wired Ethernet
AUDIO Driver	To achieve recording and playback functions
LCD Driver	Support 10.1 inch LCD screen
TOUCH Driver	Support touch driver
USB HOST Driver	Support USB mouse, USB keyboard, U disk read function
Keypad Driver	Supports 4 x GPIO key functions
SD/MMC Driver	Support 32GB high-capacity SD card read and write operations
RTC Driver	Supports RTC function
UART Driver	Support debugging serial port and communication serial port function

ADC Driver	Support read function of ADC value
USB Camera Driver	Support USB camera's preview and camera functions
VGA Driver	Support VGA display function
BUZZER Driver	Support the control function of the buzzer
LED Driver	Support the control function of the indicator light

Product Configuration List

	User CD		Power Adapter
	Experimental Tutorial		Touch Pen
	Serial Line		Camera (Optional)
	Cable		4G module (Optional)
	USB Cable		SD card (Optional)
	USB to Serial Port		ZigBee Coordinator (Optional)
	IP Camera (Optional)		ZigBee Sensor (Optional)

Accessories Parameters——4G



4G module using Quectel_EC20, to achieve the whole Netcom, to fast Internet access, send and receive messages.

- ◆ Support GSM: 900 /1800MHz
- ◆ Support WCDMA: B1/B8
- ◆ Support TD-SCDMA: B34/B39
- ◆ Support LTE FDD: B1/B3/B8
- ◆ Support LTE TDD: B38/B39/B40/B41
- ◆ Support LTE/WCDMA/TD-SCDMA receive diversity

Accessories Parameters——IP Camera

Feature	Function	Body size is small, the use of software limit and the perfect combination of hardware, more stable.
System	Operating System	Embedded Linux
	System Safety	Three levels of user rights management
System	Number of online users	4 users watch online at the same time
	Dynamic DNS	Comes with dynamic DNS
	Control Protocol	ONVIF2.4 agreement, global agreement, enhance product interoperability
	Processor	Uses a powerful, high-performance programmable media HiSoft processor with built-in ARM926@Max.440MHz and high-speed video coprocessor
	Reset	Press and hold for 15 seconds to restore factory settings
Collection	Image Sensor	1/4 inch 720p progressive scan CMOS sensor
	Sensor performance	Support automatic white balance, automatic gain control, automatic backlight compensation
	Sensor size	3.84*2.16mm
	Signal to noise ratio	≥ 39dB
	Minimum illumination	0.8Lux / F1.4 (color mode), 0.3Lux / F1.4 (black and white mode)
	Lens / viewing angle	3.6mm@F1.4/56.14°
	Night vision	Dual filter automatically switch, 9 *850nmΦ infrared light, night vision more clear ,night view 10 meters
	IR Control	IR open, night vision function enabled, infrared, ICR automatic detection; IR closed, night vision function disabled, infrared extinguishing, ICR fixed in day view mode

Video	Compression standard	H.264 Main Profile/H.264 Baseline Profile/MJPEG/JPEG Baseline
	Video coding processing	CBR / VBR two rate control mode, and the output rate range of 128 ~ 4096kbps
	Resolution	720p/VGA/QVGA
	Bit rate	CBR / VBR two rate control mode, and the output rate range of 128 ~ 4096kbps
	Maximum frame rate	25fps
	Image adjustment	Brightness, contrast, saturation, color adjustable
Audio	Input	Built-in 48dB microphone
	Output	Built-in speaker (8Ω1W)
	Sampling frequency / bit width	8KHz/16bit
	Compression Standard / Bit Rate	ADPCM/32kbps
LAN	Network Interface	10Mbps/100Mbps, adaptive / RJ45 interface
LAN	Network Protocol	TCP/IP,HTTP,TCP,UDP,SMTP,FTP,DHCP,DNS,DDNS,NTP,UPnP,RTSP , P2P,etc
	Wireless network	WiFi802.11b/g/n
	Antenna	3dBi antenna, the signal is stronger and more stable
	Wireless network security	One key WIFI settings
Storage	Storage method	Local storage / client storage, support 128GTF card storage, support for pre-recorded alarm
	Interface	Micro SD
Cloud Terrace	Rotation angle	Horizontal 280 ° / vertical 80 °
	Preset position	15 preset positions
	Limit method	Using software limit, preset more accurate, PTZ failure rate is low
Alarm	Alarm detection	Motion Detection
	Alarm action	Image E-mail / FTP upload pictures
Physical Instructions	Rated voltage	DC5/2A±0.3V
	Power consumption	Rated power: 3.0W (infrared light on)

	Working environment	Working temperature: -20 ~ 70 °C, working humidity 90%
	Weight	Gross Weight: 615g (Note: subject to physical)
	Shell material	ABS plastic
	Packing Size	208 * 154 * 137mm (L * W * H)
	Installation method	Wall hanging, ceiling

Service Support

Technical Support Contact:

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E-mail : ces_support@ces-tech.com

Technical Support Service Hours:

Monday to Friday : 9 : 00 ~ 12 : 00 , 13 : 30 ~ 18 : 00

Disclaimer

This manual information is for reference only, and is subject to change without notice.

For more product information, please visit www.nrisc.com

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