

Cupid – Release Notes

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Device description

OS Version/Milestone	4.0r1591
Release Date	04.08.2014
Windows CE version	Windows CE 6.0 R3
QFE version	Up to 06/2011
Supported Hardware	V1.0, V1.1, V1.2, V1.2.1, V1.3, V1.4
Minimum BIOS version	V1.16r2757
Released by	Clemens Terasa
Verified by	Marc-Oliver Westerburg
Common information	.NET Compact Framework 3.5 support OpenVG v1.1 (refer to OpenVG specification from Khronos Group) 2D-GPU on i.MX356 and i.MX357

1 Change history

1.1 Changes from version 1.23.0 to 4.0r1591

- Changed the version scheme to <major>.<fix>r<svn>. Now the major version will be incremented with each new version.
- Fixed issue with Bluetooth not working as expected. (#467)
- Fixed an issue with sample values being zero for Pinnacle touches. (#466, #460)
- Fixed an issue with sample values being zero for EETI touches. (#466, #460)
- Fixed bug with WM9705 codec based resistive touch not being able to touch in certain areas. (#465)
- Changed the interrupt type for EDT touches to edge triggered. (#441)

1.2 Changes from version 1.19.0 to 1.23.0

- Changed WM9705 touch driver sampling method due to performance issues caused by the samples filter. (#439)
- Fixed the UCB1400 touch driver to have better performance and lower CPU load (#423).
- Added EETI I2C Touch support for Cupid. (#427)
- Enabled Bluetooth support for Cupid (#431)
- Fixed Bad Block handling error in erasing flash partition (#281).
- Fixed initialisation of size for the receive message queue in CAN driver which may have caused wrong parameter errors. Added CAN driver category and tested CAN properly for Cupid (#429).
- Fixed Temperature sensor bug and added Temperature test tool to standard build (#385).
- Tested ClearRegistry Flag after setting it in Redboot and rebooting. Unlike to prior bug report, now there are no problems to be reported (#390).

1.3 Changes from version 1.18.0 to 1.19.0

- Added LUA scripting support for touch filter.

1.4 Changes from version 1.17.0 to 1.18.0

- Added support for WM9705 AC97 Audio/Touch Codec including support for Cupid HW v1.4. (#398).
- Enabled Kernel Hardware Watchdog (#416).

1.5 Changes from version 1.16.0 to 1.17.0

- Created a new platform configuration. Optimized boot up speed of the Windows CE OS, it's now about 7-8 seconds. Achieved by reducing CE main packages and not necessary drivers out of the default CUPID OS configuration, only a small explorer version has remained. Network options and configurations can't be done via the default GUI anymore a customer application is needed for doing many configurations now. (#410)

The following drivers have remained:

- NAND Flash
- UserRegMon
- GF Discovery Server
- Display
- UART
- USB High Speed Host
- USB OTG Pure Client Function
- Audio (UCB1400) / Touch
- GPT Timer
- IIC / RTC
- Backlight
- Ethernet
- Operation Hours Counter
- DIO
- GF EEPROM

1.6 Changes from version 1.15.0 to 1.16.0

- Fixed problem of temperature sensor driver (#400)
- Fixed problem with K2 touch driver initialization (#402)

1.7 Changes from version 1.14.0 to 1.15.0

- Fixed problem of freezing CAN driver due to debug output (#394).
- Added Mark and Space parity support to RS232 driver (#396).

1.8 Changes from version 1.13.0 to 1.14.0

- Initial port number for FTDI is COM9 (#391).
- USB-DMX512 support (#391).
- Added K2 Touch driver support (#371).
- Added Configuration of the touch driver via registry (#371).
- Added Calibration configuration via registry (#371).

1.9 Changes from version 1.12.0 to 1.13.0

- Implemented CAN rtr (send and receive) to the driver.
- Extended the CAN Api with some rtr functions.
- CAN BugFix: Connecting the Cupid to an already active CAN bus might disturb the communication between other remote stations.

- CAN BugFix: Can open and close leading to memory loss.
- Because of chip errata ENGcm09152 for i.MX35, an external voltage divider is added to the Pin USBPHY1_VBUS (P18). Software must configure the transceiver for external divider. The hardware version must be known. Added hardware support for V 1.3 and V 1.3.1.
- Added a Garz & Fricke SNMP extension agent which supports hardware and software information (readonly). There is also a Garz & Fricke MIB file available on our web page.
- Different displays have different requirements to the frequency of the backlight signal. A hard-coded frequency was used, though. The frequency may now be changed by a registry entry (HKLM\ Drivers\BuiltIn\Backlight\ BacklightPwmPeriod).

1.10 Changes from version 1.12.beta5 to 1.12.0

- Added support for unique Garz & Fricke touch configuration files (.xml) which will be used by all devices with windows ce and linux operating systems.
- Supporting four several touch interfaces:
 - NXP UCB 1400 AC97 Touch (resistive)
 - Pinnacle I2C Touch (capacitive)
 - EETI USB Touch (capacitive)
 - EDT Touch (capacitive)
- BugFix: If the “Discovery Service” was disabled via RedBoot configuration it was still active on runtime. Now it disables correctly.
- BugFix: Changed the display power on sequence. This fixed a bug where sometimes the display shows its content mirror inverted.
- BugFix: Fixed SD-Card pin-configuration to prevent system hangs on some systems when inserting an SD-Card.
- BugFix: While connecting the device via USB OTG to a PC a wrong device name was shown. Now it shows “Cupid” as expected.
- Adapted the freescales hardware acceleration configuration since for several cases (e.g. vertical lines of width 2 or more) it slew down the drawing performance massively.
- Added a configurable pressure and median filter for the resistive touch (UCB1400) to remove some rarely occurring error samples.
- Improved the Etcha.exe and the ucb1400 touch driver with a test mode for detection of damaged touch planes.
- Improved the DIO configuration mechanism. It is now possible to set the signal level of the DIO output pins via a configuration file.
- UserRegMon BugFix: The synchronization from registry to the xml file after deletion of a registry key could fail due a case sensitive comparison of the sub key.

1.11 Changes from version 1.12.beta3 to 1.12.beta5

- This version works with EDT capacitive touch only.

1.12 Changes from version 1.11.0 to 1.12.beta3

- The pinnacle touch driver now works with inverted touch IRQ signal too. It is also the default configuration for a selected pinnacle touch.
- The number of calibration points can be switched between five and nine. The default configuration is five.

1.13 Changes from version 1.10.0 to 1.11.0

- Supporting three touch interfaces which can be selected on runtime via RedBoot configuration. The supported interfaces are :
 - NXP UCB 1400 AC97 Touch (resistive)
 - Pinnacle I2C Touch (capacitive)
 - EETI USB Touch (capacitive)
- Fixed an AC97 bug: Sometimes the touch driver was not initialized correctly due to timing problems.
- Added support for SMSC9500 (Ethernet over USB device port).

1.14 Changes from version 1.9.0 to 1.10.0

- Improved the eeprom devices handling.
- Fixed some bugs in the display and backlight power management.
- Digital I/O driver improvements: The Digital I/O driver shows the pin names for the keypad pins correctly now.
- Digital I/O driver improvement: Supporting interrupt detection for falling and rising edges.
- Added ONFI flash support.
- Added watchdog support for the kernel.
- Added a new version of the toolbox.exe (see Garz & Fricke Tools) with the following improvements:
 - A fixed process view and process killing.
 - Possibility to manipulate the backlight settings.
 - Fixed registry key handling.
- Fixed some backlight driver bug.
- Supporting Cupid boards without SRAM: By default the registry is placed in the SRAM. If no SRAM is available the registry may be placed in a separate “Registry” partition on flash.
- Added interrupt support to driver and API of the LM73 temperature sensor.
- Extended the Garz & Fricke Version information for hardware components (added a source field).
- MDB driver support.
- MDB API support.
- FTDI driver support.
- Added a show version GUI.
- Added a Start/Programs/Tools folder with appropriate links.
- Added a Desktop/Tools folder with appropriate links.
- CAN:
 - Bug fix: CAN driver can be closed and opened again.
 - Bug fix: CanTransmitMessage no longer blocks when cable unconnected.
 - Bug fix: CAN baud rates 500 and 1000 kbit/s possible.
 - Bug fix: Return correct error codes from CAN driver.
 - Documentation of CAN API was reviewed, completed and corrected.
 - Bug fix: CAN default baud rate corrected to the value described in documentation.
 - Added timeout setting for CanTransmitMessage. Refer to API header (CAN_Api.h) for further documentation.
 - Added filter setting for CanReceiveMessage. Refer to API header (CAN_Api.h) functions CanGetInfoMessageFilter and CanSetInfoMessageFilter for further documentation.
 - CAN Feature: The receiving message queue length can be set with a fix length now. Refer to API header (CAN_Api.h) for further documentation.

2 Known restrictions in current version

- DIO falling edge interrupts seem to trigger on both edges
- DIO driver currently doesn't support configuration of open-collector for DIO pins
- Display flickering: Due to SoC-internal limitations high-bus-load situations during video playback may result in IPU buffer underruns showing as brief display flickering and error messages on the serial console. These can only be resolved by reducing the used memory bandwidth.
- As the i.MX35 SoCs don't provide hardware accelerators for video decoding and playback, the system performance limits the resolution of video streams that can still be played-back at 30fps:
- WMV and MPEG4 AVC video codecs only support video streams with up to CIF resolution (but can still be played-back in full screen even on WVGA displays)
- MPEG1, MPEG2, MPEG4 ASP, and H.263 video codecs support video streams up to D1 resolution.
- Freescale Multimedia Codecs still have several known issues. All have been reported to Freescale but bug-fixes are still pending:
- MPEG1, MPEG2, and WMV videos currently seem to play only for about 15-90s depending on the video and then just stop.
- MPEG4 AVC and H.264 videos seem only to play back after playing back an AVI-MP42 video first.
- No H.264 codec support.
- RS-485: On CUPID v1.0 boards pins 13 and 14 of the RS-485 receiver (IC13) must be shortened for RS-485 to work properly.
- Sometimes USB devices will not be mounted depending on the manufacturer of the USB device.
- The I2C communication of the edt touch driver sometimes causes errors but the touch functionality seems not to be affected.
- No support for audio recording on either used AC97 codec, UCB1400 and WM9705 (#399).
- Reset may fail on rare occurrences due to OS kernel image not loading properly (#405).

3 Features List

3.1 Garz & Fricke Tools

For detailed information about the tools and its usage see the G&F software documentation.

Tool name	Description	Supported
Autocopy	This tool provides an automatic on boot copy mechanism for specific files.	Yes
Autostart	This service is started after the OS has booted and executes specific applications.	Yes
FTP	File Transfer Protocol.	Yes
Telnet	Supports remote access via Ethernet.	Yes
DisableSerialConsole	Disable/Enable RedBoot functionality via terminal console.	Yes
Reset	Resetting the system.	Yes
SaveReg	Saving the user registry.	Yes
EraseRegistry	Erasing the user registry.	Yes
EraseFlash	Erasing the flash partition.	Yes
ShowVersion	Display current versions and driver information.	Yes
Disp	Supports display rotation.	Yes
DisableBootScript	Disables the execution of the “RedBoot” bootscript.	Yes
COM-Tool	Windows CE application for testing the serial interface.	N/A
pEEPROM	Supports reading and writing of eeprom information.	Yes
Fis	The fis.exe command line tool offers almost the same functionalities as the correspondent fis tool in RedBoot. See also the RedBoot User Manual.	Yes
Xconfig	Supporting import of an xml configuration file. See also the RedBoot User Manual.	Yes
Toolbox	A command line tool with several useful functions for Windows CE devices.	Yes
Regedit	A graphical user interface registry editor.	Yes
Touchc	This tool offers the possibility to start the touch calibration manually.	Yes
Temperature	This tool allows you to check on the internal temperature sensor and set an alarm.	Yes

3.2 Audio

Feature	Description	Supported
G&F API support		N/A
Play audio stream		Yes
Record audio stream		No

Test Environment

Devices: WM9705: Cupid v1.4.0, S/N: 01338806, UCB1400: Cupid v1.3.0, S/N: 01041853, Display AM800480R2TMQWTE1H
Peer: Intel Core i5-2400 CPU @ 3.10GHz, 1 GBit/s Ethernet-Adapter running Windows 7 (64 Bit), connected via 100 Mbit/s In-House LAN

Performed Tests

- AC97 Read/Write Register access for 30 hours in thawing and freezing chamber with a temperature range of -10°C to 70°C.
- Testing Audio output while different services/transfers are running background.
- Testing Audio output of various wav formats regarding word length, sample rate and channels being used.
- Testing audio out regarding amplitudes with different volume settings.
- Testing audio amplifier on boot up.

Description	Dev	Version	Author	Status
AC97 Read/Write Register access for 30 hours in thawing and freezing chamber with a temperature range of -10°C to 70°C.				
WM9705	1	OS1.15.0	OK	Okay
UCB1400	1	OS1.15.0	OK	Okay
Testing Audio output while different services/transfers are running background with a 10s 440Hz sine wave, sample rate 44,1kHz, 16 Bit, Stereo				
Dim background light to 70%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Dim background light to 50%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Dim background light to 30%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Transfer 10MB file over Ethernet	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Transfer 10MB file over USB	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Transfer 10MB file from SD Card	1	OS1.15.0	OK	WM9705 and UCB1400 okay
High CPU/RAM Load generated by tool	1	OS1.15.0	OK	WM9705 and UCB1400 okay, but if too high load affected as any other application
Testing Audio output of various wav formats regarding word length, sample rate and channels being used. 4kHz sine wave used as base.				
11 KHz, 8 Bit, Mono	1	OS1.15.0	OK	WM9705 and UCB1400 okay
22 KHz, 16 Bit, Mono	1	OS1.15.0	OK	WM9705 and UCB1400 okay
22 KHz, 16 Bit, Stereo	1	OS1.15.0	OK	WM9705 and UCB1400 okay
44,1 KHz, 16 Bit, Stereo	1	OS1.15.0	OK	WM9705 and UCB1400 okay

48 KHz, 16 Bit, Stereo	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Testing audio out regarding amplitudes with different volume settings.				
Volume 100%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Volume 50%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Volume 10%	1	OS1.15.0	OK	WM9705 and UCB1400 okay
Testing audio amplifier on boot up.				
WM9705	1	OS1.15.0	OK	Okay
UCB1400	1	OS1.15.0	OK	Okay

Known Restrictions

Audio recording is currently not supported by either codec, UCB1400 and WM9705. Functionality exists but quality is not sufficient yet.

3.3 Battery backed up RTC

Feature	Description	Supported
G&F API support		N/A
Update clock periodically	The clock will be updated by a time service if the device is connected to a DHCP server.	Yes

Test Environment

Manually test with G&F application.

Known Restrictions

None

3.4 Bluetooth

The Bluetooth features are taken from Microsoft Windows CE.

Feature	Description	Supported
G&F API support		N/A
Scanning for other devices	The device is able to scan for other Bluetooth enabled devices.	Yes
Bluetooth COM based communication	Tested using a G&F Bluetooth adapter board (900-2082R) equipped with Bluetooth Module F2M03GLA-S04 (HCI). Tested with in house btcomtest.	Yes

Test Environment

Manually test using the Bluetooth program in Windows Control Panel.

Known Restrictions

None

Digital I/O

Feature	Description	Supported
G&F API support	GFDigitalIOApi.h / GFDigitalIO.lib	Yes
Set output		Yes
Get input		Yes
Event handling	If a digital input value changes an event will be triggered if this pin is configured correctly.	Yes
Pin-groups		Not tested

Test Environment

Manually test with G&F application.

Known Restrictions

None

3.5 CAN

Features

- Full Implementation of the CAN protocol specification
- Standard data and remote frames
- Extended data and remote frames
- Zero to eight bytes data length
- Programmable bit rate up to 1 Mb/sec

API

Garz & Fricke Gpt:

- Header: CAN_Api.h
- Library: CAN_API.lib

Performed Tests

Device(s):

1. CUPID v1.4.0, S/N: 01338809, 7" 800x480 SVGA Display, 16 BPP

Peer: Intel Core i5-2400 CPU @ 3.10GHz, 1 Gbit/s Ethernet-Adapter running Windows 7 (64 Bit), connected via 100 Mbit/s In-House LAN

Description	Dev	Version	Author	Status
Testing baud rates for data message sending/receiving with CanApiTest_3.1.1201.exe (part of the OS) and the PCAN-View V3.1.4.195. Used commands: CanApiTest receive -b <baud> -t 2000 1 CanApiTest send -b <baud> -d 0xaa -t 1000 1				
1 Mbit/s	1	OS1.23.0-0	OK	Okay
500 kbit/s	1	OS1.23.0-0	OK	Okay
250 kbit/s	1	OS1.23.0-0	OK	Okay
125 kbit/s	1	OS1.23.0-0	OK	Okay
100 kbit/s	1	OS1.23.0-0	OK	Okay
50 kbit/s	1	OS1.23.0-0	OK	Okay

20 kbit/s	1	OS1.23.0-0	OK	Okay
10 kbit/s (not supported see API documentation)	1	OS1.23.0-0	OK	Okay, retrieved an unsupported error message
2 Mbit/s (not supported see API documentation)	1	OS1.23.0-0	OK	Okay, retrieved an unsupported error message
Extended frames test.				
Used commands:				
CanApiTest receive -b 125 -e -t 2000 1				
CanApiTest send -b 125 -d 0xaa -e -t 1000 1				
Sending extended data frame	1	OS1.23.0-0	OK	Okay
Receiving extended data frame	1	OS1.23.0-0	OK	Okay
RTR tests				
Used commands:				
CanApiTest send -rtr -b 125 -d 0xaa 1				
CanApiTest send -prtrr -b 125 -d 0xaa -I 0x45 1				
Responding rtr message (parameter -prtrr)	1	OS1.23.0-0	OK	Okay
Responding rtr message (parameter -prtrr) with fast period (1 message per ms)	1	OS1.23.0-0	OK	Okay
Sending rtr message (parameter -rtr)	1	OS1.23.0-0	OK	Okay

Notes

- Use CanApiTest.exe -h to get more information about the test tool parameters.

Known Restrictions

None

3.6 EEPROM

The EEPROM is a persistent memory which can be used by the user to store data permanently.

Feature	Description	Supported
G&F API support	EepromApi.h / EepromApi.lib	Yes
Read eeprom area	The eeprom is divided into user areas.	Yes
Write eeprom area		Yes
Support extended area writing		Not tested
Delete areas		Not tested

Test Environment

Manually test with G&F application (peeprom.exe).

Known Restrictions

None

3.7 FEC Fast Ethernet Controller

Feature	Description	Supported
G&F API support		N/A
Support 10 Mbit/s Network		Yes
Support 100 Mbit/s Network		Yes
TCP/IP v4 stack		Yes
TCP/IP v6 stack		Yes

Test Environment

Implicitly

Known Restrictions

None

3.8 FTDI driver

The initial virtual port for the FTDI driver is COM9. If a multi-port USB to serial adapter is connected the virtual ports COM10, COM11,.. will be also created by the driver.

The initial port number may be changed by the following registry key:

HKEY_LOCAL_MACHINE\Drivers\USB\ClientDrivers\FTDI_DEVICE\ InitialIndex

It is deprecated to use a port number smaller than 10 to prevent COM port conflicts with other G&F drivers.

G&F API support		N/A
Support multi-port USB to serial adapter.		Yes
Baud rates: 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 230400, 460800		Yes

Test Environment

We tested a 4 port adapter with integrated FTDI chips connected to a developer machine. Manually send and receive tests with a G&F application (serlive.exe).

Known Restrictions

None

3.9 General Purpose Timer (GPT)

Feature	Description	Supported
G&F API support	Gpt_Api.h / GptApi.lib	Yes
Support software event on hardware interrupt		Not tested

Test Environment

-

Known Restrictions

Note that COM ports greater than COM9 cannot be accessed by .NET 3.5 applications.

3.10 GF Versioning

All drivers or tools register to the kernel on each boot as information element with its svn number and its build date. The Garz & Fricke Versioning driver allows amongst others retrieving this information on run time.

Feature	Description	Supported
G&F API support	ShowVersionApi.h / ShowVersionApi.lib GFVersionApi.h / GFVersionApi.lib	Yes
Announcement to the kernel	Supporting driver/tools announcement to the kernel on boot.	Yes
Query version information from element		Yes
Creating new information element		Yes
Support a graphical user interface for ShowVersion		Yes

Test Environment

Manually test.

Known Restrictions

None

3.11 I2C

Feature	Description	Supported
G&F API support	I2c_Api.h / I2cApi.lib	Yes
Master mode		Not explicitly tested
Slave Mode		Not explicitly tested
Ports: I2C1, I2C2, I2C3		Not explicitly tested

Test Environment

Implicitly tested by setting and reading the system time.

Known Restrictions

None

3.12 NAND Flash Disk

The flash disk is a persistent memory of the system. It holds partition data like BIOS and OS.

Feature	Description	Supported
G&F API support		N/A
Read operations		Yes
Write operations		Yes

Test Environment

Manually with fis.exe

Known Restrictions

None

3.13 PWM Backlight

Feature	Description	Supported
G&F API support		N/A
Stepwise backlight configuration	The backlight has a granularity of 256 luminance steps.	Yes

Test Environment

Manually with Toolbox.exe (see the Toolbox -h for more information)

Known Restrictions

None

3.14 Serial interface

Features

- Implementation of the RS232 protocol specification.
- Hardware handshaking supported on COM1 and COM2.
- Support of 9-Bit mode implemented.
- RS485 mode available on COM3.
- MDB is (optionally) supported on COM2.
- Mark/Space parity additionally to None/Even/Odd parity supported.

You may configure the serial ports at HKLM/drivers/builtin/COMX, where X is the desired port number.

API

W32 API

Performed Tests

Device(s):

1. CUPID v1.0, S/N: 540-1073R, 128 MB RAM, 7" 800x480 SVGA Display, 16 BPP

Peer: Intel Core i5-2400 CPU @ 3.10GHz, 1 GBit/s Ethernet-Adapter running Windows 7 (64 Bit), connected via 100 Mbit/s In-House LAN

Description	Dev	Version	Author	Status
Testing baud rates for data message sending/receiving with Terminal CE 1.1 (on device, external tool) and HTerm 0.8.1beta (on peer). Each baud rate was tested separately for Mark and Space parity. Data was set to 8 bit, Stop to 1 bit and no flow control.				
4800 bits/s	1	OS1.14.0-0	OK	Okay
9600 bits/s	1	OS1.14.0-0	OK	Okay
19200 bits/s	1	OS1.14.0-0	OK	Okay
38400 bits/s	1	OS1.14.0-0	OK	Okay
57600 bits/s	1	OS1.14.0-0	OK	Okay
115200 bits/s	1	OS1.14.0-0	OK	Okay
115200 bits/s with Data set to 7 bit and Stop set to 1 bit.	1	OS1.14.0-0	OK	Okay

115200 bits/s with Data set to 8 bit and Stop set to 2 bit.	1	OS1.14.0-0	OK	Okay
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Notes

- Mark/Space Parity automatically disables the DMA support while in use.

Known Restrictions

None

3.15 SMSC9500 (Ethernet over USB device)

Feature	Description	Supported
G&F API support		N/A
Automatic mounting		Yes
Allow multiple Ethernet ports	You may run the USB-Ethernet connection and the on board Ethernet connection simultaneously.	Yes

Test Environment

Manually test.

Known Restrictions

None

3.16 SRAM Disk

The SRAM will be used for the user registry.

Feature	Description	Supported
G&F API support		N/A
Read operations		Yes
Write operations		Yes

Test Environment

Manually test.

Known Restrictions

None

3.17 Temperature sensor (I²C Sensor LM73)

Features

- 1 Programmable digital temperature resolution from 11 bits to 14 bits.
- Open-drain ALERT output pin goes active when temperature is above a programmed temperature limit

API

Garz & Fricke GFTempApi:

- Header: GFTempApi.h

- Library: GFTempApi.lib

Performed Tests

Device(s):

1. CUPID v1.4.0, S/N: 01338809, 7" 800x480 SVGA Display, 16 BPP

Description	Dev	Version	Author	Status
High temperature alarm event check with Temperature.exe V1.0 (This tool is part of the OS)				
Set the high alarm temperature (the low alarm temperature will be set implicitly to the same value) to 36DegC and captured the events for exceeding and undershoot this threshold.	1	OS1.23.0-0	OK	Okay
Converting temperature resolution with Temperature.exe V1.0				
Converted to 14 bit resolution (hardcoded in test tool) by using the function TempSetResolution()	1	OS1.23.0-0	OK	Okay

Notes

- Use Temperature.exe -h to get more information about the test tool parameters.

Known Restrictions

None

3.18 Touch

This OS version supports several touch drivers. They can be selected via xml configuration file.

Feature	Description	Supported
G&F API support		No
Support Pinnacle capacitive touch	Capacitive, Single Touch	Yes
Support UCB1400 resistive touch	Resistive, Single Touch	Yes
Support EETI capacitive touch	Capacitive, Single Touch	Yes
Support EP0700M01 capacitive touch	Capacitive, Multi Touch	Yes
Support WM9705 resistive touch	Resistive, Single Touch	Yes
Support EDT FT5X06 capacitive touch	Capacitive, Single Touch	Yes

Test Environment

Devices: WM9705: Cupid v1.4.0, S/N: 01338806, UCB1400: Cupid v1.3.0, S/N: 01041853, Display AM800480R2TMQWTE1H
Peer: Intel Core i5-2400 CPU @ 3.10GHz, 1 GBit/s Ethernet-Adapter running Windows 7 (64 Bit), connected via 100 Mbit/s In-House LAN

Performed Tests

- Drawing at various speed and pressure on the screen in drawing program Etcha.

- Testing CPU load while touch actions.
- Testing frequency of touch sampling.
- Testing sampling timing inside driver.

Description	Dev	Version	Author	Status
Drawing at various speed and pressure on the screen using drawing program Etcha				
Fast drawing	1	OS1.23.0	OK	Okay
Normal drawing	1	OS1.23.0	OK	Okay
Slow Drawing	1	OS1.23.0	OK	Okay
High pressure	1	OS1.23.0	OK	Okay
Normal pressure	1	OS1.23.0	OK	Okay
Low pressure	1	OS1.23.0	OK	Okay, but have to watch out for pressure threshold
Testing CPU load while touching action				
Idle	1	OS1.23.0	OK	7-8% load
Drawing	1	OS1.23.0	OK	UCB: 35-40% WM: 30-35%
Testing frequency of touch sampling				
UCB1400	1	OS1.23.0	OK	100 Hz
WM9705	1	OS1.23.0	OK	100 Hz
Testing timing of touch driver obtaining 10 X-values after driver requesting to poll values from touch device.				
UCB1400	1	OS1.23.0	OK	1,4 ms
WM9705	1	OS1.23.0	OK	1,1 ms

Known Restrictions

None

3.19 USB Host

Feature	Description	Supported
G&F API support	-	N/A
Write operation		Yes
Read operation		Yes
Automatic mounting of USB devices		Yes
Support USB 2.0		Yes

Test Environment

- Manually test with 2 GB USB sticks from SanDisk and devices like an USB mouse.
- Long term test with resetting the system and checking the USB stick mounting behaviour.
 - 4 GB USB Stick from Kingston: Casual mounting errors
 - 1 GB USB Stick from Sharkoon: Frequently mounting errors. Sometimes the data on the stick will be destroyed.
 - 2 GB USB Stick from SanDisk: No errors

Known Restrictions

Sometimes USB devices will not be mounted depending on the manufacturer of the USB device (see above).

3.20 USB OTG Device

Feature	Description	Supported
G&F API support		N/A
Automatic device detection by windows device manager		Yes
Automatic device detection via ActiveSync	The device will be detected automatically with active sync installed on connected PC.	Yes
Support synchronisation via ActiveSync		Yes
Support ActiveSync for debugging in visual studio.		Yes

Test Environment

Connected the device with the PC and established an Active Sync connection.

Known Restrictions

None

4 Windows Embedded CE Run-Time License Assessment

4.1 Included Features

4.1.1 Windows Embedded CE 6.0 Core Run-Time License

sysgen_atl=1
sysgen_audio=1
SYSGEN_AUDIO_STDWAVEFILES=1
SYSGEN_AUTH=1
SYSGEN_AUTH_SCHANNEL=1
sysgen_aygshell=1
sysgen_battery=1
sysgen_cachefilt=1
sysgen_ceddk=1
sysgen_cerdisp=1
SYSGEN_CERTS=1
sysgen_cmd=1
sysgen_commctrl=1
sysgen_commctrl_animate=1
SYSGEN_COMMDLG=1
sysgen_console=1
SYSGEN_CORELOC=1
sysgen_corestra=1
sysgen_cpp_eh_and_rtti=1
SYSGEN_CREDMAN=1
SYSGEN_CRYPT=1
SYSGEN_CTLPNL=1
sysgen_dcom=1
sysgen_ddraw=1
sysgen_device=1
SYSGEN_DEVLOAD=1
sysgen_display=1
sysgen_dotnetv35=1
sysgen_dotnetv35_sr=1
sysgen_dotnetv35_sr_de=1
SYSGEN_DOTNETV35_SUPPORT=1
SYSGEN_DSHOW=1
SYSGEN_DSHOW_ACMWRAP=1
SYSGEN_DSHOW_DMO=1
SYSGEN_DSHOW_VIDREND=1
SYSGEN_DSHOW_WMA=1
SYSGEN_DSHOW_WMT=1
sysgen_dshow_wmv=1
sysgen_ethernet=1
sysgen_eth_usb_host=1
sysgen_eventlog=1
sysgen_exfat=1
sysgen_fiber=1
sysgen_flashmdd=1
sysgen_fmtdmsg=1

SYSGEN_FONTS_COUR_1_30=1
sysgen_fonts_tahomabd=1
sysgen_fonts_tahoma_1_07=1
SYSGEN_FSDBASE=1
SYSGEN_FSPASSWORD=1
sysgen_fsramrom=1
sysgen_fsreghive=1
sysgen_fsreplbit=1
sysgen_ftpd=1
sysgen_full_crt=1
sysgen_gdi_alphablend=1
SYSGEN_GRADFILL=1
sysgen_imaging=1
sysgen_imaging_bmp_decode=1
SYSGEN_IMAGING_BMP_ENCODE=1
sysgen_imaging_gif_decode=1
SYSGEN_IMAGING_GIF_ENCODE=1
sysgen_imaging_ico_decode=1
sysgen_imaging_jpg_decode=1
SYSGEN_IMAGING_JPG_ENCODE=1
sysgen_imaging_png_decode=1
SYSGEN_IMAGING_PNG_ENCODE=1
sysgen_imaging_tiff_decode=1
SYSGEN_IMM=1
SYSGEN_IPHLPAPI=1
sysgen_mingdi=1
sysgen_mingwes=1
sysgen_mininput=1
sysgen_minwmgr=1
sysgen_msgqueue=1
sysgen_msim=1
sysgen_msmq=1
sysgen_mspart=1
sysgen_msxml_dom=1
sysgen_msxml_mini=1
SYSGEN_MSXML_XQL=1
sysgen_ndis=1
sysgen_netutils=1
sysgen_nkcompr=1
sysgen_nkmapfile=1
sysgen_notify=1
sysgen_pm=1
sysgen_redir=1
SYSGEN_RELFS=1
sysgen_serdev=1
sysgen_services=1
sysgen_shell=1
sysgen_softkb=1
sysgen_standardshell=1
sysgen_stdio=1
sysgen_stdioa=1

sysgen_storemgr=1
sysgen_storemgr_cpl=1
SYSGEN_STRSAFE=1
sysgen_tcpip=1
sysgen_telnetd=1
sysgen_timesvc_api=1
sysgen_timesvc_dst=1
sysgen_timesvc_sntp=1
SYSGEN_TOOLHELP=1
sysgen_touch=1
SYSGEN_UIPROXY=1
sysgen_usb=1
sysgen_usbfn=1
sysgen_usb_hid=1
sysgen_usb_hid_clients=1
SYSGEN_USB_HID_KEYBOARD=1
SYSGEN_USB_HID_MOUSE=1
sysgen_usb_printer=1
sysgen_usb_storage=1
SYSGEN_WININET=1
sysgen_winsock=1