Release Notes Linux OS Release 3.0.3 (we-wayland-qt5) for EGSpro

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Electronics

1 Overview

This release contains the Linux OS 3.0.3 (we-wayland-qt5) for Topcon Electronics EGSpro units. It is intended for all EGSpro variants of series hardware revision. Details about the prerequisites to use this Linux OS release as well as the installation instructions are described in the following.

Purpose

This Linux OS release is a major release for the EGSpro hardware.

Please refer to chapter "EGSpro Linux OS release history 15" for a detailed list of changes.

Please refer to chapter "Known issues 28" for a list of known issues.

> ⚠ **Warning**
> This release is intended to be used on preseries units and series units only. Support for older prototypes has been dropped. Do not use this release on older prototype B or C units.

Audience

This Linux OS release is provided to all customers and Topcon Electronics development departments using EGSpro units for development purposes.

This document is intended to all developers integrating software on an EGSpro unit. It explains the steps to update EGSpro units to this new release and provides a list of known issues.

Scope

This Linux OS release contains a whole new operating system including a new Bootloader, Linux kernel and root file system for the supported EGSpro units.

Applications like PClient or CODESYS are not part of this release. Updates to these packages are provided separately by Topcon Electronics.

Please refer to chapter "Supported Hardware 7" for a list of supported EGSpro units.

References

This document is just a short description for the new features and changes of the corresponding Linux OS release. For details about the driver and API implementations as well as C/C++ programming samples and the FAQ please refer to the "EGSpro C/C++ Developer Guide" provided along with this Linux OS release.

1.1 Safety instructions

> ✳ **Notice**
> Please read the complete document and these safety instructions carefully before applying any update to any EGSpro unit.

> ⚠ **Warning**
> Please follow the instructions provided in this document carefully to update the Linux OS release on an EGSpro unit. Wrong usage can lead to a none-operational state of the EGSpro unit which can only be repaired by Topcon Electronics.

Warning
Only use software packages and files which are provided by Topcon Electronics and are contained in this release to update the Linux OS on any EGSpro unit. The usage of wrong software packages can lead to a none-operational state of the EGSpro unit which can only be repaired by Topcon Electronics.

Warning
The update process contains an MD5 checksum verification to check the integrity of each software package. Only use the provided MD5 checksum files along with the software packages. The usage of wrong MD5 checksum files can lead to a none-operational state of the EGSpro unit which can only be repaired by Topcon Electronics.

Warning
Before applying any update to an EGSpro unit please make sure that a possibly installed application package (e.g. PClient or CODESYS) is compatible with this Linux OS release. An update of the application package may be required to support this Linux OS release.

Notice
If a possibly installed application package is a self-developed C/C++ application, additional changes may be required to support this Linux OS release.

Warning
Before applying any update to an EGSpro unit please make sure, that the EGSpro hardware variant is supported by this Linux OS release.

Warning
Support for older EGSpro prototype B and C samples has been dropped due to immense hardware changes. Do not install this Linux OS release on these units.

Notice
If unsure on any of these points or in case that something does go wrong please contact Topcon Electronics for further information and support.

2 Platform

In general this Linux OS release is provided for the Topcon Electronics EGSpro platform. But there are limitations regarding the support of several EGSpro hardware variants due to immense hardware differences. All supported EGSpro hardware variants as well as all older EGSpro Linux OS releases supported for the update process are listed below.

> ⚠ **Warning**
> All EGSpro hardware variants not named here has to be treated as **not supported**!

2.1 Supported Hardware

This Linux OS release supports the following EGSpro hardware variants:

- OPUS A6G2 standard/eco preseries/series (all variants)
- OPUS A8 standard/eco preseries/series (all variants)

2.2 Supported Linux OS releases for update process

This is a release for EGSpro series devices. The described update process is only valid for the following EGSpro Linux OS releases:

- EGSpro Linux OS release 0.6.0 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 0.7.0 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.0.0 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.0.1 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.0.2 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.1.0 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.1.1 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 1.1.2 (X11/Qt5 and Qt4/Embedded)
- EGSpro Linux OS release 2.0.x (Wayland/Qt5)
- EGSpro Linux OS release 2.1.x (Wayland/Qt5)
- EGSpro Linux OS release 2.2.x (Wayland/Qt5)
- EGSpro Linux OS release 2.3.x (Wayland/Qt5)
- EGSpro Linux OS release 3.0.x (Wayland/Qt5)

3 Components

This Linux OS release contains a new operating system for the Topcon Electronics EGSpro platform. The provided components of the release together with their version and license information are described below.

3.1 Versions

Release name and version

- EGSpro Linux OS release 3.0.3 (Wayland/Qt5)

Component versions

- Bootloader: U-Boot 2016.05-egspro-3.0.3
- Linux kernel: Linux egspro 5.4.263-egspro-3.0.3
- Qt: 5.12.12

3.2 License

All software components of this Linux OS release are provided under the terms of the GNU General Public License version 2 (GPLv2) unless otherwise mentioned. Source code of this release which is published under the terms of the GNU General Public License or other Open Source licenses is included in this release. You may obtain a copy of the GNU General Public License version 2 or later at http://www.gnu.org/copyleft/gpl.html.

Some software components of the provided root file system and the service RAMDISK are published under different licenses as the GNU General Public License. Please refer to the license folder provided along with this Linux OS release for a complete and detailed list of provided software packages and their corresponding licenses.

3.3 Directories and files

This Linux OS release contains the following directories and files.

3.3.1 Installation images

These images are intended to be installed directly to the EGSpro target. They are located in the folder `images` within the Linux OS release folder.

Installation images	
File	**Description**
boot_egspro_3.0.3.bin	Bootloader image for EGSpro
boot_egspro_3.0.3.bin.md5	MD5 checksum file for Bootloader image
dev-tree_egspro_3.0.3.tar.gz	Device trees for run-time OS provided by TELE in Linux BSP release
dev-tree_egspro_3.0.3.tar.gz.md5	MD5 checksum file for device-tree package.
pmic_egspro_1.4.sud	PMIC firmware image for EGSpro
pmic_egspro_1.4.sud.md5	MD5 checksum file for PMIC firmware image
rootfs_egspro_3.0.3-egspro.tar.gz	Root file system package including the Linux kernel for EGSpro and the Wayland/Qt5 components
rootfs_egspro_3.0.3-egspro.tar.gz.md5	MD5 checksum file for root file system package
service_egspro_3.0.3.bin	Software installer image. Provided by TELE in Linux BSP release.
service_egspro_3.0.3.bin.md5	MD5 checksum file for Software installer image.
update.img	New WESUD run-time component required to update system from older OS versions (1.x.y and 2.x.y).
update.img.md5	MD5 checksum file for new WESUD run-time component.

3.3.2 Boot logo pictures

This Linux OS release provides a set of default boot logo pictures. There are two types of pictures, a boot logo which is shown at start of normal operating mode and a recovery logo which is shown while loading the update RAMDISK during a software update. All provided default boot logo pictures are located in the folder `logo` within the Linux OS release folder.

Boot logo pictures	
File	**Description**
logo_egspro_a6-tele-landscape-rev2.bmp	Topcon default A6 landscape boot logo with size 800x480 px
logo_egspro_a6-tele-landscape-rev2.bmp.md5	MD5 checksum file for Topcon default A6 landscape boot logo
logo_egspro_a6-tele-portrait_90-rev2.bmp	Topcon default A6 portrait (90° rotation) boot logo with size 480x800 px
logo_egspro_a6-tele-portrait_90-rev2.bmp.md5	MD5 checksum file for Topcon default A6 portrait (90° rotation) boot logo
logo_egspro_a6-tele-portrait_270-rev2.bmp	Topcon default A6 portrait (270° rotation) boot logo with size 480x800 px
logo_egspro_a6-tele-portrait_270-rev2.bmp.md5	MD5 checksum file for Topcon default A6 portrait (270° rotation) boot logo
logo_egspro_a8-tele-landscape-rev2.bmp	Topcon default A8 landscape boot logo with size 1280x800 px
logo_egspro_a8-tele-landscape-rev2.bmp.md5	MD5 checksum file for Topcon default A8 landscape boot logo
logo_egspro_a8-tele-portrait_90-rev2.bmp	Topcon default A8 portrait (90° rotation) boot logo with size 800x1280 px
logo_egspro_a8-tele-portrait_90-rev2.bmp.md5	MD5 checksum file for Topcon default A8 portrait (90° rotation) boot logo
logo_egspro_a8-tele-portrait_270-rev2.bmp	Topcon default A8 portrait (270° rotation) boot logo with size 800x1280 px
logo_egspro_a8-tele-portrait_270-rev2.bmp.md5	MD5 checksum file for Topcon default A8 portrait (270° rotation) boot logo
recovery_egspro_a6-tele-landscape-rev2.bmp	Topcon default A6 recovery landscape boot logo with size 800x480 px

recovery_egspro_a6-tele-landscape-rev2.bmp.md5	MD5 checksum file for Topcon default A6 recovery landscape boot logo
recovery_egspro_a6-tele-portrait_90-rev2.bmp	Topcon default A6 recovery portrait (90° rotation) boot logo with size 480x800 px
recovery_egspro_a6-tele-portrait_90-rev2.bmp.md5	MD5 checksum file for Topcon default A6 recovery portrait (90° rotation) boot logo
recovery_egspro_a6-tele-portrait_270-rev2.bmp	Topcon default A6 recovery portrait (270° rotation) boot logo with size 480x800 px
recovery_egspro_a6-tele-portrait_270-rev2.bmp.md5	MD5 checksum file for Topcon default A6 recovery portrait (270° rotation) boot logo
recovery_egspro_a8-tele-landscape-rev2.bmp	Topcon default A8 recovery landscape boot logo with size 1280x800 px
recovery_egspro_a8-tele-landscape-rev2.bmp.md5	MD5 checksum file for Topcon default A8 recovery landscape boot logo
recovery_egspro_a8-tele-portrait_90-rev2.bmp	Topcon default A8 recovery portrait (90° rotation) boot logo with size 800x1280 px
recovery_egspro_a8-tele-portrait_90-rev2.bmp.md5	MD5 checksum file for Topcon default A8 recovery portrait (90° rotation) boot logo
recovery_egspro_a8-tele-portrait_270-rev2.bmp	Topcon default A8 recovery portrait (270° rotation) boot logo with size 800x1280 px
recovery_egspro_a8-tele-portrait_270-rev2.bmp.md5	MD5 checksum file for Topcon default A8 recovery portrait (270° rotation) boot logo

3.3.3 Update RAMDISK

The update RAMDISK is used to install the operating system and user software on a EGSpro target. It is placed on a USB Flash drive which is used as update media. The update RAMDISK is located in the folder `update` within the Linux OS release folder. A copy of these files is also contained in the `release` folder.

Update RAMDISK	
File	**Description**
update.img	New WESUD run-time component required to update system from older OS versions (1.x.y and 2.x.y).
update.img.md5	MD5 checksum file for new WESUD run-time component.

3.3.4 Toolchain

The Toolchain, which includes all host tools and the sysroot directory required to develop and build own applications for the EGSpro platform, is located in the folder `toolchain` within the Linux OS release folder.

Toolchain	
File	**Description**
sdk_glibc-x86_64_we-wayland-qt5_we-image-production-egspro-3.0.3-toolchain.sh	Script to install the EGSpro platform Toolchain (we-wayland-qt5) on a Linux host PC.
sdk_glibc-x86_64_we-wayland-qt5_we-image-production-egspro-3.0.3-toolchain.host.manifest	List of all packages included in the Toolchain/SDK package for the host machine.
sdk_glibc-x86_64_we-wayland-qt5_we-image-production-egspro-3.0.3-toolchain.target.manifest	List of all packages included in the Toolchain/SDK package for the target machine.

3.3.5 Documentation

All documentation is located in the main folder of the Linux OS release.

Documentation	
File	**Description**
EGSpro_Release_Notes_Linux_3.0.3-we-wayland-qt5.pdf	This document
EGSpro_C_C++_Developerguide.pdf	C/C++ Developer Guide for EGSpro platform

3.3.6   Licenses

A list of all target packages, including version and license information as well as a collection of all license files for each target and built package is located in the folder `licenses` within the Linux OS release folder.

Licenses	
File	**Description**
license_egspro_3.0.3-egspro.manifest	List of all target packages including version and license information (we-wayland-qt5 specific)
licenses_egspro_3.0.3-egspro.tar.xz	A collection of all license files for each target package and build packages used to build the target root file system (we-wayland-qt5 specific)
package_egspro_3.0.3-egspro.manifest	List of all target packages included in the root file system (we-wayland-qt5 specific)

3.3.7   Sources

The source code of all software packages and the Yocto recipes used to build the Linux operating system are located in the folder `sources` within the Linux OS release folder. All source code is published under their corresponding license specified in license manifest.

Sources	
File	**Description**
sources_egspro_3.0.3-egspro-allarch-poky-linux.tar.xz	Source code of all packages, including original source archives, patches and invoked Yocto build recipes (we-wayland-qt5 specific).
sources_egspro_3.0.3-egspro-arm-poky-linux-gnueabi.tar.xz	Split in architecture specific parts due to file sizes. Files can be extracted to the same place.
sources_egspro_3.0.3-egspro-x86_64-linux.tar.xz	

3.3.8   Yocto System

The `yocto` folder contains the Yocto system, which was used to build the release. These files can be used to rebuild the images from source code. Please refer to the chapter in the Developerguide for instructions.

Sources	
File	**Description**
yocto-meta-layers_egspro_3.0.3.tar.xz	This tarball contains all Yocto meta layers used to build the Linux operating system.
mirrortarballs_egspro_3.0.3.tar.xz	This tarball contains tarballs of VCS repositories, which are only accessible Topcon Electronics internal. These are needed to rebuild the release from source with no access to the Topcon Electronics network.

4 Installation instructions

4.1 Prerequisites

Before installing software on an EGSpro target, please make sure that it meets the requirements according to the hardware and software. These are specified in chapter "Platform 7".

In addition you need a clean USB Flash drive, an external power supply for powering the EGSpro target and an EGSpro connector cable with the connectors for power supply, Serv_EN pin and USB port.

This document only describes an update by using a USB Flash drive. For the usage of the internal file system for an update, please consult the developer guide.

4.2 Update from older 1.x.y releases

> **Notice**
> Due to a change in the partition scheme and changes in booting the kernel for the 2.x.y or 3.x.y releases it is necessary to run an one-time installer if you update from a 1.x.y release to the new 2.x.y or 3.x.y release. So if you do an update from a 1.x.y release you **must** include `update/update.img` and `update/update.img.md5` on your USB stick. When updating from a 1.x.y version the update from the internal file system is **not** supported. Trying to do so will cancel the update.

This installer will reformat the mass storage to the new partition scheme and install all necessary bootstrap and update components to make the system 2.x.y or 3.x.y compatible. Due to the reformat the user data under `/opt/data` has to be backed up on the USB stick. This requires the USB stick to have enough free memory to hold all data stored in `/opt/data`. To be safe, ensure that the USB stick has at least 2 GiB of free space. If there is not enough space to backup the data an error is shown and the update will be canceled. The update can be restarted with a stick, which has enough free memory.

> **Warning**
> After an update to a 2.x.y or 3.x.y release a downgrade to a 1.x.y release is no longer possible. If you try to install a 1.x.y release, the installer will prevent the downgrade and abort the installation process.

4.3 Update from older 2.x.y releases

> **Notice**
> Due to a change in the partition scheme and changes in booting the kernel for the 3.x.y releases it is necessary to run an one-time installer if you update from a 2.x.y release to the new or 3.x.y release. So if you do an update from a 2.x.y release you **must** include `update/update.img` and `update/update.img.md5` on your USB stick. When updating from a 2.x.y version the update from the internal file system is **not** supported. Trying to do so will cancel the update.

This installer will reformat the mass storage to the new partition scheme and install all necessary bootstrap and update components to make the system 3.x.y compatible. Due to the reformat the user data under `/opt/data` has to be backed up on the USB stick. This requires the USB stick to have enough free memory to hold all data stored in `/opt/data`. To be safe, ensure that the USB stick has at least 2 GiB of free space. If there is not enough space to backup the data an error is

shown and the update will be canceled. The update can be restarted with a stick, which has enough free memory.

> ⚠ **Warning**
> After an update to a 3.x.y release a downgrade to a 2.3.2 or older release is only possible with an indirection. Please **install the 2.3.3 release or later** on the egspro target. This step is necessary because additional required installation files (dev-tree_egspro_2.3.y.tar*) were added in later releases. **Use all files in the release folder for a downgrade!** Updates with a 2.3.2 release will fail. After the 2.3.3 release has been installed successfully you can downgrade to all other 2.x.x release versions.

4.4 Preparing a USB Flash drive

To prepare a USB Flash drive for software installation, please follow these instructions:

- Connect the USB Flash drive to your PC and copy the following files provided by this release to it. Each file has to be stored in the root directory without any sub-directories:

  - `images/boot_egspro_3.0.3.bin`
  - `images/boot_egspro_3.0.3.bin.md5`
  - `images/dev-tree_egspro_3.0.3.tar.gz`
  - `images/dev-tree_egspro_3.0.3.tar.gz.md5`
  - `images/pmic_egspro_1.4.sud`
  - `images/pmic_egspro_1.4.sud.md5`
  - `images/rootfs_egspro_3.0.3-we-wayland-qt5.tar.gz`
  - `images/rootfs_egspro_3.0.3-we-wayland-qt5.tar.gz.md5`
  - `images/service_egspro_3.0.3.bin`
  - `images/service_egspro_3.0.3.bin.md5`

- Optionally copy the installation packages, which contains the user application and data to the same USB Flash drive. You can also update or install these packages without the installation of the operating system, if it is already installed on the EGSpro target. Replace the `<version>` part with a custom version string. The file `logo_egspro_<version>.bmp` is the boot logo shown at normal start, the file `recovery_egspro_<version>.bmp` is the boot logo shown at start of the update RAMDISK, the file `user_egspro_<version>.tar.gz` contains the content which is extracted to directory `/opt` on the target. Optionally additional user Tarball archives can be provided, which are extracted to /opt in their numeric order. The files have to be named `user<1-9>_egspro_<version>.tar.gz` where `<1-9>` has to be replaced with is a number between 1 and 9. The old content on `/opt` will only be deleted, if the `user_egspro` package is installed. This method can be used to split the user application into several packages for installation.

  - `logo_egspro_<version>.bmp`
  - `logo_egspro_<version>.bmp.md5`
  - `recovery_egspro_<version>.bmp`
  - `recovery_egspro_<version>.bmp.md5`
  - `user_egspro_<version>.tar.gz`
  - `user_egspro_<version>.tar.gz.md5`
  - `user<1-9>_egspro_<version>.tar.gz`
  - `user<1-9>_egspro_<version>.tar.gz.md5`

- If you update the system from an older Linux OS release (1.x.y or 2.x.y) please also copy the one-time installer for release 3.x.y to the same USB Flash drive. All files have to be stored in the root directory without any sub-directories:

```
o update/update.img
o update/update.img.md5
```

- Disconnect and remove the USB Flash drive safely from your PC

4.5   Installation process

To install the operating software on a supported EGSpro target, please follow these instructions:
- Connect the prepared USB Flash drive to the USB port of the EGSpro target
- Make sure the EGSpro target is correctly connected.
- Connect the Serv_EN pin of the main connector to supply voltage to enter the maintenance mode.
- Power on the EGSpro target
- Disconnect the Serv_EN pin from power supply after the display shows a message that the maintenance mode is starting.
- The update process will start automatically after entering the maintenance mode. During the update process the display is showing information messages about the update progress. After successfully installing the files from USB Flash drive, the machine automatically performs a reboot and normal start up and the new Linux OS release is ready to use.

> **Notice**
> When a new root file system is installed on the EGSpro target, both boot logos will be deleted during installation of the root file system. A reinstallation of these packages is required in this case.

> **Notice**
> When a new user application package is installed on the EGSpro target, all content on `/opt` except `/opt/data` will be deleted during the installation of the first user application package. Additional user application packages will be installed in addition to the first package.

> **Warning**
> Do not switch off power supply of the EGSpro target or disconnect the USB Flash drive during the whole installation process. This can result in a loss of data or data inconsistency. Also make sure that the power supply of the EGSpro is stable throughout the complete installation process to avoid unwanted resets.

> **Notice**
> If an update from release 1.x.y to 3.x.y is executed the device must reboot once while installation. The device will enter service mode again, automatically.

5 EGSpro Linux OS release history

5.1 PMIC change history

5.1.1 Changes for EGSpro PMIC Firmware 1.4

- Rename bootloader file to match release naming convention.

5.1.2 Changes for EGSpro PMIC Firmware 1.3

- Added mechanism to detect if a EGSpro target hangs while sleep mode.

5.1.3 Changes for EGSpro PMIC Firmware 1.2

- Added explicit initialization of I2C registers at start of PMIC firmware.
- Fix PMIC showing wrong startup reason for devices without external wake inputs. This resulted in incorrectly showing "external wake" as startup reason.

5.1.4 Changes for EGSpro PMIC Firmware 1.1

- Change Makefile, remove the path declaration into the md5-file.
- Include watchdog feature into the pmic software.
- Added halt state to wait until all wake-up sources are released at shutdown. Required to halt system at "halt" command and to be able to restart system by turning ignition off and on again.

5.1.5 Changes for EGSpro PMIC Firmware 1.0 and PMIC Bootloader 1.0.0

- Fix not waking up the system from sleep mode, if ignition is reapplied immediately after entering the sleep mode.
- The 5V power supply is now switchable through the PMIC regulator interface. This is to prevent flashing of LEDs and backlight on device startup.

5.2 Bootloader change history

5.2.1 Changes for EGSpro u-boot 3.0.3

- None

5.2.2 Changes for EGSpro u-boot 3.0.2

- Remove boot modes that are not used anymore.
- Fix issue with continuous restart in case of failed USB-stick recognition.

5.2.3 Changes for EGSpro u-boot 3.0.1

- NET: Configure some print messages as debug messages.

5.2.4 Changes for EGSpro u-boot 3.0.0

- Include display clock SPREADING for all EGSpro variants. (EMI task)
- Changes in clock configuration and display initialization to set kernel configuration in bootloader to prevent display flicker while booting the system.
- Update to latest eeprom map version.

- Improve USB device detection to boot a recovery system from from USB stick mass storage.

5.2.5   Changes for EGSpro u-boot 2.3.2

- include SPREADING
change some clock register and activate the spread function for A8E and A6E . (EMV Task)

5.2.6   Changes for EGSpro u-boot 2.3.1

- fix default backlight brightness setting not being recognized by Linux kernel
  - If a default brightness setting was set in the EEPROM other than full brightness, u-boot did set the correct brightness settings. However when the Linux kernel was started the setting was overridden by the kernel. This is fixed now.

5.2.7   Changes for EGSpro u-boot 2.3.0

- add detection of new hardware variant imx6dl-a6g2-std-usb
- keypad: add two missing keys for a6g2 variants
- keypad: fix wrong bit mask value for key release events

5.2.8   Changes for EGSpro u-boot 2.2.0

- none

5.2.9   Changes for EGSpro u-boot 2.1.2

- add support for new corny standard hardware variant

5.2.10   Changes for EGSpro u-boot 2.1.1

- add support for new corny hardware variant

5.2.11   Changes for EGSpro u-boot 2.1.0

- include USB Ethernet adapter support
- rework recovery boot command in order to support booting multi file images

5.2.12   Changes for EGSpro u-boot 2.0.0

- Update mainline U-Boot version to 2016.05
- Add support for booting a device tree along the Linux kernel.
- Support the new partition scheme of the EGSpro
- Support disabling output of the serial console in the bootloader with EEPROM flag.
- Support redirecting the serial console to the first USB to Serial converter.

5.2.13   Changes for EGSpro u-boot 1.1.1

- Add support of new generation of emmc hardware. Standard 5.1 (EXT_CSD_REV = 8)

5.2.14   Changes for EGSpro u-boot 1.1.0

- fix display sometimes not initialized on boards with imx6q
The imx6 dual/quad has an issue in its clock tree. When switching the LDB root clock a clock glitch can be introduced, which then prevents the LDB from working. To prevent the glitch a special sequence has to be applied when changing the LDB root clock. The code

has been ported from u-boot-2013.10, where it was used for the weimx6. The order of the initialization was slightly modified, the LDB and IPU clocks are now switched on at the end of the sequence.

5.2.15   Changes for EGSpro u-boot 1.0.0

- Fixed selection, build of MFG bootloader possible again
- Add build variable to distinction of display settings
- Add check for wrong boot logo base address
- Add support for all keys on 12" device keypad for the "MagicKey" support.
- Add regulator driver for the 5V power supply. This supply is switched on after initializing the LED dimmer. This prevents flashing of the LEDs and backlight at device startup.

5.3   Linux OS change history

5.3.1   Changes for EGSpro Linux OS Release 3.0.3

Kernel

- Update kernel configuration to vanilla 5.4.263
- Disable eMMC HS200 mode. This caused sporadic (~1 / 250) kernel hangs during boot or during system resume
- Rework the seamless bootlogo transition from bootloader to kernel, this caused sporadic (~1 / 1000) kernel hangs during boot
  - Previously the GPU was reconfigured without disabling it to realize a flicker free bootlogo during the whole boot process
  - Now the Backlight and the GPU are disabled during boot, the GPU is reset and initialized and enabled after successful probe
  - This change causes a short visible black screen during system boot. The blank time depends on the used display and is in a range between 50ms and 300ms depending on variant

Root file system

- Update WEPMD to latest version (Added some new features (new wake-types) used by other platforms)

Update image

- Disable metadata_csum feature on file system recreation in case a corrupted file system is detected
- Rework mount path handling
- Add more detailed information for device-tree installation from tarball
- Create Doxygen documentation for the WESUD
- Fix wrong install_platform information location
- Suppress console messages `timestamp [...] in the future` spamming console if the system time is not set correctly

Yocto

- Add missing mirror tarball for the video-test application

5.3.2 Changes for EGSpro Linux OS Release 3.0.2

Kernel

- Reduce log files size.

5.3.3 Changes for EGSpro Linux OS Release 3.0.1

Kernel

- Fix issue with fast video format switch.
- Fix issue with ADV driver. Replaced delay with proper signal check to provide reliable video signal standard recognition.
- CAN: sja1000: sja1000_err(): fix issue with count arbitration lose as an error.
- sja1000: Fix wrong irq handling on state change from bus-off to error active.
- rtc-rv8803: added power management functionality to the device driver.
- isl76683: add driver for isl76683 light sensor.
- Remove mass storage, add ethernet, serial and zero OTG gadgets and set config für adding ethernet OTG gadget.

5.3.4 Changes for EGSpro Linux OS Release 3.0.0

Kernel

- Update to kernel version 5.4.129-rt61. This means a complete update of the code base. All Topcon Electronics specific drivers and changes have been ported from the old 4.1 kernel version or have been replaced by mainline drivers.
- Update device tree to support updated kernel 5.4.129-rt61.
- The whole graphic driver stack has moved from NXP's vivante stack to mainline etnaviv stack
- Add new configurable LED triggers for usbport and netdev.
- Enable HS200-mode for faster emmc communication.
- Bugfix: Flexcan driver sets can_state to active before tranceivers are enabled.
- Rename some sensors to match to a generic naming convention.

Root file system

- Package-updates for all packages. For further information look at the package manifest-files in the license folder.
- Qt update to version 5.12.9.
- Qt/gstreamer: add qml plugins.
- Gstreamer: update to version 1.16.1.
- Mesa update to version 19.3.1.
- Add support for TOPCON's cloudlynk 10 (CL10) including gps daemon.
- Add possibility to configure ethernet interface automatically to a defined IP address and start ssh-daemon on system-boot via health management command WEHMD_CMD_SET_EE_SSH_CONFIG (for development use). For further information take a look to health management chapter in the C/C++ developer guide.
- Powermanagement: Fix return value for WEPMD_CMD_RETARD_MODE command of the powermanagement daemon.
- Bugfix: system freezes if gstreamer tries to open a corrupt video file.
- Bugfix: 12" devices with resistive touch not working with Wayland after exiting sleep mode.
- Healthmanagement: Add information about the eMMC health status, poweron cylces and crash count.
- Recovery system: If the file system of one partition is corrupt the update system tries to repair/recreate the affected partition instead of the whole system.

Update image

- Repartition the memory (caused by bigger OS-image)
- Format /opt partition if it is not mountable (corrupt filesystem)
- Add possibility to update device-trees, service-kernel and service-bootloader
- bugfix: USB-Stick may be detected as corrupted if plugged into windows pc after running update on target

5.3.5 Changes for EGSpro Linux OS Release 2.3.2

Kernel

- change port setting ethernet in the framework of EMV
- bugfix egspro OPUSSWDEV-73 Keycontoler signal overflow .
  Now, the press of key or encoder button in the time of low power don't reproduce a overflow.
- dts: disable dma for external uarts (OPUSSWDEV-839)
  Due to problems with the serial line and GPS receivers in combination with sunrise software we have to disable DMA. This has already been done on 3.14 kernel branch and for X25/35 in 4.1 branch.

Root file system

- we-image-production: add function to install U-Boot license to rootfs if LICENSE_CREATE_PACKAGE is set

Update image

- In the future emmc type change from MLC to TLC , change size for check to choose the right partitions pattern.

5.3.6 Changes for EGSpro Linux OS Release 2.3.1

Kernel

- fix crash if USB stick was unplugged during write operation
- flexcan: fix tx path stalled after resume from supend to memory
  - If the suspend operation did cancel a CAN transmission, the TX path of the CAN controller was blocked after system resume. In order to get CAN interface working again a interface down/up cycle was necessary. This has been fixed.

Root file system

- Add workaround to fix problems with suspended USB root hubs not be woken by plug in of USB devices
  - Autosuspend feature of USB root hubs has been disabled to prevent the problem
- Update wepmd package to version 1907.0:
  - fix missing '/' for path of touch screen in config file
  - fix wrong path for display backlight in config file
  - fix StopTimer Function not working correctly. This resulted in a delayed switch to sleep state, if the unit just resumed from sleep state.

5.3.7 Changes for EGSpro Linux OS Release 2.3.0

Kernel

- pwm: fix glitches when changing pwm duty cycle
- add device tree for new hardware variant a6g2 std usb
- ar1020-spi: fix missing touch events after sleep/suspend to RAM
- can: flexcan: fix not working loopback mode
- update kernel config to support Cloudlink 10

Root file system

- weston: fix crash when touchscreen generates out of screen coordinates.
  - This was mainly observed when using a rotated (portrait) layout.
- add packages to support Cloudlink 10:
  - usb8801 wifi firmware
  - iw
  - gpsd (no automatic startup)
  - gps-utils
  - ccid
  - wpa-supplicant

5.3.8 Changes for EGSpro Linux OS Release 2.2.0

Kernel

- keypad: fix keypad not being initialized on some boards
- led dimmer: fix crash if no LEDs are available

Root file system

- pulseaudio: fix wrong device names in configuration file
- add the following packages:
  - parted
  - mmc-utils
  - fbgrab
- Update wepmd package to version 1901.0:
  - fix encoder not entering low power state

- Update the company name from Wachendorff Elektronik to Topcon Electronics in various files (e.g. login message)
- fix resistive touch (on older A8 basic) not supported by 2.x releases

5.3.9 Changes for EGSpro Linux OS Release 2.1.2

Kernel

- device tree: add support for new corny standard hardware variant

5.3.10 Changes for EGSpro Linux OS Release 2.1.1

Kernel

- device tree: add support for new corny hardware variant
- ethernet: fix ethernet connection problems due to missing phy clock. This should fix all ethernet connection problems with 2.x.y releases.

- analog inputs: fix inputs being updated only every ~700 ms. Shortest scan interval is now 100 ms.
- ads128d818: rework reading adc results from chip
- mxc_v4l2_capture: fix not checking return value of init_camera_struct
- framebuffer: clear FB_ACTIVATE_FORCE flag after first initialization, this prevents reinitialization (and a white screen) of the framebuffer, if no settings were changed
- framebuffer: set default yres_virtual to 3 times the y resolution to support triple buffering with default settings
- audio amplifier: fix wrong initialized power config pins for audio amplifier

Root file system

- Init Scripts: Instead to source the /etc/profile to get the system parameter, the shell login scripts are sourced directly. This saves 3 seconds boot time, when there is no terminal connected to serial interface.
- fontconfig: add additional font directories /usr/lib/fonts, /opt/fonts, /opt/share/fonts
- add SevenSegment font package
- framebuffer: export FB_MULTI_BUFFER=3 as default variable, this enables triple buffering per default
- fix wrong setting for QT_QPA_EGLFS_WIDTH environement variable for 12" display
- Update wepmd package to version 1708.0:
  - copy default config file when config file is empty (file size equals 0)

Update RAMDISK

- Update wesud package to version 1711.0:
  - Implement API function to check if a specific update package is allowed to be installed on the platform
  - Prevent downgrades to 1.x.y releases on EGSpro

SDK

- add gtest and gmock libraries to SDK

5.3.11 Changes for EGSpro Linux OS Release 2.1.0

Kernel

- device tree: add support for all EGSpro variants
- bluetooth module: disabling low energy features for workaround depends on device tree not on compile time switch
- leds-pca963x: fix driver creating led devices for disabled nodes in device tree
- use the kernel integrated driver for the Vivante GPU, instead of the out of tree package (version does not change)

Root file system

- unzip: is now built from separate package (not longer make use of unzip from busybox)
- filesystems: do not mount filesystems in sync mode (fix performance penalty)
- gstreamer: add plugins:
  - gstreamer1.0-plugins-good-rtp
  - gstreamer1.0-plugins-good-rtpmanager
  - gstreamer1.0-plugins-good-udp
- remove init-ifupdown package as there is no automatic configuration of Ethernet.
- udev:
  - disable persistent-v4l rule. This speeds up booting 1 to 2 seconds. The video device are fixed on the machine anyways

    o remove autonet.rules. There is no automatic configuration of Ethernet.
- the following packages were added:
  - o net-tools
  - o boost
  - o poppler
  - o libconfig
  - o libsocketcan
  - o taglib
  - o xerces-c

Update RAMDISK

- add hdparm package
- Update wesud package to version 1704.0:
  - o fix buffer overflow in _NotifyW function
  - o fix uninitialized memory when checking for update image
  - o Add info message when the file system sync operation is done.

5.3.12 Changes for EGSpro Linux OS Release 2.0.0

Kernel

- Update to kernel version 4.1.15. This means a complete update of the code base. The patches released by NXP for the imx6 have been applied to this kernel version. All Topcon Electronics specific drivers and changes have been ported from the old 3.0 kernel version.
- The hardware description is now handled by a device tree. The platform specific hardware configuration has been moved from the machine file to the device tree file. Drivers have been modified in order to read this information from the device tree rather to use platform init data. A device tree is provided as separate file for each hardware variant.
- SocketCAN: The previously used sysfs attributes for modifying the bitrate and controller modes of the CAN interface have not been ported to the new kernel. It is strongly encouraged to use the standard API defined for SocketCAN (ip netlink, see Developer Guide).
- Support CMA (Contiguous Memory Allocator). This allocator reserves a part of the system main RAM, which is can then be used for contiguous memory allocations (needed for example for video camera driver or the VPU). This is not user application controllable and is handled by the kernel.
- Add cpu temperature sensor values to /sys/class/analog interface

Root file system

- Update to Yocto 2.1 (Krogoth) system. This means an update for almost all software packages. For a complete overview of all packages see Developer Guide. This includes changes are:
  - o Toolchain update to GCC 5.3.0
- Switch to use a Wayland based graphical system. This replaces the previous X11 system. The Wayland system also supports hardware acceleration through OpenGL drivers provided by NXP. These are also included in this release.
- Update to QT 5.6
- Update to BlueZ 5.37
- add service pack for bt-module to switch to highest possible bitrate (3 Mbps)
- add dualVideo package in version 1702. A test application for playing to parallel video camera inputs
- Update wepmd package to version 1605.0:
  - o Changed handling of ignition input to use libhalopus instead of platform dependent implementation

- o Added a separate configuration parameter for halt command. This is used when a "halt" is requested by API.
- o If wepmd can't load the user power management configuration (usually in /opt/etc/pm_state.conf) it tries to use the original version from /etc/pm_state.conf as fallback.
- o Change timer implementation to use a CLOCK_MONOTONIC timer, which is unaffected by setting the date on the system.
- o Add error handling for failures in suspend or false wake ups. If such a failure is detected the system is powered off (enters off state).
- Update libhalopus package to version 1612.0:
  - o Add API function to get regulator path and state by name
  - o Add API functions to simplify handling of generic netlink interface used for event handling
  - o Add API functions for power regulator event I/F handling
- Changed partition scheme to:
  - o /dev/mmcblk0p1 is used for bootloader
  - o /dev/mmcblk0p2 is used for rootfs, fs is ext4
  - o /dev/mmcblk0p3 is used for /opt, fs is ext4
  - o /dev/mmcblk0p4 is used for /shadow, fs is ext4

Update RAMDISK

- Update wesud package to version 2703.0:
  - o Switch to use libhalopus for regulator handling
  - o Switch to use the hidden EEPROM partitions
  - o Update to support new partition scheme
  - o fix buffer overflow in _NotifyW function
  - o fix uninitialized memory when checking for update image

5.3.13 Changes for EGSpro Linux OS Release 1.1.2

Kernel

- Fix speed configuration of Ethernet MII interface
- tw9912 video-decoder
  - o split up setting for the video-decoder and settings for the CSI cropping into two distinct sets of parameters.
  - o set field parameter to indicate progressive video input
- adv7280 video-decoder
  - o fix size of raw video stream reported to upper layers of the v4l2 stack. Reporting the wrong size leads to memory corruption when using NTSC cameras.
  - o fix cropping parameters in NTSC use case
- mxc_v4l2_capture:
  - o fix ipu_csi_init_interface not considering cropping values from the sensor
  - o make proper use of field parameter to detect progressive or interlaced video stream, instead of using magic numbers

Root file system

- Include new touch daemon for 12" PCTs (Opus A8), this fixes some rare occurences of missed release events.

5.3.14 Changes for EGSpro Linux OS Release 1.1.1

Kernel

- fixed init isl29023 lightsensor, allow the write access to register 8 (test-register), important to reset the chip when the chip crashed
- egspro_pmic_wdog
  - added basic watchdog device functionality
  - added watchdog device information to PMIC watchdog platform data
  - added missing watchdog ioctl commands
  - added check if watchdog feature is supported by PMIC firmware
- tw9912 video-decoder
  - added tw9912 device reset during probing
  - added missing registers to register dump
- include the power up reset of the keycontroller adp5588
- include power reset of the usb-hub
- Added halt request when entering halt system call
- rtc pcf2129: set default power management
- added support of emmc cards with EXT_CSD_REV = 8 => 5.1 now
- egspro-pmic
  - Added function to test writability of a register without retry
- patch mmc: sdhci: fix dma memory leak in sdhci_pre_req()

Root file system

- Fixed license identifier of fbv to GPLv2
- re-enabled the uniaudio decoder (is a free decoder from freescale needed for gstreamer)
- X11
  - [xinit] Added script to rotate X server orientation and adjust touch screen orientation for cap. touch panels
  - [xserver-xorg] Added environment variable X_ROTATION to profile script
- Added udev rule to disable the Freescale EHCI USB root hubs as wakeup source
- Added additional PPP packages
- Added missing PPP protocols and features
- Disabled right click feature in configuration for eGalax Touch Daemon
- Update wehmd package to version 1602.0:
  - no functional changes
- Update wepmd package to version 1605.0:
  - Fixed Touch events during lowpower; use a ioctl EVIOCGRAB to get a exclusive access of input device so that the other blocked (no receive events). Attach on the existing "touch" config (on or off).

Update RAMDISK

- Update wesud package to version 1605.0:
  - added a platform dependent flag to decide if the installation files have to be copied to RAM or not.

5.3.15 Changes for EGSpro Linux OS Release 1.1.0

Kernel

- Kernel configuration:
  - add support L2CAP
  - add support BT_RFCOMM
  - add support RFCOMM_TTY
  - BNEP

- o HIDP
- Pin-Configuration
  - o Changed IOMUX settings of I2C3 pins

Root file system

- Include new packages
  - o bluez-hcidump
  - o libhalopus library
- Update wehmd package to version 1602.0:
  - o Added first implementation of monitoring
  - o Cleaned up access to system eeprom
  - o Include using of libhalopus library
  - o Add check for min/max voltage and temperature
- Update wepmd package to version 1601.1:
  - o no functional changes

5.3.16 Changes for EGSpro Linux OS Release 1.0.0

Kernel

- Ethernet
  - o Change pin muxing for ETHERNET_REF_OUT function. The SION bit must be set that Ethernet run on quad platforms.
- RTC
  - o Added Freescale's MXC SNVS RTC device.
    The IMX6 internal RTC was enabled. The wakeup process (sleep timeout) used this RTC now. Solves problems of second alarm and not initialization of external RTC as part of wakeup.
  - o Enable IRQ wake depending on I2C client flag. Additionally checks the I2C client flags.
- Display-Setting
  - o Fixed unnecessary delay when setting display backlight brightness
- ADP5588 keypad driver
  - o Remove debug statement in irq handler
  - o Add power management class to driver
  - o add KEY_TAB and KEY_END to key matrix
- Multitouch: Fix first touch not being recognized by X-Server because of missing ioctl.
- Kernel configuration:
  - o add support for FUSE
  - o add support for PPP
  - o add support for BSD Process Accounting
  - o add support for hidraw devices
- FlexCAN driver:
  - o Use the actual clock frequency instead of a fixed constant to calculate the parameters of the requested bitrate.
  - o Fix wrong can state after resuming from sleep mode.
- Video Input driver:
  - o fix parallel video input if used on a imx6 quad board
  - o Fix rolling video after low power state.
  - o Set field information to indicate progressive format of video input stream.
  - o Fix not working still capturing, when using the MIPI connected interface.
- LED timer trigger: switch off led, when delay_on is set to 0.
- AR1020 touch driver: rewrite the complete driver according to kernel programming rules. No interface changes.
- Add shutdown functions to multiple drivers to ensure disabling hardware components during shutdown.

- Analog input driver: change scaling factors according to new hardware.
- Sensor driver:
  - remove ls_imp sensor
  - rename rtc_backup_vcc to prim_in_vcc sensor
  - change scaling factors of ignition_vcc sensor according to new hardware
- Bluetooth module: Add pan13xx driver to configuration to be able to reset the module from user space.
- EEPROM driver: use mlseep instead of udelay, to prevent busy waiting.

Root file system

- Change the isl290023 driver. Include init routine to set default values of registers by the start.
- Include new packages
  - fbv
  - libungif
  - ppp
- Udev, Fixed RTC symlink rules so that /dev/rtc always points to normal RTC and dev/rtc_pm points to RTC device for power management.
- Video: Removed frame buffer blanking in DPMS callback
- Enable full support of multi touches:
  - X-Server uses evdev driver for multi touches instead of tslib
  - tslib is only used for resistive (single) touches
- Prevent auto mounting of EMMC partitions, which are not mounted by /etc/fstab
- Add mxt-app package: Tool to configure Atmel touches.
- Add system-info-tool in version 0.0.2
- Add we-halt package: we-halt is a wrapper for halt to shutdown and halt the system when halt is called without any options
- X-Server: Fix rotation not working after recent changes.
- Remove hardware support for the following multimedia codecs:
  - mpeg2
  - oggvorbis
  - aac
  - nb-amr
  - wb-amr
- Add bt-ti package: This package includes firmware for Texas Instruments bluetooth modules
- Add egtouch package: This package includes a binary daemon,which is needed to use eGalax touch screens. Also add a start script, which starts the daemon, when an eGalax touch is detected.
- busybox:
  - enable bootchart tool
  - fix double execution of system date initialization at start. Change runlevel into the init script of hwclock
- Update wehmd package to version 1601.0:
  - no functional changes
- Update wepmd package to version 1601.0:
  - include the keypad into power management
  - invert the order for waking up devices
  - fixed frame buffer blank mode for suspend state
  - change RTC device (dev/rtc1) for alarm
  - include the touch into the power management

Update RAMDISK

- Fix wesud not printing to console
- Include u-boot environment tools in update RAMDISK

- Update wesud package to version 1601.0:
  - reenable wesud being able to partition the emmc
  - user partition under /opt is no longer deleted everytime a user1-9 package is installed, instead the partition is only deleted if the user.tar.gz package is installed.

6   Known issues

- On 12" devices a mouse cursor may be shown on application's screen when using weston. This is caused by an older version of the touch device. You can workaround this issue by updating the device name of the corresponding udev-rule in */etc/udev/rules.d/10-opus-driver.rules.*
- On older 12" Eco Basic and 12" Standard Basic devices equipped with a resistive touch touch events are not forwarded to an application running on platform eglfs if *QT_QPA_EGLFS_NO_LIBINPUT=1* is set. To workaround this issue you can either unset the *QT_QPA_EGLFS_NO_LIBINPUT (*only valid for 12" Eco Basic devices) or run the application on platform wayland-egl.
- .By introducing the DRM / KMS / DPMS into the kernel the display compositor (WAYLAND-EGL / EGLFS) has exclusive access to the graphic subsystem. The WEPMD has a very limited access only. As result the functionality to control the display by the system power management is limited, too. As result there are some limitations and known issues in combination of the WEPMD, the legacy framebuffer interface and WAYLAND-EGL / EGLFS.

  - In system power mode *low-power* the display backlight is disabled but the panel still keeps enabled. Depending on environmental lighting conditions the application may be visible in this power mode.

  - If the system boots to power mode *silent-on* and EGLFS is used as display compositor, the display will not enabled if the system enters power mode *on*. To workaround this issue, please use WAYLAND-EGL.

  - If the system boots to power mode *silent-on* and WAYLAND-EGL is used as display compositor, the display will be enabled automatically if the weston starts, independently of the current system power mode.

  - If the system boots to power mode *silent-on* and no compositor is running before the system enters on-mode, a short flicker is visible at the state change to power mode *on*.

- Please report all found bugs to Topcon Electronics to help to improve stability and reliability of future Linux OS releases.