Release Notes Linux OS Release 1.2.2 (we-wayland-qt6-opensource) for EGSFusion

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1.2.2
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1 Overview

This release contains the Linux OS 1.2.2 (we-wayland-qt6-opensource) for Topcon Electronics EGSFusion units. It is intended for all EGSFusion 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 bugfix release for the EGSFusion hardwar and contains bugfixes for older release versions.

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

Please refer to chapter "Known issues 22" 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 EGSFusion units for development purposes.

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

Scope

This Linux OS release contains a new operating system including a small bootloader update, an updated service image, a new Linux kernel and root file system for the supported EGSFusion 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 EGSFusion 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 "EGSFusion 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 EGSFusion unit.

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

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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 EGSFusion unit. The usage of wrong software packages can lead to a none-operational state of the EGSFusion 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 EGSFusion unit which can only be repaired by Topcon Electronics.

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

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.

Warning
Please avoid hard reset (battery off) of EGSFusion during running application. This may lead to system functionality distortions.

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2 Platform

In general this Linux OS release is provided for the Topcon Electronics platform EGSFusion. It is intended for use with latest EGSPro and EGSCore hardware designs. Despite it may boot on former designs, not all functions/ components are guaranteed to work with this OS. The latest EGSFusion variants intended to run with this operating system are listed below.

Warning
All variants not named here have to be considered u**unsupported**!

2.1 Supported Hardware

This Linux OS release supports the following EGSFusion hardware variants:

- OPUS B6 eco basic

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3 Components

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

3.1 Versions

Release name and version

- EGSFusion Linux OS release 1.2.2 (Wayland/Qt6)

Component versions

- Bootloader: U-Boot 2022.07-egsfusion-1.2.2-1
- Linux kernel: Linux egsfusion 6.18.8-egsfusion-1.2.2-1-00341-g3675a314a65b
- Qt: 6.5.10

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 EGSFusion target. They are located in the folder `images` within the Linux OS release folder.

Software installation image files	
File name	**Description**
boot_egsfusion_1.2.2.bin	Bootloader image for run-time OS. Provided by TELE in Linux BSP release.
boot_egsfusion_1.2.2.bin.md5	MD5 checksum file for Bootloader image.
service_egsfusion_1.2.2.bin	Service OS
service_egsfusion_1.2.2.bin.md5	Boot logo for service OS
rootfs_egsfusion-opensource_1.2.2.tar.gz	Root file system of run-time OS. Provided by TELE in Linux BSP release.
rootfs_egsfusion-opensource_1.2.2.tar.gz.md5	MD5 checksum file for root file system.
dev-tree_egsfusion_1.2.2.tar.gz	Collected device tree file. It includes device trees for all device variants.

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dev-tree_egsfusion_1.2.2.tar.gz.md5	MD5 checksum file for collected device tree.
copro_egsfusion.tar.gz	PMIC+COMIC firmware provided by TELE in Linux BSP release. For 32bit and 8bit controllers.
copro_egsfusion.tar.gz.md5	MD5 checksum file for COMIC firmware.

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. This folder is split in sub-folders containing the device specific logos.

Boot logo pictures	
File	**Description**
logo_egscore_b3-tele-landscape.bmp	Topcon default B3 landscape boot logo with size 800x480 px
logo_egscore_b3-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B3 landscape boot logo
recovery_egscore_b3-tele-landscape.bmp	Topcon default B3 recovery landscape boot logo with size 800x480 px
recovery_egscore_b3-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B3 recovery landscape boot logo
logo_egscore_b3-tele-portrait_90.bmp	Topcon default B3 portrait 90 degrees rotated boot logo with size 800x480 px
logo_egscore_b3-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B3 portrait 90 degrees rotated boot logo
recovery_egscore_b3-tele-portrait_90.bmp	Topcon default B3 recovery portrait 90 degrees rotated boot logo with size 800x480 px
recovery_egscore_b3-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B3 recovery portrait 90 degrees rotated boot logo
logo_egscore_b3-tele-portrait_270.bmp	Topcon default B3 portrait 270 degrees rotated boot logo with size 800x480 px
logo_egscore_b3-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B3 portrait 270 degrees rotated boot logo
recovery_egscore_b3-tele-portrait_270.bmp	Topcon default B3 recovery portrait 270 degrees rotated boot logo with size 800x480 px
recovery_egscore_b3-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B3 recovery portrait 270 degrees rotated boot logo
logo_egscore_b4-tele-landscape.bmp	Topcon default B4 landscape boot logo with size 800x480 px
logo_egscore_b4-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B landscape boot logo
recovery_egscore_b4-tele-landscape.bmp	Topcon default B4 recovery landscape boot logo with size 800x480 px
recovery_egscore_b4-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B4 recovery landscape boot logo
logo_egscore_b4-tele-portrait_90.bmp	Topcon default B4 portrait 90 degrees rotated boot logo with size 800x480 px
logo_egscore_b4-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B4 portrait 90 degrees rotated boot logo
recovery_egscore_b4-tele-portrait_90.bmp	Topcon default B4 recovery portrait 90 degrees rotated boot logo with size 800x480 px
recovery_egscore_b4-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B4 recovery portrait 90 degrees rotated boot logo
logo_egscore_b4-tele-portrait_270.bmp	Topcon default B4 portrait 270 degrees rotated boot logo with size 800x480 px
logo_egscore_b4-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B4 portrait 270 degrees rotated boot logo

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recovery_egscore_b4-tele-portrait_270.bmp	Topcon default B4 recovery portrait 270 degrees rotated boot logo with size 800x480 px
recovery_egscore_b4-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B4 recovery portrait 270 degrees rotated boot logo
logo_egscore_b6-tele-landscape.bmp	Topcon default B6 landscape boot logo with size 1280x800 px
logo_egscore_b6-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B6 landscape boot logo
recovery_egscore_b6-tele-landscape.bmp	Topcon default B6 recovery landscape boot logo with size 1280x800 px
recovery_egscore_b6-tele-landscape.bmp.md5	MD5 checksum file for Topcon default B6 recovery landscape boot logo
logo_egscore_b6-tele-portrait_90.bmp	Topcon default B6 portrait 90 degrees rotated boot logo with size 1280x800 px
logo_egscore_b6-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B6 portrait 90 degrees rotated boot logo
recovery_egscore_b6-tele-portrait_90.bmp	Topcon default B6 recovery portrait 90 degrees rotated boot logo with size 1280x800 px
recovery_egscore_b6-tele-portrait_90.bmp.md5	MD5 checksum file for Topcon default B6 recovery portrait 90 degrees rotated boot logo
logo_egscore_b6-tele-portrait_270.bmp	Topcon default B6 portrait 270 degrees rotated boot logo with size 1280x800 px
logo_egscore_b6-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B6 portrait 270 degrees rotated boot logo
recovery_egscore_b6-tele-portrait_270.bmp	Topcon default B6 recovery portrait 270 degrees rotated boot logo with size 1280x800 px
recovery_egscore_b6-tele-portrait_270.bmp.md5	MD5 checksum file for Topcon default B6 recovery portrait 270 degrees rotated boot logo

3.3.3 Toolchain

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

Toolchain	
File	**Description**
sdk_glibc-x86_64_we-wayland-qt6-opensource_we-image-production-egsfusion-1.2.2-toolchain.sh	Script to install the EGSFusion platform Toolchain (we-wayland-qt6-opensource) on a Linux host PC.
sdk_glibc-x86_64_we-wayland-qt6-opensource_we-image-production-egsfusion-1.2.2-toolchain.host.manifest	List of all packages included in the Toolchain/SDK package for the host machine.
sdk_glibc-x86_64_we-wayland-qt6-opensource_we-image-production-egsfusion-1.2.2-toolchain.target.manifest	List of all packages included in the Toolchain/SDK package for the target machine.

3.3.4 Documentation

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

Documentation	
File	**Description**
EGSFusion_Release_Notes_Linux_1.2.2-we-wayland-qt6-opensource.pdf	This document
EGSFusion_C_C++_Developerguide_1.2.2.pdf	C/C++ Developer Guide for EGSFusion platform

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3.3.5 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_egscore_1.2.2-egsfusion.manifest	List of all target packages including version and license information (we-wayland-qt6-opensource specific)
licenses_egscore_1.2.2-egsfusion.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-qt6-opensource specific)
package_egscore_1.2.2-egsfusion.manifest	List of all target packages included in the root file system (we-wayland-qt6-opensource specific)

3.3.6 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 the license manifest.

Sources	
File	**Description**
sources_egsfusion_1.2.2-egsfusion-allarch-poky-linux.tar.xz	Source code of all packages, including original source archives, patches and invoked Yocto build recipes (we-wayland-qt6-opensource specific). Split in architecture specific parts due to file sizes. Files can be extracted to the same place.
sources_egsfusion_1.2.2-egsfusion-arm-poky-linux-gnueabi.tar.xz	
sources_egsfusion_1.2.2-egsfusion-x86_64-linux.tar.xz	

3.3.7 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_egsfusion_1.2.2.tar.xz	This tarball contains all Yocto meta layers used to build the Linux operating system.
mirrortarballs_egsfusion_1.2.2.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.

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4 Installation instructions

4.1 Prerequisites

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

In addition you need an empty USB Flash drive, an external power supply for powering the EGSFusion target and an EGSFusion 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 updating, please consult the developer guide.

4.2 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:

  - `we-wayland-qt6-opensource/images/boot_egsfusion_1.2.2.bin`
  - `we-wayland-qt6-opensource/images/boot_egsfusion_1.2.2.bin.md5`
  - `we-wayland-qt6-opensource/images/boot-bootstrap_egsfusion_1.2.2.bin`
  - `we-wayland-qt6-opensource/images/boot-bootstrap_egsfusion_1.2.2.bin.md5`
  - `we-wayland-qt6-opensource/images/copro_egsfusion_1.2.2.sud`
  - `we-wayland-qt6-opensource/images/copro_egsfusion_1.2.2.sud.md5`
  - `we-wayland-qt6-opensource/images/dev-tree_egsfusion_1.2.2.tar.gz`
  - `we-wayland-qt6-opensource/images/dev-tree_egsfusion_1.2.2.tar.gz.md5`
  - `we-wayland-qt6-opensource/images/rootfs_egsfusion_1.2.2-we-wayland-qt6-opensource.tar.gz`
  - `we-wayland-qt6-opensource/images/rootfs_egsfusion_1.2.2-we-wayland-qt6-opensource.tar.gz.md5`
  - `we-wayland-qt6-opensource/images/service_egsfusion_1.2.2.bin`
  - `we-wayland-qt6-opensource/images/service_egsfusion_1.2.2.bin.md5`
  - `we-wayland-qt6-opensource/images/update.img`
  - `we-wayland-qt6-opensource/images/update.img.md5`

- Optionally copy the installation packages, which contain 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 EGSFusion target. Replace `<version>` with a custom version string. The file `logo_egsfusion_<variant>.bmp` is the boot logo shown at regular start up, the file `recovery_egsfusion_<variant>.bmp` is the boot logo shown at start of the update RAMDISK, the file `user_egsfusion_<version>.tar.gz` contains the content which is extracted to directory `/opt` on the target. Additional user Tarball archives can be provided optionally, which are extracted to /opt in their numeric order. The files have to be named `user<1-9>_egsfusion_<version>.tar.gz` where `<1-9>` has to be replaced with a number between 1 and 9. The old content on `/opt` will only be deleted, if the `user_egsfusion` package is installed. This method can be used to split the user application into several packages for installation.

  - `logo_egsfusion_*.bmp`
  - `logo_egsfusion_*.bmp.md5`
  - `recovery_egsfusion_*.bmp`
  - `recovery_egsfusion_*.bmp.md5`

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- o user_egsfusion_<version>.tar.gz
- o user_egsfusion_<version>.tar.gz.md5
- o user<1-9>_egsfusion_<version>.tar.gz
- o user<1-9>_egsfusion_<version>.tar.gz.md5

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

4.3 Installation process

To install the operating software on a supported EGSFusion target, please follow these instructions:

- Connect the prepared USB Flash drive to the USB port of the EGSFusion target
- Make sure the EGSFusion target is correctly connected.
- Connect the Serv_EN pin of the main connector to supply voltage to enter the maintenance mode.
- Power on the EGSFusion target.
- The update process will start automatically after entering the maintenance mode. During the update process the display is showing informational messages about the update progress.

Notice
A full installation requires an update of the power management IC firmware image on order to program the comic option bytes.The firmware installation is only completed after a further reboot. The target will mark the update suceeded **before** the required reboot. Do not disconnect to Serv_EN pin until this reboot has completed. During the 2nd installation process after reboot a popup image will be displayed if the option bytes are updated. Now you can disconnect Serv_EN pin. This step is required to ensure the correct power management behavior.

- After successfully installing the files from USB Flash drive, the machine automatically performs a reboot and starts the new comic firmware and the new maintenance mode.
- The update process will start automatically after entering the maintenance mode. During the update process the display is showing informational messages about the update progress.

Notice
USB Flash drive updates rely on the recently installed service kernel. When upgrading from older versions (or Software before EGSFusion), the upgrade image will update the service kernel and the device tree first. During this update, a different screen is shown. This might not be the case on all former versions so the progress bar may simply stay for a few minutes. The Device will reboot automatically and continue installation afterwards.

- Disconnect the Serv_EN pin from power supply after the display shows a message that the option bytes are updated.
- 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 EGSFusion target, both boot logos will be deleted. A reinstallation of these packages is required in this case.

Notice
When a new user application package is installed on the EGSFusion 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 EGSFusion 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 EGSFusion is stable throughout the complete installation process to avoid unwanted resets.

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5 EGSFusion Linux OS release history

5.1 EGSCore COMIC change history

5.1.1 Changes for EGSCore COMIC Firmware 1.0

- No changes here

5.1.2 Changes for EGSCore COMIC Firmware 2.0

- Rework and optimize power management
- Improve device configuration
- Fix missed wake signal, if system is in middle of suspend
- Add system ready/busy flag for write access detection
  - I2C flag for system notification that data is received but not processed.
  - Flag is cleared if data is received. Flag is set if i2c stack data are processed by main function.
- Add suspend hang detection
  - On IMX6S a problem exists, that the system hangs while suspending.
  - To detect the system an additional parameter was added to COMIC interface to inform the COMIC about system suspend.
  - If the sleep command is set in the state change request register.
  - Immediately after this command is set, the core system starts suspending.
  - If the CPU enters the final suspend state the STBY_REQ pin is asserted. The timeout will be stopped and cleared at this moment.
  - If the STBY_REQ pin is not asserted at the moment the timeout is reached, we expect that the system hung up. Now the COMIC has to reset the whole system to leave the fault state.
  - In WEHMD we added EEPROM Value: EE_SUSPEND_CRASH_COUNT.
- Fix bug that system does not boot by adding small hardware monitoring of wake signals
  - If service adapter and debug interface are removed from board the system does not boot anymore.
  - The problem is that the wake signal is enabled and the code continues immediately. So it is possible that the enable signal is not set yet if the enable signal is processed to send the wake event.
  - To solve this problem the system is forced to wait until the wake signals are set to the expected level.
  - Remove unused variable and obsolete event calls for wake on CAN.
- Add event handling for low power state initiated by wake-sources from wepmd to firmware
  - Handling low-power requests completely in wepmd caused a race-condition which can be reached if wake-sources are toggled fast.
  - To solve this race-condition the last part of wake-source handling (low-power state change handling) was completely moved to firmware.
  - Triggering events to wake or low-power the system was completely moved to update_wake_signals routine.

5.1.3 Changes for EGSCore COMIC Firmware 2.1

- LED with a new version as configurable device implemented and can be controlled over WEPMD.
- Fixed issue where changing to On-Mode LED was hard configured on green.

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5.1.4 Changes for EGSCore COMIC Firmware 2.2

- Improve COMIC ready flag handling:
  i. If the ready flag is reset while writing the first data bytes, the function to process the data can be called before all data is received if the data is written on block.
  ii. To solve this problem the Ready flag is reset at the end of a running transmission. This guarantees that every data is processed before the whole data block is received.

- Remove unused state changes to match to WEPMD behavior:
  i. These state changes do not result in any benefit for boot-/wake-time but perhaps in an unexpected behavior from end-user's view
  ii. So this change should be removed again for a clear behavior.

- Fix a bug that KL15 is not always debounced if a hard reset was executed by removing KL30.

- Add PMIC_SR_RDY flag handling to memory access part.

5.1.5 Changes for EGSCore COMIC Firmware 2.3

- Fix wrong initialization of the Button configuration register

5.1.6 Changes for EGSCore COMIC Firmware 2.4

- Fix wrong handling of the event priorities.
- Fix bug that wake signals are not handled correct if API on request command was executed before.

5.1.7 Changes for EGSCore COMIC Firmware 2.5

- Fix hanging system on startup

5.1.8 Changes for EGSCore COMIC Firmware 2.6

- Improve automatic build

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5.2 EGSPro PMIC change history

5.2.1 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.

5.2.2 Changes for EGSPro PMIC Firmware 1.1 (2)

- 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.

5.2.3 Changes for EGSPro PMIC Firmware 1.2 (4)

- 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.

5.2.4 Changes for EGSPro PMIC Firmware 1.3 (3)

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

5.2.5 Changes for EGSPro PMIC Firmware 1.4 (3)

- Rename bootloader file to match release naming convention.

5.2.6 Changes for EGSPro PMIC Firmware 2.0

- Support Display reset and standby via regulator interface
- Support new A6G2 Redesign hardware
- Remove stubs for unsupported wake on can feature

5.2.7 Changes for EGSPro PMIC Firmware 2.1

- Remove debug prints (only kept in debug builds)
- create .hex file with version information

5.3 EGSCore PMIC change history

5.3.1 Changes for EGSCore PMIC Firmware 1.0

- This is an initial PMIC version, which has been properly tested, based on requirements.
- Behavior should be expected as with comic.
- Compare to 2.0 comic version, here we have configurable LED.
- In case of any issues emerging please report.

5.3.2 Changes for EGSCore PMIC Firmware 1.1

- Fix wrong start value of enumeration for chip register value CMC_MODE.
- Clear CAN transceiver status to complete transceiver disable process.
- Fix configuration bug for wake on CAN.

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- Close gap on counting WOC bitrates and compensate it on TJA driver.
- Bugfix wake on CAN configuration restore after reset.
- Fix a bug that KL15 is not always debounced if a hard reset was executed by removing KL30.

5.3.3 Changes for EGSCore PMIC Firmware 1.2

- Remove wrong type conversion for I2C transmit buffer register feed.
- Fix wrong handling of the PMIC_SR_RDY flag.
- Modify pin configuration temporarily to support CAN3 and CAN4 on 10" boards.
- Improve PMIC ready flag handling.
- Update powerdown sequence for 10" boards.
- Remove unused state changes to match to WEPMD behavior.
- Reconfigure wake lines to CPU as open drain.
- Fix small bug in MAKEFILE and change fw version to 0.0 for debug builds.
- Fix bug in powerdown sequence for 5" EF / 7".
- Fix bug in silent wake line handling.
- Add PMIC_SR_RDY flag handling to memory access part.
- Improve and standardize powerdown sequence one step.

5.3.4 Changes for EGSCore PMIC Firmware 1.3

- Fix wrong initialization of the Button configuration register
- Enable some additional print messages to default output
  - To give the possibility to do some basic debug event messages and some irq messages are enabled in the normal build.
  - This is useful for i.e. device reset in lab.
- Add detected HWID to boot string
- Fix wrong pin assignment comment for HWID pins.
- Update power sequencing for 10" proto B.

5.3.5 Changes for EGSCore PMIC Firmware 1.4

- Fix wrong initialization of debug interface pins
- Fix a race condition inside SPI transfer routine which may cause a system crash

5.3.6 Changes for EGSCore PMIC Firmware 1.5

- Fix bug that wake signals are not handled correct if API on request command was executed before.
- Improve accuracy of the ADC values.
- Update files to the new implementation of printf.

5.3.7 Changes for EGSCore PMIC Firmware 1.6

- Increase reset wait delay:
  - Required to avoid system restart in case of hard power-down.
  - Tested with B3 Full AE and B4 Full AE.
- Remove float functionality from printf.
- Add WDT reset to avoid update issues with larger FWs.

5.3.8 Changes for EGSCore PMIC Firmware 1.7

- fix boot timeout counter when boot is interrupted

5.3.9 Changes for EGSCore PMIC Firmware 1.9

- Support B6S Proto A CAN
- Reduce power consumption when device is switched off by better SoC's pin config

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5.3.10 Changes for EGSCore PMIC Firmware 1.10

- Support changing LED-color during startup
- Keep wake config during loss of supply voltage
- Change backup wake source: if no other wake source other than Wake on CAN is set, all are re-activated and wake on CAN will be disabled.
- Preserve Wake on CAN settings on power loss

5.3.11 Changes for EGSCore PMIC Firmware 1.11

- Fix unintended reboot with (unreleased) Firmware 1.10
- Fix LED turning on in silent-wake with (unreleased) Firmware 1.10

5.3.12 Changes for EGSCore PMIC Firmware 1.12

- Support B6S Proto B optimized power management
- support for new Hardware IDs/ Standard variant

5.3.13 Changes for EGSCore PMIC Firmware 1.13

- Support B6S Proto B USB Board (Signal Std enable)
- adjust power sequence to support B3 basic (which now has a pmic, too)
- reduce Flash Size: The firmware is limited in size due to update possibility and Byte addressing. In order to optimize costs, restrict Firmware to the 128k EEPROM version (also runs on 192k chip)

5.4 Linux OS change history

5.4.1 Changes for EGSFusion Linux OS Release 1.0.0

Bootloader

- Add a Secondary Program Loader
  - Autodetection of RAM-Settings by EEPROM-Value
  - Same `.imx` file for all devices
  - Support serial download protocol (SDP) via USB
- Upgrade to U-Boot 2022.07
- Common bootloader binary/ environment for EGSPro and EGSCore devices
  - Device specific names are changed to "EGSFusion"
- Fix issues detecting USB-Storage devices
- Add network support on automotive ethernet devices in u-boot

Root file system

- Add stress-ng package
  - Upgrade to Qt 6.8.3 (opensource) respectively 6.5 (commercial)
  - Use common Filesystem on EGSPro and EGSCore series devices (Config Files are adjusted at first boot after installing root file image)

Kernel

- Upgrade to 6.18
  - introduces new netlink interface
  - introduce Multicolor LEDs
- Support new devices:
  - A6G2
  - B6 Std Proto A
  - B4 Std Proto A
  - B3 Std Proto A
- Add new config `CORE_DUMP_DEFAULT_ELF_HEADERS` for better gdb support

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- Add TUN driver

Update

- Update eMMC Partitioning scheme
- Update gcc/libc version
- Support UUU for installation

Power management

- use new common netlink interface for regulator

Release build

- Add opensource variant due to legal restrictions sharing Qt-headers.

5.4.2 Changes for EGSFusion Linux OS Release 1.1.0

Bootloader

- Allow initializing Display brightness at boot from EEPROM value
- Allow initializing LED color at boot from EEPROM value

Root file system

- Add missing common licenses
- Fix power management configuration so display turns off in low-power mode

Kernel

- Upgrade to 6.18.8 LTS
- Support new touch controller: ili2521

Power management

- fix issues with display not switching off in low power mode

5.4.3 Changes for EGSFusion Linux OS Release 1.1.1

Bootloader

- Fix wrong loops per jiffies (lpj) value. This has an impact on all fixed delays in the kernel. Due to the wrong value delays were much shorter in real time than intended by the code. This had noticeable effects on the flexcan driver. On some units settings for low bitrate (20000 or 50000) returned a timeout error. And the CAN bus was not operating in this case.

Root file system

- None

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Kernel

- None

5.4.4 Changes for EGSFusion Linux OS Release 1.2.0

Root file system

- add NTP daemon (needs to be enabled by user)

Kernel / Botloader

- Add Support for new b3/b4 std devices
- fix bugs in RTC
- fix silent wake mode
- fix standby mode
- disable HS200 mode (leading to system not booting avery ~20th time)
- support new temperature sensor tmp1075

5.4.5 Changes for EGSFusion Linux OS Release 1.2.1

Bootloader

- Fix USB Mode propagation to linux kernel - side USB Socket (or front, where applicable) was set to otg mode, especially during update so Update files on USB Sticks in that port were not found

Root file system

- None

Kernel

- None

5.4.6 Changes for EGSFusion Linux OS Release 1.2.2

Bootloader

- Update RAM configuration for new B3S Devices

Root file system

- None

Kernel

- Fix RTC Driver on new B6S Devices
- Fix Backlight flicker on new B6S Devices
- Add Support for B3/4 eco redesign boards
- Update USB Strength according to Spec

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6 Known issues

- COMIC: When KL15(ignition) is removed during the system boot process, display should stay off. But due to Weston start (part of PClient), display reactivates and stays on until low-power timer runs out.
    - The problem is, if during the system boot the wake signal (Ignition / KL15) is set to low again, the WEPMD initializes itself into the low-power state and deactivates the devices depending on the low-power configuration in the WEPMD. After the initialization, the application comes and starts Weston. A component (not found so far), which is accessed by Weston, switches the display on again and overwrites the WEPMD settings. The display then remains on until it is deactivated again. This is done either manually or by the WEPMD when it goes into a sleep state or again into a low power state.
- Hotplugging external USB cable into side USB port may cause system crash, and can be recovered only with 2 button clicks.
- If the device boots to silent mode, applications running under platform EGLFS will not show display data after system change to power mode on. To workaround this issue please run the application under platform WAYLAND-EGL.
- When one of the CAN ports `can0` or `can1` is configured to listen-only mode it will receive an error frame on the first transmission. After that no error frames will be received. Reason for this behaviour is the CAN port still being in error-active state after being set to listen-only and executing one transmission being necessary for it to it being put to error passive state. Since this is the driver workaround for a hardware quirk it should be considered regular behavior.
- after timeout in silent-on and standby, display turns on briefly before device turns off eventually.

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