

Zweite Generation der Ginzinger Embedded Linux Distribution. Basierend auf Mainline Linux Kernel 5.4. und 5.10 (i.MX8M)

1 Hardware Unterstützung

- NPTL (Native POSIX Thread Library)
- Compiler Optimierung: O2
- Linker Optimierung: hash=both, O1
- Konsole: automatisch (kernel argumente)

i.MX28:

- ARMv5TEJ
- EABI (embedded-application binary interface)
- softfloat

i.MX53:

- ARMv7-A
- EABI (embedded-application binary interface)
- hardfloat: vfpv3/neon (FPU Register)

i.MX6:

- ARMv7-A
- EABI (embedded-application binary interface)
- hardfloat: vfpv3/neon-fp16 (FPU Register)

i.MX6 UltraLite/ULL:

- ARMv7-VE
- EABI (embedded-application binary interface)
- hardfloat: vfpv4/neon (FPU Register)

i.MX8M:

- ARMv8-A
- AArch64 ABI

i586:

- x86 i586

2 Qt Creator

- qt-creator-v8.0.2

- Qt-v5.15.8-lts-lgpl

- Kompatibel: Debian: 10, 11, Ubuntu: 22.04, 23.04 (latest)

3 GINZINGER UPDATE MECHANISMUS

- ge_update_V7.13
- Einfache Erzeugung von Update-Images
- Automatische Erkennung der System-Konfiguration (system-type, ...)
- Patch- oder Full-Updates für Patch-Versions-Nummer
- Konfigurierbare Update-Regeln (down-date, re-date, up-date)

- Zusätzliche Checks
- Automatische Display-Rotation
- Unterstützung für Update von MMC/SD-Karten
- Unterstützung Kernel-Parameter für rootfs-, data- und flag-partition
- Unterstützung rootfs-Filesysteme: squashfs, ubifs, jffs2 auf ubi

- Unterstützung data-Filesysteme: jffs2 und ubifs
- Unterstützung für Update vom internen Flash (Daten Partition)
- Verwendung von squashfs statt cramfs für Update Images auf i.MX6, i.MX6UL und i.MX8
- Unterstützung für Headless Devices (ohne Framebuffer)

4 KERNEL SOURCE

- linux-5.4.236-ge-23.03 ^{1,2,3,4,5}
- linux-5.10.72-imx-ge-22.04 ⁶

5 PROJECT TEMPLATES

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • EMPTY • c • cpp | <ul style="list-style-type: none"> • nodejs ^{2,3,4,6} • qtcore • qtgui | <ul style="list-style-type: none"> • qt-quick ^{3,4,6} • tflite-label-image ^{2,3,4,6} • tflite-python-label-wav ^{2,3,4,6} |
|---|--|--|

6 SOFTWARE PAKETE FÜR GELIN-Projekte

- | | | | |
|---|---|--|--|
| <ul style="list-style-type: none"> • busybox • ca_certs • can_utils • datafs_async • dosfstools • e2fsprogs • firmware_rtl8192cu • firmware_tiwli18xx • fonts_X11 • fonts_base • fonts_dejavu • fonts_liberation • gdbserver • ge_ethmgr • ge_update ^{1,2,3,4,6} • ge_wlanmgr • gpg2 • gpio_tools • gstreamer • gstreamer_bayer2rgbneon ^{2,3,4} | <ul style="list-style-type: none"> • gstreamer_v4l2 • hotplugd • i2c_tools • libgecan_tools • linrpcd2 • mtdutils • mtdutils_test • nodejs ^{2,3,4,6} • python3 ^{2,3,4,6} • qt_common • qt_display_auto • qt_display_common • qt_display_eglfskms ^{3,6} • qt_display_linuxfb • qt_misc • qt_plugins_3d ^{3,6} • qt_plugins_bearer • qt_plugins_canbus • qt_plugins_imageformats • qt_plugins_input_misc | <ul style="list-style-type: none"> • qt_plugins_location • qt_plugins_multimedia • qt_plugins_qmldebug ^{3,4,6} • qt_plugins_sensors • qt_plugins_sql • qt_plugins_webview ^{3,4,6} • qt_qmlmodules_3d ^{3,6} • qt_qmlmodules_bluetooth ^{3,4,6} • qt_qmlmodules_charts ^{3,4,6} • qt_qmlmodules_common ^{3,4,6} • qt_qmlmodules_graphicaleffec ^{3,6} • qt_qmlmodules_location ^{3,4,6} • qt_qmlmodules_multimedia ^{3,6} • qt_qmlmodules_nfc ^{3,4,6} • qt_qmlmodules_qml ^{3,4,6} • qt_qmlmodules_qt_labs ^{3,4,6} • qt_qmlmodules_quick2 ^{3,4,6} • qt_qmlmodules_sensors ^{3,4,6} • qt_qmlmodules_test ^{3,4,6} • qt_qmlmodules_webchannel ^{3,4,6} | <ul style="list-style-type: none"> • qt_qmlmodules_webengine ^{3,4,6} • qt_qmlmodules_webkit ^{3,4,6} • qt_qmlmodules_websockets ^{3,4,6} • qt_qmlmodules_webview ^{3,4,6} • qt_quick ^{3,6} • qt_touchscreen • qt_webengine ^{3,4,6} • rng • rootfs_base • splashscreen • splashscreen_logo • ssh_client • ssh_server • telnet_server • tensorflow_lite ^{2,3,4,6} • tensorflow_lite_cpu ^{2,3,4,6} • tpmtools • tslib • tslib_tools • tslib_uinput |
|---|---|--|--|

- ubiutils
- valgrind_callgrind ^{2,3,4,5,6}

- valgrind_common ^{2,3,4,5,6}
- valgrind_full ^{2,3,4,5,6}

- valgrind_memcheck ^{2,3,4,5,6}
- wlan

- zoneinfo

7 QUELLEN PAKETE

7.1 TOOLCHAIN

- binutils-2.38
- gcc-11.3.0
- gettext-tiny-0.3.2

- glibc-2.36-81-g4f4d7a13edfd2fd ^{2,3,4,5,6}
- gmp-6.2.1

- isl-0.25
- linux-5.4.233
- mpc-1.2.1

- mpfr-4.1.1
- ncurses-6.3-20221224

7.2 BUILDROOT

- acl-2.3.1
- alsa-lib-1.2.8
- alsa-utils-1.2.8
- at-3.2.5
- attr-2.5.1
- aumix-2.9.1
- autoconf-2.71
- autoconf-archive-2022.09.03
- automake-1.16.5
- avahi-0.8
- bayer2rgb-neon-15feb1115b48284 ^{2,3,4,6}
- berkeleydb-5.3.28
- binutils-2.38
- bison-3.8.2
- bluez5_utils-5.65
- bluez5_utils-headers-5.65
- boost-1.80.0
- brotli-1.0.9
- bubblewrap-0.7.0

- busybox-1.36.0
- bzip2-1.0.8
- c-ares-1.19.0
- ca-certificates-20230311
- cairo-1.16.0
- can-utils-2021.08.0
- cifs-utils-6.15
- cmake-3.22.3
- cramfs-2.1
- crda-4.15
- cryptsetup-2.6.1
- cyrus-sasl-2.1.28
- dbus-1.12.24
- dbus-glib-0.112
- dbus-triggerd-ba3dbec805cb707c ^{2,3,4,6}
- dejavu-2.37
- dhystone-2
- dnsmasq-2.89
- dosfstools-4.2

- dtc-1.6.1
- e2fsprogs-1.46.5
- elfutils-0.186
- ethtool-6.1
- evemu-2.7.0
- evtest-1.35
- expat-2.5.0
- faad2-2.10.1
- fakeroot-1.30.1
- fbdump-0.4.2
- fbgrab-1.5
- fcgiwrap-99c942c90063c73734e56 ^{2,3,4,6}
- ffmpeg-4.4.3
- fftw-double-3.3.8
- firmware-imx-8.15 ⁶
- flac-1.4.2
- flatbuffers-2.0.0 ^{1,2,3,4,6}
- flex-2.6.4
- fontconfig-2.13.1

- freetype-2.12.1
- gawk-5.2.0
- gcc-final-11.3.0
- gcc-initial-11.3.0
- gcc-runtime-11.3.0
- gdb-10.2
- genext2fs-1.5.0
- gengetopt-2.23 ^{2,3,4,6}
- gettext-tiny-0.3.2
- glib-networking-2.70.1
- glibc-2.36-81-g4f4d7a13edfd2fd ^{1,2,3,4,6}
- glibmm-2.68.2
- glmark2-06e78b67702b5413335ecd ³
- gmp-6.2.1
- gnupg-2.2.4.0
- gnutils-3.7.8
- gperf-3.1
- gst1-libav-1.22.0

- gst1-plugins-bad-1.22.0
- gst1-plugins-base-1.22.0
- gst1-plugins-bayer2rgb-neon-b6^{2,3,4,6}
- gst1-plugins-good-1.22.0
- gst1-plugins-ugly-1.22.0
- gstreamer1-1.22.0
- gzip-1.12
- harfbuzz-5.3.1
- hostapd-2.10
- hotplugd-14993
- htop-3.2.1
- i2c-tools-4.3
- icu-70-1
- ifplugd-0.28
- imagemagick-7.1.0-51
- imx-gpu-viv-6.4.3.p2.4-aarch64⁶
- imx-mkimagetf-5.10.72_2.2.0⁶
- inotify-tools-3.20.2.2
- input-event-daemon-0.1.3
- intltool-0.51.0
- iperf3-3.1.2
- iproute2-6.1.0
- iptables-1.8.9
- isl-0.25
- iw-5.19
- jasper-2.0.33
- jmtcl-0.81
- jitterentropy-library-3.4.1
- jpeg-turbo-2.1.4
- jq-a17dd3248a666d01be75f6b16be⁶

- json-c-0.16
- kbd-2.5.1
- kmod-30
- lame-3.100
- lapack-3.10.1^{1,2,3,4,6}
- latencytop-0.5
- ldd-crosstool-ng-1.24.0
- leveldb-1.23
- libaio-0.3.113
- libao-1.2.0
- libargon2-20190702
- libassuan-2.5.5
- libatomic_ops-7.6.14
- libbsd-0.11.3
- libcap-2.65
- libcurl-7.88.1
- libdaemon-0.14
- libdrm-2.4.115
- libepoxy-1.5.10
- liberation-2.1.5
- libestr-0.1.11
- libevdev-1.12.1
- libevent-2.1.12
- libfastjson-0.99.9
- libfcgi-2.4.2
- libffi-3.4.4
- libftdi-0.20
- libgcrypt-1.10.1
- libgecan-1529
- libglib2-2.72.3
- libglu-9.0.2³

- libgpg-error-1.46
- libgpiod-1.6.3
- libhid-0.2.16
- libhttpparser-2.9.4
- libiberty-2.32
- libical-1.0.1
- libjpeg-9e^{3,4,6}
- libkrb5-1.20.1
- libksba-1.6.3
- liblog4c-localtime-1.0
- liblogging-1.0.6
- libmd-1.0.4
- libmicrohttpd-0.9.76
- libmms-0.6.4
- libmnl-1.0.5
- libmodbus-3.1.8
- libmpeg2-0.5.1
- libnftnl-1.2.3
- libnft-3.7.0
- libnPTH-1.6
- libnspr-4.35^{3,4,6}
- libnss-3.88.1^{3,4,6}
- libogg-1.3.5
- libopenh264-2.3.1
- libopenssl-1.1.1t
- libpcap-1.10.3
- libpng-1.6.39
- libpsl-0.21.2
- libpthread-stubs-0.4
- libqrencode-4.1.1
- libseccomp-2.5.4

- libsigc-3.4.0
- libsndfile-1.2.0
- libsocketcan-0.0.12
- libsoup-2.74.2
- libssh2-1.10.0
- libsysfs-2.1.1
- libtasn1-4.19.0
- libtheora-1.1.1
- libtirpc-1.3.3
- libtool-2.4.6
- libuboot-ge-env-15951
- libunistring-1.1
- liburcu-0.13.2
- liburiparser-0.9.7
- libusb-1.0.26
- libusb-compat-0.1.7
- libuv-1.44.2
- libv4l-1.22.1
- libvncserver-0.9.14
- libvorbis-1.3.7
- libvpx-1.12.0
- libwebsockets-4.3.2
- libwpe-1.14.0
- libxcb-1.15
- libxkbcommon-1.4.0
- libxml-parser-perl-2.46
- libxml2-2.10.3
- libxslt-1.1.37
- libzip-1.9.2
- libzlib-1.2.13
- linrpcd-2-16522

- linux-headers-5.10.170⁶
- linux-headers-5.4.233^{1,2,3,4,5}
- linux-zigbee-0.3.1
- linuxconsoletools-1.8.1
- live555-2021.05.03
- log4cplus-2.1.0
- logrotate-3.20.1
- lrzsz-0.12.20
- ltrace-82c66409c7a93ca6ad2e456^{1,2,3,4,5}
- lttng-libust-2.12.0
- lvm2-2.03.14
- lz4-1.9.4
- lzip-1.23
- lzo-2.10
- lzop-1.03
- m4-1.4.19
- matchbox-1.2
- matchbox-common-0.9.1
- matchbox-desktop-0.9.1
- matchbox-fakekey-0.3
- matchbox-keyboard-0.1.1
- matchbox-lib-1.12
- matchbox-panel-0.9.3
- mdadm-4.2
- memstat-1.0
- memtester-4.5.1
- mesa3d-22.3.4^{1,2,3,4,5}
- meson-1.0.0
- mmc-utils-dfc3b6ecda84d21418fb^{1,2,3,4,5}
- mosquito-2.0.15
- mpc-1.2.1
- mpfr-4.1.1
- mpg123-1.25.15
- mtd-2.1.5
- mtdev-1.1.6
- mx+app-15949
- nano-7.2
- nasm-2.16.01⁵
- ncurses-6.3-20221224
- ne10-1.2.1^{2,3,4}
- neard-0.18
- netcat-openbsd-1.218
- netsnmp-5.9.3
- nettle-3.8.1
- nfs-utils-2.6.2
- nftables-1.0.5
- nghttp2-1.41.0^{2,3,4,6}
- nginx-1.22.1
- ninja-1.11.1.g95dee.kitware.jp^{1,2,3,4,5}
- nodejs-16.18.1^{2,3,4,6}
- ntp-4.2.8p15
- numactl-2.0.16^{5,6}
- oniguruma-6.9.8
- openblas-0.3.21^{1,2,3,4,6}
- opencv3-3.4.19
- openjpeg-2.5.0
- openldap-2.4.59
- openobex-1.7.2
- openssh-9.3p1
- openvpn-2.5.7
- oprofile-1.4.0
- opus-1.3.1^{3,4,6}
- p11-kit-0.24.1
- patchelf-0.13
- pcre-8.45
- pcre2-10.42
- perl-5.36.0
- php-8.2.3
- pixman-0.42.2
- pkgconf-1.6.3
- popt-1.19
- pppd-2.4.9
- pptp-linux-1.10.0
- protobuf-21.12
- pwgen-2.08
- python-attrs-22.2.0^{1,2,3,4,6}
- python-beniget-0.4.1^{1,2,3,4,6}
- python-cython-0.29.33^{1,2,3,4,6}
- python-dateutil-2.8.2^{1,2,3,4,6}
- python-editables-0.3^{1,2,3,4,6}
- python-flit-core-3.8.0^{1,2,3,4,6}
- python-gast-0.5.3^{1,2,3,4,6}
- python-hatch-vcs-0.3.0^{1,2,3,4,6}
- python-hatchling-1.12.2^{1,2,3,4,6}
- python-iniconfig-2.0.0^{1,2,3,4,6}
- python-installer-0.6.0^{1,2,3,4,6}
- python-mako-1.2.4^{1,2,3,4,5}
- python-markupsafe-2.1.1^{1,2,3,4,5}
- python-numpy-1.23.5^{1,2,3,4,6}
- python-packaging-22.0^{1,2,3,4,6}
- python-pandas-v1.4.1^{1,2,3,4,6}
- python-paths-0.10.3^{1,2,3,4,6}
- python-pep517-0.13.0^{1,2,3,4,6}
- python-pillow-9.4.0^{1,2,3,4,6}
- python-pip-22.3.1^{1,2,3,4,6}
- python-pluggy-1.0.0^{1,2,3,4,6}
- python-ply-3.11^{1,2,3,4,6}
- python-py-1.11.0^{1,2,3,4,6}
- python-pybind-2.10.3^{1,2,3,4,6}
- python-pycryptodomex-3.16.0
- python-pypa-build-0.9.0^{1,2,3,4,6}
- python-pyparsing-3.0.9^{1,2,3,4,6}
- python-pytest-7.2.0^{1,2,3,4,6}
- python-pythran-0.12.0^{1,2,3,4,6}
- python-pytz-2022.7^{1,2,3,4,6}
- python-scipy-1.8.1^{1,2,3,4,6}
- python-setuptools-65.6.3
- python-setuptools-scm-7.1.0^{1,2,3,4,6}
- python-six-1.16.0^{1,2,3,4,6}
- python-toml-0.10.2^{1,2,3,4,6}
- python-typing-extensions-4.4.0^{1,2,3,4,6}
- python-wheel-0.37.1^{1,2,3,4,6}
- python3-3.11.2
- qemu-7.2.0^{2,3,4,6}
- qjson-0.9.0
- qt53d-5fd3906445ac95bf1cca6e7a^{3,6}
- qt5base-2ffb7ad8a1079a0444b9c7^{3,6}
- qt5charts-16c2a8821135bf89369c^{3,6}
- qt5connectivity-c5f35f89e975c2^{3,6}
- qt5declarative-51efb2ed2f071be^{3,6}

- qt5graphicaleffects-4c6ec38635 ^{3,6}
- qt5imageformats-b43e31b9f31ec4 ^{3,6}
- qt5location-db3b6bc6afed6477e6 ^{3,6}
- qt5multimedia-dc0ee181d4c56ff6 ^{3,6}
- qt5quickcontrols-d405bf6a29bc9 ^{3,4,6}
- qt5quickcontrols2-0d3d39e821ea ^{3,4,6}
- qt5script-5cec94b2c1503f106f4e ^{3,4,6}
- qt5sensors-1ab8d6c7257f9ec0607 ^{3,4,6}
- qt5serialbus-e34053fbda8d687e3 ^{3,4,6}
- qt5serialport-191e67e428522a0e ^{3,4,6}
- qt5svg-23b8cf7d833c335d7735855 ^{3,4,6}
- qt5webchannel-8c842152da613f94 ^{3,4,6}
- qt5webengine-5.15.2 ^{3,4,6}
- qt5webkit-5.212.0-alpha4
- qt5websockets-6a4991250793cd38 ^{3,4,6}
- qt5webview-826d2a33929c6980791 ^{3,4,6}
- qt5xmlpatterns-dfcae10dec8c1c2 ^{3,4,6}
- quazip-1.3
- qwt-6.1.6
- readline-8.2
- rng-tools-6.16
- rp-pppoe-3.15
- rpcbind-1.2.6
- rsync-3.2.7
- rsyslog-8.2204.1
- rt-tests-2.4 ^{5,6}
- ruby-3.1.3
- sdl-1.2.15
- sdl2-2.26.3
- sdl_mixer-d1725fcb7c4e987aeb7 ^{3,4,6}
- sdl_net-620b0ba7dd84a0fdbd4cc ^{3,4,6}
- slirp-4.7.0 ^{2,3,4,6}
- snappy-1.1.9
- socat-1.7.4.4
- softether-4.30-9700-beta
- spawn-fcgi-1.6.4
- spidev_test-4.10 ^{1,2,3,4,5}
- spidev_test-5.8 ⁶
- splashscreen-14997
- sqlite-3.40.1
- squashfs-4.5.1
- sshpass-1.09
- strace-6.1
- sudo-1.9.13p3
- swig-4.1.1 ^{1,2,3,4,6}
- sysstat-12.6.1
- tar-1.34
- tcpdump-4.99.3
- tensorflow-lite-v2.8.0 ^{2,3,4,6}
- fflite-abseil-cpp-997aaf3a2830 ^{1,2,3,4,6}
- fflite-clog-d5e37adf1406 ^{1,2,3,4,6}
- fflite-cpuinfo-5916273f79a2 ^{1,2,3,4,6}
- fflite-eigen-085c2fc5d53f ^{1,2,3,4,6}
- fflite-farmhash-0d859a811870 ^{1,2,3,4,6}
- fflite-fft2d-1.0 ^{1,2,3,4,6}
- fflite-flatbuffers-v1.12.0 ^{1,2,3,4,6}
- fflite-gemmlowp-fda83bdc38b1 ^{1,2,3,4,6}
- fflite-ruy-e6c1b8dc8a8b ^{1,2,3,4,6}
- tiff-4.5.0
- tim-vx-19e4e86651109966d519187 ⁶
- tmux-3.3a
- tpm2-tools-5.2
- tpm2-tss-3.1.0
- tpm2-tss-engine-1.1.0
- trace-cmd-2.9.7
- tremor-7c30a66346199f3f09017a0 ⁶
- tslib-1.22
- tzdata-2022f
- ubiexecdump-13895
- uboot-tools-2021.07
- unzip-6.0
- usb_modeswitch-2.6.1
- util-linux-2.38
- valgrind-3.19.0 ^{2,3,4,5,6}
- vorbis-tools-1.4.2
- vx-delegate-07bb4353ba6b0275c5 ⁶
- waf-2.0.24 ³
- wavpack-5.5.0
- wayland-1.21.0
- wayland-protocols-1.31
- webp-1.2.4
- wget-1.21.3
- whetstone-1.2
- wireless-regdb-2023.02.13
- wireless_tools-30.pre9
- wlansimplescan-r274
- woff2-1.0.2
- wpa_supplicant-2.10
- wpbackend-fdo-1.14.1
- wpewebkit-2.38.5
- x11vnc-0.9.16
- xapp_bdfptopf-1.1.1
- xapp_mkfontscale-1.2.2
- xapp_xauth-1.1.2
- xapp_xbacklight-1.2.3
- xapp_xev-1.2.5
- xapp_xeyes-1.2.0
- xapp_xhost-1.0.9
- xapp_xinput-1.6.3
- xapp_xkbcomp-1.4.6
- xapp_xkbved-1.1.5
- xapp_xkbprint-1.0.6
- xapp_xlogo-1.0.6
- xapp_xmessage-1.0.6
- xapp_xmodmap-1.0.11
- xapp_xset-1.2.5
- xapp_xsetmode-1.0.0
- xapp_xsetpointer-1.0.1
- xapp_xsetroot-1.1.3
- xcb-proto-1.15.2
- xcb-util-0.4.1
- xcb-util-image-0.4.1
- xcb-util-wm-0.4.2
- xdata_xbitmaps-1.1.2
- xdg-dbus-proxy-0.1.4
- xfont_encodings-1.0.6
- xfont_fontalias-1.0.4
- xfont_font-cursor-misc-1.0.3
- xfont_font-misc-misc-1.1.2

- xfont_fontutil-1.3.3
- xkeyboard-config-2.37
- xlib_libICE-1.1.1
- xlib_libSM-1.2.4
- xlib_libX11-1.8.4
- xlib_libXScrnSaver-1.2.4
- xlib_libXau-1.0.11
- xlib_libXaw-1.0.14
- xlib_libXcomposite-0.4.6
- xlib_libXcursor-1.2.1
- xlib_libXdamage-1.1.6

- xlib_libXdmpc-1.1.4
- xlib_libXext-1.3.5
- xlib_libXfixes-6.0.0
- xlib_libXfont-1.5.4
- xlib_libXfont2-2.0.6
- xlib_libXft-2.3.7
- xlib_libXi-1.8
- xlib_libXinerama-1.1.5
- xlib_libXmu-1.1.4
- xlib_libXpm-3.5.15
- xlib_libXrandr-1.5.3

- xlib_libXrender-0.9.11
- xlib_libXres-1.2.2
- xlib_libXt-1.2.1
- xlib_libXtst-1.2.4
- xlib_libXv-1.0.12
- xlib_libXxf86vm-1.1.5
- xlib_libfontenc-1.1.7
- xlib_libxcvt-0.1.2⁴
- xlib_libxkbfile-1.1.2
- xlib_libxshmfence-1.3.2^{3,6}
- xlib_xtrans-1.4.0

- xmlstarlet-1.6.1
- xorgproto-2022.2
- xterm-376
- xutil_util-macros-1.20.0
- xvkbd-4.1
- xz-5.2.10
- zic-2022f
- zip-3.0
- zstd-1.5.2