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-v7.0.2

- Qt-6c72c262f38faca7f5b36f34a9768098c307f601

- Kompatibel: Debian: 10, 11, Ubuntu: 21.10, 22.04 (latest)

## 3 GINZINGER UPDATE MECHANISMUS

- ge_update_V7.12
- 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)

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## 4 KERNEL SOURCE

- linux-5.4.188-ge-22.04 [1,2,3,4,5]
- linux-5.10.72-imx-ge-22.04 [6]

## 5 PROJECT TEMPLATES

- c
- cpp
- EMPTY

- nodejs [2,3,4,6]
- qt-core
- qt-gui

- 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

- busybox
- ca_certs
- can_utils
- datafs_async
- dosfstools
- e2fsprogs
- firmware_rtl8192cu
- firmware_tiwl18xx
- fonts_base
- fonts_dejavu
- fonts_liberation
- fonts_X11
- gdbserver
- ge_ethmgr
- ge_update [1,2,3,4,6]
- ge_wlanmgr
- gpio_tools
- gstreamer
- gstreamer_bayer2rgbneon [2,3,4]
- 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
- 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]
- 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_cpu [2,3,4,6]
- tensorflow_lite [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

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electronic systems

## 7 QUELLEN PAKETE

### 7.1 TOOLCHAIN

- binutils-2.36.1
- gcc-10.4.0
- gettext-tiny-0.3.2

- glibc-2.34-109-gd64b08d5ba7ffb [2,3,4,5,6]
- gmp-6.2.1

- isl-0.23
- linux-5.4.188
- mpc-1.2.1

- mpfr-4.1.0

- ncurses-6.1

### 7.2 BUILDROOT

- acl-2.3.1
- alsa-lib-1.2.6.1
- alsa-utils-1.2.6
- at-3.2.4
- attr-2.5.1
- aumix-2.9.1
- autoconf-2.71
- autoconf-archive-2021.02.19
- automake-1.16.5
- avahi-0.8
- bayer2rgb-neon-15feb1115b48284 [2,3,4,6]
- berkeleydb-5.3.28
- binutils-2.36.1
- bison-3.8.2
- bluez5_utils-5.63
- bluez5_utils-headers-5.63
- boost-1.78.0
- brotli-1.0.9
- bubblewrap-0.5.0
- buildroot-2022.02.6
- busybox-1.35.0
- bzip2-1.0.8

- ca-certificates-20211016
- cairo-1.16.0
- can-utils-2021.08.0
- c-ares-1.18.1
- cifs-utils-6.15
- cmake-3.16.9
- cramfs-2.1
- crda-4.14
- cryptsetup-2.4.3
- cyrus-sasl-2.1.28
- dbus-1.12.22
- dbus-glib-0.112
- dbus-triggerd-ba3dbec805cb707c [2,3,4,6]
- dejavu-2.37
- dhrystone-2
- dnsmasq-2.86
- dosfstools-4.2
- dtc-1.6.1
- e2fsprogs-1.46.5
- elfutils-0.186
- ethtool-5.15
- evemu-2.7.0

- evtest-1.34
- expat-2.4.8
- faad2-2.10.0
- fakeroot-1.26
- fbdump-0.4.2
- fbgrab-1.5
- fcgiwrap-99c942c90063c73734e56 [2,3,4,6]
- ffmpeg-4.4.2
- fftw-double-3.3.8
- firmware-imx-8.12 [6]
- flac-1.3.4
- flatbuffers-2.0.0 [1,2,3,4,6]
- flex-2.6.4
- fontconfig-2.13.1
- freetype-2.11.1
- gawk-5.1.1
- gcc-final-10.4.0
- gcc-initial-10.4.0
- gcc-runtime-10.4.0
- gdb-10.2
- genext2fs-1.5.0
- gengetopt-2.23 [2,3,4,6]

- gettext-tiny-0.3.2
- glibc-2.34-109-gd64b08d5ba7ffb [1,2,3,4,6]
- glibmm-2.68.2
- glib-networking-2.70.1
- glmark2-06e78b67702b5413335ecd [3]
- gmp-6.2.1
- gnupg-1.4.23
- gnutls-3.7.7
- gperf-3.1
- gst1-libav-1.20.3
- gst1-plugins-bad-1.20.3
- gst1-plugins-base-1.20.3
- gst1-plugins-bayer2rgb-neon-b6 [2,3,4,6]
- gst1-plugins-good-1.20.3
- gst1-plugins-ugly-1.20.3
- gstreamer1-1.20.3
- gzip-1.12
- harfbuzz-3.3.2
- hostapd-2.10
- hotplugd-14993
- htop-3.1.2

- i2c-tools-4.3
- icu-70-1
- ifplugd-0.28
- imagemagick-7.1.0-45
- imx-gpu-viv-6.4.3.p2.4-aarch64 [6]
- imx-mkimage-rel_imx_5.4.70_ [6]
- imx-vpu-hantro-1.22.0 [6]
- imx-vpu-hantro-vc-1.4.0 [6]
- inotify-tools-3.20.2.2
- input-event-daemon-0.1.3
- intltool-0.51.0
- iperf3-3.10.1
- iproute2-5.16.0
- iptables-1.8.7
- isl-0.23
- iw-5.16
- jasper-2.0.33
- jimtcl-0.81
- jitterentropy-library-3.3.1
- jpeg-turbo-2.1.2
- jq-a17dd3248a666d01be75f6b16be [6]
- json-c-0.15
- kbd-2.4.0
- kmod-29
- lame-3.100
- lapack-3.10.0 [1,2,3,4,6]
- latencytop-0.5
- ldd-crosstool-ng-1.24.0
- leveldb-1.23
- libaio-0.3.112

- libao-1.2.0
- libargon2-20190702
- libatomic_ops-7.6.12
- libbsd-0.11.3
- libcap-2.62
- libcurl-7.84.0
- libdaemon-0.14
- libdrm-2.4.109
- libepoxy-1.5.9
- 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-3.4.2
- libftdi-0.20
- libgcrypt-1.9.4
- libgecan-1529
- libglib2-2.70.4
- libglu-9.0.2 [3]
- libgpg-error-1.42
- libgpiod-1.6.3
- libhid-0.2.16
- libhttpparser-2.9.4
- libiberty-2.32
- libical-1.0.1
- libjpeg-9e [3,4,6]
- libkrb5-1.18.4
- liblog4c-localtime-1.0
- liblogging-1.0.6

- libmd-1.0.4
- libmicrohttpd-0.9.75
- libmms-0.6.4
- libmnl-1.0.5
- libmodbus-3.1.7
- libmpeg2-0.5.1
- libnftnl-1.2.1
- libnl-3.5.0
- libnspr-4.33 [3,4,6]
- libnss-3.75 [3,4,6]
- libogg-1.3.5
- libopenh264-2.2.0
- libopenssl-1.1.1q
- libpcap-1.10.1
- libpng-1.6.37
- libpsl-0.21.1
- libpthread-stubs-0.4
- libqrencode-4.1.1
- libseccomp-2.5.3
- libsigc-3.0.7
- libsndfile-1.1.0
- libsocketcan-0.0.12
- libsoup-2.74.0
- libssh2-1.10.0
- libsysfs-2.1.1
- libtasn1-4.18.0
- libtheora-1.1.1
- libtirpc-1.3.3
- libtool-2.4.6
- libuboot-ge-env-15951
- libunistring-1.0

- liburcu-0.13.1
- liburiparser-0.9.6
- libusb-1.0.25
- libusb-compat-0.1.7
- libuv-1.42.0
- libv4l-1.22.1
- libvncserver-0.9.13
- libvorbis-1.3.7
- libvpx-1.11.0
- libwebsockets-4.0.21
- libwpe-1.12.3
- libxcb-1.14
- libxkbcommon-1.3.1
- libxml2-2.10.2
- libxml-parser-perl-2.46
- libxslt-1.1.35
- libzip-1.8.0
- libzlib-1.2.12
- linrpcd2-16362
- linux-5.4.188 [1,2,3,4,5]
- linuxconsoletools-1.7.1
- linux-headers-5.4.188 [1,2,3,4,5]
- linux-headers-linux-5.10.72-im [6]
- linux-linux-5.10.72-imx [6]
- linux-zigbee-0.3.1
- live555-2021.05.03
- log4cplus-2.0.7
- logrotate-3.20.1
- lrzsz-0.12.20
- ltrace-82c66409c7a93ca6ad2e456 [6]
- lttng-libust-2.12.0

**GINZINGER**
electronic systems

- lvm2-2.03.14
- lz4-1.9.3
- 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
- matchbox-lib-1.12
- matchbox-panel-0.9.3
- mdadm-4.2
- memstat-1.0
- memtester-4.5.0
- mesa3d-21.3.5 [1,2,3,4,5]
- meson-0.61.4
- mmc-utils-d40ec535b9d4e4c974e8 [6]
- mosquitto-2.0.15
- mpc-1.2.1
- mpfr-4.1.0
- mpg123-1.25.15
- mtd-2.1.3
- mtdev-1.1.6
- mxt-app-15949
- nano-6.0
- nasm-2.15.05 [5]
- ncurses-6.1
- ne10-1.2.1 [2,3,4]
- neard-0.18

- netcat-openbsd-1.218
- netsnmp-5.9
- nettle-3.7.3
- nfs-utils-2.6.1
- nftables-1.0.1
- nghttp2-1.41.0 [2,3,4,6]
- nginx-1.20.1
- ninja-1.10.2
- nodejs-14.20.0 [2,3,4,6]
- ntp-4.2.8p15
- numactl-2.0.14 [5,6]
- oniguruma-6.9.7.1
- openblas-0.3.18 [1,2,3,4,6]
- opencv3-3.4.17
- openjpeg-2.5.0
- openldap-2.4.59
- openobex-1.7.2
- openssh-8.9p1
- openvpn-2.5.6
- oprofile-1.4.0
- opus-1.3.1 [3,4,6]
- p11-kit-0.24.1
- patchelf-0.9
- pcre2-10.40
- pcre-8.45
- perl-5.34.1
- php-8.0.20
- pixman-0.40.0
- pkgconf-1.6.3
- popt-1.18
- pppd-2.4.9

- pptp-linux-1.10.0
- protobuf-3.19.1
- pwgen-2.08
- python3-3.10.7
- python-attrs-21.4.0 [1,2,3,4,6]
- python-beniget-0.4.1 [1,2,3,4,6]
- python-cython-0.29.27 [1,2,3,4,6]
- python-dateutil-2.8.2 [1,2,3,4,6]
- python-gast-0.5.3 [1,2,3,4,6]
- python-iniconfig-1.1.1 [1,2,3,4,6]
- python-mako-1.1.5 [1,2,3,4,5]
- python-markupsafe-2.0.1 [1,2,3,4,5]
- python-numpy-1.21.2 [1,2,3,4,6]
- python-packaging-21.3 [1,2,3,4,6]
- python-pandas-v1.4.1 [1,2,3,4,6]
- python-pillow-9.1.1 [1,2,3,4,6]
- python-pip-21.2.4 [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-1.10.0 [1,2,3,4,6]
- python-pybind-2.9.0 [1,2,3,4,6]
- python-pycryptodomex-3.14.0
- python-pyparsing-3.0.7 [1,2,3,4,6]
- python-pytest-6.2.5 [1,2,3,4,6]
- python-pythran-0.11.0 [1,2,3,4,6]
- python-pytz-2021.3 [1,2,3,4,6]
- python-scipy-1.7.3 [1,2,3,4,6]
- python-setuptools-60.7.0
- python-setuptools-scm-6.4.2 [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-tomli-1.2.0 [1,2,3,4,6]
- python-wheel-0.37.1 [1,2,3,4,6]
- qemu-6.2.0 [2,3,4,6]
- qjson-0.9.0
- qt53d-dba14d48611b9e9d59576172 [3,6]
- qt5base-f31e001a9399e4e620847e [3,6]
- qt5charts-130463160b4923069eb9 [3,6]
- qt5connectivity-5e9ca5d36d65da [3,6]
- qt5declarative-9349f3975d26632 [3,6]
- qt5graphicaleffects-c36998dc15 [3,6]
- qt5imageformats-cb82c74310837f [3,6]
- qt5location-861e372b6ad81570d4 [3,6]
- qt5multimedia-bd29c87027637a01 [3,6]
- qt5quickcontrols2-d8d6b14b9907 [3,4,6]
- qt5quickcontrols-cf3f6d7fec824 [3,4,6]
- qt5script-5be95f966aabc5170f0a [3,4,6]
- qt5sensors-921a31375f29e429e95 [3,4,6]
- qt5serialbus-8884c5e43df846dea [3,4,6]
- qt5serialport-941d1d8560d1f3e4 [3,4,6]
- qt5svg-728012f7762ecd5762d493f [3,4,6]
- qt5webchannel-fa8b07105b5e274d [3,4,6]
- qt5webengine-5.15.2 [3,4,6]
- qt5webkit-5.212.0-alpha4
- qt5websockets-b13b56904b76e96e [3,4,6]

1=I.MX28 | 2=I.MX53 | 3=I.MX6 | 4=I.MX6UL | 5=I586 | 6=I.MX8M

GINZINGER
electronic systems

- qt5webview-920de5f1cd9f9001cfe [3,4,6]
- qt5xmlpatterns-189e28d0aff1f3d [3,4,6]
- quazip-1.1
- qwt-6.1.6
- readline-8.1.2
- rng-tools-6.14
- rpcbind-1.2.6
- rp-pppoe-3.15
- rsync-3.2.5
- rsyslog-8.2204.1
- rt-tests-2.3 [5,6]
- ruby-3.1.2
- sdl-1.2.15
- sdl2-2.0.20
- sdl_mixer-d1725fcb7c4e987aeb7 [3,4,6]
- sdl_net-620b0ba7dd84a0fdbd4cc [3,4,6]
- snappy-1.1.9
- socat-1.7.4.3
- softether-4.30-9700-beta
- spawn-fcgi-1.6.4
- spidev_test-4.10
- splashscreen-14997
- sqlite-3.39.2
- squashfs-4.5
- sshpass-1.09
- strace-5.16
- swig-4.0.2 [1,2,3,4,6]
- sysstat-12.4.2
- tar-1.34
- tcpdump-4.99.1

- tensorflow-lite-v2.8.0 [2,3,4,6]
- tflite-abseil-cpp-997aaf3a2830 [1,2,3,4,6]
- tflite-clog-d5e37adf1406 [1,2,3,4,6]
- tflite-cpuinfo-5916273f79a2 [1,2,3,4,6]
- tflite-eigen-085c2fc5d53f [1,2,3,4,6]
- tflite-farmhash-0d859a811870 [1,2,3,4,6]
- tflite-fft2d-1.0 [1,2,3,4,6]
- tflite-flatbuffers-v1.12.0 [1,2,3,4,6]
- tflite-gemmlowp-fda83bdc38b1 [1,2,3,4,6]
- tflite-ruy-e6c1b8dc8a8b [1,2,3,4,6]
- tiff-4.4.0
- tim-vx-19e4e86651109966d519187 [6]
- tmux-3.1c
- tpm2-tools-5.2
- tpm2-tss-3.1.0
- tpm2-tss-engine-1.1.0
- trace-cmd-2.9.6
- tremor-7c30a66346199f3f09017a0 [6]
- tslib-1.22
- tzdata-2021e
- ubiecdump-13895
- uboot-tools-2021.07
- unzip-6.0
- usb_modeswitch-2.6.1
- util-linux-2.37.4
- valgrind-3.18.1 [2,3,4,5,6]
- vorbis-tools-1.4.2
- vx-delegate-07bb4353ba6b0275c5 [6]
- wavpack-5.5.0
- wayland-1.19.0

- wayland-protocols-1.25
- webp-1.2.1
- wget-1.21.3
- whetstone-1.2
- wireless-regdb-2022.02.18
- wireless_tools-30.pre9
- wlansimplescan-r274
- woff2-1.0.2
- wpa_supplicant-2.10
- wpebackend-fdo-1.12.0
- wpewebkit-2.36.7
- x11vnc-0.9.16
- xapp_bdftopcf-1.1
- xapp_mkfontscale-1.2.1
- xapp_xauth-1.1.1
- xapp_xbacklight-1.2.3
- xapp_xev-1.2.4
- xapp_xeyes-1.2.0
- xapp_xhost-1.0.8
- xapp_xinput-1.6.3
- xapp_xkbcomp-1.4.5
- xapp_xkbevd-1.1.4
- xapp_xkbprint-1.0.5
- xapp_xlogo-1.0.5
- xapp_xmessage-1.0.5
- xapp_xmodmap-1.0.10
- xapp_xset-1.2.4
- xapp_xsetmode-1.0.0
- xapp_xsetpointer-1.0.1
- xapp_xsetroot-1.1.2
- xcb-proto-1.14.1

- xcb-util-0.4.0
- xcb-util-image-0.4.0
- xcb-util-wm-0.4.1
- xdata_xbitmaps-1.1.2
- xdg-dbus-proxy-0.1.4
- xfont_encodings-1.0.5
- xfont_font-alias-1.0.4
- xfont_font-cursor-misc-1.0.3
- xfont_font-misc-misc-1.1.2
- xfont_font-util-1.3.2
- xkeyboard-config-2.34
- xlib_libfontenc-1.1.4
- xlib_libICE-1.0.10
- xlib_libSM-1.2.3
- xlib_libX11-1.7.3.1
- xlib_libXau-1.0.9
- xlib_libXaw-1.0.14
- xlib_libXcomposite-0.4.5
- xlib_libXcursor-1.2.0
- xlib_libxcvt-0.1.1 [4]
- xlib_libXdamage-1.1.5
- xlib_libXdmcp-1.1.3
- xlib_libXext-1.3.4
- xlib_libXfixes-6.0.0
- xlib_libXfont-1.5.4
- xlib_libXfont2-2.0.5
- xlib_libXft-2.3.4
- xlib_libXi-1.8
- xlib_libXinerama-1.1.4
- xlib_libxkbfile-1.1.0
- xlib_libXmu-1.1.3

GINZINGER
electronic systems

- xlib_libXpm-3.5.13
- xlib_libXrandr-1.5.2
- xlib_libXrender-0.9.10
- xlib_libXres-1.2.1
- xlib_libXScrnSaver-1.2.3

- xlib_libxshmfence-1.3 [3,6]
- xlib_libXt-1.2.1
- xlib_libXtst-1.2.3
- xlib_libXv-1.0.11
- xlib_libXxf86vm-1.1.4

- xlib_xtrans-1.4.0
- xmlstarlet-1.6.1
- xorgproto-2021.5
- xterm-371
- xutil_util-macros-1.19.3

- xvkbd-4.1
- xz-5.2.5
- zic-2021e
- zip-3.0
- zstd-1.5.2