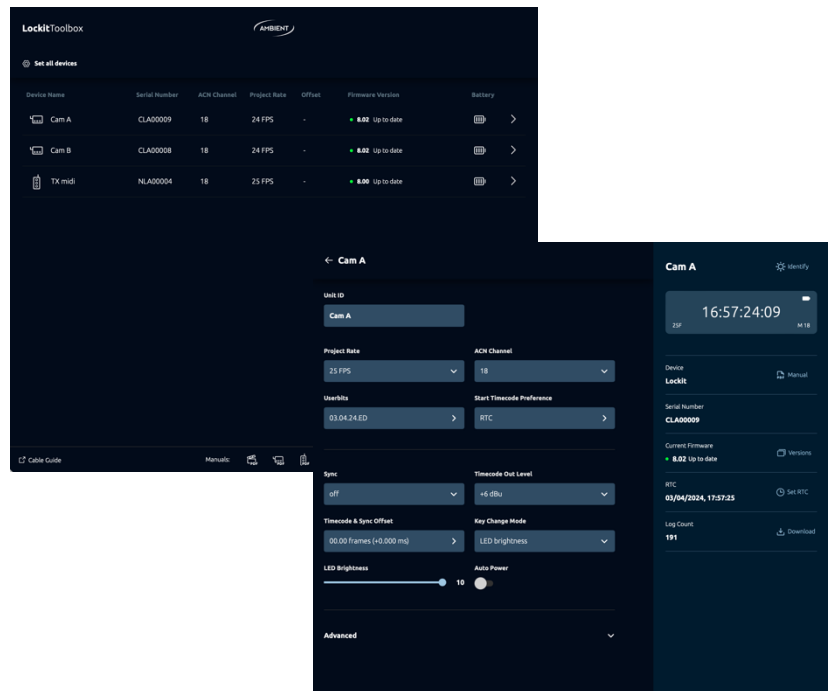# Firmware Update with the LockitToolbox

LockitToolbox is an application for PC or Mac to up- and downgrade firmware and additional configuration for the following units:

- **Lockit (ACN-CL)**
- **LockitSlate Take 2 (ACN-LS2)**
- **NanoLockit (ACN-NL)**
- **LockitModule (ACN-NLM)**

In the LockitToolbox interface, you can see the currently installed and available firmware as well as the available configuration options.

When a Lockit device is updated the LED is flashing alternately red and green as the progress bar fills up. After that the device reboots.

*Note: **Lockit+ (ACN-LP)** and discontinued **MasterLockit ACN-ML(P)** require updating with a different firmware file via the web interface. Please download this from ambient.de/en/downloads and refer to the device manual.*

*For **ACN-LS, ACN-TLM, ACL 204, ACN-TL** please use the Legacy Toolbox also available from ambient.de/en/downloads. Further information can be found in the release notes for firmware 6.x below.*

Get the LockitToolbox

MacOS: https://static.ambient.de/LockitToolbox.dmg

Windows: https://static.ambient.de/LockitToolbox.exe

Note: For Mac OS: Please open the Application via right click and click open. There is a warning popup to confirm to open an application downloaded from the internet (only required on first run).

Release Notes Lockit Firmware

Firmware 8.02 (April 2024)

Update for Lockit and LockitSlate Take2

- New feature: identify via LED flash (LockitToolbox)
- Bug fix: Connection to USB-C ports under MacOS or Windows failed if the device was started before connection.

Release of new LockitToolbox for current Lockit, NanoLockit, LockitSlate Take2

- New interface design and improved functionality
- Connect and set settings for several Lockit devices at once
- Download Logs from NanoLockit, Lockit or LockitSlate Take2.
    The Logger Software is now included within LockitToolbox.
    In addition to NanoLockit: Lockit and LockitSlate are enabled to log.

Lockit+ Webinterface 2.4 (January 2024)

Update for Lockit+

- Improved layout of the Lockit+ web interface for mobile devices.

Lockit+ Webinterface 2.3.1 / Firmware 8.01 (November 2023)

Update for Lockit+

- WiFi and LAN connections are now displayed in the info screen of the display menu.
- Bug fix: running timecode was miscalculated in the frontend of the web interface. (only with NTSC framerates).

Firmware 8.01 (October 2023)

Update for LockitSlate Take2, Lockit, LockitModule

- Bug fix for LockitSlate Take2:
    - Slates with serial number LSA2xxxx are not initialized with Firmware 8.00.
    - Display module was flickering on startup. Occurs only if timecode was not set yet.

Firmware 8.00 / Lockit+ Webinterface 2.3 (September 2023)

Update for Lockit+, Lockit, LockitSlate Take2, NanoLockit and LockitModule

- Improved **TX Mode**
  - The TX master will automatically adapt its speed to the LTC-in timecode source.

  Pro tip for VFX, Volume, 3D setup and projects with high demand of genlock accuracy:
  We recommended to project tune the ACN devices once. The Project Tune feature is available within the ACN Radar of the Lockit+. Find more information at manuals.ambient.de/lockitplus

  - The TX sender will start ACN broadcasting even with no connected LTC source. Lockit devices on the same ACN channel will automatically join the TX setup even without a timecode broadcasted.

  - Units in TX receiving mode are allegiant within a power cycle and will only accept ACN commands from its TX sender. To leave the TX receiver mode, change the ACN channel and reboot your Lockit device.

Update for Lockit+, Lockit, LockitSlate Take2, LockitModule

- New feature: **Timecode & Sync Offset**
  This setting will offset timecode and sync on all hardware outputs and the LockitSlate's timecode display. The OLED will still show the current running timecode with an indication of the offset value.

Update for Lockit+

- New feature: **Tune to external timecode**
  Tune your Lockit+ to an external studio clock and recalibrate fellow ACN receivers.

- New feature: **Set Sync Parameter and Offset Values via ACN**
  Monitor and control all ACN devices. Set up your devices remotely.
  (requires ACN receiving units to run on a firmware higher than 8.x)

- New feature: **Enhanced Compare Mode** in the web interface
  Analyze the LTC-input and compare it to the internal Lockit generator

- Lens Data: fix timeout when initializing connection

Update for Lockit+, Lockit, LockitSlate Take2

- New menu item: Info

Firmware 7.02 available for NanoLockit (May 2023)

Update for NanoLockit

- Blink codes revision
- TX Mode - successor of TRX:
  - it is only necessary to start your TX transmitter in TX mode
  - all other Lockit devices will follow
  - TX will send continuous jams (TRX only sent start/stop commands)
  - on TC Stop > Lockit will freeze their Generator

  TX Mode requires all Lockit Units to run on a firmware higher than 7.0

- New startup and power handling
  For reset: press red+green while unit is off

- New manual for NanoLockit available: manuals.ambient.de/nanolockit

Firmware 7.02 / Lockit+ Webinterface 2.2 (April 2023)

Update for Lockit+, Lockit, LockitSlate Take2

- Fix minor bug within display menu
- Fix LED colour with LockitSlate Take2 revision LS2B

Update for Lockit+

- Lens metadata web interface GUI
  - Show panel for external connected storage when no storage is connected
- Radio wizard
  - New action to hide and show intermodulations in frequency scan

Update for Lockit+, Lockit, LockitSlate Take2 and LockitModule

- Fix of project tune only being saved on further user interaction
- Implementation of the logging function (known from NanoLockit Logger)

New API command for LockitModule

- Status of generator source

Firmware 7.01 / Lockit+ Webinterface 2.1 (February 2023)

*Update for **Lockit+, Lockit** and **LockitSlate Take2***

- New display menu
    - set timecode (RTC, RTC-12, zero, one, manual)
    - LockitSlate Take2 only : Customize Clap Settings
      (Show Userbits, Show Clapped TC, Show Running TC, Flash LED)

*Update for **Lockit** and **LockitSlate***

- Blink codes revision

- TX Mode - successor of TRX

- New startup and power handling
  For reset: press red+green while unit is off

Firmware 7.0 / Lockit+ Webinterface 2.0 (December 2022)

*Official Release of **Lockit+***

- Blink codes revision
- TX Mode - successor of TRX:
    - it is only necessary to start your TX transmitter in TX mode
    - all other Lockit devices will follow
    - TX will send continuous jams (TRX only sent start/stop commands)
    - on TC Stop > Lockit will freeze their Generator
  TX Mode requires all Lockit Units to run on a firmware higher than 7.0

- Advanced generator settings
- Automaster on startup
- Improved ACN Radar
- Improved userbit handling
- NEW: lens metadata workflow with Cooke/i
- NEW: radio wizard
- Redesign: control Sound Devices 6 and 7 series
- Improved camera metadata handling for LockitScript

*New API command for **LockitModule***

- LTCin Callback

LockitToolbox for legacy devices (Firmware < 6.3x)

LockitToolbox is an application for PC or Mac to up- and downgrade firmware and additional configuration for the following units:

ACN-CL, ACN-LS2, ACN-NL, ACN-NLM, ACN-LS, ACN-TLM, ACL 204, ACN-TL

> Note: **ACN-LP** and **ACN-ML(P)** require updating with a different firmware file using the web interface, please download at ambient.de/en/downloads and refer to device manual.
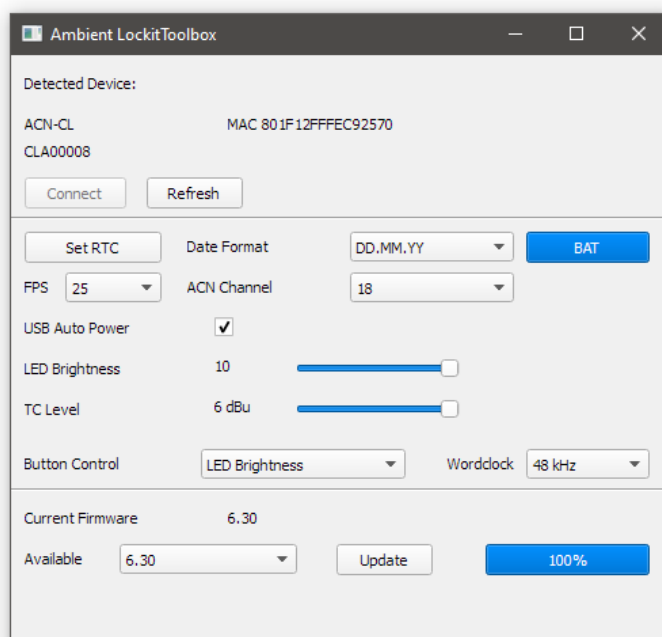
Simply unzip to a location of your choice and run open the Application.

> Note: For Mac OS: Please open the Application via right click and click open. There is a warning popup in which you need to "trust the developer". (only required on first run).

Power off your Lockit device and then plug it directly to your PC / Mac via USB. Some USB hubs may not work. Once listed click "Connect".

You will now see current loaded and available firmware and available configuration options depending on device and/or revision.

On clicking "Update" the unit will upload the firmware with red and green LEDs flashing alternating while the progress bar fills up until it reaches 100% after which the unit will reboot with new firmware and a success message will appear in the status window.

Note: As of 6.0 LockitToolbox also include the preceding firmware for free up- and downgrade. The dropdown list will show all firmware compatible with the connected device.

ACN-NL: Preferably use the supplied cable. Some aftermarket cables come in OTG configuration which will put the Nano in a special mode and although it will charge properly through those cables will not connect to LockitToolbox.

ACL204, ACN-TL (requires ACN-USB cable), ACN-LS: If your device doesn't show up as available device load factory settings under Sys/Reset. Coming from firmware previous to 5.xx you may need to switch USB or ACN-B/USB to "COM".

6.34 (06. 2022)

*Consolidate firmware for **LockitSlate Take2, Lockit and NanoLockit***

6.32 (02. 2022)

*Official Release of **LockitSlate Take2***

6.30 (11. 2021)

LockitToolbox,

Removed firmware now completely from header (Any Toolbox version above 6.00 will work with all firmware revisions and devices since moving over to ACN-LM as exclusive platform)

Cleaned up and rearranged the interface

Consolidated ACN-NL and ACN-CL

ACN-NL

Official Release of the Logging Feature (https://logger.ambient.de)

ACN-LM

Introduced new API commands for internal use

Further implementation of Lockit+

Preparation for ACN-LS II

All units

Preparation to synchronize double project rates over cable through SMPTE 12M stream (currently internal use only)

6.20 (01.2021)

ACN-ML(P)

Consolidated subreleases 6.12.3 through 6

Further improved log file handling

Extended ARRI CAP2 lens information over API

New auto-start feature to start unit on applying external power (available through system/debug menu)

Double project frame rate handling on Lemo/cable jam (limited to Ambient ACN gear running 6.20)

LockitToolbox,

Removed firmware subversion from header

ACN-NLM

ATTENTION Build 6.20.0077 was not intended for public release but made it out into the wild somehow. It contains a critical bug that may lead to an offset on jam, please do not use this build for productive use!!! (later builds of 6.20 are fine)

Internal implementation for ACN-LP (Lockit+)

Extended features for integrators (PPS) and metadata processing

ACL204, ACN-TL, ACN-LS, ACN-TLM, ACN-ML(P), ACN-NL, ACN-CL, ACN-NLM

Double project frame rate handling on Lemo/cable jam (limited to Ambient ACN gear running 6.20)

6.12.2 (06.2020)

ACN-ML(P)

Improved log handle that could lead to filling the disk and corrupt the file system

6.12 (01.2020)

LockitToolbox,

no change labelled 6.11

ACL204, ACN-TL, ACN-LS, ACN-TLM

no change, release includes current firmware 6.11

ACN-CL, ACN-NL, ACN-NLM

Fixed failed USB initialization with unit connected at host platform boot on some OS

Added silent user bit insert over ACN C-Jam Master

Project tune persistent over firmware update

Updated API command stack

Preparation for upcoming features

ACN-CL

Pressing red button for 3 seconds resets Generator to zero and sends out single jam

Added TC compare and re-jam option on external TC applied via cable

Fixed a random sub frame offset on jam when booting with external TC applied.

ACN-NL

Fixed a random bug in battery telemetry read out

Improved battery life time on Rev. D

Implemented logging of button presses for NanoLockit Logger feature

ACN-NLM

Activated buttons green and red (OK/Bad)

Designated GPIO 3 for special purposes on request (default pulse per second on last frame)

Optimized serial tunneling for sub frame accurate metadata parsing and processing

ACN-ML(P)

Improved Low battery blink pattern

Fixed a bug where disabling ACN on the unit was not reflected on the GUI

Muted erratic clips transmitted by RED cameras when an unformatted card with clips previously recorded on another camera was inserted

Muted wrong serial number transmitted from ARRI cameras during boot

Added ACN channel "off" to web interface

Reorganized the system menu for better logic

European and American Date scheme now reflected by separators "." or "/" on MetaSlate view

Further improvements of MetaSlate tab since production releases 6.10 and 6.11

Improved remote power state readout for remote units on ACN radar

6.11 (08.2019)

Lockit Toolbox

Added support for ACN-CL, ACN-NLM, ACN-NL Rev. D

Known issue: although ACN-CL firmware labelled as ACN-NLM, firmware is consolidated and works

ACN-CL, ACN-NLM

Initial release

ACN-NL

Included hardware revision D with protection against downgrade to incompatible previous releases

Improved battery gauge readout on Rev. C and earlier

Added LED indication when ACN signal is received when in charge/idle mode

Slowed down C-Jam tune to compensate for increased sensitivity of ARRI Alexa Mini to timing changes of external TC reference introduced with latest ARRI SUP

Added Option "Off" to ACN channel in Lockit Toolbox to disable ACN

Added option to restart the unit on the fly on external power to enable a re-jam to a newly started master when the slave was not unplugged/powered down.

Improved low bat LED indication

ACL204, ACN-TL, ACN-LS, ACN-TLM

Fixes an error, where a Master will continue to send out C-Jams on the former channel when ACN is switched off while Master is active.

Improved low bat LED indication

ACN-ML(P)

Added script tab, allows uploading and viewing of script in .pdf format

6.10

ACN-ML(P)

New ACN MetaSlate tab accepts manual input or slating info via LockitScript app

Sound recorder control optionally inserts slating info from LockitScript app and MetaSlate tab into next take metadata

6.02

ACN NL

Build 62 stores Unit ID until factory reset

Build 61 fixes random latch-up on powering on

6.01

ACN-NL

Resolved a random issue on physical RCP connection between NanoLockit and RED DSMC could lead to an offset when changing the cameras project rate.

6.00

Attention, as the leap from 5.xx to 6.xx suggests, 6.00 introduces significant changes to the system. Although completely backwards compatible with 5.xx it may require additional manual configuration (e.g. selecting channel 11 on a TRX Master to connect to NanoLockits on 5.xx). For best experience we strongly suggest updating all units to the same firmware.

LockitToolbox

Selection of default ACN channel, framerate and battery readout for all supported devices

Adjust LED Brightness and TC output level on ACN-NL

Rearranged layout with consolidated Update section and drop down list for all supported devices

Further GUI enhancements

Lockit devices

General

Merged default ACN channels for C-Jam and TRX. NanoLockits will no longer change their ACN channel to 11 in TRX mode. ACN channel selectable in the devices menu will apply to both modes. Selection of this default channel is now available across all devices in the LockitToolbox.

Project Tune over ACN. Using a MasterLockit(Plus) as C-Jam master, slaves can now be tuned to its reference clock to further minimize C-Jam pull during operation. This tune value is persistent as devices default until a factory reset which loads the factory calibrated value.

ACN-ML(P), ACN-TL, ACL204, ACN-LS

Introduction of Unit ID to be displayed below timecode (requires MasterLockit(Plus) to edit)

Mode: Removed Int TC and Ext TC from Mode, these functions can now be achieved by selecting RF channel to "Off" in C-Jam or TRX Mode respectively.

FPS: Consolidated project frame rate including double rates in top menu level.

TC: FPS removed in favor of global project rate.

New Intelli-Jam algorithm with selection Auto/Man for TC and userbits

On TC "Auto" represents a Mix of former "Full" and "Auto" settings with automatic adoption of FPS. When video sync is enabled frame rate will be maintained to maintain continuous camera sync. "Man" locks FPS until manual change/confirmation.

On UB "Auto" userbits will follow the jam source while follow "Man" allows for applying a unique ID. After editing, userbits will be locked and displayed underneath the free run TC in the OLED.

TC compare with interactive jam options: when timecode is supplied on Lemo ports, the display will wake up, shows aberration against the generator timecode and give the option to (re-) jam the generator. Depending on Jam mode, internal and external frame rate available choices may be limited to either full jam with change of framerate or x-jam which keeps the framerate.

Red blink along with "Sync Failed" message on OLED when receiving ACN C-Jam with incompatible frame rate

ACN: "Ant" replaced with "Ch" with only parameter being the ACN channel.

New option "Channel = Off". This will disable all RF activity. Units will then work as autonomous generators or MTC to SMPTE convertors

ACL 204

Sync: Video settings improved to format being the only required parameter, 2 options 1080i/PsF or 1080p cover all usual applications in standard mode. Extended will give access to obsolete 720p and SD Settings. PPF is automatically activated with video sync and follows FPS with no further adjustment necessary.

Sync signal follows TC output mute when generator has not been synced/set.

ACN-TL

PPF follows project rate with no further adjustment required

ACN-ML(P)

Reset WiFi option added

WiFi info screen to display mode (AP or client) including IP address

TRX changed to Extended

GUI:

Double frame rates added to FPS selection.

FPS displayed in title bar

Improved TC display latency

Set Unit ID of local and remote devices in ACN Radar displayed underneath TC on OLED

Color markings for slaves running on cross compatible and incompatible frame rates in ACN radar

Assign names via unicast, permanently stored and displayed on the slaves

Improved power telemetry over ACN

Option to remove all slaves from ACN radar with one button

ACN Project Tune to pre calibrate slaves for smoother C-Jam pull

Previous known metadata devices shifted to "Orphaned Devices"

Client mode in WiFi configuration to join existing networks as DHCP client

ACN-NL

Auto Power changed from On to Off in default settings

Adjustable LED brightness and TC output level via LockitToolbox

Improved algorithms to cater for sources with output of standing frame in TRX mode

TRX mode uses same preconfigured channel as C-Jam (default Ch. 18)

Improved initializing of RCP handshake

Fixed:

ACN-ML(P)

Accepts cross area jam when generator is not set.

Fixed broken export to USB media on some reports.

Fixed track arming always linked on SD 688 for tracks 1-2 and 3-4.

5.20 – 5.23 (internal maintenance releases, included in higher public releases)

MasterLockit(Plus):

New:

Sys/Reset Menu options to reset WiFi SSID and password to defaults and purge recorded metadata

Fix:

Accidental setting internal clock to a date in the future by accessing through web GUI will no longer lock setting TC to time of day when in Master

When enabled, wordclock output is now persistent over boot and shutdown.

Other:

Preparation for new metadata sources and developer features

Reworked RCP routines

Reworked serial number assign routines

ACN port test routines for optimized QC on production

LockitToolbox

New:

Support for TLM module

Up- and downgrade on all supported devices

LED brightness for NanoLockit

TC output level setting for NanoLockit

ACL204, ACN-TL, ACN-NL, TLM

Change:

Adapted polling to revised RCP handshake by RED for robust clip transfer

Known Issues:

ACN-ML(P)

Won't accept cross area jam when generator is not set.

5.10

General

Change:

Blink code for Master lost "softened" from red every 6 seconds to green-red / orange

ACN-ML(P): Revised serial number scheme

Specific:

ACL204, ACN-TL, ACN-LS , ACN-ML, ACN-MLP

First Release for MasterLockit*Plus*

Splash Screen Updated to visualize model, product code and full reading of serial number

Fix:

Sys/Info Screen updated to display full serial number

New:

First Release for MasterLockit*Plus*

Auto LNA when powered from external

Added option to output 48KHz Wordclock on TC Lemo pin 4 when Sound recorder is selected as metadata device. (Requires ACN-ML hardware Revision H or higher, upgrade path for older revisions available on request)

Shutdown and factory reset available through System Menu

Preparation for support of ARRI CAP 2 protocol, exparimental, pending on introduction of required fields in CAP

New Features in 5.00:
Updater:
renamed to LockitToolbox
Added support for ACN-NL incl. setting of RTC and TC frame rate
General:
Harmonized blink codes and behavior between legacy devices and NanoLockit
IMPORTANT – TC output is hence muted with generator not set as default. You must set/jam the generator or switch on C-Jam Master to enable output. To revert to legacy behavior (not recommended) go to TC/Output and select "No" for "Mute on Gen not set".
C-Jam Slaves will automatically follow a channel change on their active C-Jam Master
Active C-Jam Master and Slaves immune to ACN commands from different units
Updated internal API command stack
Even less reasons to use Extended menu depth ;)
TC Menu

Set: New submenu (formerly Edit in Jam submenu)After confirming an edited TC sending out C-jam master broadcasts can be enabled directly form here

FPS: locked on ACL204 in case sync output is set to "Video" (only exception 29.97 Drop/NonDrop selectable for 29.97 and 59.94 video framerates)

Sync Menu (ACL204 only)

Video: TC framerate does no longer have to be confirmed explicitly when selecting video sync signal (29.97 Drop/NonDrop selectable on appropriate video rates of 29.97 and 59.94)

Audio: also available in Standard menu depth with 48 KHz word clock as only available option preselected.

ACN Menu

Jam: generator can be set if not done so already to allow quickly jamming a set with current timecode.

Master: generator TC can be confirmed or edited before enabling Master. If Unit is actively receiving C-Jam Master broadcasts form another device, selecting Master will be prohibited with a warning message.

Ant: ACN preference channel can only be selected for the currently active mode.

New Features in 4.10:

Lockit Menu

Mode: C-Jam new default setting across all devices. USB/LemoACN is mode dependent and will automatically toggle to "*Com*" for intTC and C-Jam or "*MTC*" for extTC and TRX (can be overridden in Sys/Config menu).

TC: new submenu "Output" combines options for Offset, Level (ACN-TL only) and new Mute option.

TC/Jam: set to "*Full*" C-Jam Slaves will now dynamically follow the framerate of the Master when changed.

TC/Output/Mute: "Mute on Gen Not Set: No/Yes". Set to "Yes" this will defeat the physical timecode signal if the generator has not been jammed/edited (red flashing LED).

ACN: simplified, easy switchover between "Slave" (one time) "Jam" and "Master" in C-Jam mode from top level.

ACN: revised Ant menu with user selectable preference channels for "C-Jam" and "TRX" modes (semi-persistent until factory default reset).

Sys/Menu: added „Lock" option to prevent unintended alterations to settings.

Sys/Config/Ant: freely assignable preference channels for C-Jam and TRX modes, semi persistent, will be stored until a factory reset.

General

Simplified LED blink codes for easy mode and status identification.

ACN-ML

Improved boot time.

Harmonized version numbering for ML OS and Lockit firmware.

Timecode: edit userbits from web interface, quick load current date (US and EU scheme), tick counter for UB slots 7/8.

Harmonized wording of web GUI and Lockit menu for C-Jam sync modes "Slave" and "Master".

ACN Radar: moved to own tab for better display on smaller screens.

Connected Devices (renamed from Metadata Network): New device class „Sound Recorder" for integration of Sound Devices 788T, 633, 664, and 688 with or without CL-12 (MLC-CL cable required for 788T, MLC-HID cable required on 6series).

Remote Control: Subpage for sound mixers using supported field recorders featuring Rec Start/Stop, track and take administration incl. circle take and notes for sound report preparation. (Further options depending on capabilities of connected recorder).

Quick access to Timecode and ACN Radar tabs from right within Remote Control screen for focused workflow.

Transfer of takes into the Metadata Export section with all new sound report export function. Editable front page and .xlsx export to the accessing device for immediate relay or editing.

System/About: Information on Lockit Firmware added, debug log option.

Smaller graphical renovations.

New Features in 4.01:

Harmonized device class branches and menu structure on Lockit family

Linked conditions in preparation for remote control

Complete GUI overhaul

Partially automated, consecutive configuration with

2 selectable levels of menu complexity

Exit button, defaulted in every (sub) menu

Merged Timecode and Generator menus into TC menu

New global Mode menu, selection determines ACN behavior and slate display's source

New default "Full" jam mode for automatic framerate setting on new configurations over cable and/or ACN

Streamlined userbit options, automatic insert now default in all modes,

Option to display UB in home screen

Improved frame rate detection and automatic configuration on MTC

Condensed ACN menu, maintaining all previous features with minimal interaction

ACN TRX full auto hybrid TC radio link supporting source detection and LTC/MTC cross conversion

Improved C-Jam mode with selectable Once and Continuous broadcasts

Intelligent mode change on subsequent en-/disabling of ACN

Individual, preselected ACN channels for C-Jam and TRX

Selection of external/internal antenna now persistent through factory reset on ACL 204 and ACN-TL

New indication of C-Jam status: master, slave (active and idle)

New LED blink code in C-Jam for clear master identification with OLED off

New LED blink code in C-Jam slave mode displays remote master status

New LED blink codes in TRX for clear identification of transmitter and receiver incl. TC activity status

Various improvements to ACN API

Detection of absence of previous active C-Jam master incl. slow speed ramp back to factory tune value

30 sec "masterlock" prevents loop back inadvertently present 2nd C-Jam master

Infrared port now switchable, off by default for improved robustness against interference

New Lockit Firmware Tool with downgrade option (downgrade to 3.34 available as separate download pack)

ACL 204

Timecode and video rates crosslinked and hard locked for improved fail safe operation. Timecode will always follow video rate when changed, feasible cross rates available when in *"Extended"* mode

Moved BNC load selection to consecutive video sync selection menu

Improved auto configuration and metadata forwarding of ACL 204 and ACN-ML for RED DSMCs. (When shooting in HFR please make sure DSMC is running firmware 6.2.8 or later)

Even smoother C-Jam pull for rock stable sync operation on ACL 204

ACN-LS

Merged TC output and display offset for ACN-LS

Global mode selection that not only determines the display's source but also sets all according switches in the background

Revised display mode now allows for flexible configuration of display showing userbits, clapped time and running timecode after clap

Improved hall sensor response

Improved slate clap broadcast over ACN