

	Release Notes		Lantronix AVL Products
	Firmware version: avl_3.21.0_rc3		Release date: March 5, 2024
			Document revision: 3.21.0.0

Lantronix AVL FIRMWARE RELEASE

VERSION: [avl_3.21.0_rc3](#)
 BIOS version: [3.0.4](#)
 Official release date: [05/02/2024 \(D/M/Y\)](#)
 List of firmware files: [avl_3.21.0_rc3_20240301.frp](#)
[avl_3.21.0_rc3-Z94428290.zip](#)
[avl_3.21.0_rc3_20240301.txt](#)

Hardware compatibility: This firmware applies to the following LANTRONIX products with Cortex processor:

With Cortex processor:			
Devices	Hardware Revisions	Supported firmware versions	Notes
FOX3-2G Series	13,15,17,19,20,21	avl_3.x.x (only)	<p>1) Use the PFAL command \$PFAL,MSG.Version.HardwareRev to get shown the hardware revision of your AVL device. The device responses with (second line shows the hardware version):</p> <pre>\$<MSG.Version.HardwareRev> \$11-NUCHB \$\$SUCCESS</pre> <p>2) The hardware revision is also printed on the product label, located on the back panel of the device. In the Serial Number (S/N) field there are 3 digits in parenthesis, for example, 60148(9XX)50600014, and the number “XX” is the hardware revision of the device. If the number is “11”, it means that the hardware revision is 11.</p>
FOX3-3G Series	06,11,13,15,17,19,20,21	avl_3.x.x (only)	
FOX3-3G-BID*			
FOX3-4G Series	All	avl_3.x.x (only)	
BOLERO40 Series	All	avl_3.x.x (only)	

* On request

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IMPORTANT

- This firmware version is **ONLY** for the LANTRONIX products explicitly Mentioned above! Do not try to update other LANTRONIX products with this firmware, otherwise, you will not be able to operate your device anymore.
- Before updating the new firmware on your FOX3 or BOLERO40 series, it is strongly recommended to back up the configuration with the command **\$PFAL,CNF.Backup**
- Before upgrading the firmware on your FOX3 or BOLERO40 series, it is recommended to upload and back up all history data on your server (if needed) and finally delete this data on the device.

NOTE

- If FOX3-3G-BLE devices with older firmware versions (e.g. 3.0.0_xx) are upgraded to this new firmware version (3.3.0_xx), please contact LANTRONIX to receive the BLE activation codes and continue to use this feature without additional costs.
- The latest FW 3.21.0_rc3 is for FOX3-2G/3G/4G with the CORTEX CPU as well as BOLERO40 series.
- Sleep=Ring on BOLERO40 series works only by using SIM-SLOT2 (the upper SLOT) on BOLERO40 series

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DOCUMENTATION:

The following document(s) is (are) provided on <https://www.lantronix.com/> as part of the AVL firmware release "[avl_3.21.0_rc3](#)".

Filename	Description
PFAL Command Reference	Lists and describes all PFAL commands supported by this firmware release.

Version	Description	Created by	Date (M/D/Y)
3.21.0.0	Firmware release "avl_3.21.0_rc3"	Lantronix	05/02/2024
3.21.0.0	Firmware release "avl_3.21.0_rc1"	Lantronix	08/02/2024
3.20.0.0	Firmware release "avl_3.20.0_rc14"	Lantronix	18/01/2024
3.20.0.0	Firmware release "avl_3.20.0_rc12"	Lantronix	17/10/2023
3.19.0.0	Firmware release "avl_3.19.0_rc4"	Lantronix	25/07/2023
3.18.0.0	Firmware release "avl_3.18.0_rc9"	Lantronix	06/02/2023
3.18.0.0	Firmware release "avl_3.18.0_rc8"	Lantronix	01/25/2023
3.18.0.0	Firmware release "avl_3.18.0_rc5"	Lantronix	11/24/2022
3.17.0.0	Firmware release "avl_3.17.0_rc5"	Lantronix	09/16/2022
3.16.0.0	Firmware release "avl_3.16.0_rc9"	Lantronix	06/01/2022
3.16.0.0	Firmware release "avl_3.16.0_rc3"	Lantronix	12/13/2021
3.15.0.0	Firmware release "avl_3.15.0_rc4"	Lantronix	16/09/2021
3.14.0.0	Firmware release "avl_3.14.0_rc5"	Lantronix	04/19/2021
3.14.0.0	Firmware release "avl_3.14.0_rc4"	Lantronix	04/09/2021
3.14.0.0	Firmware release "avl_3.14.0_rc1"	Lantronix	02/17/2021
3.13.0.0	Firmware release "avl_3.13.0_rc5"	Lantronix	01/12/2021
3.12.0.0	Firmware release "avl_3.12.0_rc2"	Lantronix	11/17/2020
3.11.0.0	Firmware release "avl_3.11.0_rc4"	Lantronix	10/14/2020
3.9.0.0	Firmware release "avl_3.9.0_rc2"	Lantronix	07/14/2020
3.8.0.0	Firmware release "avl_3.8.0_rc3"	Lantronix	06/03/2020
3.7.0.0	Firmware release "avl_3.7.0_rc2"	Lantronix	04/21/2020
3.6.0.0	Firmware release "avl_3.6.0_rc2"	Lantronix	03/10/2020
3.5.0.0	Firmware release "avl_3.5.0_rc8"	Lantronix	02/05/2020
3.4.0.0	Firmware release "avl_3.4.0_rc8"	Lantronix	12/03/2019
3.3.0.0	Firmware release "avl_3.3.0_rc15"	Lantronix	10/02/2019

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3.2.0.3	Firmware release "avl_3.2.0_rc39"	FALCOM	07/04/2019
3.1.0.2	Firmware release "avl_3.1.0_rc33"	FALCOM	11/09/2018
3.1.0.1	Firmware release "avl_3.1.0_rc20"	FALCOM	05/15/2018

1) Preface

This release note describes the new functionalities of the firmware release "**avl_3.21.0_rc3**" and is intended for use as a reference when updating an AVL device to version "**avl_3.21.0_rc3**".

2) Important Notes

The firmware file with extension "***.frp**" is for the update through the **Workbench** and for the update remotely OTA (RUpdate). The firmware file with extension "***.txt**" is for the update through **terminal emulators** (e.g.: Hyperterminal, PComm Pro). The firmware file with extension "***.zip**" is for the WebUpdate. To update the firmware with the extension "***.frp**", please use the **Workbench** version **10.7127.beta**. To update the firmware with the extension "***.txt**" you can use any **terminal emulator** (example: Hyper terminal, Pcomm Pro). To initiate a WebUpdate use the command **\$PFAL,SYS.WebUpdate.Start,"[http://url](#)",80** or **\$PFAL,SYS.WebUpdate.Start,"[http://url](#)"** or **\$PFAL,SYS.WebUpdate.Start,"[https://url](#)",443** or **\$PFAL,SYS.WebUpdate.Start,"[https://url](#)"** on the device. DON'T switch off the AVL device while it reboots after the firmware update. The duration of the reboot after the firmware update may take approx. 45 seconds.

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3) Firmware Installation Notes

The installation package consists of firmware in three different formats *.frp and *.zip. and *.txt. You can choose whether you want to update the firmware via following interfaces:

Interfaces	File	Description	References
RS-232 PORT	*.frp	This is primarily intended for updating one device first, to ensure the process completes properly before rolling the update to a group of other devices. Use " Workbench " and update the "*.frp"-file via the serial port.	
WEB-SERVER	*.zip	This is a perfect solution when multiple deployed AVL devices need updating. The firmware file is located in your webserver and you send to the AVL device the URL of a web server you have set up for downloading over-the-air the firmware file.	
Remote with Workbench	*.frp	This solution lets you update the firmware remotely on several AVL devices. More details can be found in the online help in the Workbench software.	
TCP-SERVER	*.frp	This solution lets you update the firmware remotely on several AVL devices.	
Remote with Perception	*.zip	This solution lets you update the firmware remotely on several AVL devices. More details can be found in the online help in the Perception software.	
TerminalSW	*.txt	You can upload the firmware with the extension *.txt serially over a terminal SW such as PComm Lite, Tera Term, etc.	

4) Prerequisites concerning the PC

A 32/64-bit-WINDOWS operating system (Windows XP, Vista, 7) or Linux is running on your PC and about 50 MByte free space on your hard disk is required. The RS-232 interface must be configured

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with the following parameters:

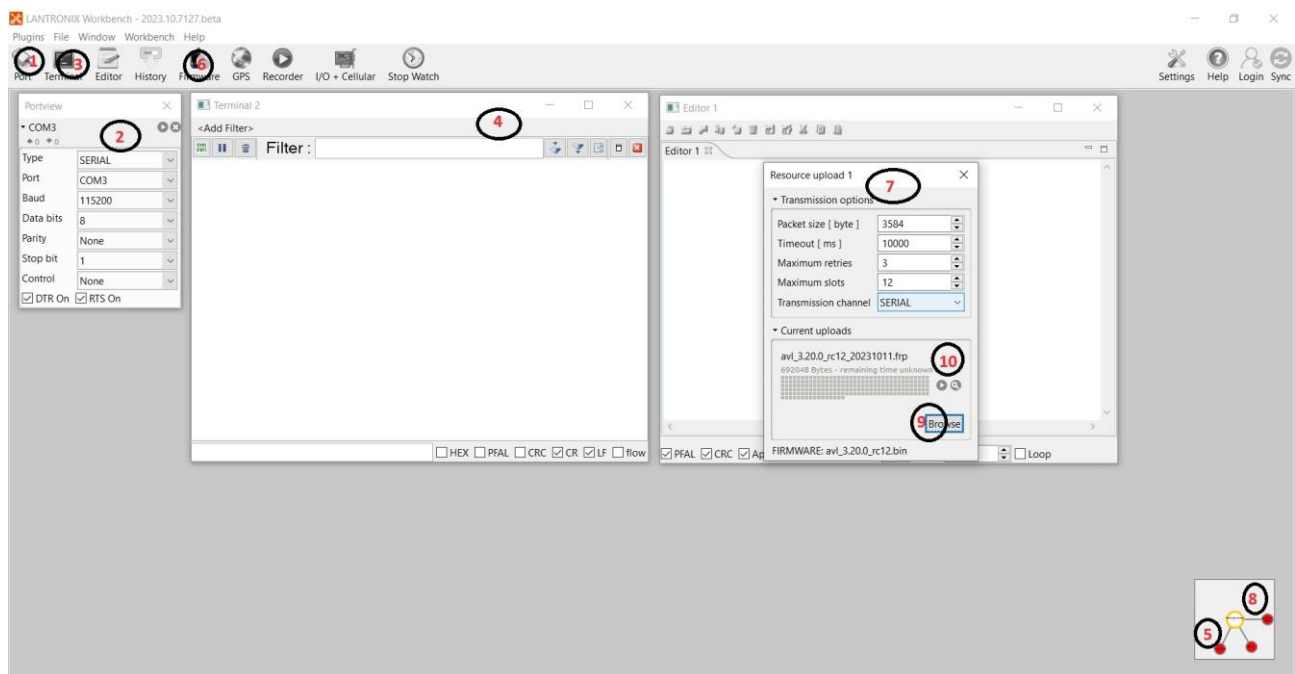
- Baud rate: 115200
- Data Bits: 8
- Parity: None
- Stopbits: 1
- Flow Control: None

5) Firmware Update Process

These instructions are specific to updating your LANTRONIX AVL device via COM interface (Serial Port).

(a) Download the firmware file and Workbench software needed from the following hyperlinks.

1. <https://www.lantronix.com/products/workbench/#tab-docs-downloads>
2. <https://www.lantronix.com/products/fox3-series/#tab-docs-downloads>
3. Download "avl_3.21.0_rc3" and extract the file you downloaded into a temporary folder on your PC.
4. Run the "workbench" software. If this software is still not installed on your PC, download it first and start the installation.



(b) Begin the firmware update process (refer to the fig. above).

1. Connect the AVL device to your PC either directly using the programming cable or the corresponding evaluation board.
2. Do **NOT** update the firmware version 3.x.x on FOX3-2G/3G/4G devices with an older processor. The firmware version 3.x.x is **ONLY** for FOX3-2G/3G/4G and BOLERO40 devices with the **CORTEX (CT)** processor. Please verify the hardware revision from the table "Hardware compatibility" above and make sure you are upgrading a FOX3-2G/3G/4G device with CORTEX processor. LANTRONIX takes no

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liability and no responsibility for any cases, firmware versions have been flashed wrongly nor will LANTRONIX cover any costs associated with this happening.

3. Click **Port** (1) icon, select the COM port settings from the **PortView1** (2) and click the **Play** button next to the text "COM.." to open the selected COM port.
4. Click **Terminal** (3) icon, select the **TerminalView 1** (4) and go to the **ConnectionView** (5) and connect it to the **Serial Port COM1**.
5. Click **Firmware** (6) icon, select "SERIAL" from the **Transmission Options** (7), go to **ConnectionView** (8) and connect it to the **Serial Port COM1**.
6. Click **Browse** (9) button and select the firmware file as "*.frp" from the temporary folder where the firmware was expanded.
7. Click **Play** (10) button to start the firmware update. This button appears only if the firmware file has already been selected.
8. Wait until the update process completes. While the update is running, do not send any command to the device and do not manually reboot it until the device restarts itself.
9. After the update process successfully completes, a success message will appear. Click "OK" button to restart the AVL device.
10. After device restarts and configuring the unit, you can execute the command **\$PFAL,Cnf.Backup** to save the user configuration as factory settings. If the AVL device was already configured, you can execute the same command after the firmware update to save the user configuration as factory settings.
11. LANTRONIX recommends that you update one device first, to ensure the process completes properly before rolling the update to a group of other devices.

6) New and Modified Functions

IMPROVEMENTS and BUGS FIXED:

- Added PercepXion client to project
 - Support for SARA-R500
 - Support for Serial1 RS485 option
 - Activate support for LARA-R2XX
 - Use a temp file for LUA script RUpdate
 - Fixed invalid values for elevation/azimuth when parsing UBX
 - Fixed TLS initialisation without secrets for TCP.MQTT client
 - Added subscription support to MQTT client - Removed filename restrictions for WebUpdate
 - Enable batmode DEVICE.BAT.MODE=always
 - Implemented FOTA procedure for TOBY devices
 - Fixes GPS.Geofence.sID
- PFAL commands: - GSM.StartFOTA,""[,]

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- Set the FOTA resource and start update. The update resource is encoded as [ftp://\[user:pwd@\]ftp.server.com/path/file.zip](ftp://[user:pwd@]ftp.server.com/path/file.zip)
- GSM.StopFOTA -- Stop a pending update procedure
- Added support of using optional certificate, priv.key to connect PercepXion server.
- Fixes Capability Exchange failure caused by dynamic(user feeded).
- Added user notifications for PercepXion client.
- Fixed SOFTWARE_VERSION.
- Implemented User Audit feature
- Refresh IMSI, ICCID after cellular restart.
- Support multiple updates in content check.
- Publish Telemetry over REST, if size exceeds max MQTT length.
- Migration from ConsoleFlow to PercepXion related changes.
- All PFAL commands which have 'CF' will have to be replaced with 'PX'.
- Fenced 'device' certificate download, 'control_device_access' option in supported commands.
- Certificates/Key name used by PercepXion client changed as below.

"/sys/pxclient-rootca.crt"

"/sys/pxclient-private.key"

"/sys/pxclient-client.crt"

- Added PFAL command to set Azure mqtt & Device certificate version
- Added additional events to the PX client

PFAL events:

- TCP.PX.eRegistered
- TCP.PX.eCapabilityNegStarted
- TCP.PX.eCapabilityNegCompleted
- TCP.PX.eReceivedMessage
- TCP.PX.eMQTTConnected
- TCP.PX.eMQTTDisconnected
- TCP.PX.eStarted
- TCP.PX.eStopped
- TCP.PX.ePublished
- TCP.PX.eUpdatesAvailable

LUA Types:

- ALARM_PX_CLIENT_STARTED
- ALARM_PX_CLIENT_STOPPED
- ALARM_PX_CLIENT_CAP_NEG_STARTED
- ALARM_PX_CLIENT_CAP_NEG_COMPLETED
- ALARM_PX_CLIENT_MQTT_RECEIVED,

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- ALARM_PX_CLIENT_MQTT_CONNECTED
- ALARM_PX_CLIENT_MQTT_DISCONNECTED
- ALARM_PX_CLIENT_REGISTERED
- ALARM_PX_CLIENT_PUBLISHED
- ALARM_PX_CLIENT_UPDATES_AVAILABLE

- Added device and azure certificate version to status update.
- Added support for on-premise in PX client.
- Avoiding delays for quicker execution of Telemetry update iterations
- Log the watchdog condition to DEVICE.WDG
- Merged function to use/build a signed FW
- Merged CF changes from avl_3.20.6_rc12_no_secureboot_debug
- Merged PX changes from b_avl_3.20.0 - Prefer PX configuration and fallback to CF values
- Fixed content firmware version check flag
- Increase DNS timeout to 30 seconds
- Fixed timeout for TLS handshake
- Fixed parsing MBEDTLS_SSL_TLS1_3_NEW_SESSION_TICKET state
- Change telemetry minimum supported refresh rate to 1 second
- Remove metadata from telemetry data
 - Config settings:
 - PX.CLIENT.CERT_VERIFICATION=<0|1> - Set the certificate verification mode
 - CNF.SET,CF.CLIENT.AUDITLOGS=<0|1> - Set the Audit Log enable/Disable mode
 - CNF.Set,PX.CLIENT.ONPREMISE=<0|1> -0 Set the Configuration to On-premise enable/Disable mode.
- More detailed error answer for SYS.LUA.Start,SYS.LUA.Stop,SYS.LUA.Info
- Added SMS configuration AT+USVCDOMAIN
- Set TCP.MQTT.SEND as ACTION_FLAG_VALUE_HIGH_PRIO to help with synchronizing nvCounter used for messageSequenceNumber
- PX certificate files differ between PFAL and PX Client

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Section	Commands
Config settings:	CNF.Set,PX.CLIENT.CONNECT=1,<URL> CNF.Set,PX.CLIENT.CONTENT_CHECK_INTERVAL CNF.Set,PX.CLIENT.DEVICE_DESCRIPTION CNF.Set,PX.CLIENT.DEVICE_NAME CNF.Set,PX.CLIENT.STATUS_UPDATE_INTERVAL

KNOWN ISSUES:

None