Lantronix AVL FIRMWARE RELEASE

VERSION: avl_4.2.0_rc25

BIOS version: 3.0.6

Official release date: 19/12/2024 (D/M/Y)

List of firmware files: avl_4.2.0_rc25_20241218.signed.frp
avl_4.2.0_rc25-Zdeba399d.signed.zip
avl_4.2.0_rc25_20241218.signed.txt

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

Devices	Hardware Revisions	Supported firmware versions	Notes
FOX4	13,15,17,19,20,21	avl_4.x.x (only)	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): $<MSG.Version.HardwareRev> $11-NUCHB $SUCCESS 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.

* On request

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 FOX4 series, it is strongly recommended to back up the configuration with the command **$PFAL,CNF.Backup**
- Before upgrading the firmware on your FOX4 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 FOX4 devices with older firmware versions (e.g. 4.0.0_xx) are upgraded to this new firmware version (4.2.0_xx), please contact LANTRONIX to receive the BLE activation codes and continue to use this feature without additional costs.
- The latest FW avl_4.2.0_rc25 is for FOX4 with the CORTEX CPU

DOCUMENTATION:

The following document(s) is (are) provided on https://www.lantronix.com/ as part of the AVL firmware release " avl_4.2.0_rc25".

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

Version	Description	Created by	Date (M/D/Y)
4.2.0.0	Firmware release “avl_4.2.0_rc25”	Lantronix	19/12/2024

4.1.0.0	Firmware release " avl_4.1.0_rc6"	Lantronix	04/06/2024
4.1.0.0	Firmware release " avl_4.1.0_rc5"	Lantronix	28/05/2024
4.0.0.0	Firmware release " avl_4.0.0.0_rc15"	Lantronix	28/02/2024

1) Preface

This release note describes the new functionalities of the firmware release "**avl_4.2.0_rc25**" and is intended for use as a reference when updating an AVL device to version " **avl_4.2.0_rc25**".

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.

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 Percepxion	*.zip	This solution lets you update the firmware remotely on several AVL devices. More details can be found in the online help in the Percepxion software.	
Terminal SW	*.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

with the following parameters:

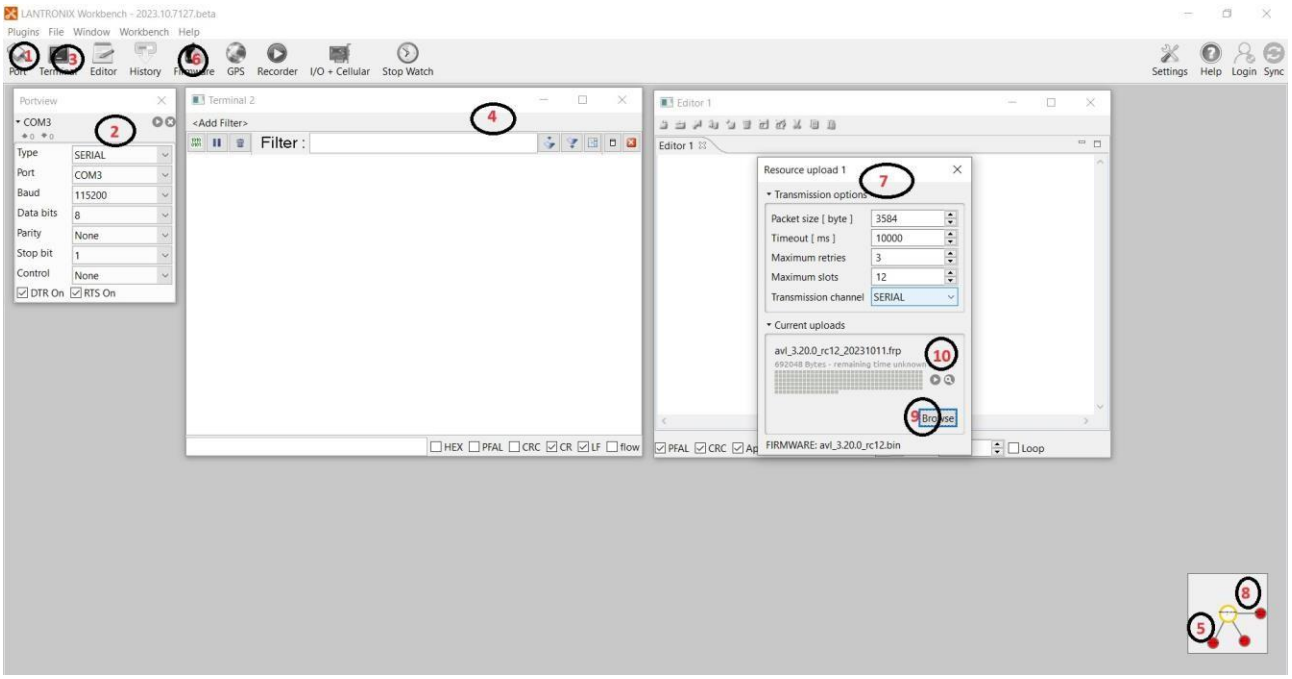
- Baud rate: 115200
- Data Bits: 8
- Parity: None
- Stopbits: 1
- Flow Control: None

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_4.2.0_rc12**" 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 4.x.x on FOX4 devices with an older processor. The firmware version 4.x.x is **ONLY** for FOX4 with the **CORTEX (CT)** processor. Please verify the hardware revision from the table "**Hardware compatibility"** above and make sure you are upgrading a FOX4 device with

CORTEX processor. LANTRONIX takes no 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 updating 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 support for new modem type QUECTEL EG91
  - added control io_expander IO_ENABLE_GSM and IO_EN_WLAN
  - added switch for PB13
  - Fixed usage of GetNetState() for PPP/WLAN

PFAL commands:

SYS.WLAN.Enable	-- Enable the WIFI module
SYS.WLAN.Disable	-- Disable the WIFI module
SYS.WLAN.Reset	-- Reset the module
WLAN.State	-- State of the module
WLAN.MAC	-- MAC address of the module
WLAN.Scan	-- Scan the network

- Implemented FOTA procedure for SARA-R500S devices

- Added autostart for BLE/WIFI
- Use console switch on higher API level
- Merged with avl_3_19_6_rc12 for latest consoleflow updates
- Updated wifi-host-driver 2.6.1.20115, see wifi_43439A0_bin.h
- Added HW id FOX4

PFAL commands:

GSM.StartFOTA,"<resource>"[,<port>] -- Set the FOTA resource and start update

The update resource is encoded as "ftp://[user:pwd@]ftp.server.com/path/file.zip"

GSM.StopFOTA -- Stop a pending update procedure

TCP.CF.ClearCertificate -- Clear used certificates
TCP.CF.GetRootCA -- Show RootCA certificates
TCP.CF.SetRootCA -- Set RootCA used by TLS library
TCP.CF.GetCertificate -- Show used certificates
TCP.CF.SetCertificate -- Set certificate used by TLS library
TCP.CF.GetPrivateKey -- Show used private key
TCP.CF.SetPrivateKey -- Set private key used by TLS library
-The certificates or key data must send after the command and the transmission is finished by ".<CR><LF>"

CNF.Lock=<"password"> -- Lock the config (rdonly)
CNF.Unlock=<"password"> -- unLock the config

--TCP buffer initialisation in MQTT client improved
- Bugfix for SYS.Security.HideAlarm
- Cleanup optinal certs in MQTT, MQTT & CFLOW clients.
- Fixed init of the network scan timer
- Check kill switch in modbus_rtu_send()
- Check disable debug port in CModBusDevice::Enable()
- Added additional events to the PX client

PFAL events:

-TCP.PX.eRegistered -- PX client is registered on the server
-TCP.PX.eCapabilityNegStarted -- PX client starts the capability negotiation
-TCP.PX.eCapabilityNegCompleted -- PX client completed the capability negotiation
-TCP.PX.eReceivedMessage -- PX MQTT client got a subscription
-TCP.PX.eMQTTConnected -- PX MQTT client was connected with server
-TCP.PX.eMQTTDisconnected -- PX MQTT client was disconnected from server
-TCP.PX.eStarted -- PX MQTT client was started
-TCP.PX.eStopped -- PX MQTT client was stoped
-TCP.PX.ePublished" -- PX client published telemetry data
-TCP.PX.eUpdatesAvailable -- PX client got available updates

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,
ALARM_PX_CLIENT_MQTT_CONNECTED, ALARM_PX_CLIENT_MQTT_DISCONNECTED,
ALARM_PX_CLIENT_REGISTERED, ALARM_PX_CLIENT_PUBLISHED,
ALARM_PX_CLIENT_UPDATES_AVAILABLE

-Added country setting for WIFI
- Rewrote o_NetInterface.Shutdown()

Config settings:

WLAN.COUNTRY=XX<REV> -- Country code setting

- Added secure boot support
- Adapted more AT commands for the EG91 device
- Fixed firmware header magic
- Increase DNS timeout to 30 seconds
- Fixed timeout for TLS handshake
- Fixed parsing MBEDTLS_SSL_TLS1_3_NEW_SESSION_TICKET state
- Using UTC time from +CCLK only SARA-R412
- Replaced buggy doEscapeSpecialCharacters()
- Fixed SNI for EnableSecurity()
- Fixed SNI for EnableSecurity()
- Simplfy DNS timeout usage
- set TLS handshake time to 60s
- remove duplicate publish event for telemetry
- support minimum refresh rate of 1s

- deEscapeSpecialCharacters for CLI command
- Added trces for low_level_input(), low_level_output()
- Make WIFI network traffic more noisy
- More detailed error answer for SYS.LUA.Start,SYS.LUA.Stop,SYS.LUA.Info
- Avoid TLS input buffer overflow in ReceiveBytesTLS()
- Avoid a deadlock when calling ASYNC event handler in WIFI driver
- Removing PX credentials from MSG.Info.Serverlogin
- Changed return parameter for CNetSocket:DataRcvd()
- Changed configuration for lwIP
- added commands to write default MAC address

PFAL commands:

Secured,"10h[MAC:6 Byte]" -- Write default WLAN MAC
Secured,"11h[MAC:6 Byte]" -- Write default BLE MAC

PFAL dyn.Variablen:

&(BLE.Addr) -- local BLE address
&(WIFI.MAC) -- WIFI MAC address

- Bugfix to prevent content corruption of the MQTT send buffer
- Increase MQTT content size
- Added host_platform_get_mac_address()
- Alternate implementation to read the BLE scan results
- 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
- Using local BDADDR for BLE, see bt_interface.cxx
- Fixed bug while transition between wifi <-> modem
- Skipped test for additional MNF data in advertisement
- Bugfix for SYS.WLAN events,
- Bugfix for additional telemetry data
- Bugfix for changed polarity of the GSM antenna switch
- Bugfix for failed MNO profile set up
- Deactivate DBG_NET_WIFI_INFO by default
- Bugfix for FOTA SARA-R500S-01B module firmware update
- New feature: dynamic variable for the current value of a CAN variable, displayed in hexadecimal
- Extended format for BLE tag listings
- Increase buffer size of UDP.Client

-Percepxion: improve script updates from Percepxion

- Fixed DNS resolution in UDP.Client

PFAL commands:

$PFAL,SYS.BLE.ListExt -- List scanned tags with MAC,Name,RSSI,MNF-Data

PFAL dyn. variables:

&(CAN.H<variable_slot>)

- Raise the reqiered PDOP value for SaveLastPosition
- Support float parameter for GPS.Nav.eSpeed|sSpeed
- Save module state in SYS.BLE.Disable
- Fixed reset during SYS.Device.Doze
- Unescape results for SYS.ModBus.Scan,
- Make Counter and nvCounter alarms more flexible
- Adding a $GPNET protocol to show cellular/wifi states
- Set the correct date/time in SetCurrentTime()
- Adding an iperf client for bandwith measurement

Config settings:

PROT.NET=<interval> -- Shows $GPNET protocol at the specified interval

PFAL commands:

TCP.Iperf.Start,"<[udp://]server|IP>",<port> -- Start the iperf client
TCP.Iperf.Stop -- Stop the iperf client
TCP.Iperf.State -- Show the state of the iperf client

PFAL events:

SYS.Counter.e<id><'=','!=','<','>','<=','>='><value> -- counter change event
SYS.nvCounter.e<id><'=','!=','<','>','<=','>='><value> -- nvcounter change event

- Fixed stack overflow in PX client
- Increased MQTT_TELEMETRY_DATA_LEN size
- Reduced I2C clock to 100 KHz
- corrected misleading trace messages in PX-MQTT
- Bugfix for enabling Quectel EG91 lte module
- Fixed pooling GPRS in tls_net_recv()
- Fixed in case of disconnecting a serial connection, resets Modbus variables
- Fixed 1-wire temperature value stuck at 85.0ºC

Fixes for better DNS handling

- Fixes memory leak in the WIFI driver
- Improved robustness for PX/MQTT client
- Use seperate thread for handling TCP sockets
- Fix udp send in case of not ready gsm or not connected
- Improved stability of the PX MQTT client
- Improved fitering for WIFI scan results
- Leave the WIFI network for low RSSI level
- Reset watchdog when defining subscriptions for MQTT
- Blocking duplicate execution for EnableHW(),DisableHW()
- Fixed event creation for Counter and nvCounter
- Block the TCP clients during shutdown
- Fixed polling GPRS in tls_net_recv()
- Fix AVL3-765: in case of disconnecting a serial connection

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