



- FOX3-3G-BLE

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- **Application Note**

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Version history:

This table provides a summary of the document revisions.

Version	Author	Changes	Modified
1.0.2	F. Beqiri	- Renamed evaluation android app to "SPP Terminal Demo"	5/15/2017
1.0.1	F. Beqiri	- New document design - Added new commands <code>\$PFAL, Sys.Ble.Send,<protocol>,"<text+dynamic entries>"</code> and <code>\$PFAL,Msg.Send.Ble,<protocol>,"<text+ dynamic entries>"</code> - Added new configuration parameter "DEVICE.BLE.STARTUP=<on off>"	5/11/2017
1.0.0	F. Beqiri S. Mohamad	- Initial version	12/20/2016

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1 INTRODUCTION

This guide shows how to configure your FOX3-3G-BLE device, connect it to the FALCOM evaluation android app and monitor device activities via the BLE interface.

1.1 General

Bluetooth® Low Energy (BLE) (also called Bluetooth® Smart or Version 4.0+ of the Bluetooth® specification) is the power- and application-friendly version of Bluetooth® that was built for the Internet-of-Things (IoT). The FOX3-3G-BLE is a 3G vehicle telematics device that features Bluetooth Low Energy connectivity for in car access, company fleets, car-sharing, and car-rental applications to connect, share or distribute information in real time. FOX3-3G-BLE can operate as a master or slave device depending on required functionality. As a master device it detects BLE beacons within its field and collects their data.

As a slave device it connects to another device (e.g. BLE smartphone or tablet) and exchange data.

FALCOM has designed an evaluation android app (**for evaluation only**) called “**BLE Terminal Demo**” which can be used to test and evaluate the BLE functions of the FOX3-3G-BLE on your smartphone or tablet. This demo application runs under **Android 4.4** and higher.

1.2 Hardware requirements

- FOX3-3G-BLE with the firmware version 3.x.x or higher.
- Smartphone or tablet with Android 4.4 or higher to install the demo application which FALCOM provides for test purposes.
- BLE beacons (if needed)

NOTES

- **The FOX3-3G-BLE does not run with the firmware version 2.xx or lower.**
- **The BLE on the FOX3-3G-BLE supports the Terminal I/O profile (Terminal I/O works similar to SPP).**
- **No audio support over Bluetooth®**
- **The maximum length for the FOX3-3G-BLE advertised name is 10 characters.**

1.3 BLE features implemented in the AVL firmware 3.x.x

In table below you find the list of the PFAL commands/events/dynamic entries which are implemented in AVL firmware 3.x.x related to use the BLE functionality.

Configuration Parameter Settings	Description
\$PFAL,CNF.Set,DEVICE.BLE.STARTUP=<on off>	Sets up the configuration of the BLE module in FOX3-3G-BLE devices. Please do not set it "off".
\$PFAL,CNF.Set,Ble.AdvName=<Advertized_friendly_name>	Defines the BLE device name. Default = FOX3-3G-AVL e.g. \$PFAL,CNF.Set,Ble.AdvName=FOX3-BLE
Events Syntax	Description
SYS.BLE.eConnected	Occurs when the connection to a host is established (e.g. tablet or smart-phone)
SYS.BLE.eDisconnected	Occurs when the connection to a host is lost (e.g. App on the tablet)
SYS.BLE.eRegister="<BLE-BeaconID/Name>"	Occurs when a BLE beacon is inside the range of the FOX3-3G-BLE.
SYS.BLE.eRegister=whitelist	Occurs when the incoming ID or name matches one of the entries available in the Whitelist. Entries in the Whitelist can be set with <i>\$PFAL,Sys.Whitelist.Set</i>
SYS.BLE.eRelease="<BLE-BeaconID/Name>"	Occurs when an already registered BLE beacon is out of range of the FOX3-3G-BLE.
SYS.eBleData="<userTxt>"	Occurs when the device receives a user text from the connected host (e.g. tablet or smart-phone)
Commands syntax	Description
\$PFAL,Sys.Ble.Scan	Starts scanning for new BLE devices in your near environment
\$PFAL,Sys.Ble.List	Shows all available BLE devices listed by names.
Sys.Ble.Send,<protocol>,"<text+dynamic entries>"	Sends the specified protocols and/or user text to the BLE connected devices
Msg.Send.Ble,<protocol>,"<text+ dynamic entries>"	Sends the specified protocols and/or user text to the BLE connected devices
Dynamic Entries Syntax	Entries Description
&(BLE.Name)	Used to report the name of last registered BLE device
&(BLE.RSSI)	Used to report the RSSI value in dbm from last registered BLE device
&(BLE.Released)	Used to report the name of last released BLE device
&(BLE.List)	Used to report the found devices from last scan

1.4 Setup your FOX-3G-BLE device to send specific data to a host via BLE

Below you will find an example how to setup and establish the Bluetooth® connection between the FOX3-3G-BLE and a host periphery (example App on the tablet with Android 4.4 and higher) and how they communicate between each other.

FALCOM provides a demo application “**app-debug.apk**” for Android 4.4 and higher called “**BLE Terminal Demo**” which can communicate with the FOX3-3G-BLE over the Bluetooth®. The file “**app-debug.apk**” can be sent to the customers upon request.

1. Turn on the FOX3-3G-BLE and configure it with such alarm configuration lines

```
$PFAL,CNF.Set,AL1=SYS.BLE.eConnected:Sys.Timer0.start=cyclic,5000
```

```
$PFAL,CNF.Set,AL2=Sys.Timer.e0:Msg.Send.Ble,8,"Name:&(Devicename); IMEI:&(IMEI); Date:  
&(Date); Time:&(Time)"
```

```
$PFAL,CNF.Set,AL3=SYS.BLE.eDisconnected:Sys.Timer0.stop
```

2. Turn on your tablet (or smart phone) and install the application “**BLE Terminal Demo**” (see **app-debug.apk**. After a successful installation, its icon appears on the display (see Figure 1).

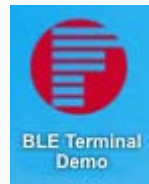


Figure 1: icon

3. Activate the Bluetooth® on the tablet.
4. Start the "**BLE Terminal Demo**" App by hitting the icon.
5. When the "BLE Terminal Demo" starts up, you would see this window (see Figure 2).

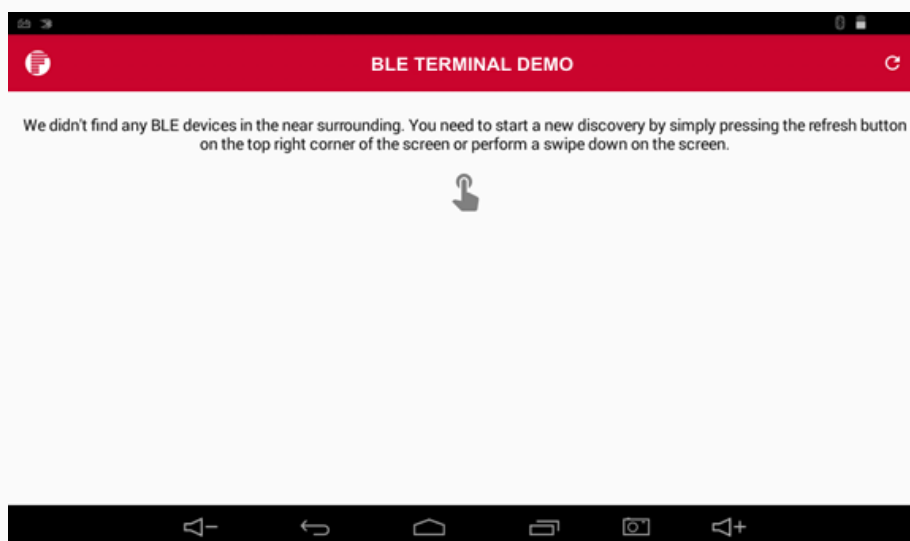



Figure 2: Main user interface after starting the “BLE Terminal Demo”

- 6. Click on the "scan" symbol  to start scanning the BLE devices near the tablet
- 7. The App should find "FOX3-3G-AVL".
Please note that the maximum length for the FOX3-3G-BLE advertised name is 10 characters.
- 8. Click on the name "FOX3-3G-AVL" (see Figure 3)

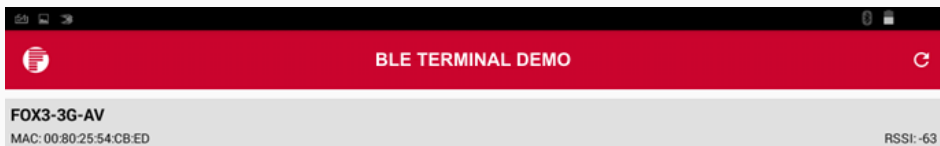


Figure 3: Result of the found BLE devices near the tablet

- 9. A terminal starts (see Figure 4)

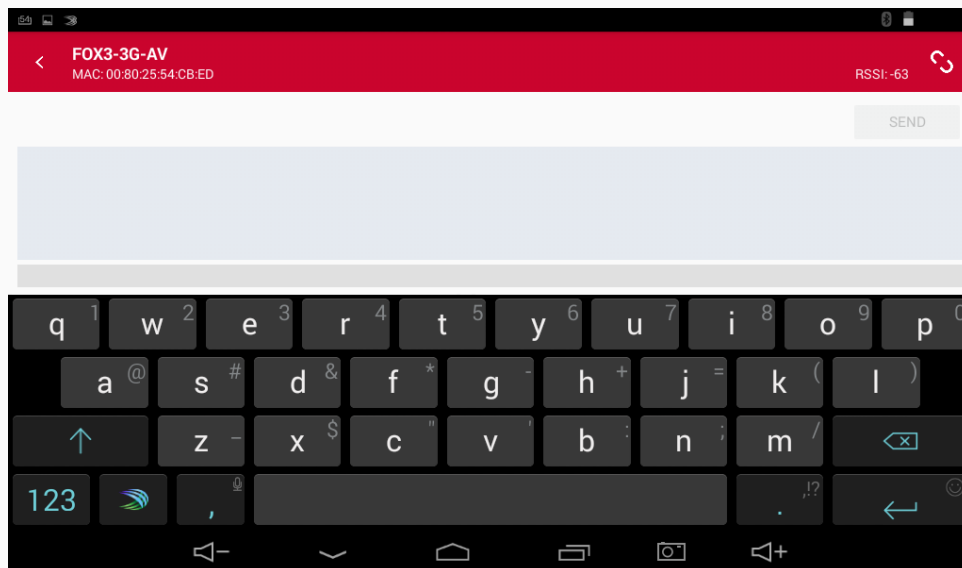



Figure 4: Terminal interface on the "BLE Spp Demo"

- 10. Click on the "connect/disconnect" symbol  to establish the BLE connection.

11. Once the BLE connection between the FOX3-3G-BLE and the tablet is established, the FOX3-3G-BLE generates the event: **SYS.BLE.eConnected** and it starts sending periodically (every 5 seconds) its data (see Figure 5).

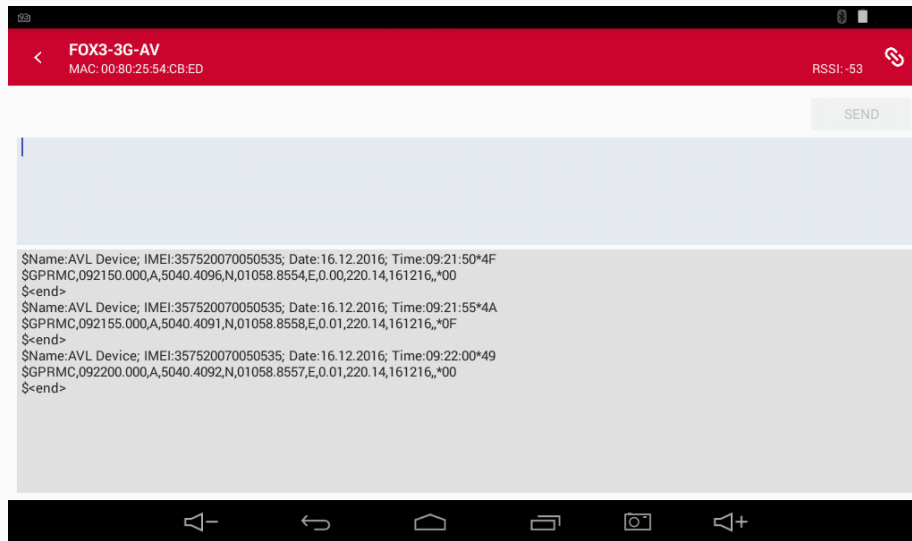


Figure 5: The tablet receives data from the FOX3-3G-BLE

12. To send data e.g. GPRMC protocol and user text to the connected host device, use the command `$PFAL, Sys.Ble.Send,08,"Hello host device"`.
13. While receiving data from the FOX3-3G-BLE you can send from the tablet texts or PFAL commands to the FOX3-3G-BLE. Type **Hello FOX3** in the upper field then hit **"SEND"** (see Figure 6)

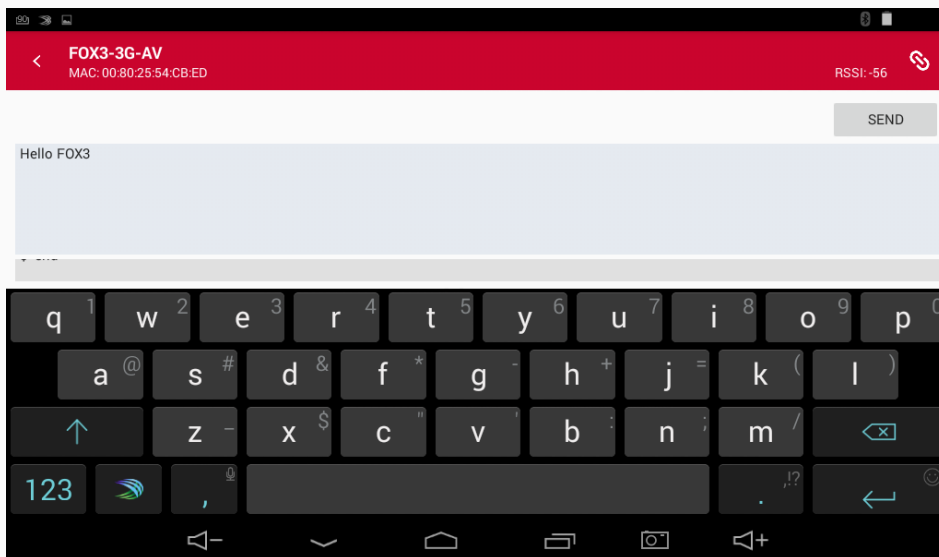


Figure 6: Sending data from the tablet to the FOX3-3G-BLE

14. The FOX3-3G-BLE receives this message and generates the EVENT: **SYS.eBleData="Hello FOX3"**

1.5 Setup your FOX3-BLE device to scan BLE beacons

For the applications which require BLE beacons detections, you can automate the BLE scan procedure by using this action/command (Sys.Ble.Scan) in PFAL alarm lines.

Example:

```
$PFAL,CNF.Set,AL4=sys.device.eStart:sys.Timer1.Start=cyclic,60000
$PFAL,CNF.Set,AL5=sys.Timer.e1:Sys.Ble.Scan
$PFAL,cnf.set,AL6=SYS.BLE.eRegister?SYS.BLE.eRelease:MSG.Send.Serial0,0,"&(Ble.name)      &(Ble.rssi)
&(Ble.list) &(Ble.released)"&TCP.Client.send,8," &(Ble.name) &(Ble.rssi) &(Ble.list) &(Ble.released)"
```

NOTES

- **Please be sure that the cyclic scan for the BLE beacons is not less than 60 sec.**
- **The FOX3-3G-BLE can't be operated in two modes, i.e. BLE connection with a host and scanning BLE beacons simultaneously.**