FOX3 Series
Promotion Kit User Guide

FOX3-2G Series
FOX3-3G Series
FOX3-4G Series

Part Number PMD-00021
Revision A October 2019

Intellectual Property

© 2019 Lantronix, Inc. All rights reserved. No part of the contents of this publication may be transmitted or reproduced in any form or by any means without the written permission of Lantronix.

Lantronix is a registered trademark of Lantronix, Inc. in the United States and other countries.

Patented: https://www.lantronix.com/legal/patents/. Additional patents pending.

Windows and *Internet Explorer* are registered trademarks of Microsoft Corporation. *Firefox* is a registered trademark of the Mozilla Foundation. *Chrome* is a trademark of Google Inc. All other trademarks and trade names are the property of their respective holders.

Warranty

For details on the Lantronix warranty policy, please go to our web site at https://www.lantronix.com/support/warranty.

Contacts

Lantronix, Inc.
7535 Irvine Center Drive, Suite 100
Irvine, CA 92618, USA
Toll Free: 800-526-8766
Phone: 949-453-3990
Fax: 949-453-3995

Technical Support
Online: www.lantronix.com/support

Sales Offices
For a current list of our domestic and international sales offices, go to the Lantronix web site at www.lantronix.com/about/contact

Disclaimer

All information contained herein is provided “AS IS.” Lantronix undertakes no obligation to update the information in this publication. Lantronix does not make, and specifically disclaims, all warranties of any kind (express, implied or otherwise) regarding title, non-infringement, fitness, quality, accuracy, completeness, usefulness, suitability or performance of the information provided herein. Lantronix shall have no liability whatsoever to any user for any damages, losses and causes of action (whether in contract or in tort or otherwise) in connection with the user’s access or usage of any of the information or content contained herein. The information and specifications contained in this document are subject to change without notice.

Open Source Software

Some applications are Open Source software licensed under the Berkeley Software Distribution (BSD) license, the GNU General Public License (GPL) as published by the Free Software Foundation (FSF), or the Python Software Foundation (PSF) License Agreement for Python 2.7.3 (Python License). Lantronix grants you no right to receive source code to the Open Source software; however, in some cases, rights and access to source code for certain Open Source software may be available directly from Lantronix' licensors. Your use of each Open Source component or software is subject to the terms of the applicable license. The BSD license is available at http://opensource.org/licenses. The GNU General Public License is available at http://www.gnu.org/licenses/. The Python License is available at http://cmpt165.csil.sfu.ca/Python-Docs/license.html. Your use of each Open Source component or software is subject to the terms of the applicable license.

OPEN SOURCE SOFTWARE IS DISTRIBUTED WITHOUT ANY WARRANTY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SEE THE APPLICABLE LICENSE AGREEMENT FOR ADDITIONAL INFORMATION.

You may request a list of the open source components and the licenses that apply to them. Contact your regional Lantronix sales associate. https://www.lantronix.com/about-us/contact/

Revision History

Date	Rev.	Comments
02/12/2015	1.0.0	- Initial version.
06/02/2015	1.0.1	- Updated: chapters 2.2 and 5.1.
06/03/2015	1.0.2	- Changed: STARTER-KIT to PROMOTION-KIT
06/04/2015	1.0.3	- Added figure 14 in chapter 5.3
06/05/2015	1.0.4	- Added basic configuration settings when using your SIM card and TCP server - see chapter 5.3
06/23/2015	1.0.5	- Added new items in the PROMOTION-KIT: 1) USB to serial converter with extension cable 2) External antenna (ANT-11 for FOX3 only and ANT-12 for FOX3-3G and ANT-14 for FOX3-4G device) 3) 8 hours free technical support
12/21/2017	1.0.6	- Added explanation of the sample configuration – see chapter 5 - Extended the contents of promotion kit – added CA27, CA76 and CA123
05/09/2018	1.0.7	- Extended the contents of promotion kit – added CA27, CA76 and CA123
July 2019	A	Initial Lantronix document. Added Lantronix document part number, Lantronix logo, branding, contact information, and links.

For the latest revision of this product document, please check our online documentation at www.lantronix.com/support/documentation.

Table of Contents

1 About this Document 4

1.1 Audience 4

1.2 How this document is organized 4

2 Overview 5

2.1 Scope of delivery 5

2.2 Related documents 6

3 Getting Started 8

3.1 PROMOTION-KIT hardware set up 8

3.1.1 Unpacking the PROMOTION-KIT 8

3.1.2 Connecting FOX3-2G/3G/4G to the control-box 9

3.1.3 Charge the internal battery and power up the device 9

3.1.4 Installing the Lantronix Workbench software and start evaluation 11

3.1.5 Accessing online documentation 12

3.2 Customer Support 12

3.3 LANTRONIX D2Sphere server-frontend 12

3.4 How the sample configuration works? 12

4 Control-Box - Hardware Description 13

4.1 Front panel overview 13

4.2 Top panel overview 13

4.3 Rear panel overview 14

5 Explanation of the Sample Configuration 15

6 Appendix 21

6.1 How does the FOX3-2G/3G/4G firmware operate? 21

6.2 Installation cables (CA27 & CA31 & CA69 & CA76 & CA123) 22

6.3 Installing your own SIM card and replacing the internal battery 24

1 About this Document

This document provides information about the FOX3-2G/3G/4G/-4G PROMOTION-KIT giving customers the possibility to easily and quickly evaluate the product and all its functionality.

This document was written assuming the user has basic computer knowledge, and is familiar with the Windows operating environment.

1.1 Audience

This document is intended for system integrator and application developers.

1.2 How this document is organized

This guide consists of following chapters:

- Chapter **2**, "Overview" gives an overview of the PROMOTION-KIT and describes its contents.
- Chapter **3**, "Getting started" provides installation instructions of the PROMOTION-KIT and testing its functionality.
- Chapter **4**, "Control-Box" provides an overview of the control-box and describes how to use it.
- Chapter **5**, "A detailed explanation of the sample configuration" provides information about the configuration preloaded at the factory. It shows the functionality of each alarm configuration and the description of each configuration parameter settings.
- Chapter **6**, "Appendix" provides information how the firmware operates and information about the included installation cables. Here is also explained how to operate with your own SIM card and how to login the FOX3-2G/3G/4G device to your own remote server.

2 Overview

This PROMOTION-KIT provides all the necessary hardware, software, and documentation to easily and quickly evaluate the performance of your FOX3-2G/3G/4G device. The FOX3-2G/3G/4G device is shipped pre-configured allowing system integrators and developers to test the factory-preloaded configuration and see how the FOX3-2G/3G/4G device works. Once the device is powered up, it connects automatically to the Lantronix *D2Sphere* server which supports two-way communication interface between server and device and lets you track all activities of the device, pull and change the factory-preloaded device configuration. You don't need anything else to get started with PROMOTION-KIT. Only an internet enabled computer (PC client) with a pre-installed standard web browser is required. After you log in to the *D2Sphere* server, the exact location and other information transmitted from the device will be displayed on the map.

2.1 Scope of delivery

PROMOTION-KIT consists of 1 outer box with 3 small boxes inside. Before you start up the PROMOTION-KIT, make sure that your package includes the following items listed in table 1 below. If any item is missing or damaged, please contact your vendor immediately..

In addition to the D8 interface, the IOBOX-CAN device offers several flexible features such as CAN-Bus interface and programmable inputs and outputs for almost every application within the automobile industry. For more details, please refer to the chapter 3.1, and download the document *"FOX3_3G_4G_HardwareManual.pdf"* from our website.

Figure 1: PROMOTION-KIT delivery package.

Article name	QTY	Description
FOX3-2G/3G/4G (BOX)		
FOX3 unit	1	FOX3 or FOX3-3G unit, pre-configured with access to the Lantronix **D2Sphere** server. The device is placed in the IGN-Sleep mode prior to being shipped from the factory and can be woken up via IGN-Switch or a high signal on IGN-pin.
Battery	1	1000 mAh rechargeable battery (already inserted and connected to the FOX3-2G/3G/4G/-4G)
PREMIUM-FEATURES	-	All PREMIUM-FEATURES are activated by the factory. For details how to use them refer to the corresponding Application Notes listed in chapter 2.2
SIM-Card	1	Prepaid SIM card. Service fee includes 10MB of data transfer and 3 months access to the Lantronix *D2Sphere* server for evaluation purposes.
ANT-11 / ANT-12 / ANT-14 /	1	Depending on which Promotion Kit you ordered, one of the following external antennas will be part of your kit: **ANT-11 :** Quad Band GSM+GPS combination antenna for FOX3 only. **ANT-12** : Penta Band GSM/WCDMA combination antenna for FOX3-3G. **ANT-14** : GSM/UMTS/WCDMA/LTE and GNSS combined antennas for FOX3-4G. More details: https://www.lantronix.com/products/fox3-series/
Instruction sheet	1	Necessary information how to get started with Lantronix AVL devices.
Info-Sheet	1	Contains log-in data to access the Lantronix *D2Sphere* server for evaluation purposes.
FOX3-2G/3G/4G-CONTROL-BOX		
Control-Box	1	To test the functions of the FOX3-2G/3G/4G device and allows connection to your PC for evaluation purposes.
USB to SERIAL	1	This cable allows a serial connection through the USB port of the PC to the serial port of the control box.
CA27	1	Main port service and power connection cable
CA31	1	Installation cable for FOX3-2G/3G/4G with interface to the RFID-Reader or JAZZ2. This cable allows to install your FOX3-2G/3G/4G to the vehicle.
CA69	1	This cable allows testing of the available pins on the accessory port of the FOX3-2G/3G/4G (e.g. 1-Wire bus). It has a 4pin connector for connecting to a RFID-Reader or JAZZ2 device.
CA76	1	Accessory port service cable with 2x3pin connector to DB9 female socket with a length of 1.0 m
CA123	1	2x4pin connector to OBDII cable with separated IGN-wire. Cable length of 1.5 m
POWER-SUPPLY-BOX		
Power Suppy	1	Type **FW7238/12** incl. UK/US/AU/EU adaptor

Table 1: The list of items included in the PROMOTION-KIT.

2.2 Related documents

In addition to this document, the following files comprise the full set of FOX3-2G/3G/4G product manuals. Visit the Lantronix web site at www.lantronix.com/support/documentation/ for the latest documentation and the following additional information.

NR	PDF file name	Description
[1]	AVL_PFAL_Configuration_Command_Set.pdf	Contains the description of the internal firmware and the supported Configuration Command Set for the Lantronix AVL devices.
[2]	FOX3_hardware_manual.pdf	Contains information about the hardware of the FOX3 device.

Table 2: FOX3 Series Documentation

Application Notes

NR	PDF file name	Description
[3]	AppNotes_AVL_IO.pdf	Contains information about the use of the IOs on AVL devices
[4]	AppNote_CAN_FMS_CAN_OBDII_Howto.pdf	Contains information about the use of the CAN-BUS interface
[5]	AppNotes_AES_TCP.pdf	Contains information about the AES128 data encryption on AVL devices
[6]	AppNotes_ECO-DRIVE-GPS.pdf	Contains information about the using of ECO-DRIVE-GPS on AVL devices
[7]	AppNotes_INDEXED_HISTORY.pdf	Contains information about the indexed history on AVL devices
[8]	AppNotes_Transform_history_data.pdf	Contains information about the conversation of the history data stored in a AVL device
[9]	AppNote_Remote_update.pdf	Contains information of how to upgrade AVL devices to a new firmware revision remotely via TCP
[10]	AppNotes_connecting_a_bar_code_scanner.pdf	Describes how to connect a bar code scanner to a STEPPII, STEPPIII, BOLERO-LT, FOX3-2G/3G/4G etc. and store or transmit the scanned data.
[11]	AppNotes_AVL_Installation_Guide.pdf	This document provides all the necessary information to allow your Lantronix product to be properly and safely installed
[12]	AVL_AppNote_RFID_Howto.pdf	This document provides all the necessary information how to connect a RFID reader to your Lantronix product and work with it
[13]	AppNotes_1-Wire-Guide.pdf	This document provides all the necessary information how to connect 1-Wire sensors to your Lantronix product and work with them.
Lantronix D2Sphere-fleet documents		
[14]	t4y_fleet_UsersGuide.pdf	This document provides all the necessary information how to get started and work with Lantronix *D2Sphere*-fleet server application/frontend.

Table 3: Application Notes

These PDF files are viewable and printable from Adobe Reader. If you do not have the Adobe Reader installed, you can download it from http://www.adobe.com.

3 Getting Started

3.1 PROMOTION-KIT hardware set up

This chapter explains how to connect and set-up the PROMOTION-KIT.

Installing the PROMOTION-KIT in five steps:

1. Unpack the PROMOTION-KIT.
2. Connect the FOX3 unit to the control-box, PC and apply power.
3. Charge the internal battery of the FOX3-2G/3G/4G and power up the device.
4. Install the Lantronix Workbench software and start the evaluation of the FOX3-2G/3G/4G device
5. Access the online documentation from the Lantronix website using the login data available in the info sheet supplied with PROMOTION-KIT.

3.1.1 Unpacking the PROMOTION-KIT

Unpack the contents as shown in the figure below. There are no external antennas included in the PROMOTION-KIT, as the FOX3-2G/3G/4G has also internal GSM/GPS antennas.

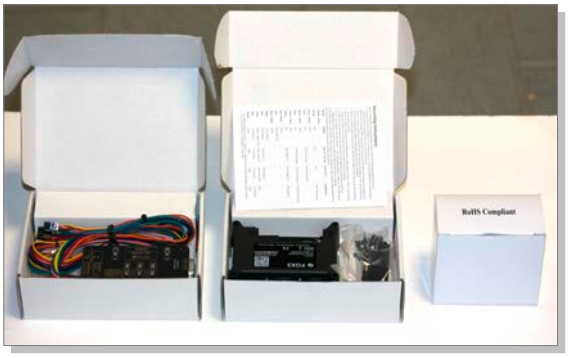

Figure 2: Boxes inside the PROMOTION-KIT.

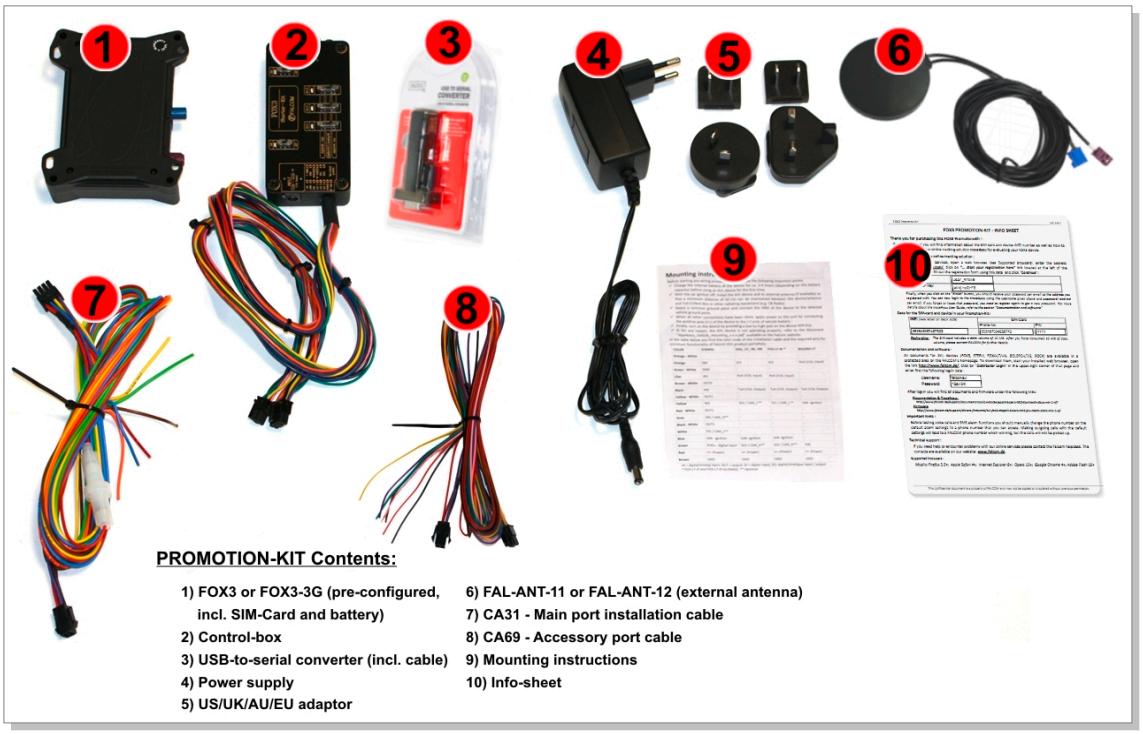

Figure 3: PROMOTION-KIT contents.

3.1.2 Connecting FOX3-2G/3G/4G to the control-box

1. Before starting initial operation, switch all switches on the Control-Box to "OFF" (factory default setting).
2. Plug in the 8pin double row connector (1a) of cable (1) to the 8pin main port on the FOX3-2G/3G/4G device. To unplug, press the "lever" on the back of this connector (1a) and pull it out.
3. Plug in the 6pin double row connector (1b) of cable (1) to the 6pin accessory port on FOX3-2G/3G/4G. To unplug this connector press the "lever" on the back of this connector (1b) and pull it out.

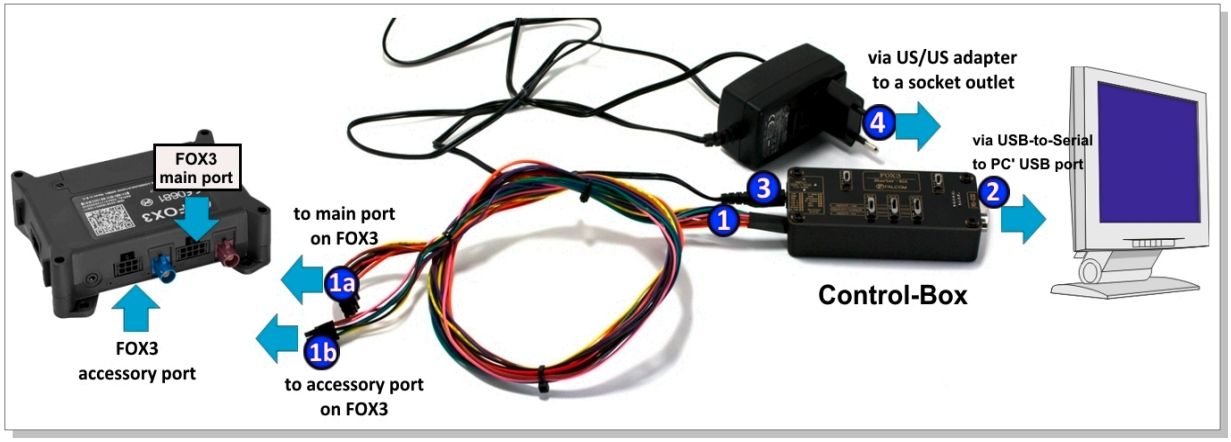

Figure 4: Connecting PROMOTION-KIT to FOX3-2G/3G/4G and PC

4. Now, unpack the power supply from the box and plug it into the left input socket on the control-box marked "INPUT 12.0V … 32.0V". Then plug the AC adapter into the wall socket of your 220V electric mains (to access British/American wall socket use the included UK/US adaptor accordingly).
5. ***Important:*** *Even the FOX3-2G/3G/4G series devices provide two serial ports (except LITE models which have only one serial port), the control-box offers only one serial port for the communication with them. That means if you would like to connect and test a third-party-product to a FOX3-2G/3G/4G series device you have to use the second serial port (the serial port [RX,TX,GND] on the 6pin connector) instead of the first serial port which is available on the control-box. That means, please do not reconfigure the first serial port, except when you have already a self-made serial cable for the second port (accessory port).*

3.1.3 Charge the internal battery and power up the device

The internal battery in the device may be shipped with a minimal charge and will need to be fully charged before use.

To charge the internal battery, follow the steps below:

1. After connecting the AC adapter to the Control-Box and into the wall socket, apply power to the control box and FOX3-2G/3G/4G device by turning just the "**+IN**" switch to "**ON**" position.

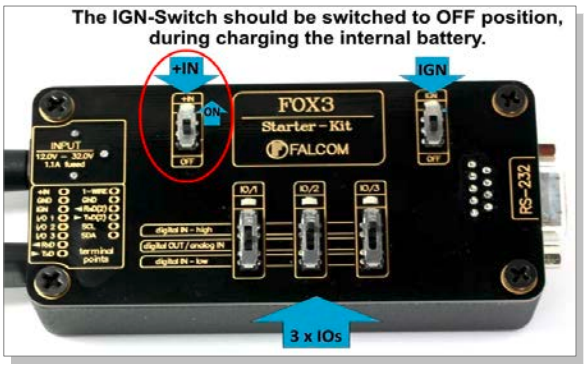

Figure 5: Overview of the control-box top panel (+IN = ON)

1. Depending on the battery charge state, the charging time may by different but usually it takes 3-4 hours to fully charge the internal battery.
2. After the battery is fully charged, unpack the USB to serial converter and the USB extension cable. Remove the USB cover on the converter and connect the USB cable to the converter (1), see figure below. Plug the serial port of the converter to the COM port of the control box (2). Finally, plug the other end of the cable into a free USB port on your PC (3). This cable is used for communication between the FOX3-2G/3G/4G and Workbench software for sending and receiving data as well as to change the configuration stored in the FOX3/3G device.

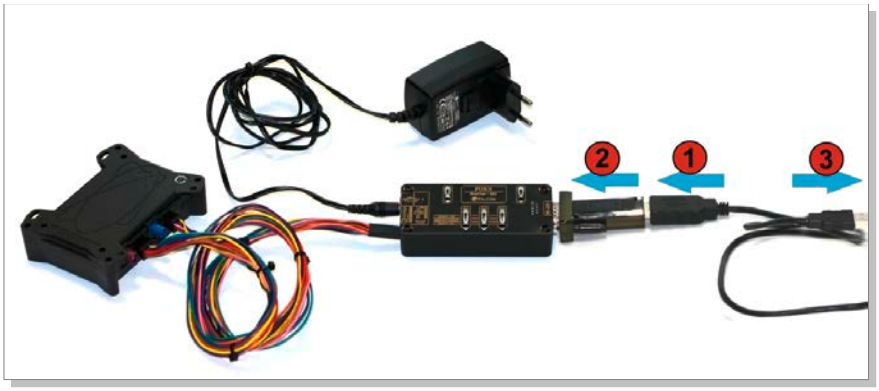

Figure 6: Connecting the converter with the USB cable

3. Finally, power up the FOX3-2G/3G/4G device by turning the "**IGN**"-switch to "**ON**" position.

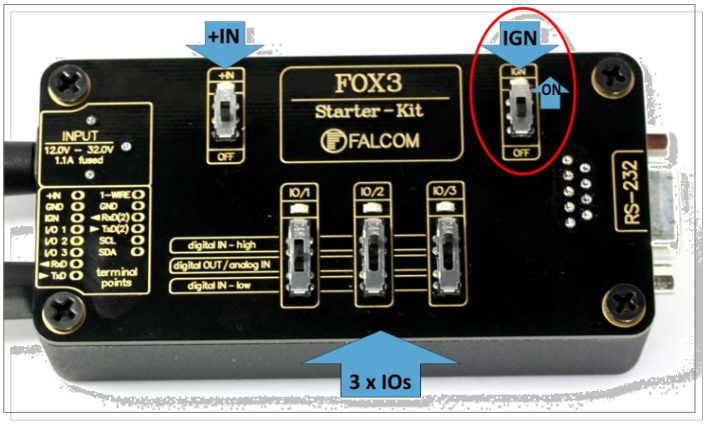

Figure 7: Overview of the control-box top panel (IGN = ON)

"+IN" It supplies power to the control box and FOX3-2G/3G/4G.

"IGN" It turns on the FOX3-2G/3G/4G (wakes it up from the IGN sleep mode).

4. If you want to use the FOX3-2G/3G/4G with external antenna, remove first power from the device, unpack the supplied antenna and connect both ends of the antenna to the same colours of FAKRA connectors on the FOX3/3G and power up the device again.

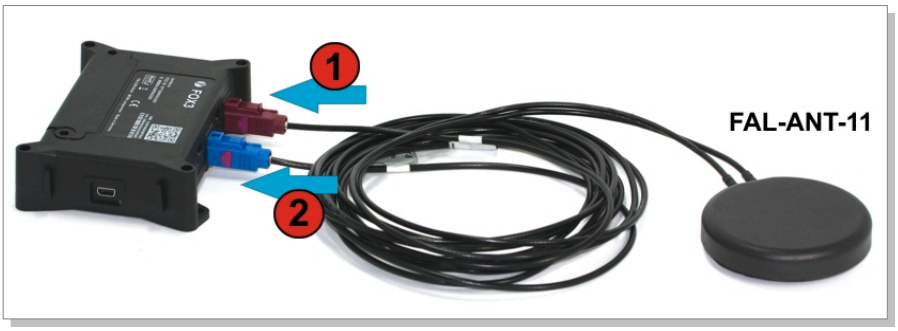

Figure 8: Connecting the external antenna

3.1.4 Installing the Lantronix Workbench software and start evaluation

System requirements for Workbench software

(a) PC with 700 megahertz or higher processor Intel Pentium II or compatible processor recommended,
(b) 512 megabytes (MB) of RAM or higher recommended (512MB minimum supported; may limit performance and some features),
(c) 90 megabytes (MB) of available hard disk space (recommended 2 gigabytes),
(d) Keyboard and Mouse.

To test your device with factory preloaded configuration or to change this configuration, you need to install the ***Workbench*** evaluation software. To download Workbench software, go to https://www.lantronix.com/products/workbench/.

1. After completing the installation, start the **Workbench.exe** by double-clicking on it. Open a new **COM Port** from the Toolbar **(1)**, on the **COM Port view (2)** choose the Port where FOX3-2G/3G/4G is connected (go to Device Manager > Ports > USB Serial Port (COMxx), where **xx** is the COM port to use), define the port settings (**115200** bps, **8** Data bits, **No** Parity bit, **1** Stop bit, **None** Flow control) and finally, click the connect (play) icon **(2.1)** to open that COM Port. You can also get an online help in HTML format if you click "**Help**" button on the upper-right corner.
2. Open a new **Console** from the Toolbar **(3)**, click on the **Console1 (4)**, then go to **Connection view** and click on **COMPort (5).**
3. Open a new **Editor** from the Toolbar **(6)**, click on the **Editor1 (7)**, then go to **Connection view** and click on **Console1 (8).**
4. To send commands to the FOX3-2G/3G/4G device, type them on the **Editor (9)** and then click on **Start sending configuration (10)** or double click with left mouse each configuration line on the **Editor (9)** individually.
5. To see all events generated by the FOX3-2G/3G/4G device, either open a new console "Console2" or on the Console1 **(4)**, click "Add" **(11)**, type the text "GPEVENT" on input field **(12)**, finally click the button **(13)**"Filter incoming". A description how to operate with the Control-Box is given in chapter 4.

3.1.5 Accessing online documentation

References to the online documentation are listed in chapter 2.2, Related documents.

How to send the data to a TCP-Server or SMS messages to a phone number/SMS server and how to reconfigure the loaded configuration on the device, refer to the Related Documents [1]. A description of how the firmware on the FOX3-2G/3G/4G works is given in chapter 5.1.

3.2 Customer Support

To view the support options, go to https://www.latronix.com/support.

3.3 LANTRONIX D2Sphere server-frontend

The D2Sphere-fleet is a web-based tracking application that provides users with an easy-to-use interface from where you can remotely monitor and view the location of the AVL devices in real-time. D2Sphere also allows to view the device history, device-generated event, view reports, manage geofences, pull and change the factory-preloaded device configuration. After the FOX3-2G/3G/4G is successfully powered up, open a web browser (IE or Firefox) and follow the registration process as given on the enclosed slip of paper called „Info-Sheet“.

3.4 How the sample configuration works?

Once the FOX3-2G/3G/4G device is powered up, it tries automatically to register to the GSM network, attach to the GPRS network and finally connect to the LANTRONIX *D2Sphere* server using the factory-preloaded configuration. The connection state of the GPRS and TCP services will be shown by the generated events GSM.GPRS.eConnected and TCP.Client.eConnected telling you that the device is connected to the GPRS/TCP server. These events are displayed on the Terminal in the Workbench. The device GPS location is shown on the *D2Sphere* frontend server after log-in. For more details about the *D2Sphere* server refer to the Related Documents [14].

4 Control-Box - Hardware Description

This chapter gives you some information about the operation of the control box. It allows you to exercise the function of all inputs and outputs on the FOX3-2G/3G/4G device without the need to add any other external component to them.

The components on the control-box can be identified from the figures below showing the front, top, and the rear panels.

4.1 Front panel overview

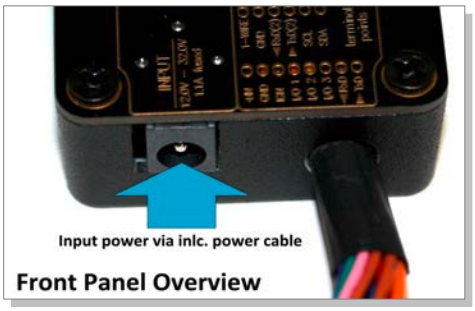

Figure 10: Front panel of the control-box.

A description of each of the items on the front panel is provided in Table 4.

Item	Description
INPUT (12V – 32V)	Input power supply for control-box and FOX3-2G/3G/4G device with **1.1 A** fuse protected.

Table 4: Front panel overview.

4.2 Top panel overview

Figure 11: Top panel of the control-box.

A description of each of the items on the top panel is provided in Table 5.

Item	Description
LED (+IN)	Lights when the **+IN**-switch is turned to ON.
LED (IGN)	Lights when the **IGN**-switch is turned to ON.
+IN - switch	This two-way-switch enables or disables power to the connected FOX3-2G/3G/4G unit. (To enable power to the device, the **Current**- switch must be set to "**ON**")
IGN - switch	This two-way-switch wakes up the FOX3-2G/3G/4G device from **IGN-sleep** mode and sets the **IGN-pin** of the FOX3-2G/3G/4G to **High** or **Low signal level** for using the rising edge and falling edge events.
IO - switches	These pins have dual functions. All are controlled by the internal firmware of FOX3-2G/3G/4G. Therefore, the user must define whether to use them as analog or digital pins. The configured digital pins can be inputs or outputs while the analog pins can only be inputs. Their function is controlled with commands with ***$PFAL,IO0[1,2].Config=DI,1,10*** *or* ***$PFAL,IO0[1,2].Config=AI,1,10*** by changing the electrical behaviour of the reference pin to digital or analogue input (**DI** = Digital input; **AI** = Analogue input). These three-way switches (from IO/1 to IO/3) allow operation of the IOs either as digital/analogue inputs or digital outputs. More details how to test these IOs, are given below. **Please note that,** due to the the PROMOTION-KIT comes with all PREMIUM-FEATURE activated, the IO2 and IO3 are activated for using the "CAN-INTERFACE". Only IO/1 remains

Item	Description
	free and can be used as general purpose input/output pin. For more details please refer to the Related Documents [2].
Testing IOs as digital inputs:	When the reference IO (e.g: IO/1) is configured as digital input with "**$PFAL,IO0.Config=DI,2,10**", the FOX3-2G/3G/4G device will generate a rising edge event "IO.e0=redge" and set the state of the IO/1 to high "IO.s0=high", if: • the position of the IO/1-Switch changes from "**Digital IN - Low"** to "**Digital IN - High".** and will generate a falling edge event "IO.e0=fedge" and sets its state to low "IO.s0=low", if: • the position of the IO/1-Switch changes from "**Digital IN - High"** to "**Digital IN -Low".**
Testing IOs as analogue inputs:	When the reference IO (e.g: IO/1) is configured as analogue input with "**$PFAL,IO0.Config=AI,2,10**, you have to calibrate first this IO the low and high voltages. To do it, perform the following steps (e.g. IO/1): 1. Switch the IO/1-Switch (IO/1) to "**Digital IN - Low**" position**.** 2. Send the command "**$PFAL,IO0.Calibrate,offset=0**" from the Workbench **Editor** ❾ (see Fig. 8) to FOX3-2G/3G/4G. 3. Switch the IO/1-Switch (IO/1) to **"Digital IN - High**" position**.** 4. Send the command "**$PFAL,IO0.Calibrate,gain=15**" from the Workbench **Editor** ❾ (see Fig. 8) to FOX3-2G/3G/4G. 5. Switch the IO/1-Switch (IO/1) to **"Digital OUT / analogue IN**" position. This position has a fixed voltage of approx. 6V. Now, you can configure an alarm (e.g. *$PFAL,CNF.Set,AL31=Sys.Timer.e0&IO.s0>6.0:IO6.Set=high*) to switch on an LED (e.g. IO/3) when the voltage on the IO/3 is higher than e.g. 5.0 V. To test it, perform the steps below: 6. Send the configuration "**$PFAL,CNF.Set,AL31=Sys.Timer.e0&IO.s2>5.0:IO13.Set=hpulse,5000**" from the Workbench **Editor** ❾ (see Fig. 8) to FOX3-2G/3G/4G. 7. Switch the IO/1-Switch (IO/1) to **"Digital OUT / analogue IN**" position**.** 8. Send the command **"$PFAL,Sys.Timer0.Start=single,1000**" from the Workbench **Editor** ❾ (see Fig. 8) to FOX3-2G/3G/4G After the timer expires (1 second has passed), the red LED on the FOX3-2G/3G/4G (front side, next to the 6pin accessory port) goes ON for 5 seconds and then turns OFF. For more details about the LED on the FOX3-2G/3G/4G, refer to the Related Documents [2].
Testing IOs as digital outputs:	When the reference IO (e.g: IO/1) is supposed to be used as digital output, there is no configuration to be done in the firmware. To test it, perform the steps below: 1. Remove the available configuration for the IO/1 with "**$PFAL,IO0.Config="** 2. Switch the IO/1-Switch to the *"Digital OUT / analogue IN"* position 3. Send the command "**$PFAL,IO4.Set=high**" to set it to High 4. Send the command "**$PFAL,IO5.Set=low**" to set it to Low

Table 5: Components on the top panel of the control-box and their functionality

4.3 Rear panel overview

Figure 12: Rear panel of the control-box.

A description of each of the items on the rear panel is provided in Table 6.

Item	Description
Serial port 0	Via your own RS-232 cable you can connect the PROMOTION-KIT to a PC and evaluate the connected FOX3-2G/3G/4G device.

5 Explanation of the Sample Configuration

In the table below you find a detailed description of the configuration preloaded in the device shipped with promotion kit. To call this configuration use either the command *$PFAL,Cnf.Show* or use the button "*Read current device configuration*" from the **Editor** of the Workbench software. See chapter 3.1.4, Fig. **9**.

Functions	Configuration alarms and their descriptions.
Tracking	$PFAL,CNF.Set,AL0=SYS.Device.eStart:SYS.TIMER1.start=cyclic,20000&SYS.TIMER0.start=cyclic,5000&SYS.TIMER2.start=cyclic,2000
	AL0: Every time the FOX3 turns on or wakes up, it starts three cyclic Timers: Timer0, Timer1 and Timer2 with repeat timer events that occur every time a 20000, 5000 and 2000 of milliseconds elapses. These timer events will be used later in other alarms to start or stop actions (PFAL commands). E.g. Timer0 event (*Sys.Timer.e0*) is used in **AL9** to save GPS position data every 20 sec. in the history if other set conditions (*like: displaced distance is > 50m and GPS fix is valid*) are true.
	$PFAL,CNF.Set,AL1=SYS.Device.eStart:GPS.Nav.Position0=load0&GPS.Nav.Position1=load0&Sys.Timer3.Start=single,10000
	AL1: Every time the FOX3 turns on or wakes up, it loads the saved Position from memory slot zero to GPS.Nav.Position0 and starts a Timer3 with a single timer event that occurs once, after 100000 of milliseconds (10 sec.).
	$PFAL,CNF.Set,AL2=SYS.Device.eShutdown:GPS.Nav.Position0=save0&GPS.Nav.SaveLastValid
	AL2: Before the device goes in sleep mode, it saves both its position from GPS.Nav.Position0 to memory slot zero and the last valid position in the corresponding configuration parameter.
	$PFAL,CNF.Set,AL3=SYS.Device.eShutdown:TCP.Client.Send,8,"<sfal.event text='shutdown'>"
	AL3: Before the device goes in sleep mode, it sends a TCP packet to the server including the RMC GPS protocol and the user text <sfal.event text='shutdown'>, telling the server D2Sphere its current location with the text event 'shutdown'.
	$PFAL,CNF.Set,AL9=Sys.Timer.e0&GPS.Nav.Position.s1>50&GPS.Nav.sFix=correct&GPS.Nav.sSpeed>2:GPS.Nav.Position1=current&GPS.History.Write,0,""
	AL9: Each time the cyclic Timer0 runs out, the displaced distance from the position 1 is greater than 50 meters, the GPS is corrected and the speed is > 2m/s, then the device sets the new position to current position and saves the position in the history (Data logging) inside the device.
	$PFAL,CNF.Set,AL10=Sys.Timer.e1&GPS.Nav.Position.s0>200&GPS.Nav.sSpeed>2:GPS.Nav.Position0=current&TCP.Client.Send,8,"<sfal.pos>"
	AL10: Each time the cyclic Timer1 runs out, the displaced distance is greater than 200 meters, the GPS is corrected and the speed is > 2m/s, then the device sets the new position to current position and sends a TCP packet to the server including the GPRMC protocol and the user text <sfal.pos>.
	$PFAL,CNF.Set,AL11=GPS.Nav.eChangeHeading&GPS.Nav.sSpeed>2:GPS.Nav.Position1=current&GPS.Nav.Position0=current&GPS.History.Write,0,"HEAD"
	AL11: Each time the predefined angle (course) is exceeded and the speed is > 2m/s, then the device sets the new position to current position AND it saves the position in the History (Data logging) with the user text "HEAD"
	$PFAL,CNF.Set,AL12=GPS.Nav.eChangeHeading&GPS.Nav.sSpeed>2:TCP.Client.Send,8,"<sfal.pos>"
	AL12: Each time the predefined angle (course) is exceeded and the speed is > 2m/s, then the device sends a TCP packet to the server including the GPRMC protocol AND the user

Functions	Configuration alarms and their descriptions.
	text 'HEAD'.
	$PFAL,CNF.Set,AL13=IO.e8=redge:Sys.Timer3.Start=single,2000&Sys.Timer4.Stop
	AL13: Each time the Ignition is turned ON (IO.e8=redge), the device starts Timer3 with a single timer event that occurs once, after 2000 of milliseconds (2 sec.) and stops running the Timer4.
	$PFAL,CNF.Set,AL14=Sys.Timer.e3&IO.s8=high:TCP.Client.Send,8,"<sfal.trip.start>"&GPS.History.Write,20,"<sfal.trip.start>"&GPS.Nav.Distance=0
	AL14: When the single Timer3 runs out and the status of the Ignition is still high, then the device sends a TCP packet to the server including the GPRMC protocol, the user text <sfal.trip.start> and also it saves the user text in the history (data logging) with the user text *<sfal.trip.start>*.
	$PFAL,CNF.Set,AL15=IO.e8=fedge:Sys.Timer4.Start=Single,2000&Sys.Timer3.Stop
	AL15: When the Ignition is turned OFF (IO.e8=fedge), the device starts Timer4 with a single timer event that occurs once, after 2000 of milliseconds (2 sec.) and stops running the Timer3.
	$PFAL,CNF.Set,AL16=Sys.Timer.e4&IO.s8=low:TCP.Client.Send,8,"<sfal.trip.stop dist='&(NavDist)'>"&GPS.History.Write,20,"<sfal.trip.stop dist='&(NavDist)'>"&Sys.Timer5.Start=single,60000
	AL16: When the Timer4 runs out and the Ignition pin is still OFF, then the device sends a TCP packet to the server including the GPRMC protocol, the user text *<sfal.trip.stop>* and the driven distance in meters *&(NavDist)*. It also saves the user text in the history (data logging) with the user text *<sfal.trip.stop>*, the driven distance in meters and starts Timer5 with a single timer event that occurs once, after 60000 of milliseconds (60 sec.). //If another unit of the driven distance is needed, then replace *&(NavDist)* with the corresponding dynamic variable: *&(NavDist.km)* or *&(NavDist.miles)*
	$PFAL,CNF.Set,AL17=Sys.Timer.e5&IO.s8=low:Sys.Device.Sleep=IGN
	AL17: When the Timer5 runs out and the status of the Ignition pin is still low, then the device goes in sleep mode with the wakeup parameter IGN. The wakeup parameter 'IGN' means, the device will wake up whenever the Ignition pin is switched to high.
LED status	$PFAL,CNF.Set,AL4=SYS.Power.eDropped:IO13.Set=cyclic,200,200
	AL4: When the external/main power drops and the FOX3 runs on its internal backup battery, the red LED (IO13) starts flashing 200msON/200ms OFF.
	$PFAL,CNF.Set,AL5=SYS.Power.eDetected:IO13.Set=high
	AL5: When the external/main power is applied and the FOX3 runs on its internal backup battery, the red LED (IO13) gets solid.
	$PFAL,CNF.Set,AL6=Sys.Device.eStart&Sys.Power.sVoltage>=9:IO13.Set=high
	AL6: When the FOX3 turns on or wakes up from Sleep and external/main power is applied, the red LED (IO13) gets solid.
	$PFAL,CNF.Set,AL7=Sys.Device.eStart&Sys.Power.sVoltage<9:IO13.Set=cyclic,200,200
	AL7: When the FOX3 turns on or wakes up on its internal backup battery and the external power is below 9VDC, the red LED (IO13) starts flashing 200msON/200msOFF.
	$PFAL,CNF.Set,AL8=TCP.Client.ePacketSent:IO12.Set=lpulse,200
	AL8: Each time the FOX3 sends a TCP message to the server, the green LED (IO12) initiates a low pulse of 200ms.
	$PFAL,CNF.Set,AL18=Sys.device.eStart&GPS.Nav.sFix=invalid:IO11.Set=cyclic,200,200
	$PFAL,CNF.Set,AL19=GPS.Nav.eFix=valid:IO11.Set=high
	$PFAL,CNF.Set,AL20=GPS.Nav.eFix=invalid:IO11.Set=cyclic,200,200
	$PFAL,CNF.Set,AL27=Sys.device.eStart&GPS.Nav.sFix=valid:IO11.Set=high

Functions	Configuration alarms and their descriptions.
	AL18, 19, 20, 27: Every time the FOX3 turns on or wakes up, it checks all the time for GPS fix and sets the orange LED (IO11) either blinking (AL19, AL27) or turns it ON (AL18, AL27) depending if the device has a GPS fix (AL19, AL27) or not (AL18, AL20).
	$PFAL,CNF.Set,AL21=GSM.eOpfound:IO12.Set=cyclic,200,200
	$PFAL,CNF.Set,AL26=GSM.eOplost:IO12.Set=low
	AL21, 26: Once the device has found a GSM operator, the green LED (IO12) will blink and when it has lost a GSM operator, the LED will turn OFF.
	$PFAL,CNF.Set,AL22=GSM.GPRS.eConnected:IO12.Set=cyclic,400,400
	$PFAL,CNF.Set,AL25=GSM.GPRS.eDisconnected&GSM.sOpValid:IO12.Set=cyclic,200,200
	AL22, 25: Once the device is attached to GPRS services, the green LED (IO12) will blink and when it is detached from that services but it still has a valid GSM operator, the green LED (IO12) will blink fast.
	$PFAL,CNF.Set,AL23=TCP.Client.eConnected:IO12.Set=high
	$PFAL,CNF.Set,AL24=TCP.Client.eDisconnected&GSM.sOpValid:IO12.Set=cyclic,400,400
	AL23, 24: Once the device is connected to TCP server, the green LED (IO12) goes ON and when it is disconnects from that server but it still has a valid GSM operator, the green LED (IO12) will blink slower than when it detaches from GPRS services.
Configuration parameters	$PFAL,CNF.Set,DEVICE.BAT.CHARGEMODE=eco
	Starts charging if the voltage of the internal battery drops to less than 3.9V and terminates charging when the battery is full-charged.
	$PFAL,CNF.Set,DEVICE.BAT.MODE=auto
	Automatically switching between external power and internal battery power source depending on the power source currently available. External DC power supply has priority, if it is higher than 8 V.
	$PFAL,CNF.Set,DEVICE.COMM.SERIAL0=cmd,7F
	The serial port 0 is set into the command operation mode with protocols and events output enabled.
	$PFAL,CNF.Set,DEVICE.COMM.TCP.CLIENT=cmd,60
	The serial port 0 is set into the command operation mode without protocols and events output enabled
	$PFAL,CNF.Set,DEVICE.GPS.AUTOCORRECT=on,5.0,58,50,10,50
	Enables filtering of GPS auto correction to calculate a valid GPS fix using maximal allowed PDO of 5.0, maximal speed limit of 58 m/s, maximal allowed distance error of 50, drop count incorrect position of 10 and maximal acceleration of 50 m/s.
	$PFAL,CNF.Set,DEVICE.GPS.CFG=4
	At least 4 satellites must be in use to consider a GPS fix as valid.
	$PFAL,CNF.Set,DEVICE.GPS.HEADING=25
	Heading tolerance is set to 25 degrees. Each time this angle is exceeded, the event *GPS.Nav.eChangeHeading* occurs, and the driving direction resets to zero.
	$PFAL,CNF.Set,DEVICE.GPS.TIMEOUT=1,30
	Restarts the GPS receiver to do a new search for visible GPS satellites, if within this time no valid fix is available.
	$PFAL,CNF.Set,DEVICE.NAME=FOX3
	Device name is defined to FOX3
	$PFAL,CNF.Set,DEVICE.PFAL.SEND.FORMAT="$",CKSUM,"","$<end>"

Functions	Configuration alarms and their descriptions.
	The syntax of the PFAL messages is defined to start each line with the character '$', followed by the user text and terminated by a NMEA compatible checksum and <CRLF>. The complete message(s) end(s) with $<end>. These settings can be changed based on your server requirements.
	$PFAL,CNF.Set,PPP.PASSWORD=blau
	Required string (password) for the Chap and Pap authentication methods over PPPP to attach the device into the GPRS network. This setting is provider-dependant.
	$PFAL,CNF.Set,PPP.USERNAME=blau
	Required string (username) for the Chap and Pap authentication methods over PPPP to attach the device into the GPRS network. This setting is provider-dependant.
	$PFAL,CNF.Set,GPRS.APN=Public4.m2minternet.com
	APN (Access Point Name) name that your network operator has provided to you to connect the device to the GPRS/Internet. This setting is operator or provider dependant.
	$PFAL,CNF.Set,GPRS.AUTOSTART=1
	Enables automatic attachments to the GPRS network. If the GPRS network connection gets lost, it tries to reconnect automatically as soon as the network is available again.
	$PFAL,CNF.Set,GPRS.DIAL=ATD*99***1#
	The V.250 'D' (Dial) command causes the device to enter the V.250 online data state.
	$PFAL,CNF.Set,GPRS.QOS=0,0,0,0,0
	Quality of Service Profile used when the device sends an Activate PDP Context Request message to the GPRS network.
	$PFAL,CNF.Set,GPRS.QOSMIN=0,0,0,0,0
	Minimum acceptable profile checked by the device against the negotiated profile returned in the Activate PDP Context Accept message.
	$PFAL,CNF.Set,GPRS.TIMEOUT=1,600000
	Detaches the device from GPRS network if no TCP communication available within the timeout.
	$PFAL,CNF.Set,GSM.BALANCE.DIAL=*100#
	GSM dial number for retrieving balance information
	$PFAL,CNF.Set,GSM.OPLOST.RESTART=1,1200000,8
	Reinitializes the GSM engine periodically until a GSM operator is found.
	$PFAL,CNF.Set,PROT.3DP=0
	3DP protocol (motion sensor data) is deactivated
	$PFAL,CNF.Set,PROT.AREA=0
	AREA protocol (area states) is deactivated
	$PFAL,CNF.Set,PROT.BIN=0
	BIN protocol (FALCOM) is deactivated
	$PFAL,CNF.Set,PROT.GGA=0
	GGA protocol is deactivated
	$PFAL,CNF.Set,PROT.GLL=0
	GLL protocol is deactivated
	$PFAL,CNF.Set,PROT.GSA=0
	GSA protocol is deactivated

Functions	Configuration alarms and their descriptions.
	$PFAL,CNF.Set,PROT.GSM=1
	GSM protocol is activated
	$PFAL,CNF.Set,PROT.GSV=0
	GSV protocol is deactivated
	$PFAL,CNF.Set,PROT.IOP=1
	IOP protocol is activated
	$PFAL,CNF.Set,PROT.RMC=1
	RMC protocol is activated
	$PFAL,CNF.Set,PROT.START.BIN=$!
	BIN protocol starts with '$!'.
	$PFAL,CNF.Set,PROT.VTG=0
	VTG protocol is deactivated
	$PFAL,CNF.Set,TCP.CLIENT.CONNECT=1,5.35.253.3,4444
	Enables the connection to the remote server and specifies the IP address and the Port number of the TCP server to connect to.
	$PFAL,CNF.Set,TCP.CLIENT.DNS.TIMEOUT=86400
	The length of time (in seconds) to keep the DNS cache valid.
	$PFAL,CNF.Set,TCP.CLIENT.LOGIN=1
	Sends the login data automatically to the remote server after requesting the TCP server for establishing a connection.
	$PFAL,CNF.Set,TCP.CLIENT.PING=1,240000
	Activates sending of pings and specifies the amount of time, in milliseconds, on which a ping will be sent to the remote server.
	$PFAL,CNF.Set,TCP.CLIENT.SENDMODE=2
	Safe and non-volatile transmission mode.
	$PFAL,CNF.Set,TCP.CLIENT.TIMEOUT=300000,30000
	Period of time in milliseconds that the device will wait for a response and between two connection attempts when TCP connection fails.
	$PFAL,CNF.Set,GSM.PIN=1111
	Enters/saves the PIN code of the SIM card inserted into the device..
	$PFAL,GSM.Band=auto
	The GSM band to be used by the device is set to 'auto'. The device registers to that frequency band currently available. Refer to the PFAL command set for the supported settings.
Factory settings	It consists of configuration settings preloaded at the factory during the manufacturing of FOX3 series devices. The user has the possibility of personalizing this configuration and with the help of *$PFAL,Sys.Device.FactoryReset* command it is possible to overwrite the **User Settings** with the **Factory Settings**. After reseting the device to factory settings, the device must be configured in order to operate referring to your application (see chapter for more details
Add-ons*	The Promotion Kit is shipped with some sample functions. To extend its functionality, you can refer to the setting file „AddOns.conf" and modify it according to your needs. Please contact support (see chapter 3.2) for more details about the file „AddOns.conf". **eCodrive** (This feature includes instant and results for driving activities and driver behaviors such as: TripStart / TripStop / Harsh-Brake / Harsh-Acceleration / Harsh-Turn) - refer to the Related documents [6]

Functions	Configuration alarms and their descriptions.
	Tampering Detection of GPS antenna (unplugged / plugged / cut) – Refer to the PFAL command set manual. **Waypoints** (define reference GPS points along a specific route where the vehicle should track. Alerts when exiting/entering that route) **Tilting** (> 45°) and crash detection (1 x Tilt alert every 15 sec.) **1Wire** (iButton + Temp. Sensors) Supported iButton: DS1402D-DR8+ Blue Dot Receptor iButton Reader Cable with DS1982 iButton and DS1921 iButton (MAXIM). Supported 1Wire Temp.Sensor: DS18(B)20 (MAXIM). Refer to the Related documents [13] **CAN-OBDII** (read out some of the supported OBDII raw values). Refer to the Related documents [4] **CAN-FMS** (read out some of the supported FMS parameters). Refer to the Related documents [4]

HINT: The user text (in quotation marks “ ”) started with “sfal” indicates an event on our D2Sphere serve. This event text is only supported on our server, use other text formats for your own server.

6 Appendix

6.1 How does the FOX3-2G/3G/4G firmware operate?

FOX3-2G/3G/4G device can be easily integrated into a variety of new applications. It contains independent-customized software that provides even greater performance and flexibility for its users and system integrators to develop high-performance applications. The concept of the device is based on a simple implementation for a wide range of applications with low costs and high flexibility. The software enables you to configure, to track, control and monitor the FOX3-2G/3G/4G device via SMS, as well as allows you set and poll the configuration remotely over Internet from the remote server. The software comprises a set of word-like commands termed “PFAL”. Each of these causes the system FOX3-2G/3G/4G either to take a particular action or to read or set a particular configuration. The software provides the basic configuration settings needed when the system starts up and is used as starting points for the creation of user applications. The development of user applications is based on the advanced event-handling features provided by the operating software. The exact point at which you configure the FOX3-2G/3G/4G unit depends on your application you want to develop. Events are triggered automatically at system run-time and manually when the inputs change.

A part of events triggered at system run-time can be:

- Geo-fence violations (in/out)
- Changes to analog inputs (signal exceeds the range)
- Over speed detection (exceeding the speed limits)
- Specific distance reached (distance reached event)
- Towing detection (park events)
- Moving/acceleration detection and many many other features.

A part of events triggered manually can be:

- Changes on digital or analog inputs (car' door open/close events, ignition on/off events)

FOX3-2G/3G/4G executes actions in response to an event or state(s) or in any combination. FOX3-2G/3G/4G can also execute direct actions immediately after the user sends a command (via SMS, TCP, RS-232) to the device. When an event is triggered, the alarms related to that event are automatically sent either over GSM (SMS, Data call) and/or via TCP, or internally used to switch On/Off something in remote e.g. activating a Buzzer.

A part of alarms that can be executed can be:

- Message generation (route verification arrival/departure notification via SMS/TCP)
- Activation of outputs in a number of ways (activate a buzzer)
- Data logging activation (stores the data inside the device)
- Handling of incoming messages of any type (Activation on SMS text type
- Vehicle doors Lock & Unlock
- Vehicle engine starter Disable and Enable
- Handling of Timers, Triggers and Counters, and many others

Above are listed just a few software features and for a full view of the set of events, states, alarms, configurations and their functionalities refer to the Related Documents [1].

6.2 Installation cables (CA27 & CA31 & CA69 & CA76 & CA123)

There are two installation cables (CA31 and CA69) included in the PROMOTION-KIT. The CA31 is used to install your FOX3-2G/3G/4G device in a vehicle and additionally to interface Lantronix RFID reader or 3rd party products with RS-232 interface via the 4-pin UCOM connector. This cable has an 8pin double row connector that connects to the FOX3-2G/3G/4G and a 4pin double row connector that connects to one of the LANTRONIX accessories or 3rd party products.

The CA69 is used to test 1-wire interface using your own 1-wire temperature sensors and 3rd party products with RS-232 interface via the 4-pin UCOM connector. Table 7 and Table 8 provide a reference to the colour codes of these cables. More details about the in-vehicle installation refer to the Related Documents [11].

HINT: When connecting the CA31 to the vehicle wiring, for security reason firstly connect the ground pin to the negative pole of the vehicle battery and then the +IN pin to the positive pole. When using a switch between FOX3-2G/3G/4G and external power source, first turn OFF the switch during the installation and then turn ON after completing the installation.

The CA27 is used as service cable, which connects to the 8pin main port of one of the FOX3-2G/3G/4G series device, your PC/Laptop COM port and to the cigarette lighter socket of a vehicle to apply power to the device. To (re)configure the device install the Workben software.

The CA76 is used as service cable if the 8pin main port or 1st serial port of one of the FOX3-2G/3G/4G series device cann't be accessed. It connects to the 6pin accessory port and your PC/Laptop COM port. To (re)configure the device install the Workben software.

The CA123 is used to connect the device to the CAN OBDII connector of your vehicle and apply poer to the device from this OBDII connector.This cable has also a separate wire which needs to be connected to the ignition sense of your vehicle for using the Ignition-Sleep mode and trip starts and stops.

Figure 13: Supplied cables (*a reference to the colours and pinout is provided in* Table 7 and Table 8)

The pin function and the colour codes of the **CA31** is listed in table below:

COLOUR	NAME	DIRECTION	DESCRIPTION	LEVEL
Open-end wires				

COLOUR	NAME	DIRECTION	DESCRIPTION	LEVEL
RED	+IN	Input	Power supply input.	V_{+IN} = + 10.8 ... + 32.0 V Imax ≤ 1.5 A
BROWN	GND	-	Ground.	0 V
BLUE	IGN	Input	It can be connected to the vehicle ignition d for trip START and STOP reports and IGN- ode.	**HIGH** ≥+10.8 .. +32.0 V DC; **LOW**
ORANGE	I/O1	Input/Output	Software configurable pins. They can either as input or output. They have dual ıs as analog or digital inputs.	**OUT**: 100 mA max. @ +0 .. DC
YELLOW	I/O2	Input/Output		**IN**: 0 V..+32.0V DC (**High** & **Low** free- ımable)
GREEN	I/O3	Input/Output		**Analog : <** 32.0 V / 10 bits on
PURPLE	RxA_0	Input	Serial Port 0 - Receive data	V24, ±12 V
BLACK	TxA_0	Output	Serial Port 0 - Transmit data	V24, ±12 V
4pin UCOM Connector				
PURPLE	RxA_0	Input	Serial Port 0 - Receive data	V24, ±12 V
BLACK	TxA_0	Output	Serial Port 0 - Transmit data	V24, ±12 V
RED	+IN	Input	Power supply input.	=+IN
BROWN	GND	-	Ground.	0V

Table 7: PIN function of the CA31 cable

The pin function and the colour codes of the **CA69** is listed in table below:

COLOUR	NAME	DIRECTION	DESCRIPTION	LEVEL
Open end wires				
PINK	1-Wire	Input /Output	1-Wire master interface for Driver ID, temperature and humidity sensors.	V_{OUT} = + 2.8 .. +5.0 V
BROWN	GND	-	Ground Reference.	0 V
PURPLE	RxA_1	Input	Serial Port 1 - Receive data.	V24, ±12 V
BLACK	TxA_1	Output	Serial Port 1- Transmit data	V24, ±12 V
YELLOW	SCL	Output	I2C bus interface - Serial Clock line	-
GREEN	SDA	Input /Output	I2C bus interface - Serial Data line	-
4pin UCOM Connector				
PURPLE	RxA_1	Input	Serial Port 1 - Receive data	V24, ±12 V
BLACK	TxA_1	Output	Serial Port 1- Transmit data	V24, ±12 V
RED	+IN	Input	Power supply input.	V_{+IN} = + 10.8 ... + 32.0 V Imax ≤ 1.5 A
BROWN	GND	-	Ground.	0V

Table 8: Pinout of the CA69 cable

The pinout of this cable **CA76** is listed in table below:

2x3 MICROFIT	DB9 female	Description
RX	RX	Receive data

TX	TX	Transmit data
GND	GND	Ground

Table 9: Pinout of the CA76 cable

The pinout of this cable **CA123** (OBDII 4Pin Cable) is listed in table below:

2x4 MICROFIT	OBDII connector	Description
2	5	GND
6	6	CAN_High
5	14	CAN_Low
1	16	V+
3	NC	IGN as separate wire

Table 10: Pinout of the CA123 cable

6.3 Installing your own SIM card and replacing the internal battery

To insert your own SIM card into the FOX3-2G/3G/4G' SIM holder and replace the internal battery by a new one, follow the steps represented in figure below:

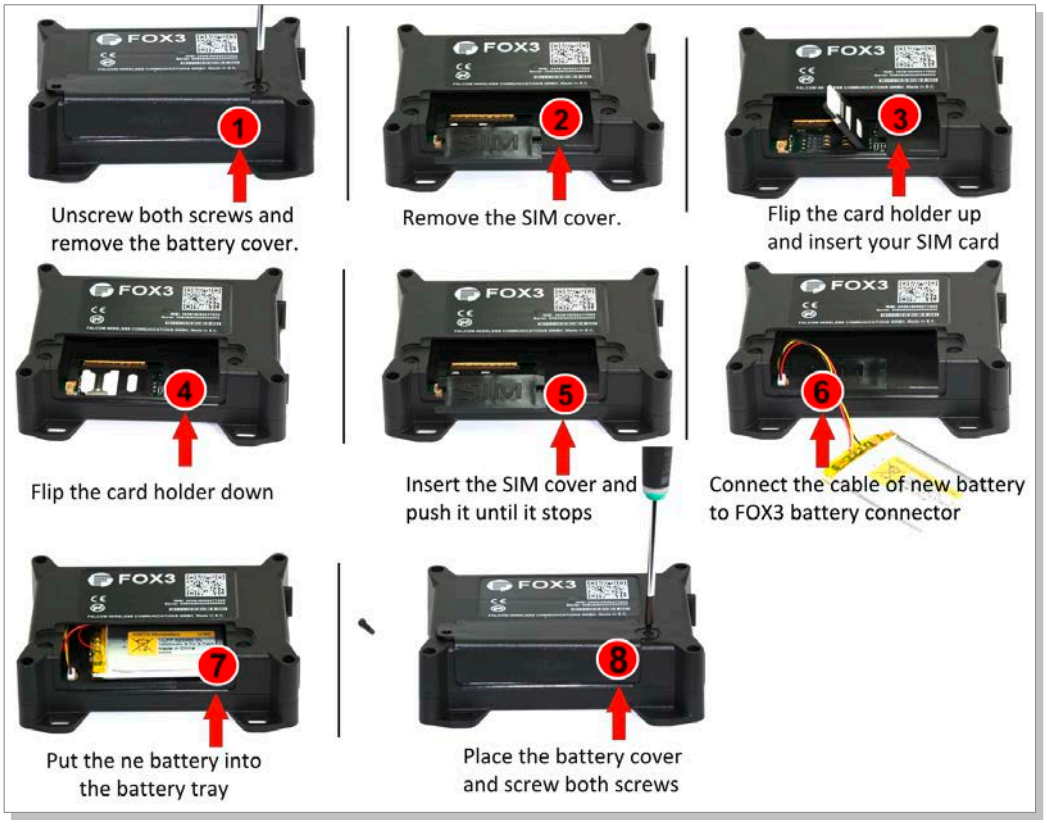

Figure 14: Inserting you SIM card and replacing the battery by a new one

For more details refer to the Related Documents [2].

When using your own SIM card and another TCP server, the following table shows the basic configuration settings that should be done in the FOX3 device to register the device

in the GSM network and enable internet connection to your TCP-Server. These configuration settings should be done locally via serial port connection. After inserting your SIM card and powering up the device, send the following commands (marked in red) from Workbench **Editor** ❾ (see Fig. 8) to the FOX3-2G/3G/4G.

SETUP	$PFAL,Cnf.Set,GPRS.APN=internet.t-d1.de (enter your provider's APN) $PFAL,Cnf.Set,GPRS.QOS=3,4,3,0,0 $PFAL,Cnf.Set,GPRS.QOSMIN=0,0,0,0,0 $PFAL,Cnf.Set,PPP.USERNAME=t-d1 (if your provider requires) $PFAL,Cnf.Set,PPP.PASSWORD=gprs (if your provider requires)
	Settings required for a GPRS attachment
SETUP	$PFAL,Cnf.Set,TCP.CLIENT.CONNECT=1,2222.222.222.222,1111 (enter your IP and Port)
	Settings required for a TCP connection. Where: 2222.222.222.222 - is the IP-address of the TCP server to be connected; 1111 - is the TCP port number of the TCP server to be connected;
	$PFAL,CNF.Set,TCP.CLIENT.LOGIN=1
	Sends the login data automatically to the remote server after requesting the TCP server for establishing a connection.
SETUP	$PFAL,Cnf.Set,GPRS.AUTOSTART=1 (default = 0)
	Activate GPRS autostart to reconnect automatically when GPRS network connection gets lost.
SETUP	$PFAL,Cnf.Set,DEVICE.PIN=1111 (enter the PIN of the used SIM card)
	Enter the SIM PIN to register the FOX3 device into the GSM network: Where: 1111 - is the PIN of the inserted SIM card.

Table 11: Adapt device configuration settings to your application conditions (mandatory settings).

FOX3-2G/3G/4G/-4G LOGIN DATA TO YOUR SERVER	After establishing TCP connection with your remote server, the following ServerLogin data is automatically sent to your remote server. For more details refer to the Related Documents [1].
	$<MSG.Info.ServerLogin> $DeviceName=FOX3 $Security=0 $Software=avl_2.13.0 (BxBGT1gzIHJldjowMy1OVUNIAgEA) $Hardware=FOX3 rev:03-NUCH $LastValidPosition=$GPRMC,143445.000,A,5040.4096,N,01058.8542,E,0.01,0.00,040315,, $IMEI=353816054739497 $PhoneNumber=+491734567124564 $LocalIP=10.208.151.168 $CmdVersion=2 $SUCCESS $<end>

Table 12: Login data sent automatically from the FOX3-2G/3G/4G to your remote server when the device starts up.