

xE922-3GR Starting Guide

1VV0301316 Rev.1- 2017-07-04



Making machines talk.



APPLICABILITY TABLE

PRODUCT

HE922-3GR

WE922-3GR

APPLICABILITY TABLE 1



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1. Introduction

1.1. Scope

The aim of this document is to introduce Telit xE922-3GR modules and allow user to start working with Telit xE922-3GR Evaluation Board (EVB). All the detailed features and solutions are applicable to all xE922-3GR products, where "xE922-3GR" refers to the modules listed in the applicability table.

If a specific feature is applicable to a specific product, it will be clearly highlighted.



NOTICE:

The description text "xE922-3GR" refers to all module variants listed in the APPLICABILITY TABLE 1.

1.2. Audience

This document is intended to any person who needs to work with Telit xE922-3GR modules, such as software engineers, hardware engineers, and those who want to be able to build applications and run them on Telit xE922-3GR modules. This document is intended to Telit customers, especially system integrators, about to implement their applications using Telit xE922-3GR modules.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit's Technical Support Center (TTSC) at:

<u>TS-EMEA@telit.com</u> <u>TS-AMERICAS@telit.com</u> Email subject should start with "xE922-3GR", "HE922-3GR" or "WE922-3GR"

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit's Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

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1.4. Text Conventions



Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- 1VV0301272_xE922-3GR Hardware User Guide.pdf
- 1VV0301249_ EVB User Guide.pdf
- 1VV0301285_Interface Board HW User Guide xE922-3GR.pdf
- 1VV0301324_MMI EXT CARD HW User Guide.pdf

1.6. Product Variants

xE922-3GR is available in the following hardware variants:

Type Number	Description
HE922-3GR	GSM/GPRS/EGPRS/WCDMA/HSPA+/WiFi/BT/GNSS
WE922-3GR	WiFi/BT/GNSS

1.7. Abbreviations

Term	Definition
ABB	Analog baseband
ADC	Analog-to-digital converter
AE	Application-Enabled



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AFE	Audio FrontEnd
CABC	Content Adaptive Backlight Control
CDP (USB)	Charging downstream port
CSI	Camera serial interface
DAC	Digital-to-analog converter
DBB	Digital baseband
DCP (USB)	Dedicated charging port
DBP	dead battery provision
DSI	Display serial interface
DSDS	Dual Sim Dual Standby
EOC	End of charge
EVB	Evaluation Board
FDD	Frequency division duplex
GLONASS	Global orbiting navigation satellite system
GNSS	Global navigation satellite system
GPIO	General-purpose input/output
GPRS	General packet radio services
GPS	Global positioning system
GSM	Global system for mobile communications
I2C	Inter-integrated circuit
IDI	Inter die interface
IFBD	Interface Board
LE	Low Energy
LVDS	Low Voltage Differential Signaling
MIPI	Mobile Industry Processor Interface
PMU	Power management unit
SD	Secure digital
SDP (USB)	Standard downstream port
SIM	Subscriber identity module
SOC	System-On-Chip
SOC	State of charge
SPI	Serial peripheral interface
ТЕ	Tearing effect
UART	Universal asynchronous receiver transmitter
UMTS	Universal mobile telecommunications system
USB	Universal serial bus
USIF	Universal serial interface
VMM	Virtual machine manager
WCDMA	Wideband code division multiple access





2. General Product Description

2.1. Overview

Telit's xE922-3GR module family is a highly integrated 3G entry platform running Android Marshmallow (Android 6.0) or Yocto Linux (3.14.55) operating system and 3GPP Release 9 Cellular Protocol Stack. The platform consists of:

- ATOM X3 SoC The Digital Baseband based on Intel® Atom[™] x3 Quad Core processor
- A-GOLDTM620 The Analog Baseband

<u>DBB</u>: SoC Atom x3

- CPU: Quad Core (Silvermont) 1.2GHz (android 32bit, linux 64bit)
- GPU: GFX core modified Mali-450 MP4
- Media Encode/Decode Engine: modified VeriSilicon Media Engine (dec G1/enc H1)

ABB: AGOLD 620

- 2G/3G RF transceiver
- WLAN
- Bluetooth
- GNSS
- Audio
- Analog measurement
- Power management

The module incorporates the following key technologies:

- 2G/3G cellular subsystem
- GNSS subsystem
- Wi-Fi and Bluetooth subsystem
- Display subsystem
- Camera subsystem
- Audio subsystem
- Energy management



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xE922-3GR modules are designed for commercial market quality needs ($0^{\circ}C$ to $70^{\circ}C$) and for industrial market quality needs (extended temperature -40°C to +85°C).

In its most basic use case, xE922-3GR can be applied as a wireless communication front-end for M2M products, offering GNSS and mobile communication features to an external host CPU through its rich interfaces.

xE922-3GR modules can further support customer software applications and security features. xE922-3GR modules provide software application environment with sufficient system resources for creating rich on-board applications. Thanks to a dedicated application processor and embedded security resources, product developers and manufacturers can create products which guarantee fraud prevention and tamper evidence without extra effort for additional security precautions.

xE922-3GR modules can be self-sufficient and serve as fully integrated IoT solutions. In such cases, customer would simply complement the module with a power supply, speaker amplifier, microphone, antennae and an HMI (if applicable).

xE922-3GR is offered with different variants per the list in Section 1.6:

- HE922-3GR: Cellular / Wi-Fi / BT / GNSS
- **WE922-3GR:** Wi-Fi / BT / GNSS



Telit does not provide the software (Android or Yocto) for xE922-3GR modules.

The official software deliveries must be requested to Intel or to the following ISVs (Independent Software Vendors):

Vendor	Contact	E-Mail / Phone No.
AMI	Doil in Huong	pailinhuang@ami.com.tw
(American Megatrends)	Failin Huang	+886-2-2516-8887 x2345
A such as M for a	Ctarlan Hanna	steven.huang@archermind.com
Archerwind	Stephen Hwang	+886-939-703-513
	Kalaada Cala	kalpesh_gala@mentor.com
Mentor Graphics	Kalpesh Gala	+1 (512) 219-1900
		rick.anderson@windriver.com
Wind Diver Sustains	Rick Anderson	+1 (503) 924-1855
white Kiver Systems	Ean Hsu	ean.hou@windriver.com
		+886-2-2345-2765 x503





2.2. Hardware overview

The below Figure 1 provides an overview of the internal architecture of the xE922-3GR modules. One can observe the following sub-functions:

- DBB Atom x3 SOC (QuadCore CPU / GPU)
- ABB AG620 + RF front end (GNSS / Wi-Fi / BT / Cellular).
 → Cellular applies only to HE922-3GR variant
- Analog Audio codec.
- Rich IO interfaces.

Depending on which xE922-3GR software features are enabled, some interfaces that are exported due to multiplexing may be used internally and thus may not be usable by the application.



Figure 1: Hardware block diagram



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2.3. Software overview

The below Figure 2 briefly describes the xE922-3GR module software architecture for Android OS:



Figure 2: Software architecture

The system software consists of the following main subsystems:

- Atom x3 MobileVisor Hypervisor for hardware resource shared between Android and Modem
- Modem VM Modem system with a running RTOS providing modem services to Android
- Android VM The main smartphone OS which sits on top of a Linux Kernel.
- Security VM Provides security services to the other VMs which run in a separate isolated and trusted environment.

The virtualized system allows both Modem and Android to concurrently run on the same Intel® AtomTM Quad Core processor. Additionally, the MobileVisor provides an IPC Framework to allow VMs (Modem and Android systems) to communicate between each other.



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The MobileVisor provides the following services:

- Host of several guest OS's on the same CPU (single or multi-core).
- Configuration of guest OS's independently, including boot parameters, memory partitioning, and devices.
- Provide a choice of guest OS scheduling policy: priority-based scheduling by default. If the RTOS is present, it always runs at a higher priority than Android, preserving its real-time characteristics.
- Management of the dispatching of interrupts
- Provide shared memory and cross interrupt mechanism for implementing shared device drivers and efficient IPC (Inter-Processor Communication)
- Tracing and profiling capabilities

The Modem VM provides Protocol Stack functionality and Platform services to insure functionalities such as IO, memory, RTC, boot operations, IP data transfer...

Linux/Android VM is the VM where both Linux kernel and Android are hosted. The Figure 4 depicts the Android System architecture.



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Figure 1: Android System Architecture



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3. xE922-3GR Development Kit Content

The xE922-3GR Development Kit includes both hardware and software as well as some further supporting resources.

3.1. Development kit material content

- 1. EVB Motherboard
- 2. MMI Board (Multimedia board)
- 3. xE922-3GR Interface Board
- 4. Power Supply
- 5. Cable USB3.0 A to Micro B
- 6. Cable USB A / Mini USB
- 7. Cellular Antenna



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3.2. Telit EVB and HE922-3GR IFBD

This section briefly provides an overview of HE922-3GR Interface Board plugged on top of EVB Motherboard. More detailed information (pinout, electrical, connectivity...) are described in the following documents:

- 1VV0301249_ EVB User Guide.pdf
- 1VV0301285_Interface Board HW User Guide xE922-3GR.pdf



Figure 2: EVB with HE922-3GR IFBD



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Contact us

4. Getting started

4.1. Training package

All documentations, firmware binaries and software tools are provided in four zip files at following URL: <u>http://www.telit.com/3gr-devkit/</u>.



xE922-3GR Development Kit

Below you can find the available set of user guides to be used in conjunction with Telit development kit, interface board and MMI, in order to thoroughly test the performance of Telit module xE922-3GR.

Please refer to the appropriate documentation in order to connect and operate correctly with Telit devices.

DOWNLOADS

- Firmware

- ₩ xE922-3GR_Starting_Package_pt1
- ₩ xE922-3GR_Starting_Package_pt2
- ₩ xE922-3GR_Starting_Package_pt3
- ★ xE922-3GR_Starting_Package_pt4

+ User Guides



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Download <u>ALL</u> these files and put them in the same location. Open the *xE922-3GR_Starting_Package.zip.001* file and extract the top folder

- I 🏒		R_Starting_Package					_	o x
File	Home Share	View						~ ?
Navigation pane •	Preview pane	Extra large icon Medium icons E List	s ■ Large icons Small icons Details ▼	Sort by ▼	 □ Group by ▼ □ ▲ Add columns ▼ □ ➡ Size all columns to fit 	 Item check boxes File name extensions Hidden items 	Hide selected items	Detions
	Panes	I	Layout		Current view	Show/hide		
$\leftarrow \ \ \rightarrow$	~ 🛧 🔤 « xE9	22-3GR > xE922-3GR	_Starting_Package	~ Ū	Search xE922-3GR_Startin	g_Package		<i>م</i>
~	kE922-3GR_Sta	rting_Package	Name		Date modif	ied Type	Size	
>	Firmware		- Firmware		05-Jul-17 0	8:17 File folder		
>	Sample		Sample		05-Jul-17 0	8:17 File folder		
>	Tools		Tools		05-Jul-17 0	8:18 File folder		
3 items	State: 📀 Online	•						

Figure 3: xE922-3GR starting package contents

<u>Firmware folder:</u>

This folder contains binaries files to be flashed on xE922-3GR module:

- Android MR3.0 Official Release
- Linux-Yocto MR3.2 Official Release



Android and Yocto binaries cannot be used at the same time, either one, or the other.



These two binaries are provided as reference to enable starting of the development kit. For any other use, the official software deliveries must be requested to Intel and/or the ISVs listed in chapter <u>"2.1 Overview"</u>.

• Samples folder:

This folder contains basic sample applications source code and samples APK for Android version

• Tools folder:

This folder contains all required tools allowing to connect, communicate, flash xE922-3GR module, and build and debug applications



Note that tools provided in this Starting Guide represents the current version of Intel tools when this document was produced. Telit doesn't provide any support for these tools. Consequently, any other versions or updates for these tools should be asked to Intel support





4.2. xE922-3GR Development Kit setup

For the following instructions, please refer to Section 3.1 "<u>Development Kit material content</u>" and to <u>Figure 2</u>. To setup the development kit, please follow the below instructions:

- Connect Power Supply cable to the Main Power Supply connector.
- Connect USB3.0 A to MicroB cable to USB3.0 A to MicroB connector.
- Connect USB A to MiniB cable to USB A to MiniB connector.
- Connect each antenna to its respective connector.
- Insert a functional SIM card in USIM1 connector.
- Press ON/OFF button until INTEL splash screen appears on the MMI EXT display. After several seconds of xE922-3GR booting, "Intel Inside" logo will pop up.

At this stage, it is possible that your Windows OS recognize xE922-3GR USB ports as "Unknown Devices" and propose to install drivers.

You can decline this proposition – drivers will be installed in next section.

4.3. Install Intel Mobile Family USB drivers

For your Windows OS to recognize and use xE922-3GR USB and UART ports, Intel Mobile Family USB drivers must be installed.

Run setup.exe from Tools\Usb\Windows_Host_Driver\WMC_imc1_v4.41.0\setup_disk

🚽 Setup		및 Setup	
	Welcome to the Intel Mobile Family IMC1 v4.41.0 Setup Wizard	Choose Install Location Choose the folder in which to install Intel Mobile Family IMC1 v4.41.0.	ļ
	This wizard will guide you through the installation of Intel Mobile Family IMC1 v4.41.0. It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer. Click Next to continue.	Setup will install Intel Mobile Family IMC1 v4.41.0 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation. Destination Folder C:\Program Files\IMC\HighspeedModem\IMC1 Browse Space required: 5.8MB Space available: 106.2GB	
	Next > Cancel	< Back Install Cancel	





길 Setup						
Installing Please wait while Intel Mobile Family IMC1 v4.41.0 is being installed.	P					
This may take some time to complete. Please wait						
Preparing installation.	Preparation.					
This may take some time to complete. Please wait						
< <u>B</u> ack <u>N</u> ext >	Cancel					

From here, when connecting Micro USB from USB 2.0/3.0 of xE922-3GR to your host Windows system, following ports will appear in the device manager:

📲 Device Manager	
Eile Action View Help	
A Su Intel ADB	~
Mice and other pointing devices Monitors Metwork adapters	
▷ Other devices ▲ IP Portable Devices Image: Signarbar of the second	E
Ports (COM & LPT) Thete Mobile AT Commands (COM126) The Mobile GTI/IPICOM (COM124) Thete Mobile OCT Trace (COM125)	Ŧ

Additionally, when connecting Mini USB from UART port of xE922-3GR to your host Windows system, two others COM ports will appear:



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In the above picture, COM89 is the Linux console. A TeraTerm can be opened on this port to get logs from the xE922-3GR module.

xE922-3GR is now ready to be flashed with latest Android binaries in next section.



From this point, required tools will be installed on your Windows laptop Pay attention that xE922-3GR Telit EVB is still powered on with USB cables connected.



For the following sections of present document, at any point of tools installation, if something goes wrong or for any reason doesn't match with sections description, user should contact Telit's Technical Support Center (TTSC) to the following email address:

TS-EMEA@telit.com

TS-AMERICAS@telit.com

Email subject should start with "xE922-3GR", "HE922-3GR" or "WE922-3GR"



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4.4. Required Tools Installation

4.4.1. Java SE8 Development Kit

Android Studio relies on Java SE8 or greater version. Download latest JDK SE Kit8 (32bits or 64bits) corresponding to your host system from http://www.oracle.com/technetwork/java/javase/downloads/index.html



Click on the Java logo (highlighted in red)



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Overview Downloads	Documentation	Community	Technologies	Training	
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Java SE Development Kit 8 Downloads

Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications, applets, and components using the Java programming language.

The JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java platform.

See also:

- Java Developer Newsletter: From your Oracle account, select Subscriptions, expand Technology, and subscribe to Java.
- Java Developer Day hands-on workshops (free) and other events
- Java Magazine

JDK 8u131 checksum

Java SE Development Kit 8u131 You must accept the Oracle Binary Code License Agreement for Java SE to download this software.					
Accept Licer	nse Agreement	Decline License Agreement			
Product / File Description	File Size	Download			
Linux ARM 32 Hard Float ABI	77.87 MB	jdk-8u131-linux-arm32-vfp-hflt.tar.gz			
Linux ARM 64 Hard Float ABI	74.81 MB	jdk-8u131-linux-arm64-vfp-hflt.tar.gz			
Linux x86	164.66 MB	jdk-8u131-linux-i586.rpm			
Linux x86	179.39 MB	jdk-8u131-linux-i586.tar.gz			
Linux x64	162.11 MB	jdk-8u131-linux-x64.rpm			
Linux x64	176.95 MB	jdk-8u131-linux-x64.tar.gz			
Mac OS X	226.57 MB	jdk-8u131-macosx-x64.dmg			
Solaris SPARC 64-bit	139.79 MB	jdk-8u131-solaris-sparcv9.tar.Z			
Solaris SPARC 64-bit	99.13 MB	jdk-8u131-solaris-sparcv9.tar.gz			
Solaris x64	140.51 MB	jdk-8u131-solaris-x64.tar.Z			
Solaris x64	96.96 MB	jdk-8u131-solaris-x64.tar.gz			
Windows x86	191.22 MB	€jdk-8u131-windows-i586.exe			
Windows x64	198.03 MB	jdk-8u131-windows-x64.exe			

Tick "Accept Licence Agreement" and choose the one corresponding to your Windows OS type exe file In the screenshot below, users with Windows10 operating on 64bits processor will download the jdk-*xxx*windows-x64.exe e.g. jdk-8u131-windows-x64.exe file for this version.

Once downloaded, execute this JDK installer.



Note that following screenshots depicts the jdk-8u131-windows-x64.exe execution, but execution of the downloaded file should not differ much from this one, except paths for instance.



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👸 Java SE Development Kit 8 Update 91 - Setup	븅 Java SE Development Kit 8 Update 91 - Custom Setup
Welcome to the Installation Wizard for Java SE Development Kit 8 Update 91	Select optional features to install from the list below. You can change your choice of features after installation by using the Add/Remove Programs utility in the Control Panel
This wizard will guide you through the installation process for the Java SE Development Kit 8 Update 91.	Feature Description Java SE Development Kit 8 Joare S1, including the JavaFX Source Code Public JRE Wission Control tools suite. This will require 180/MB on your hard drive.
The Java Mission Control profiling and diagnostics tools suite is now available as part of the JDK.	Install to: C:\Program Files (x86)\Java\jdk1.8.0_91\
Next > Cancel	<back next=""> Cancel</back>

Java Setup - Destination Folder	Java Setup - Destination Folder
Destination Folder	Destination Folder
Click "Change" to install Java to a different folder.	Click "Change" to install Java to a different folder.
Install to: C:\Program Files (x86)\Java\jre1.8.0_91	Install to: C:\Program Files (x86)\Java\jre1.8.0_91
< Back Next >	< Back Next >

Java Setup - Progress	😼 Java SE Development Kit 8 Update 91 - Complete
Java Java	
Status: Installing Java	Java SE Development Kit 8 Update 91 Successfully Installed
Set Top Ballion Switches Routers, Ballion Devices Lotters Systems Devices Run Java Devices Run Java Java #1 Development Platform	Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK. <u>N</u> ext Steps
	Close



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4.4.2. Android Studio

Android Studio is the Android's official IDE. It speeds up your development and helps you build the highest-quality apps for every Android devices.

It offers custom-tailored tools for Android developers, including rich code editing, debugging, testing, and profiling tools.

You can download the <u>latest</u> Android Studio from <u>https://developer.android.com/studio/index.html</u> (for instance *android-studio-bundle-162.3934792-windows.exe*)



Click on the "DOWNLOAD ANDROID STUDIO" button (in this example, it is version 2.3.2 but the latest available one is to be used)

Android Studio

The Official IDE for Android

Android Studio provides the fastest tools for building apps on every type of Android device.

World-class code editing, debugging, performance tooling, a flexible build system, and an instant build/deploy system all allow you to focus on building unique and high quality apps.

DOWNLOAD ANDROID STUDIO 2.3.2 FOR WINDOWS (1,893 MB)



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Once downloaded, execute this Android Studio installer:

🙊 Android Studio Setup			🙊 Android Studio Setup	
	Welcome to Android Stu	dio Setup	Choose Component Choose which featur	ts es of Android Studio you want to install.
	Setup will guide you through the installat Studio.	ion of Android	Check the components you want to install and unc install. Click Next to continue.	heck the components you don't want to
R	It is recommended that you close all othe before starting Setup. This will make it pr relevant system files without having to r computer. Click Next to continue.	er applications sssible to update eboot your	Select components to install: Android Stud Android SDK Android Virtue	Description Position your mouse over a component to see its description.
Android Studio			Space required: 4.2GB	
	< <u>B</u> ack Next >	Cancel		< Back Next > Cancel
😥 Android Studio Setup			Android Studio Setup	
	License Agreement Please review the license terms before insta	lling Android Studio.	Configuration Settin Install Locations	ngs
Press Page Down to see the	rest of the agreement.		Android Studio Installation Location	
To get started with the Andr conditions.	oid SDK, you must agree to the following ter	ms and	The location specified must have at least 500M Click Browse to customize:	IB of free space.
This is the Android SDK Licen	ise Agreement (the "License Agreement").		C:\Program Files\Android\Android Studio	Browse
1. Introduction 1.1 The Android SDK (referre including the Android system	ed to in the License Agreement as the "SDK" I files, packaged APIs, and SDK library files a	and specifically nd tools , if and	Android SDK Installation Location	B of free space
when they are made availab Agreement. The License Agr If you accept the terms of th	le) is licensed to you subject to the terms of eement forms a legally binding contract betw agreement, click I Agree to continue. You is budie	the License veen you and 🔻	Cick Browse to customize: Cick Browse to customize: C:\Users\jeansa\AppData\Local\Android\sdk	Browse
agreement to instail Android	3000.			
	< <u>B</u> ack I <u>Ag</u> ree	Cancel		< Back Next > Cancel

Click "Next" to start the installation.



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After several minutes, installation is complete:





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Android Debug Bridge (ADB) is a versatile command line tool allowing communication with an emulator instance or with a connected Android-powered device. It is a client-server program that includes three components:

- A client, which runs on your development machine. You can invoke a client from a shell by issuing an ADB command. Other Android tools such as DDMS also create ADB clients.
- A server, which runs as a background process on your development machine. The server manages communication between the client and the ADB daemon running on an emulator or device.
- A daemon, which runs as a background process on each emulator or device instance.

Fastboot is a diagnostic protocol included with the Android SDK package and used to modify the flash filesystem via an USB connection from host computer. It requires for the device to be started in a bootloader mode.



Once Android Studio is opened, choose SDK Manager in the Configure menu :



Project Defaults



)	Appearance & Behavior > System Settings > Android	SDK		
Appearance & Behavior	Manager for the Android SDK and Tools used by Android	Studio		
Appearance	Android SDK Location: C:\Users\jeansa\AppData\Loca	I\Android\Sdk	Edit	
Menus and Toolbars	SDK Platforms SDK Tools SDK Update Sites			
System Settings	Each Android SDK Platform package includes the Andro	oid platform and sources per	taining to an API level	by
Passwords	default. Once installed, Android Studio will automatical	lly check for updates. Check	"show package details	'to
HTTP Proxy	display individual SDK components.			
Undates	Name	APILevel	Revision	Not installed
- poures	Android 7.1.1 (Nougat)	20	2	Not installed
Usage Statistics	Android 5.0 (Marshmallow)	24	â	Installed
	Android 5.1 (Lollipop)	22	2	Not installed
Matifications	Android 5.0 (Lollipop)	21	2	Not installed
Nourications	Android 4.4W (KitKat Wear)	20	2	Not installed
Quick Lists	Android 4.4 (KitKat)	19	4	Not installed
Path Variables	Android 4.3 (Jelly Bean)	18	3	Not installed
	Android 4.2 (Jelly Bean)	17	3	Not installed
Keymap	Android 4.1 (Jelly Bean)	16	5	Not installed
Editor	Android 4.0.3 (IceCreamSandwich)	15	5	Not installed
Physics	Android 4.0 (IceCreamSandwich)	14	4	Not installed
Tidgins	Android 3.2 (Honeycomb)	13	1	Not installed
Build, Execution, Deployment	Android 3.1 (Honeycomb)	12	2	Not installed
Tools	Android 2.3.3 (Gingerbread)	10	2	Not installed
	Android 2.3 (Gingerbread)	9	2	Not installed
	Android 2.2 (Frovo)	8	3	Not installed
	Android 2.1 (Eclair)	7	3	Not installed
	Lunch Standalone SDK Manager			Show Package De
	Launch Standaione SUK ivianager			

Android 6.0(Marshmallow) checkbox should be ticked indicating it has been installed. Note that C:\<ANDROID_SDK> is the path displayed in Android SDK Location of this window.

Open the SDK Manager, by clicking *Launch Standalone SDK Manager* and install the following packages in their latest version (the one corresponding to your Android Studio):

- In Tools part:
 - $\circ \quad \text{Android SDK Tools}$
 - Android SDK Platform-tools
 - o Android SDK Build-tools
- In Android 6.0 (API xx) part:
 - Documentation for Android SDK
 - SDK Platform
 - Sources for Android SDK
- In Extras part:
 - Android Support Repository
 - Google Repository
 - Google USB Driver



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When all these packages are installed, tick only the "*Installed*" checkbox in Android SDK Manager and check that resulting window contains all packages installed as shown in below screenshot:

Android SDK Manager Dackager Tools	3	. 6		x
SDK Path: C:\Users\ieansa\AnnData\Local\Android\sdk				
Packages				
ackages		-		
i Name	API	Rev.	Status	
Tools				_
🔲 🦨 Android SDK Tools			👼 Installed	
🔲 差 Android SDK Platform-tools			👼 Installed	
🔲 差 Android SDK Build-tools			😿 Installed	
🔄 🌄 Android 6.0 (API 23)				
Documentation for Android SDK			🔯 Installed	
🔲 🖷 🖬 SDK Platform			🔯 Installed	
Sources for Android SDK			🔯 Installed	
📕 🧰 Extras				
🔲 💼 Android Support Repository			👼 Installed	
🔲 🖬 Google Repository			👼 Installed	
🔲 📻 Google USB Driver			👼 Installed	
< III				P.
Show: Updates/New V Installed Select New or Updates			Install packages	
Obsolete Deselect All			Delete packages	
Done loading packages.			()	-[586

Finally, modify your Windows path by adding following paths to Windows path: *C:\<ANDROID_SDK>\tools and C:\<ANDROID_SDK>\platform-tools* Then reboot the computer.



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4.4.3. PuttyADB Tool

Another way to connect to xE922-3GR module is to use Intel Mobile(ADB) with PuttyADB tool. Start *putty_adb.exe* from *Tools\PuttyAdb and follow howto.txt instructions*

🕵 PuTTY Configuration		x
Category: - Session - Logging - Teminal - Keyboard - Bell - Features - Window - Mapearance	Basic options for your PuTTY session Specify the destination you want to connect to - Host Name (or IP address) Port [transport-usb [503] Connection type: C C Raw ● Adb C Telnt C Rlogi C SSH	7 C Seți
Behaviour Translation Selection Colours Connection Data Proxy Telnet Rogin	Load, save or delete a stored session Saved Sessions Default Settings Adb	.oad Ga <u>v</u> e
E SSH Serial	Close window on e <u>xi</u> t: C Always C Never C Only on clean e Open <u>C</u> a	xit

Press open and PuttyADB will give you access to xE922-3GR shell:





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4.4.4. USB Driver for Flash Loader Utility

Start setup.exe from *Tools**FlashUSB_Driver_1_0_1_1*\(x64 or x86)

🔒 Flash Loader Utility Driver Installer	Windows Security
Press "Install"" button to Install the drivers for Flash Loader Utility. To cancel the installation press ""Exit"" button."	Would you like to install this device software? Name: Intel Mobile Communications Universal Se Publisher: emsys Embedded Systems GmbH
Install Exit	Always trust software from "emsys Embedded Jystems GmbH". You should only install driver software from publishers you trust. How can I decide which device software is safe to install?







4.4.5. PlatformFlashTool

PlatformFlashTool is used as the verified flashing tool for xE922-3GR modules. Start *PlatformFlashTool_5.5.1.0_win32.exe* from *Tools\PlatformFlashTool_5.5.1.0_win32*

Press "Next" on each following screen:

Setup - Intel(R) Platform Fl	lash Tool	Setup - Intel(R) Platform Flash Tool	
(intel)	Welcome to the Intel(R) Platform Flash Tool Setup Wizard	License Agreement	(intel)
	This will install Intel(R) Platform Flash Tool version 5.5.1.0 on your computer.	Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
	It is recommended that you close all other applications before continuing.	INTEL(R) DEVELOPMENT TOOLS LIMITED LICENSE AGREEMENT	
	Click Next to continue, or Cancel to exit Setup.	IMPORTANT - THIS IS A CONTRACT. PLEASE READ CAREFULLY BEFORE ACCEPTING THE TERMS OF THIS INTEL(R) DEVELOPMENT TOOLS LIMITED LICENSE AGREEMENT (CARCEMENT') OR COPYING, DOWNLOADING, INSTALLING, OR USING ANY OF THE DEVELOPMENT TOOLS. INTEL CORPORATION AND ITS AFFLICATES (TIMEL') OFFER THE DEVELOPMENT TOOLS THROUGH ITS WEBSITES. LICENSEE'S PRIVACY RIGHTS ARE SET FORTH IN INTEL'S PRIVACY NOTICE, WHICH FORMS A PART OF THIS AGREEMENT. PLEASE REVIEW THE PRIVACY NOTICE AT	-
	Next > Cancel	< Back Next >	Cancel
Setup - Intel(R) Platform F	lash Tool	Setup - Intel(R) Platform Flash Tool	
Information	(intel)	Installation	(intel)
When you are ready to c	ontinue with Setup, dick Next.	Please select the installation mode:	
Intel(R) Platform Flash T	ool makes use of the following libraries/packages:	 Standard (Components will be automatically installed or updated) 	
Libraries: Qt License: Lesser Gen Website: <u>http://download.0</u> parties/dt-everywhere-co Xfstk Downloader API License: LCPL 2.1 Website: <u>http://sou</u> sources <u>https://download.0</u>	E heral Public License (LGPL) (version 2.1), wnload.qt.lo/archive/qt/4.8/4.8.4/ 11.org/android-ia/tools/platformflashtool-lite/3rd- ppensource-src-4.8.4.zip urceforge.net/projects/xfstk 11.org/android-ia/tools/platformflashtool-lite/3rd-	Advanced	
	< Back Next > Cancel	<back next=""></back>	Cancel



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Press "Install" to start the installation.

R	leady to Install		(inte
	Click Install to continue with the installa change any settings.	tion, or click Back if you want to revi	ew or
	Setup type: Installation		-
	Selected components: Platform Flash Tool binaries		
	Start Menu folder: Intel\Platform Flash Tool		=
	Additional tasks: Additional icons: Create a desktop icon Update PATH:		-
	*		4



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4.4.6. Intel PhoneTool

Intel Phone is used as the verified tool on xE922-3GR modules to configure it while in Production Mode.

Start PhoneTool_setup.exe from Tools\PhoneTool

Setup - PhoneTool		📓 Setup - PhoneTool
intel	Welcome to the PhoneTool Setup Wizard This will instal PhoneTool version 218 on your computer. It is recommended that you dose all other applications before continuing. Click Next to continue, or Cancel to exit Setup.	Select Destination Location Where should PhoneTool be installed? Image: Setup will install PhoneTool into the following folder. To continue, click Next. If you would like to select a different folder, click Browse. Stypogram Files (click) Untell/PhoneTool Browse
		At least 220,7 MB of free disk space is required.
	Next > Cancel	< Back Next > Cancel
Setup - PhoneTool Select Additional Tasks Which additional tasks shi Select the additional tasks then cikk Next. Additional icons: Create a desktop ico	ould be performed?	

Press « *Install* » button in next screenshot:

Setup - PhoneTool	🔓 Setup - PhoneTool
Ready to Install Setup is now ready to begin installing PhoneTool on your computer.	Installing Please wait while Setup installs PhoneTool on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.	Extracting files C:\Program Files (x86)\Inte\'PhoneTool\Audio_help.chm
Destination location: C:\Program Files (x86)\Intel\PhoneTool 	
< Back Instal Cancel	Cancel



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4.4.7. Vysor

As a Google Chrome extension, Vysor puts a fully controllable window of your Android on your desktop. Vysor allows to get the same full view of xE922-3GR display interface as if Telit MMI board was connected to the xE922-3GR module.

To install it on your laptop, you first need to have Google Chrome browser installed. You can download it from following URL: <u>https://www.google.fr/chrome/browser/desktop/</u>



Then, you need to download the Vysor extension. It can be downloaded from following URL: <u>https://chrome.google.com/webstore/detail/vysor/gidgenkbbabolejbgbpnhbingjbffefm?authuser=1</u>



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You just have to click on the "ADD TO CHROME" button on the top right side of the window.



<u>Remark:</u> An error could occur when installing the extension (could not unzip the extension). It is due to an invalid character present in a folder's name of the extension pack.

<u>Solution:</u> Download the Vysor extension (.crx file) at <u>http://chrome-extension-</u> <u>downloader.com/</u>. Paste the same URL: <u>https://chrome.google.com/webstore/detail/vysor/gidgenkbbabolejbgbpnhbimgjbffefm?auth</u> <u>user=1</u> and press "Download Extension".



When download is finished, open 'chrome://downloads' tab and click "Show in folder".



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Once the .crx file is downloaded, unzip it in a dedicated folder and remove the "*_metadata*" folder. It is the one creating the issue.

Finally, in '*chrome://extensions/*' tab, choose "*Load unpacked extension...*", browse to the dedicated Vysor folder. Vysor extension will appear, just tick "*Enabled*" to finish the installation.



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5. First xE922-3GR powerOn

5.1. Flashing Image on xE922-3GR



<u>Yocto Linux binaries can be flashed only after an Android version has been previously flashed.</u>

The flash files for flashing Android software firmware are in *Firmware* Android_MR3.0A sf3gr_telit_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A.zip

Dz C:\Us	ers\jeansa\Docur	nents\Projects	xE922-GR\xE922	-3GR_Trainin	g_0.4\Firmwa	re\Android_MR	3.0A\sf3gr_telit_he922	2-flashfiles-us	erdebug_a60_ww	v16_01.1709.05_MR	3.0A.zip\	
Fichier	Édition Affich	ige Fa <u>v</u> oris	<u>O</u> utils <u>A</u> ide									
_ ^ _	_	~7	n 📥	-	*	ត						
Aioute	vr Extraina	Terter	Conjer	Déplacer	Supprimer	Informations						
Ajoute	a condite	rester	сорієї	Depiacei	Subburner	intornations						
1	kE922-3GR_Train	ing_0.4\Firm	ware\Android_MR	3.0A\sf3gr_te	lit_he922-flas	hfiles-userdebu	g_a60_ww16_01.1709.0	05_MR3.0A.zip	>\			-
Nom								Taille	Compressé	Modifié le	Créé le	Accédé le
📗 mvco	onfigs							322 837	150 537			
boot	_signed.fls							8 284 787	7 869 356	2009-01-01 00:00		
📄 cach	e_signed.fls							5 895 648	7 971	2009-01-01 00:00		
💽 flash	json							23 130	2 665	2009-01-01 00:00		
📄 fwu_	image_signed.fls							20 657 775	4 149 996	2009-01-01 00:00		
mob	ilevisor_signed.fls							1 109 531	481 773	2009-01-01 00:00		
mvco	onfig_smp_signed	.fls						324 657	150 821	2009-01-01 00:00		
oem_	signed.fls							9 418 256	2 555 278	2009-01-01 00:00		
📄 psi_fl	ash_signed.fls							397 440	203 601	2009-01-01 00:00		
reco	/ery_signed.fls							9 280 120	8 862 985	2009-01-01 00:00		
secvi	m_signed.fls							1 458 967	670 407	2009-01-01 00:00		
slb_s	igned.fls							1 220 119	525 160	2009-01-01 00:00		
📄 splas	h_img_signed.fls							17 415 279	2 841 793	2009-01-01 00:00		
📄 syste	m_signed.fls						8	77 626 960	366 442 769	2009-01-01 00:00		
ucod 🗌	e_patch_signed.f	s						288 966	154 420	2009-01-01 00:00		
usero	lata_signed.fls							79 911 496	86 166	2009-01-01 00:00		
vrl_si	gned.fls							412 271	150 408	2009-01-01 00:00		
•												۲.
1 objet(s)	sélectionné(s)		322 837	322 837								

The flash files for flashing Yocto software firmware are in *Firmware*\ *Yocto_MR3.2\sofia-3gr-telit_he922-flashfiles-20170608_074423_01.1709.05_MR3.2.zip*



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C:\Users\jeansa\Documen	ts\Projects	\xE922-GR\xE92	2-3GR_Trainir	ng_0.4\Firmwa	are\Yocto_MR3.2\s	sofia-3gr-telit_he	922-flashfiles-2017(06	X
<u>Fichier</u> <u>Édition</u> Affic <u>h</u> age	Fa <u>v</u> oris	<u>O</u> utils <u>A</u> ide							
ф <u>—</u>	\checkmark	•		×	ភ្ម				
Ajouter Extraire	Tester	Copier	Déplacer	Supprimer	Informations				
C:\Users\jeansa\Do	cuments\F	Projects\xE922-GF	R\xE922-3GR_	Training_0.4\F	Firmware\Yocto_N	/IR3.2\sofia-3gr-te	lit_he922-flashfiles-	20170608_074	4423_0 ▼
Nom		-		_	Taille	Compressé	Modifié le	Créé le	Ac
mvconfigs					322 645	150 525	2017-06-08 18:16		
boot_signed.fls					10 092 537	9 537 481	2017-06-08 18:16		
cache_signed.fls					105 138 799	255 211	2017-06-08 18:16		
💽 flash.json					13 252	1 331	2017-06-08 18:16		
fwu_image_signed.fls					41 131 631	24 129 959	2017-06-08 18:16		
mobilevisor_signed.fls					1 109 531	480 739	2017-06-08 18:16		
mvconfig_smp_signed.fls					324 465	150 782	2017-06-08 18:16		
psi_flash_signed.fls					397 440	203 754	2017-06-08 18:16		
recovery_signed.fls					11 558 905	10 981 949	2017-06-08 18:16		
secvm_signed.fls					843 479	404 776	2017-06-08 18:16		
slb_signed.fls					1 220 082	525 342	2017-06-08 18:16		
splash_img_signed.fls					17 415 279	2 860 962	2017-06-08 18:16		
system_signed.fls					831 749 743	202 742 304	2017-06-08 18:16		
ucode_patch_signed.fls					288 966	154 642	2017-06-08 18:16		
vrl_signed.fls					412 271	151 044	2017-06-08 18:16		
•									Þ
0 objet(s) sélectionné(s)									

Follow the steps below on the Windows machine to proceed to flash the Target Platform. **Screenshots will depict Android MR3.0A software flashing**

Open the *PlatformFlashTool* from Windows start menu.



On the *PlatformFlashTool* window, verify the used version of the *PlatformFlashTool* and check it is like the recommended version (v.5.5.1.0). The flash tool version is printed on the top left of the *PlatformFlashTool* window, as highlighted in next figure.



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xE922-3GR Starting Guide

1VV0301316 Rev.1 2017-07-04

Sintel® Platf	orm Hash Tool 5.5.1.0	
>		Browse (intel)
Flash	Elach file:	
7		experience what's inside"
	Platform: Intel	A
Flash editor	Hardware: sf3gr_telit_he922 Connected on port 1/2/1 Start to flash	
	Status: MOS Batt: 50 SN: 0123456789012345	
Security		
Provision		
Log level	Start to flash	On-demand flash Clear devices
INFO 💌	Revision 68de85bd98d-android Revision 68de85bd98d-android	*
<u> </u>	uoruoruz 14:55:50.343 INFO : OS version detected: Windows 7 (x64)	
Save Log	06/08/17 14:55:51.394 INFO : SSL supported: Yes 06/08/17 14:55:51.394 INFO : Using TMT API version: 1.8.0.0	
2	06/08/17 14:55:51.394 INFO : Using TMT API build: Thursday March 24th 2016, 14:28:48 UTC 06/08/17 14:55:51.485 INFO : Disk space available on drive C:/ : 23.82 GB	E
	06/08/17 14:55:51.607 INFO : Adb and fastboot binaries OK 06/08/17 14:55:51.885 INFO : Platform Flash Tool initialized successfully	
Clear Log	06/08/17 14:55:52.199 INFO : [Port 1/2/1] New device detected on 1/2/1 (id=010100000000002)	

Check that *PlatformFlashTool* has detected xE922-3GR module as shown in above screenshot, on the left of "Start to flash" button. If it is not the case, that means the USB ports of xE922-3GR are not detected and consequently no flash procedure could be successful. Report to section 4.2 to successfully power up Telit xE922-3GR EVB.

Click on "Browse" button and choose the *sf3gr_telit_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A.zip* file and click on "*Open*".



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PlatformFlashTool will unzip the file:

🔀 Intel® Platf	orm Flash To	ol 5.5.1.0								- 0 <mark>- X -</mark>
Eile Help										
*	its\Projects\¢	xE922-GR	xE922-3GR_Traini	ng_0.4\Firmware\	Android_MR3.0A\sf3gr_telit	_he922-flas	hfiles-userdebug_a60_v	vw16_01.1709.05_MR3.0A	.zip Browse	(intel)
Flash	Flash file:			Configuration:		- *	2 🔆	Unzipping		experience
										what's inside
Flash editor	Plat	tform: rdware:	Intel sf3gr_telit_he922	Connect	ted on port 1/2/1		Start to flash	24		<u> </u>
2	Stal	itus: tt:	MOS	OS SN:	0123456789012345		Start to hash			
l 💽	<u> </u>									
Security										
Provision										
		_								*
Log level	Start to	flash							On-demand flash	Clear devices
INFO 💌	06/08/17 14: 06/08/17 14:	55:51.885	INFO : Platform INFO : [Port 1/	Flash Tool initialize 2/1] New device de	ed successfully etected on 1/2/1 (id=01010	000000000)2)			A
2	06/08/17 15: userdebug_a	01:59.335 60_ww16	01.1709.05_MR3	ig archive "C:/User .0A.zip"	s/jeansa/Documents/Projec	ts/xE922-G	K/XE922-3GR_Training_(u.4/Hirmware/Android_MR3	.ua/st3gr_telit_he922-fla	innies-
Save Log	userdebug_a	60_ww16	_01.1709.05_MR3	.0A.zip" unzipped	Documents/Projects/xE922-	GK/XE922-3	GK_iraining_0.4/Hirmwa	are/Android_MR3.UA/sf3gr	_tellt_ne922-flashfiles-	
~	06/08/17 15: 06/08/17 15:	02:12.314	INFO : Flash file	e C:\Users\jeansa\	Documents\Projects\xE922	-GR\xE922-	3GR_Training_0.4\Firmw	are \Android_MR3.0A \sf3gr	_telit_he922-flashfiles-	=
Clear Log	06/08/17 15:	03:34.171	L INFO : Unzippin	ig archive "C:/User	s/jeansa/Documents/Projec	ts/xE922-G	R/xE922-3GR_Training_(0.4/Firmware/Android_MR3	0.0A/sf3gr_telit_he922-fla	shfiles-
	userdebug_a	00_ww16	_01.1/09.05_MR3	.ux.zip						*



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Once finished, *PlatformFlashTool* window should appear as shown below:



Carefully check that Configuration is set to "SMP FLS only". If not, select this Configuration option before to continue flashing process



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Intel® Platf	m Flash Tool 5.5.1.0	• X
Eile Help		
*	ts/Projects/xE922-GR/xE922-3GR_Training_0.4/Firmware/Androld_MR3.0A/sf3gr_telt_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A.zip Browse	intel
Flash	Flash file: f flash.json 🔹 Configuration: SMP FLS only 🔹 💥 🥪 🌟	experience
		vhat's inside"
Flash editor	Platform: Intel Hardware: sf3gr_telt_he922 Connected on port 1/2/1 Stop 💥 7, 0% Rebooting	
2	Status: 05 5N: 0123456789012345	
Security		
Provision		
	Cill leare leases Dog mantel Projecte VE972-CD VE972-3CD Training 0 4/Eirmusze ländraid MD3 08/Ef2gr tall+ ha072	*
Log level	Stop flashfles-userdebug_a60_ww16_01.1709.05_k0522_01xp2522_01xp1501 [0] millional Philoidol_mk5.04 philoido	Clear devices
INFO 💌	users yeansa µocuments yrtojectis yez y22-yk V(£922-3GR, Training)0. 41 µrm ware \Android _MR3.04 \sf3gr_teit_ne922-flashties- serdebug_a60, ww 16_01.1709.05_MR3.0A \splash_img_signed.fls" "C: \Users\'eansa \Documents\Projects \ye292-23CR Helden wards have a 50 ww 16_01.2709.05_MR3.0A \splash_img_signed.fls" "C: \Users\'eansa \Documents\Projects \ye292-23CR_teits teits 2630.	elit_he922-
<u> </u>	asumes user dueuug_aou_ww.sp.g.t.1/vs.vo_yms.J.vos.vo_yms.Sp.gence.nst; users yeansa yocumensyrrojects xcts2/c- iR (xE922-3GR_Training_0.4)Firmware\Android_MR3.0A)sf3gr_telit_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A\userdata_signed.fls" "C: Logalapase\DecumentalDecisetat/vE023.2CD_VE023.2CD_Tables_0_04/stars.suserdebug_a60_ww16_01.1709.05_MR3.0A\userdata_signed.fls" "C:	
Save Log	users y councer is y ruppus puszerse VCES/2/304_iral animg_u-tyrninwate y andro ugines.ouging_ineru_ines/2/instinues- serdebug_a60_ww 16_01.1709.05_MR3.0A (ecovery_signed.fis*"C:\Users\ieansa\Documents\Projects\XE922-GR\XE922-GR\Ze922-GR_Training_0.4\Firmware\Android_MR3.0A\sf3gr_teli lahdhaeuserdahun_a60_ww15_01.1709.05_MR3.0A[kuu imana_cinnad] 4e*"1\Users\ieansa\Documents\Projects\XE922-GR\Xe922-GR	it_he922-
8	asi mes use use use use use use use use use u	_
Clear Log	users y province in services in services were accounted in an imply of the initial of the initial of the initial initial of the initial initia Initial initial	

Press "*reset*" button of Telit xE922-3GR EVB (refer to <u>Figure 2</u>) in order for *PlatformFlashTool* to proceed to the flashing.



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The let of the second s		x
S Intel® Plath	orm Fish Tool 5.5.1.0	
	ts/Projects/xE922-GR/xE922-3GR_Training_0.4/Firmware\Android_MR3.0A/sf3gr_telit_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A.zp	Ð
Flash	Flash file: [flash.json 🔹 Configuration: SMP FLS only 💌 % 🍣 🌟	nce
	what's ins	ide"
Flash editor	Platform: Hardware: Connected on port 1/2/1 Stop & 60% Flashing SMP FLS only image (9/15) image (9/15)	
2	Status: DNC_FW DIX SN: 0123456789012345	
Security		
Provision		
	C: (Users \yeansa \Documents \Projects \xE922-GR \xE922-3GR_Training_0.4 \Firmware \Android_MR3.0A \sf3gr_telt_he922-	ices
Log level	stop flashfles-userdebug_66_www.f_01.1709.05_WR3.0A/flash.json [SMP FLS only]	ices
INFO Save Log	user euougaouwritio_01.1709.05_mrs.uwisplasm_mg_signed.ms_C: User's yearsa pocuments Projects yce 222-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 years_signed.ms*C; User's yearsa plocuments Projects yce 222-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 years_signed.ms*C; User's yearsa plocuments Projects yce 222-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 years_signed.ms*C; User's yearsa plocuments Projects yce 222-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 yearset, yearsa plocuments Projects yce 222-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 yearset, yearsa plocuments Projects yce 22-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 flashfiles-userdebug_a60_writi6_01.1709.05_MR3.04 writig teit_he922.14 sahfiles-userdebug_a60_writi6_01.1709.05_MR3.04 writi6_ms*C; Users yearsa plocuments Projects yce 22-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 writi6_writi6_01.0709.05_MR3.04 writi6_ms*C; Users Weansa plocuments Projects yce 22-3x K_training_0.4Pirmware Vandroid_MR3.04 yf3gr_teit_he922 writi6_writi6_writi6_01.0709.05_MR3.04 writi6_01.1709.05_MR3.04 wr	-
Clear Log	Gelve522-36R_Training_0.4PirmwareVanfoid MR3.048/sign:telt.he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A\vrl_signed.fls [™] command 06/08/17 15:08:14.967 INFO : [Port 1/2/1] Flashing 15 files	• III



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When procedure is successfully ended, *PlatformFlashTool* should appear as shown below:

[🖸 Intel® Platf	orm Flash Tool 5.5.1.0	
Eile Help	its \Projects \xE922-GR \xE922-GR \xE922-GR Training_0.4 \Firmware \Android_MR3.0A \sf3gr_telit_he922-flashfiles userdebug_a60_ww16_01.1709.05_MR3.0A.zip Browse)
Z Flash editor	Platform: Disconnected Start to flash March 2000 0123456789012345: Flash success (duration: 2 min and 7 s) Hardware: DnX SN: 0123456789012345 Start to flash March 2000 0123456789012345: Flash success (duration: 2 min and 7 s)	*
Security		
		Ŧ
Log level	Start to flash C: Users \jeansa \Documents \Projects \xE922-GR \xE92-GR \x	
INFO Save Log Clear Log	flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A\system_signed.fls" "C:\Users\eansa\Documents\Projects\xE922- GR\xE922-3GR_Training_0.4Firmware\Android_MR3.0A\system_signed.fls" "C:\Users\eansa\Documents\Projects\xE922-GR Users\eansa\Documents\Projects\xE922-GR\xE922-3GR_Training_0.4Firmware\Android_MR3.0A\sf3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "C:\Users\eansa\Documents\Projects\xE922-GR\xE922-3GR_Training_0.4Firmware\Android_MR3.0A\sf3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "C:\Users\eansa\Documents\Projects\xE922-GR\XE922-3GR_Training_0.4Firmware\Android_MR3.0A\sf3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "C:\Users\eansa\Documents\Projects\xE922- GR\xE922-3GR_Training_0.4Firmware\Android_MR3.0A\sf3gr_telt_he922-flashfiles-userdebug_a60_ww16_01.1709.05_MR3.0A\vnconfig_smp_signed.fls" "C: Users\eansa\Documents\Projects\xE922-GR\xE922-3GR_Training_0.4Firmware\Android_MR3.0A\sf3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "C:\Users\Vers\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "L:\Users\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "C:\Users\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "L:\Users\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "L:\Users\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" "L:\Users\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" \user\VersRef3gr_telt_he922-flashfiles- userdebug_a60_ww16_01.1709.05_MR3.0A\vecovery_signed.fls" \user\VersRef3gr_telt_he922-flashfiles- User\User\VersRef3gr_telt_he922-flashfiles- user\VersRef3gr_telt_he922-flashfiles- User\VersRef3gr_telt_he922-flashfiles- User\VersRef3gr_telt_he922-	•

Now *PlatformFlashTool* can be closed.



Note that when flashing Android software, the first reboot after the flashing takes longer than usual one because Android has to configure and initialize more items than usual.



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5.1.1. Using Vysor

To use Vysor, you first need to connect the module via USB and start an ADB daemon.



In Google Chrome browser, go to "chrome://apps" and launch Vysor:

		5.1.	Connect and pe	ower on sE922-3GB	LEVB		
Apps	×	Faller	TAXABLE PARTY	Carllade all action 124	and indications are the	CHT hallow	
$\epsilon \rightarrow C$ () chro	ome://apps						☆ * :
👖 Apps 📙 Telit							
						(You	Not signed in to Chrome .'re missing out—sign in)
	Web Store	Google Docs	Gmail	Google Drive	YouTube	Google Sheets	
		•					
	Google Slides	Vysor					
o chrome							Web Store 🛛 🔊



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Table offering the	
Vysor	
Choose a device	
sf3gr crb_v1 Serial: 0123456789012345	View Share
Settings	
Image Quality 500Kbps (fast, low quality)	
Vysor Keyboard (IME)	
Share All Devices	
Start automatically 🕑	
Status	
💘 You've used Vysor for 0 hours. Support Vysor. Go Pro.	
Windows users need ADB Drivers.	
Using Android SDK ADB binary.	
Vysor Version 1.0.9.3	
@vysorapp by ClockworkMod Support Reload Vysor	

Vysor window will appear with "sf3gr crb_v1 device". Click on "View":



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The xE922-3GR Display emulator will appear as shown below:

When using Vysor or Add-On Display board, both display interfaces will print the same UI.



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6. First application with Android Studio

The "*Getting Started*" Android web page is a powerful way to start with Android applications. (<u>https://developer.android.com/training/index.html</u>)

The aim of this section is to describe how to build an existing project and how to run and debug this application on xE922-3GR module with Android MR3.0A software embedded.

Open Android Studio. On the Welcome screen, choose "*Open an existing android Studio project*" and browse into *Sample* folder to select "*MyFirstApp*".



"MyFirstApp" project is opened into Android Studio:





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"MyFirstApp" is a simple application with a main Activity in a LinearLayout.

Main activity invites to enter a message in a textbox and to press the *Send* button.

When the *Send* button is pressed, main activity starts a *DisplayMessage* Activity through a *RelativeLayout* and transfers the message entered by the user.

Then, *DisplayMessage* activity displays the message and an xE922-3GR picture.

6.1. Download and run MyFirstApp on xE922-3GR

In Run menu, choose "*Run App*". The following window with "*Sf3gr_crb_vi*" Connected Devices appears:

💮 Select Deployment Target	×
Connected Devices	
Intel Sf3gr_crb_v1 (Android 6.0.1, API 23)	
Create New Emulator	Don't see your device?
Use same selection for future launches	OK Cancel

Press 'OK'. *MyFirstApp* is downloaded to xE922-3GR thanks to ADB commands.



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Vysor extensions will show the following:

a generation		
		⊿ 9 2:27
xE922-3GR		
Enter a message		SEND
1	0	=
Ň	0	=

$$\textcircled{0}$$

xE922-3GR can possibly be in idle state. In that case, just press the Home button and slide the screen to see MyFirstApp on it.

Enter "Hello world" in the *TextBox* and press *Send* button. *RelativeLayout* will display your message:

er te ∠ 1 2:30 ← DisplayMessageActivity
Hello world !!!
Telefit test23.00 Bur Barn Wir Barn von Hammenn Wir Barn von Hammenn
∢ 0 ≡

DisplayMessageActivity can be closed by pressing back key and a new message can be typed in *TextBox*. To stop *MyFirstapp*, press the *Stop* button in *AndroidStudio*.



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6.2. Download and debug MyFirstApp on xE922-3GR

First, set a breakpoint in Myactivity.java file in the following code line: intent.putExtra(EXTRA_MESSAGE, message);

In the *Run* menu, choose "*Debug App*" and choose again "*Sf3gr_crb_vi*" as Connected Devices.

Enter "Hello debug world !!!" in the *TextBox* and press *Send* button. The execution in AndroidStudio will stop at the breakpoint, offering a common debug view.



To resume program execution, press F9 key (resume program). Thus, Vysor enters in *DisplayMessageActivity*.



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To stop *MyFirstapp*, press the *Stop* button in *AndroidStudio*. *AndroidStudio* can now be closed.

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Note that MyFirstApp is permanently installed on xE922-3GR after this session. Pressing the Vysor application button will show the xE92-3GR icon allowing to run application again.



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7. APK Installation

This section describes how to install already-built applications (apk packages). Open Cmd window and browse to the *Sample* folder. Enter "*adb install cpu-speed-performance-test.apk*".

Administrator: C:\Windows\system32\cmd.exe	x
C:\xE922-3GR_Training\Sample>dir Volume in drive C has no label. Volume Serial Number is 6E94-76E4	*
Directory of C:\xE922-3GR_Training\Sample	
29/06/2016 16:39 <dir> 29/06/2016 16:39 <dir> 11/05/2016 11:58 1 758 958 cpu-speed-performance-test.apk 29/06/2016 16:08 <dir> 20/01/2016 21:51 185 335 Phone Tester.apk 2 File(s) 1 944 293 bytes 3 Dir(s) 100 072 706 048 bytes free</dir></dir></dir>	Ш
C:\xE922-3GR_Training\Sample>adb install cpu-speed-performance-test.apk [100%] /data/local/tmp/cpu-speed-performance-test.apk pkg: /data/local/tmp/cpu-speed-performance-test.apk Success	
C:\xE922-3GR_Training\Sample>_	
	Ŧ
<	► a

Then start the "CPU Speed Test" application with Vysor.



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8. Debug and Trace

Telit can ask customers to provide log files and traces from the module for problem analysis. This section describes debugging facilities available on xE922-3GR and how to use them.

8.1. Embedded Debug Utilities

The first stage of debugging consists in three embedded commands in Linux/Android stack.

8.1.1. Dmesg

dmesg is a command on most Unix-like operating systems that prints or controls the Kernel Ring Buffer. The output of this command typically contains the messages produced by the device drivers and the kernel itself.

Use:

- <u>Get *dmesg* buffer from xE922-3GR filesystem:</u> Either on Uart Linux console or under ADB shell, enter *dmesg* > *qath*>/*dmesgLog.txt* In Cmd window, enter *adb shell "dmesg* > *qath*>/*dmesgLog.txt*"
- Download *dmesgLog.txt* from xE922-3GR to the host: Enter following command in cmd window: *adb pull <path>/dmesgLog.txt <Host path>*

Examples:

1. PuttyAdb



2. Cmd window:







8.1.2. Logcat

logcat is an Android command-line tool that dumps a log of system messages, including stack traces when the device throws an error and messages that you have written from your app with the Log class.

Use:

- Get logcat buffer from xE922-3GR filesystem: Either on Uart Linux console or under ADB shell, enter *logcat* > *<path*>/*logcatLog.txt* After a while, press Ctrl+C to stop logcat. In Cmd window, enter *adb shell "logcat* > *<path*>/*logcatLog.txt*"
- 2. Download *logcatLog.txt* from xE922-3GR to the host: Enter the following command in cmd window: *adb pull <path>/ logcatLog.txt <Host path>*

Examples:

1. PuttyAdb

PN8052.tmt.telital.com - PuTTY	
root@sf3gr_crb_v1:/ # pwd /	*
root@sf3gr_crb_v1:/ # logcat > /data/logcatLog.txt ^C 130 root@sf3gr_crb_v1:/ #	-

2. Cmd window:







8.1.3. Dumpsys

dumpsys Android tool runs on xE922-3GR and provides information about the status of system services.

It provides information for many Android services (try *dumpsys –l* for exhaustive list), but most commonly used *dumpsys* services are for:

- Viewing Input Diagnostics (dumpsys input)
- Viewing RAM Usage Data (dumpsys procstats)
- Viewing Network Data (dumpsys netstats)
- Viewing Battery Usage Data (dumpsys batterystats)

To get *dumpsys* information, follow the same steps as described for *dmesg* and *logcat* in the previous chapters.



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9. Document History

Revision	Date	Changes
0.1	2016-04-15	First Draft
0.2	2016-08-16	Corrections and Updates
1	2017-07-04	Reworked Starting Guide with more details and



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