STS-RBM
Installation Manual

Abstract

The LAVA STS-RBM products permit the charging of select Samsung tablets while simultaneously interacting with USB accessories. The STS-RBM enhanced features include battery modulation, screen brightness management, and improved network operation.

This document describes the STS-RBM setup and software installation procedure for the tablet.

Contents

Introduction

Using a LAVA STS-RBM requires the following installation steps:

- ❑ Obtain a copy of the "LAVA STS-RBM Software Release.ZIP" from LAVA Sales or Support
- ❑ Copy the LTM.INI file, to the Internal Storage folder of the tablet
- ❑ Install the LAVA Tablet Manager applications on the tablet
- ❑ Allow LAVA Tablet Manager to change system settings
- ❑ Enable a WiFi connection
- ❑ Enable the LTM application as a Device Administrator and activate the KNOX license
- ❑ Disable the WiFi connection (optional)
- ❑ Turn off the "auto screen brightness" on the Tablet
- ❑ Verify the time zone and time on the Tablet
- ❑ Verify the TYPE jumpers on the STS-RBM are set for your tablet model
- ❑ Connect the STS-RBM product to the Tablet with the supplied LAVA cable
- ❑ Apply power to the STS-RBM product

Do not plug in USB accessories during the initial setup. Always test a system in incremental steps and in the prescribed order.

This document describes each of the above steps in further detail.

Note: *The LAVA Tablet Manager* **must** *be installed on the tablet; else the STS-RBM product restarts the tablet power and USB connection every few minutes.*

Note: *The TYPE jumpers on the STS-RBM must be set for your tablet model.*

Note: *This document does not discuss issues related to the remote setup of a mobile device when using Samsung's KNOX Configure.*

LAVA STS-RBM Software Release Package

The "LAVA STS-RBM Software Release" package is provided by LAVA Sales or Support for STS-RBM customers. The file is named "LAVA STS-RBM Software Release.zip". The package content can be extracted on a PC or Tablet with one of many decompression tools that are freely available.

	LAVA STS-RBM Software Release - Files	
Item	**File Name**	**Description**
1	README.TXT	A summary of the release packages along with any last minute information. The version of each application is also noted.
2	LTM_v2.03.APK	The "LAVA Tablet Manager" application for earlier versions of Android, typically 5 and 6.
3	LTM_v3.01.APK	The "LAVA Tablet Manager" application for newer versions of Android, typically 7 and 8.
4	board-type=1\LTM.INI board-type=2\LTM.INI board-type=3\LTM.INI	The LTM.INI is the configuration file for the "LAVA Tablet Manager" application. The "board-type" parameter in the file must be matched to the tablet. Three versions are present with the "board-type" already set.
5	LTM_Setup.APK	The "LTM Setup" utility allows the LTM.INI file to be viewed, modified, or created on a tablet.
6	LBI.APK	The "LAVA Battery Information" application is an optional utility used to verify the battery charge status. Installation of this application is recommended for initial verification of the STS-RBM. This application can be removed once the STS-RBM is operational.
7	STS-RBM Installation Manual.PDF	This is the document currently being read.
8	LAVA Battery Information Manual.PDF	The manual for the LAVA Battery Information application.

The LAVA Tablet Manager (LTM) is only available as part of the release package. The LTM application is not on GooglePlay due to the special installation steps required.

The STS-RBM applications are "sideloaded" onto the Tablet, rather than going through Google Play. To "sideload" an application, copy the APK file to a Tablet folder such as the Download folder. Using the "My Files", locate and select the APK to begin the installation. You may have to permit installation from "Unknown sources" depending on your specific Tablet settings.

An alternative to copying the APKs to a Tablet folder is to place the files on a memory stick and use an OTG adapter such as the LAVA TL002 to make the files accessible by the Tablet.

Product Setup

Selecting the LTM.INI file

The LTM.INI file is the configuration file for the LAVA Tablet Manager (LTM) application. There are several samples of the file in the release package, each with minor adjustments.

LTM.INI FILE SELECTION	
Configuration File	**Tablets**
board-type=1\LTM.INI	Tab S2 9.7", Tab S2 8.0", Tab E 8.0", and Tab 4 10.1"
board-type=2\LTM.INI	Tab E 9.6", Tab A 9.7", and Tab A 8.0"
board-type=3\LTM.INI	Tab A 10.1"
Do not keep the "board-type=n" folder name, only copy the INI file to the Internal Storage folder.	

Once the STS-RBM product is working, you may customize the settings in LTM.INI file for your project. The "STS-RBM Product Family - Reference Manual" contains a detailed description of the INI file. The file format is UTF-8 (simple ASCII). Any simple text editor can be used to view and change an LTM.INI file. The mobile devices do not ship with a suitable editor for the INI file as a standard feature.

The "LTM Setup" utility allows the most common attributes in the LTM.ini file to be directly managed on the tablet.

The LTM application checks for updates to the LTM.INI file, which permits updates to the configuration to be made at any time.

Selecting the version of LTM

There are two versions of the LAVA Tablet Manager (LTM) in the release package. The primary difference is support for the Samsung KNOX SDK.

The LTM v3.00 (and newer) works with tablets using KNOX 2.7 and newer. For the tablets available to LAVA as of October 2018, LTM v3.00 is compatible with devices running Android 7 and Android 8. All Samsung tablets running Android 8 have been observed to use KNOX 3.0 and newer.

The LTM v2.03 works with tablets running older versions of KNOX. There is an additional requirement to support the KNOX Standard SDK v5.1 or newer. The tablets identified as having been tested with STS-RBM products running Android 5 and Android 6 should use LTM v2.03. The list of tested Samsung tablets can be found on the LAVA web site.

The LTM v2.03 works with all Android 7 based Samsung tablets identified by LAVA as being compatible with STS-RBM products. It is recommended that these tablets use LTM v3.00 (or newer) to deal with a tablet update to Android 8.

Installation of LAVA Software

	Software Installation Steps	
Step	Action	Comment(s)
1	Copy the required LTM.INI file to the Internal Storage folder of the Tablet. This folder that contains sub-folders such as Download, Music, and so on.	The LTM.INI file is the configuration file for the LAVA Tablet Manager application. The "board-type" parameter MUST be set correctly for the tablet being used. There are three sample copies of the file in the release package, each with a different setting for "board-type".
2	Install required LTM APK.	This application is "sideloaded" onto the tablet. This application appears in the tablet Application manager as "LAVA Tablet Manager VII". This application has no displayable component.
3	Allow LTM to access system settings.	Locate "LAVA Tablet Manager VII" in the Application Information screen of the mobile device. Under Advanced settings, go into the "Apps that can change system settings" screen. Enable the permission, which allows LTM to update the screen brightness of the mobile device. This is only required for LTM v3.0 and newer.
4	Allow LTM permission to access the tablet "Storage".	Locate "LAVA Tablet Manager VII" in the Application Information screen of the mobile device. Under Permissions settings, enable access to "Storage". This is only required for LTM v3.0 and newer.
5	Install LTM_Setup.APK	This utility is "sideloaded" onto the mobile device. The utility appears in the the mobile device Application manager as "LTM Setup". Installation of this utility is optional.
6	Install LBI.APK	This application is "sideloaded" onto the tablet. This application appears in the tablet Application manager as "Battery Information". Installation of this utility is optional.
7	Enable WiFi on the tablet.	The next step requires a valid Internet connection over WiFi.
8	Activate the "LAVA Tablet Manager VII" as a Device Administrator.	Locate the "Device administrators" menu. On newer Tablets, the required menu is under the "Lock screen and security" + "Other security settings". On older Tablets, the required menu is under "General" + "Security". Enable "LAVA Tablet Manager VII" in the Device Administrator menu, and then select ACTIVATE. After selecting activate, the next menu presented is for accepting a Samsung KNOX license. If you previously installed a Mobile Device Management application, the KNOX license screen may not be presented, as it has already been agreed to. After the KNOX license activation, an Android Toast message reports success or failure. If the request fails, disable the application in "Device administrators" and try again in a few minutes. Ensure you have a connection to the Internet over WiFi.
9	Disable WiFi (optional)	After completing the Samsung KNOX authentication, the WiFi connection can be turned off.
10	Disable the tablet Auto Screen Brightness.	The Auto Screen Brightness must be disabled in the tablet to permit LTM to manage the screen brightness.
11	Verify the tablet time zone, date, and time are correct.	Several LTM features require that the correct time is set on the tablet.
	End of the Software Installation	

Preparation of the STS-RBM Board

The TYPE Headers determine the type of Samsung tablet to be connected to. It is **critical** to set these headers with the correct jumpers else the tablet may not charge very well or may not charge at all. Each of these headers has two pins and uses a standard 0.1- inch jumper.

TYPE Header Jumper Options		
Header 1	**Header 2**	**Description**
Open	Open	Operation with Tab E, Tab S2, Tab A
Installed	Open	Operation with Tab 4
Open	Installed	Reserved for future use
Installed	Installed	Force Boot Loader to run.

Connecting STS-RBM to the Tablet

Connect the STS-RBM to the tablet using the LAVA provided cable. This cable has a Micro USB-B connector at each end. This cable must not be extended.

Plug one end of the LAVA cable to the Micro USB-B Port on the board. Either end of the cable can be used. Always verify the connector orientation to prevent damaging the receptacle.

Plug the other end of the LAVA cable to the tablet. Always verify the connector orientation to prevent damaging the receptacle.

Powering up the STS-RBM (PoE)

Attach an RJ45 Cat-5 cable between the STS-RBM and a PoE Enabled Network Switch. The alternative is to use a PoE Power Injector and a non-PoE Network Switch.

Warning: When using a Network Switch Port that is providing power, the 5 Volt input must not be used.

Powering up the STS-RBM (5V USB Supply)

If not using PoE to supply power to the STS-RBM, then a 5V USB Supply can be used.

Attach the power cable from a 5V USB Power supply to the 5V Input Port of the STS-RBM.

The Power Supply provided with the Samsung tablet is an ideal choice. Do not extend the original power supply cable until the system has been debugged. Ensure the supply is rated for at least 2 amperes.

The voltage reaching the STS-RBM should be at least 5 volts. The preferred range is 5.1 to 5.25 volts. The input voltage must never exceed 5.25 volts. Exceeding 5.25 volts can result in immediate system damage.

Warning: *When supplying power using the 5 Volt input, you must not use a Network Switch Port that is providing PoE power.*

Power Up Behavior

With power applied the green Charge-Only LED will flash on and off for the first 2 to 3 seconds and then the yellow SimulCharge LED goes active.

Note: If the Type 1 jumper is open, the green Charge-Only LED flashes with a pulse-pulse-pause pattern for the first 2 to 3 seconds.

Note: If the Type 1 jumper is closed, the green Charge-Only LED flashes with a continuous on-off pattern for the first 2 to 3 seconds.

The Android Notification line at the top of the screen has an "LTM" displayed while the LTM Service is active. When the Notification information is examined; the message "LTM Handler, LAVA Tablet Manager is operational" is present. If the LTM notification is not present, the LTM Service is not running.

Attach the STS-RBM to an Ethernet network via the RJ45 connector. The STS-RBM Network Link and USB Activity LEDs start to pulse to confirm an active network connection. In the event the network connection fails to work, verify the Ethernet interface is enabled in the tablet setup.

The LAVA Battery Information application can be used to observe the battery charge status. This application can also be used to log the battery charging status to a file.

The LTM.ini can be replaced at any point to alter the configuration. Changing the "user-debug=0" and "Ethernet-debug=0" settings can enable several useful debug messages. The "STS-RBM Reference Manual" contains a detailed description of the INI file.

If the STS-RBM is placed into the Charge-Only mode using the Charge Mode button, the LTM Service shuts down and all USB devices are disconnected.

If the "Allow LTM to access system settings" is skipped during the installation of LTM v3.00 (or newer), the required tablet setup screen is automatically presented shortly after LTM runs for the first time. This permission is required to allow LTM to manage the tablet screen brightness. If screen brightness management is turned off, this permission is not required. Using the screen brightness management feature is strongly recommended to reduce heat issues over time.

The "LTM Setup" Utility

The "LTM Setup" utility can be used to review, modify, or created an LTM.ini configuration file. The utility can be used while LTM is running, as changes are automatically picked up. This APK is part of the standard software release package for the STS-RBM product.

The utility allows the most common attributes in the LTM.ini file to be directly managed. Attributes that are not managed by LTM are written back to a modified INI file without any changes. The attributes not directly handled by "LTM Setup" can be modified on a PC with any standard text editor.

The "APPLY" in the top right corner is selected to write changes to the mobile device. Only comments at the top of the LTM.ini file are preserved. Attributes not directly managed by the utility are moved to the bottom of the file.

Once an LTM.ini file is finalized, it can be directly copied to other mobile devices which are to run with the same configuration.

The "LTM Setup" utility compatible with all LAVASync+, eSTS, and STS-RBM products.

Installing the "LTM Setup" utility is optional.

The "LAVA Device Info" Utility

This utility is used to report the firmware versions on the LAVA product and several non-volatile settings. The non-volatile settings are generally modified by LTM based on the INI configuration file. Some settings can be directly modified with this utility. In some case LAVA Support may ask you to install this utility to assist in diagnosing installation issues. This utility is not included in the installation steps.

Additional Comments

The "Allow LTM permission to access the tablet Storage" step in the Software Installation Steps should not be required for LTM v3.00 and newer as a special feature in the KNOX SDK is used to grant the permission dynamically. When installing LTM for the first time, manually grant the permission in case the required KNOX function is not operational on the tablet you are using.

With LTM running, the battery level is maintained between the upper and lower thresholds defined in the LTM.INI file. The LAVA Battery Information (LBI) application can be used to monitor the battery charge status. When the charging state is active, the battery charging current can be viewed with LBI to ensure the tablet is charging. The LBI application is used to log the battery charging status to a file, which allows the behavior over several hours to be monitored.

The tablet charging icon cannot be relied upon to indicate if the battery is charging - only by checking the battery charge current, or observing the charge level for a period of time, is a valid check. The tablet draws less current from the external power supply during SimulCharge mode by design. If the tablet is not charging and a 5V USB supply is being used, verify the voltage reaching the STS-RBM is at least 5 volts. In some cases reducing the tablet screen brightness, by 10 to 20 percent, allows the battery to charge.

The LTM.ini can be replaced at any point to alter the configuration. Changing the "user-debug=0" and "Ethernet-debug=0" settings can enable several useful debug messages. The "STS-RBM Reference Manual" contains a detailed description of the INI file.

Removing STS-RBM power shuts down the LTM application, and all USB accessories are disconnected.

Note: *When using "board-type=2" or "board-type=3", removing power from an STS-RBM does not result in a shutdown of the STS-RBM board if Battery Modulation is in the discharge state. The STS-RBM continues to function in this state until the lower charging threshold is reached as defined by "btty-lower-threshold".*

STS-RBM Board

Board Layout

This document presents the basic information for the STS-RBM board layout. Please consult the "STS-RBM Reference Manual" for a detailed description of the board connectors, buttons, and options.

STS-RBM (L181.1) Board
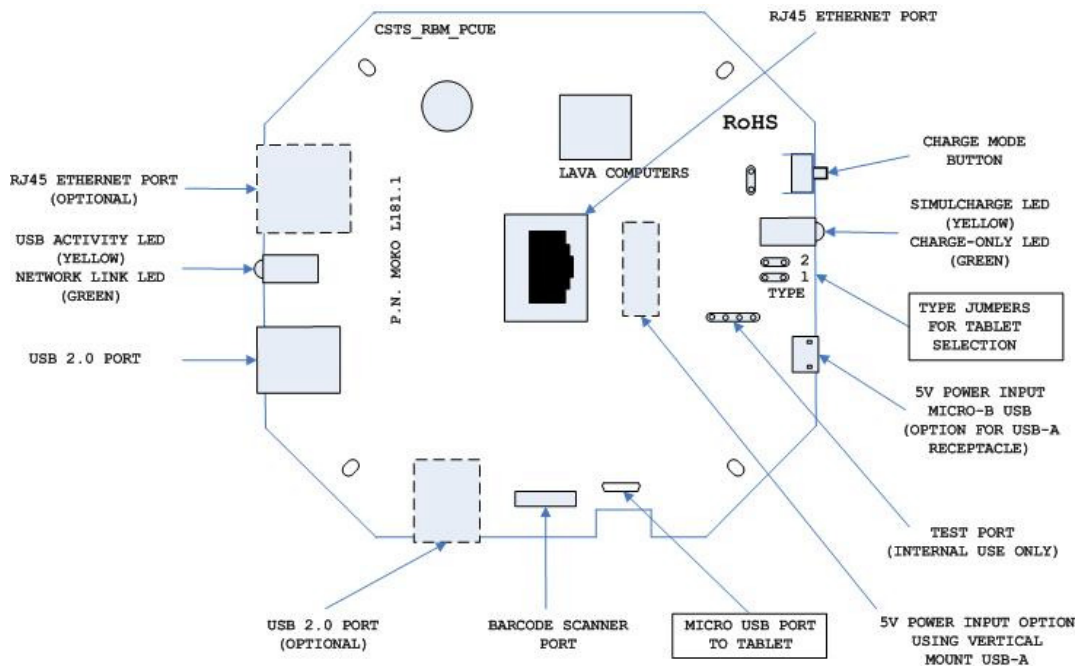
Technical Support

LAVA Technical support is open from 9:00 am to 5:00 pm Monday to Friday (EST).

Telephone: +1 416 674-5942

Fax: +1 416 674-8262

Toll-Free (US and Canada): 800 241-5282

Internet: www.lavalink.com/helpdesk

History

Document Revision	Date	Change
A00	Oct.02, 2016	Initial release.
A01	Nov.01,2016	Revised the software installation steps. Revised the "Power Up Behavior" section.
A02	May 16,2017	Revised the document to follow layout of the eSTS Installation Manual.
A03	Sep.27,2017	Added effect of a Mobile Device Management application during LTM installation. Removed the "LAVA Scanner Receiver" application. Removed the "STS-RBM Reference Manual", which is available on the LAVA web-site. Added comment that Tab A 8.0" uses board-type=2.
A04	Jan. 8, 2018	Added Tab S2 8.0" to list of tablets in Software Installation Steps. Minor updates in other sections.
A05	Oct. 10,2018	Updated for LTM v3.xx, which is compatible with Android 7 and 8.
A06	Jan. 11, 2019	Now using LTM_v3.01 in place of LTM_v3.00. Eliminated the term "root" when referring to the storage location of the INI file. Added summary of the LAVA Device Info utility. Changed "rar" to "zip".