ISL55185 EVM Getting Started

Rev A02 : In Progress

This document contains information on a product under development. The parametric information contains target parameters that are subject to change.

Table of Contents

List of Figures

List of Tables

1 Introduction

Congratulations on your purchase of a Elevate Semiconductor ISL55185 EVM evaluation system. You will find that it serves as an invaluable development platform to help get your product to market in the shortest possible time. The ISL55185 EVM and Graphical User Interface (GUI) allow the customer to demonstrate and evaluate the ISL55185 performance and functionality.

This document provides the instructions to install, setup, and operate the ISL55185 EVM. Refer to the ***Elevate Semiconductor EVM User's Guide*** for a detailed description of the FVMI and Motherboard.

1.1 Unpacking - ISL55185 EVM Contents

Please check the contents of the ISL55185 EVM shipping carton to make sure you have received all of the items listed in Table 1. The system is already configured for the best setup, except for connections to the power supply, PC controller, and test equipment.

Table 1: ISL55185 EVM Contents

Qty	Description
1 ea.	ISL55185 EVM System (3 boards: Loadboard, EVM Motherboard, Octal FVMI)
1 ea.	ISL55185 EVM Getting Started (this document)
1 ea.	Elevate Semiconductor User Interface Program Installation CD
1 ea.	DB25M-DB25M, 6 Foot Parallel Port Cable

1.2 Recommended Test and Measurement Setup

1.2.1 Power Supply

Table 2 provides the required power supplies and current rating. The power supplies are connected using standard banana plugs. The customer needs to provide the power supply cables.

It is recommended to use a triple supply to control the EVM supplies. This allows the 3 EVM supplies to be turned on at the same time. However, if this is not feasible, then the supplies should be enabled in the following sequence. Power down should be performed in the reverse order.

1. +20V
2. -15V
3. +5V

The ISL55185 VCC and VEE are gated using an Opto-FET switch on the loadboard so it is safe to set and enable the ISL55185 VCC/VEE voltages before powering up the EVM and running the software.

Table 2: Power Supply Requirements

Module	Supply	Current Rating
EVM	+20V (1)	1.0 A
EVM	+5V	0.5 A
EVM	-15V	0.5 A
ISL55185 VCC (4)	+10V (2, 3)	0.5 A
ISL55185 VEE (4)	-5V (2, 3)	0.5 A

1) The EVM +20V could also be used as the ISL55185 VCC
2) The ISL55185 VCC – VEE voltage should not exceed 32V. Refer to the ABS max section in the datasheet.
3) Once the EVM operation is verified, the customer can adjust the VCC/VEE supplies.
4) There is a provision to use the FVMI LT1206 to source the VCC/VEE supplies; this is controlled by the E2/E3 Jumpers on the loadboard. The LT1206 can support +15V/-10V. The EVM GUI software V3.9.x does not support the option where the FVMI LT1206 is used to source the VCC/VEE supplies so an external power supply must be used.

1.2.2 PC Controller

To use the ISL55185 EVM User Interface Program (UIP), a PC with the following configuration is required:

- Win98, Win2000, WinNT 4.0+, or Win XP
- Parallel/Printer Port – 25-pin female connector

1.2.3 Test Equipment

- Voltage and/or Current Meter
- Voltage and/or Current Source

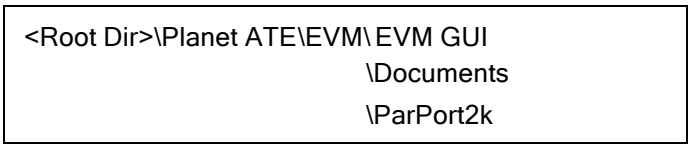
1.3 Software Installation

There are 2 steps to install the ISL55185 EVM demonstration program.

1. Install the ISL55185 EVM UIP from the CD-ROM.
2. Install the parallel port driver (ParPort2k).

Figure 1 illustrates the default directory structure. The user may change the <root dir> during the installation.

Figure 1: Installation Directory Structure



1.3.1 ISL55185 EVM UIP Installation

To install the ISL55185 EVM software package, run the SETUP program on the distribution CD and follow the prompts. The **PlanetATE.exe** executable will be installed in the ***EVM GUI*** sub-directory. In addition, a short cut will be installed onto the desktop and in the **Start->Programs** folder. The **Start->Programs** folder also contains links to the different product datasheets, EVM User's Guide, and documentation folder.

1.3.2 Parallel Port (ParPort2K) Installation

To install the ParPort2K parallel port driver, run the **setup.exe** from the ***ParPort2k*** sub-directory after the main installation is complete and click the **Install** button. For WinNT users, the user must have administration rights.

Note: ParPort2k is a copyright of Zeecube Software.

1.3.3 Reboot Machine

After the ISL55185 EVM and Parallel Port software is installed, it is recommended to re-boot the machine.

1.3.4 Launching the Elevate Semiconductor Program

The user can launch the Elevate Semiconductor GUI from the desktop, **Start->Programs** folder, or ***EVM GUI*** sub-directory.

1.3.5 Software Un-Installation

The Elevate Semiconductor demonstration program may be un-installed using the **Add/Remove Program** from the Windows Control Panel.

2 Getting Started

The ISL55185 EVM is shipped in a pre-configured state that allows a customer to evaluate the different modes.

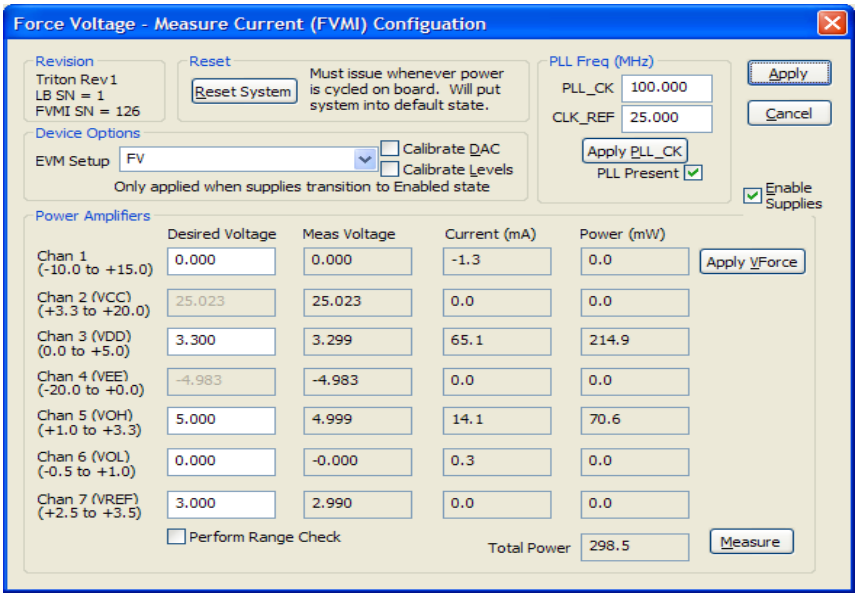
Note: Any external equipment providing digital signals into the ISL55185 device should only be enabled after the ISL55185 EVM is enabled. Also, the external equipment should be disabled prior to disabling the ISL55185 EVM.

2.1 Quick Start Instructions

1. Disable external power supplies
2. Connect the power supplies cables (not provided) from the power supply to the Elevate Semiconductor EVM Motherboard and ISL55185 loadboard; refer to Section 2.2.1.
3. Connect the parallel cable (provided) from the PC to J2 on the Octal FVMI board.
4. Connect the EVM to any external equipment; refer to Section 2.2.
5. Setup Motherboard Jumpers; refer to Section 2.4
6. Set external power supply voltages and current.
7. Enable external power supply.
8. Run the Elevate Semiconductor GUI software; refer to Section 1.3.4 for details.
9. At the Force Voltage – Measure Current dialog box (refer to Figure 2 below):
    a. Select the **EVM Setup** option based on the desired configuration, see Section 2.2
    b. Select the **Enable Supplies** check box
    c. Hit the **Apply** button to power up the device.
10. At this point, the device should be outputting the desired signal.

Note: the software can measure the external VCC/VEE supply voltage but has no mechanism to measure the external VCC/VEE supply current.

Figure 2: Expected Current Readings



The **Reset System** will put the EVM and ISL55185 device into the default state. The **Reset System** should be issued whenever the power supply is powered OFF then ON. The **Reset System** is automatically performed when the program is initially launched.

2.2 Default Configuration Setup Options

The EVM has several default options for configuring for device into different modes.

Table 3: ISL55185 Default Configuration Options

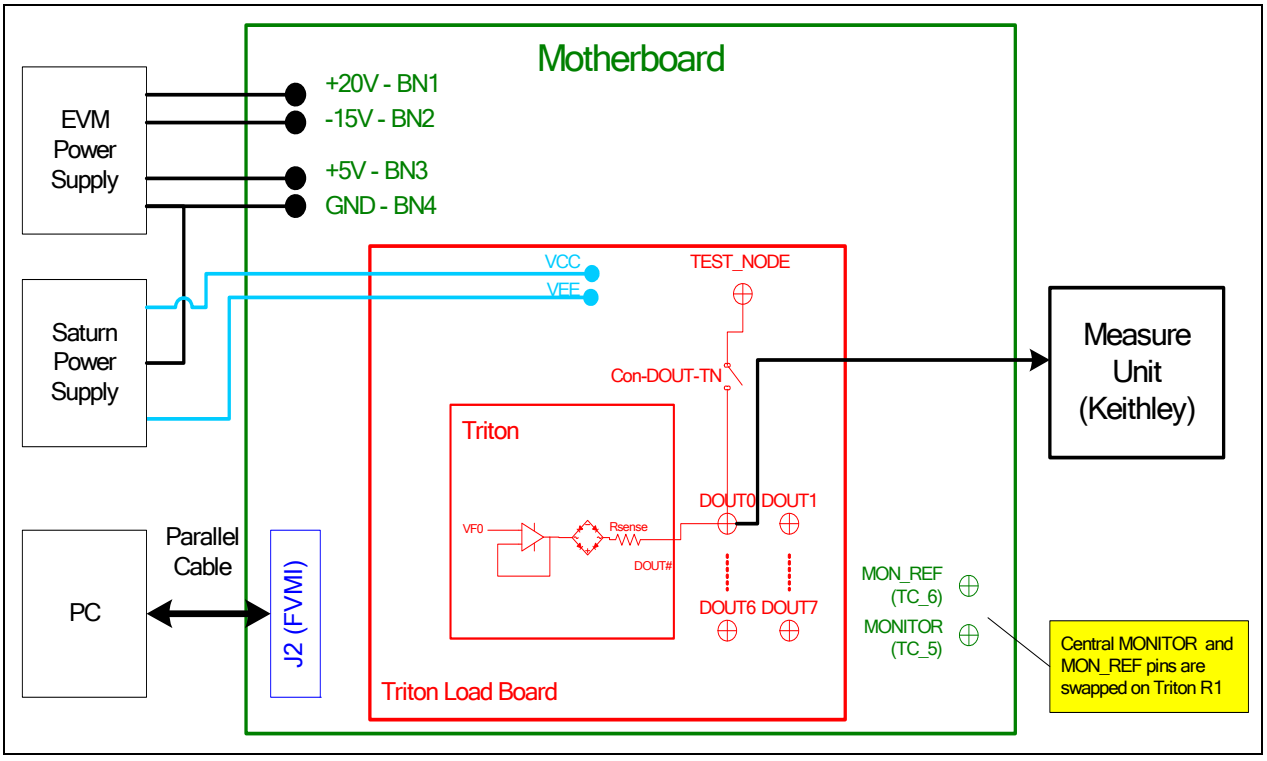
Mode	See Section #	Brief Description
Hardware Reset	N/A	All registers default to the hardware default state.
Three-State (High-Z)	N/A	Puts device in three-state (high-Z). Opens all switches.
FV (Force Voltage)	2.2.1	Configures all 8 channels to output 3.0V

2.2.1 PMU Force Voltage and Active Load

Figure 3 illustrates the recommended configuration for PMU FV and Active Load evaluation. The external measurement unit (MU) should be configured in the opposite mode as ISL55185. After the configuration is completed, use the **DC Levels** dialog box the change the ISL55185 output levels. The user can also connect the DOUT# to TEST_NODE switch. The TEST_NODE can be connected to an on-board Resistor Network.

ISL55185	MU
FVMI	FIMV
Active Load	FVMI

Figure 3: PMU FV Block Diagram



2.3 ISL55185 EVM Jumper Definitions

Table 4 lists the ISL55185 EVM Jumper definitions.

Table 4: ISL55185 EVM Jumper Definitions

Jumper	Description	Configuration
E1	Connect VFORCE	Installed
E2	VCC Source	Short Pin 1 & 2. Towards back of board
E3	VEE Source	Short Pin 1 & 2. Towards back of board

Note: The EVM GUI software V3.9.x does not support the option where the FVMI LT1206 is used to source the VCC/VEE supplies. An external power supply must be used.

2.4 Motherboard Jumper and SMA Definition

Table 5 lists the Tester Channel (TC_#) connector definitions for the ISL55185 EVM Loadboard.

On the EVM Motherboard, most of the TC_# signals can be connected to an SMA. In addition, some TC_# signals (digital inputs) go through a 3-pin jumper to allow the inputs to be sourced from either the SMA or a latch.

Table 5: TC# Resource Allocation

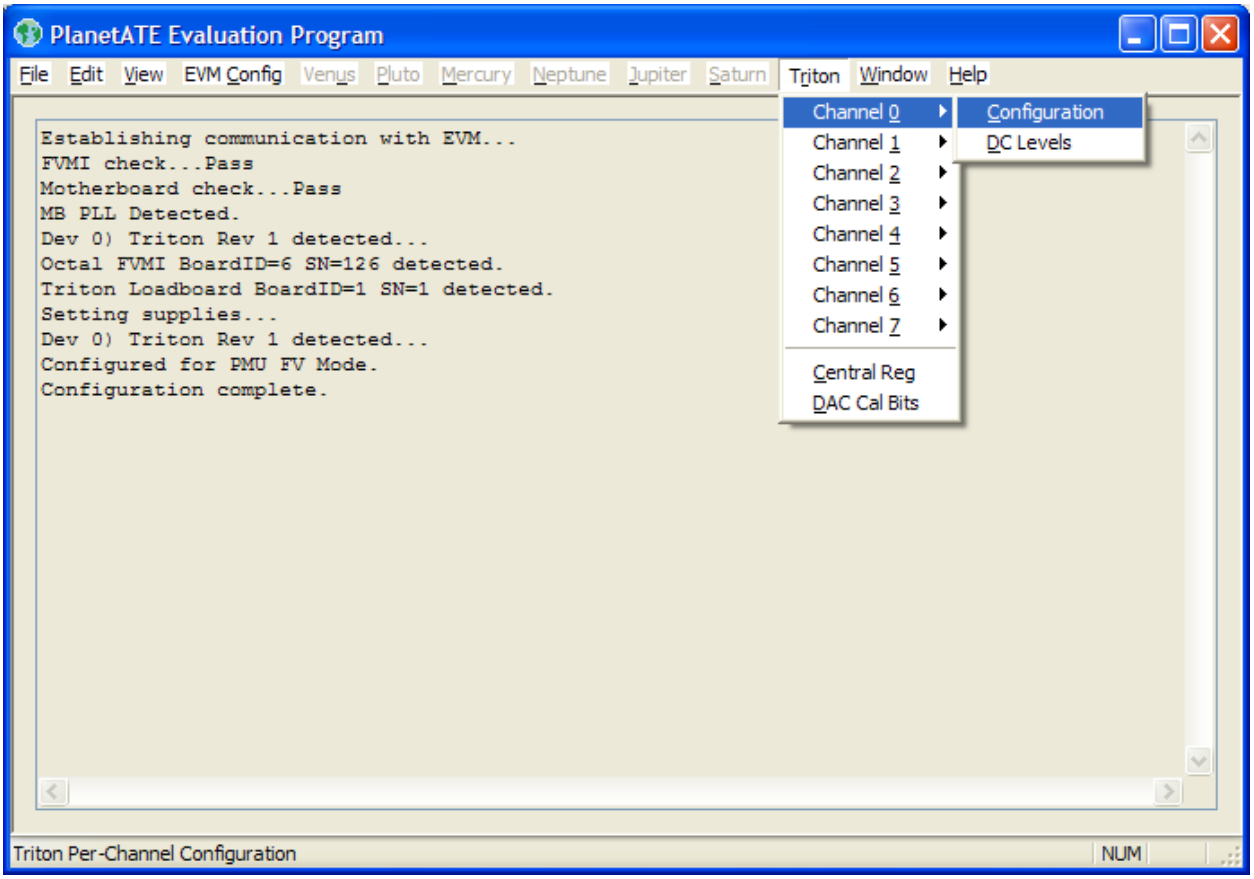
TC#	Usage	EVM MB Jumper	EVM MB Jumper Configuration
1	TPIN	-	
2	CPU_SDIO	-	
3	CPU_STB	-	
4	RESET	-	
5	MONITOR	-	
6	MON_REF	-	
7	Reserved	-	
8	MON#	-	
9	MON_REF#	-	
10	CPU_CK	-	
11*	EXT_FORCE#_P	-	
12*	EXT_SENSE#_P	-	
13	TJ	-	
14*	LB_AMUX_P	-	
15	DUT_GND DG_[D:A]	E20	Only applicable when DUT_GND_SEL = TC_15 • Install to short to GND • Do not install to use TC_15 SMA
16	TEST_IN	E13	Only applicable when TEST_IN_SEL = TC_16 • Install to short to GND • Do not install to use TC_16 SMA
17	DATA0/4	E3	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
18	DATA1/5	E4	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
19	EN0/4	E4	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
20	EN1/5	E6	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
21	SDI_RCK	E1	Always Short Pin 1 & 2. towards back of board
22	DATA2/6	E7	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
23	DATA3/7	E8	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
24	EN2/6	E9	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
25	EN3/7	E10	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
26	EXT_MON_SEL0	E2	Always Short Pin 1 & 2. towards back of board
27	EXT_MON_SEL1	E15	Always Short Pin 1 & 2. towards back of board
28	EXT_MON_SEL2	E14	Always Short Pin 1 & 2. towards back of board
29	Reserved (EVM) EXT_MON_OE (ATE)	E11	Don’t care
30	Reserved (EVM) EXT_TJ_OE (ATE)	E12	Don’t care
31	Not Used	-	
32*	TEST_NODE_P	-	

Note: An ‘*’ means the signal goes through a channel protector before routed to TC#.

2.5 ISL55185 EVM Menu Dialog Boxes

Figure 4 illustrates the ISL55185 EVM menu options. These provide access to the ISL55185 registers.

Figure 4: Device Config Menu Options



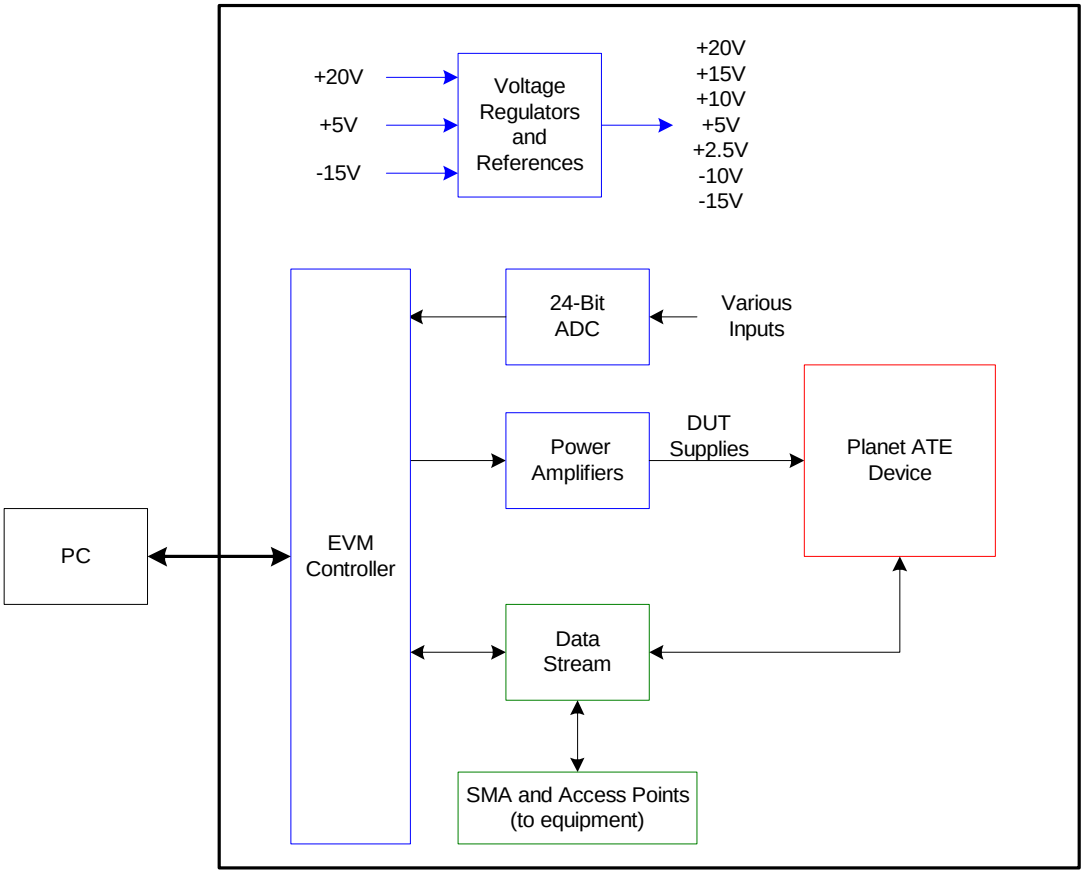
3 Detailed Hardware Description

Figure 5 illustrates the ISL55185 EVM system overview. The ISL55185 EVM is comprised of 3 boards:

- Device Loadboard – this is the top board and contains the Elevate Semiconductor device. Represented in red in the figure.
- Motherboard – this is the middle board and contains the data stream and comparator output test access points. Represented in green in the figure.
- Octal FVMI Board – this is the bottom board and contains the power amplifiers, A/D converter, voltage regulators/references, and EVM controller. Represented in blue in the figure.

Refer to the ***Elevate Semiconductor EVM User's Guide*** document for a detailed description of the Octal FVMI and Motherboard.

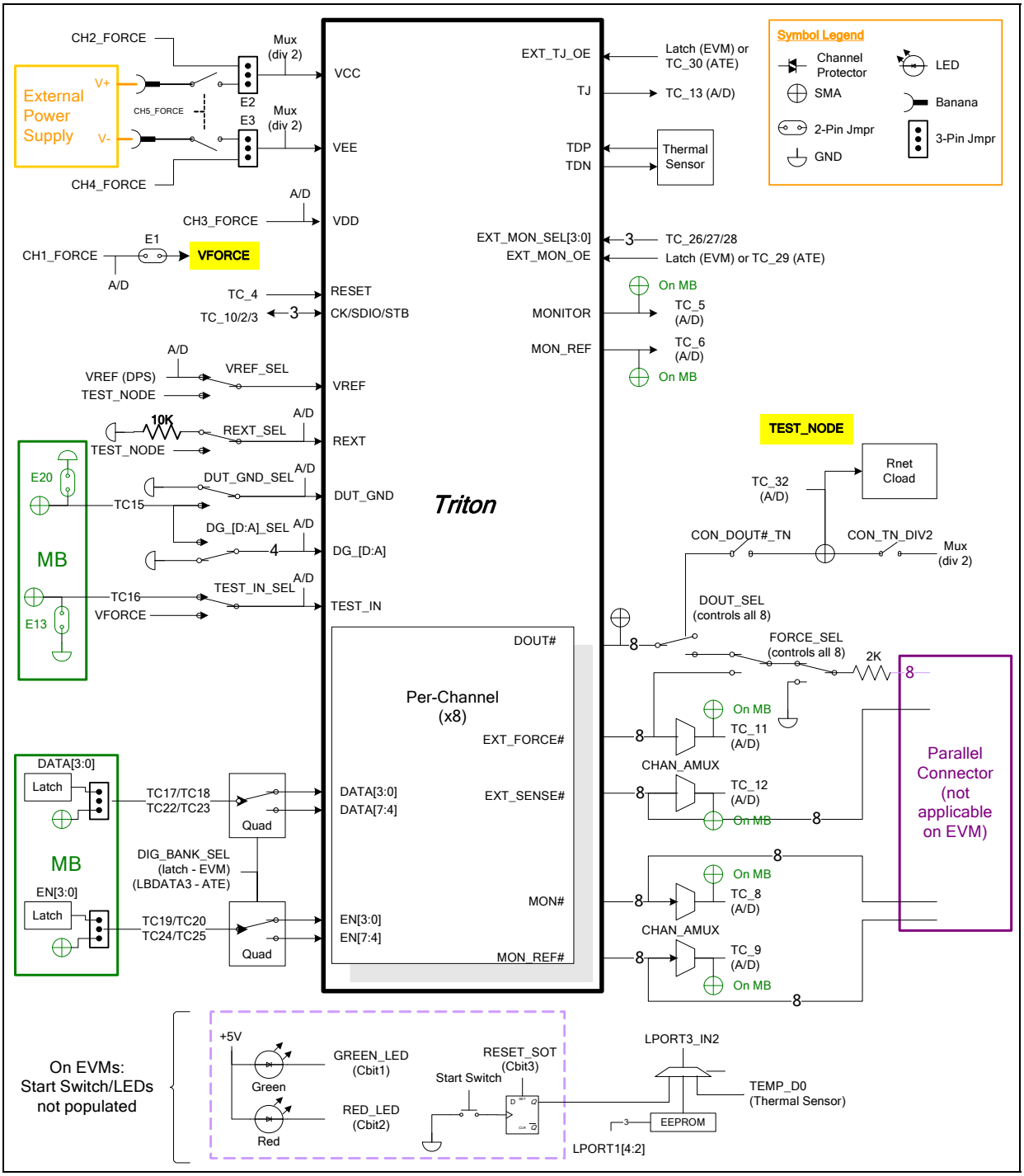
Figure 5: Elevate Semiconductor EVM Overview Block Diagram



3.1 ISL55185 EVM Loadboard Detailed Description

Figure 6 illustrates the ISL55185 EVM loadboard. Almost all of the circuitry is used to test, validate & characterize on the bench and ATE environment. Besides decoupling caps, the only external component required is the 10K resistor connected to REXT.

Figure 6: ISL55185 EVM Loadboard Detailed Block Diagram



3.2 Capacitor and Resistor Network Definitions

Figure 7 illustrates while Table 6 and Table 7 list the ISL55185 EVM capacitor/resistor load network definitions. Any capacitor combination can be switched in. The software only allows a single resistor value to be switched in.

Figure 7: ISL55185 EVM Capacitor/Resistor Network Block Diagram

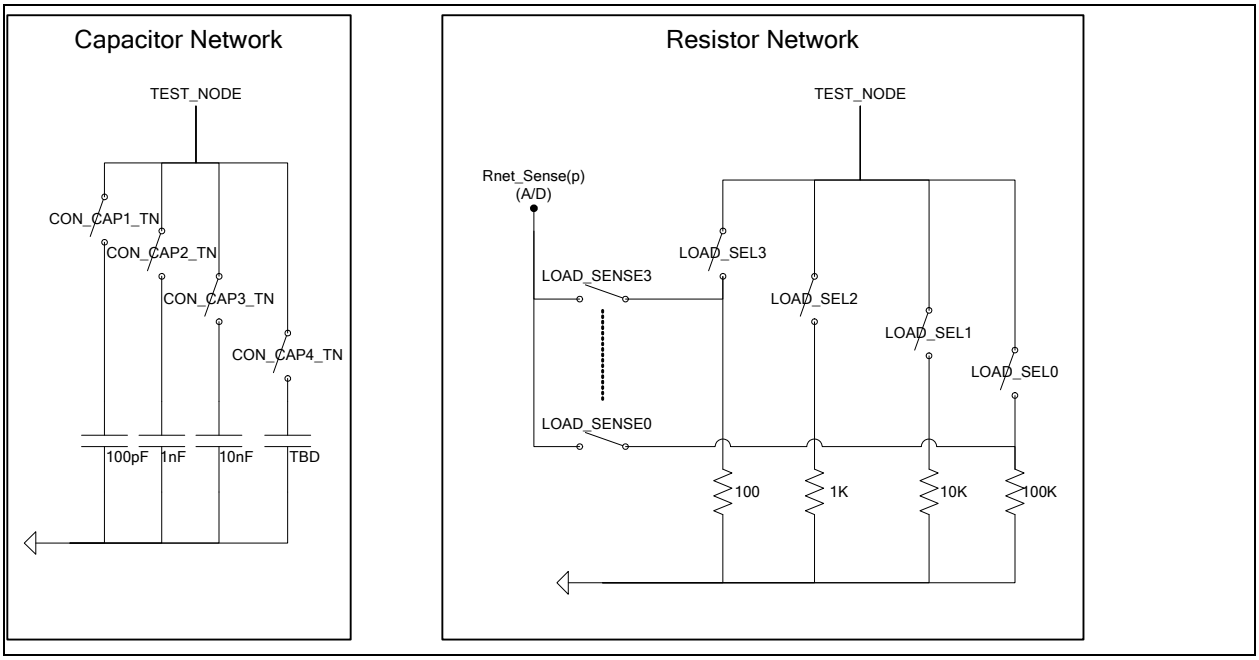


Table 6: Capacitor Network Definitions

Code	Capacitor Value
-1 or 0	Open All
1	100pF
2	1nF
4	10nF
8	TBD

Table 7: ISL55185 EVM Resistor Network Definitions

Code	Resistor Value
-1	Open All
0	100K
1	10K
2	1K
3	100

3.3 ADC and Analog Mux

The Octal FVMI contains a 24-bit ADC and analog muxes which allows for the accurate measurement of many device and system voltages. Table 8 lists the ISL55185 EVM loadboard specific mux input sources. Table 9 lists the ISL55185 EVM loadboard AMUX_OUT analog mux which is routed to the TC-28 and VINN10 nodes.

Notes:

1) Signals that have a '_P' appended to the end of the name implies the signal goes through a channel protector or voltage dividers (i.e. VCC) since they could exceed the motherboard supplies (+20V/-15V).
2) VINP13 and VINP14 are connected to TC_31 and TC_32 on the motherboard.

Table 8: FVMI Analog Mux – VINPOS(A) & VINNEG(A) Mapping

Addr	VINP#	VINPOS(A)	VINN#	VINNEG(A)
7	VINP8	Reserved	VINN8	VREF
8	VINP9	MON# (per-chan)	VINN9	MON_REF# (per-chan)
9	VINP10	LB_AMUX_P (see below)	VINN10	LB_AMUX_P (see below)
10	VINP11	MONITOR (Central)	VINN11	MON_REF (Central)
11	VINP12	REXT	VINN12	
12	VINP13	TC_31	VINN13	
13	VINP14	TC_32 (TEST_NODE_P)	VINN14	

Table 9: ISL55185 EVM Loadboard Analog Mux Definitions – LB_AMUX Mapping

Addr	NO#	LB_AMUX
0	1	DUT_GND
1	2	DG_A
2	3	DG_B
3	4	DG_C
4	5	DG_D
5	6	TN_DIV
6	7	VCC_DIV
7	8	VEE_DIV
8	9	EXT_FORCE#
9	10	EXT_SENSE#
10	11	TJ
11	12	TEST_IN
12	13	SENSE_RNET0
13	14	SENSE_RNET1
14	15	SENSE_RNET2
15	16	SENSE_RNET3

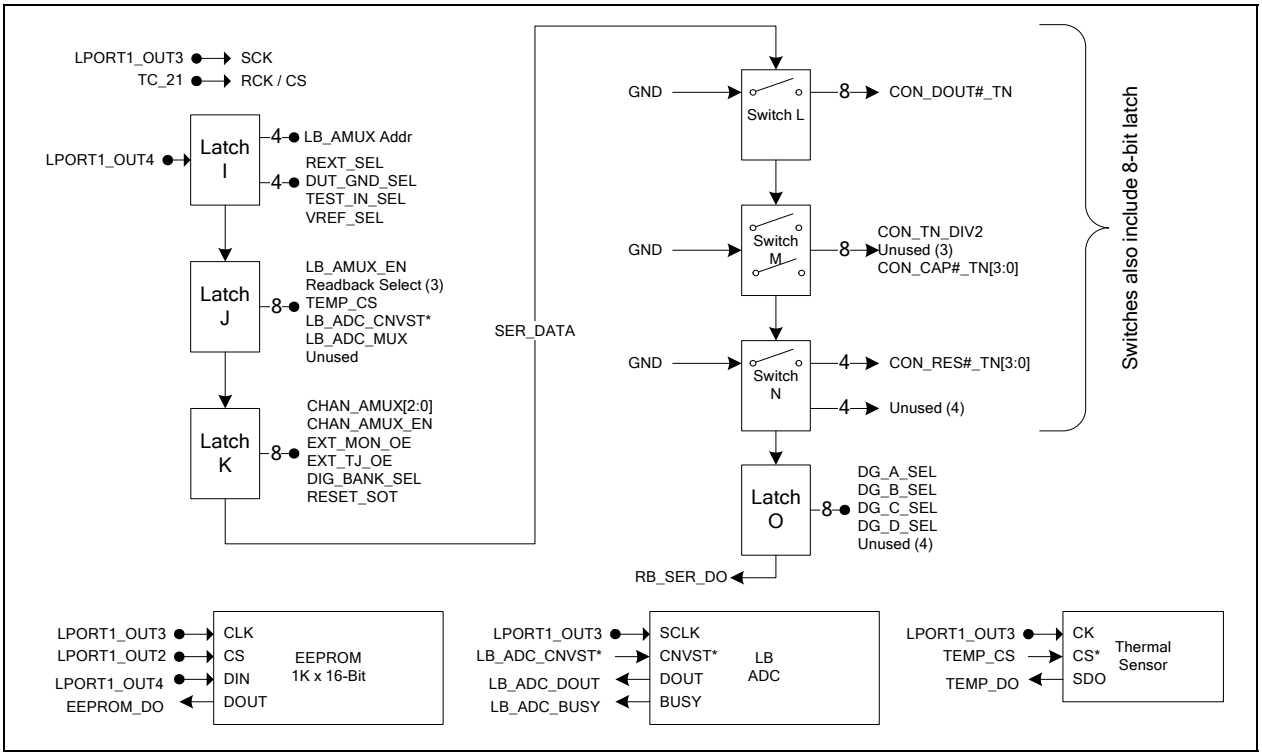
3.4 ISL55185 EVM Loadboard Controller

The ISL55185 EVM loadboard contains seven 8-bit latches (registers), 16K EEPROM, Thermal Sensor, and an Analog-to-Digital Converter (ADC). The Cbit1 to CBit7 are also used to control various relays, the C-Bit# originate from the Octal FVMI board. Figure 8 illustrates the ISL55185 EVM controller section.

The latches are daisy chained together using the SDI_SCK/RCK/CS signals originating from the Motherboard. The EEPROM is controlled by the LPORT1_OUT[4:2] signals originating from the motherboard. The loadboard latches are labeled STB_I to STB_N. This was named as an extension to the REG_A to REG_H Octal FVMI / Motherboard registers.

Note: The EVM GUI software V3.9.x does not support the ability to measure the Loadboard ADC and Thermal Sensor.

Figure 8: Controller Section Detailed Block Diagram



4 Document Revision History

Revision	Date	Description
A01	Feb 7, 2006	Initial Draft
A02	In Progress	