

ISL55180 EVM Getting Started

Rev A04: 11/28/2012



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

Table of Contents

1	Introduction	4
1.1	Unpacking - ISL55180 EVM Contents	4
1.2	Recommended Test and Measurement Setup	5
1.2.1	Power Supply	5
1.2.2	PC Controller	5
1.2.3	DMM or Source Measurement Unit	5
1.3	Software Installation	6
1.3.1	ISL55180 EVM UIP Installation	6
1.3.2	Parallel Port (ParPort2K) Installation	6
1.3.3	Reboot Machine	6
1.3.4	Launching the Elevate Semiconductor Program	6
1.3.5	Software Un-Installation	6
2	Getting Started	7
2.1	Caution	7
2.2	Quick Start Instructions	7
2.2.1	Default Power Supply Option	7
2.2.2	Switching Regulator Supply Option	9
2.3	Default Configuration Setup Options	10
2.3.1	Remote Kelvin Sense	10
2.3.2	FV/MI Configuration	11
2.3.3	Channel#0 and Channel#1 Ganging (Merging) Configuration	12
2.4	Motherboard Jumper and SMA Definition	13
2.5	ISL55180 Loadboard Jumper Definitions	14
2.6	ISL55180 EVM Menu and Dialog Boxes	15
3	ISL55180 EVM Loadboard Detailed Description	18
3.1	ISL55180 EVM Loadboard Controller	19
4	Document Revision History	20

List of Figures

Figure 1: Installation Directory Structure.....	6
Figure 2: Expected Current Readings.....	8
Figure 3: ISL55180 EVM FV/MI Simplified Block Diagram.....	11
Figure 4: ISL55180 EVM Ganging Configuration Simplified Block Diagram	12
Figure 5: Device Config Menu Options	15
Figure 6: ISL55180 Configuration Dialog Box.....	16
Figure 7: ISL55180 DC Levels Dialog Box	16
Figure 8: ISL55180 DAC Configuration Dialog Box.....	17
Figure 9: ISL55180 Central Register Dialog Box	17
Figure 10: ISL55180 EVM Detailed Block Diagram.....	18
Figure 11: Controller Section Detailed Block Diagram	19

List of Tables

Table 1: ISL55180 EVM Contents	4
Table 2: Power Supply Requirements	5
Table 3: ISL55180 Default Configuration Options	10
Table 4: Motherboard SMA and Jumper Definitions (ISL55180 Input Signals).....	13
Table 5: Motherboard SMA Definitions (ISL55180 Output Signals)	13
Table 6: ISL55180 Loadboard Jumper Definitions	14

1 Introduction

Congratulations on your purchase of an Elevate Semiconductor ATE ISL55180 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 ISL55180 EVM and Graphical User Interface (GUI) allow the customer to demonstrate and evaluate the ISL55180 performance and functionality.

This document provides the instructions to install, setup, and operate the ISL55180 EVM. Refer to the *Elevate Semiconductor EVM User's Guide* for a detailed description of the EVM system.

1.1 Unpacking - ISL55180 EVM Contents

Please check the contents of the ISL55180 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: ISL55180 EVM Contents

Qty	Description
1 ea.	ISL55180 EVM System (3 boards)
1 ea.	ISL55180 EVM Getting Started (this document)
1 ea.	CD Contents List
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 ISL55180 VCCO and VEE are gated using an Opto-FET switch on the loadboard so it is safe to set and enable the ISL55180 supplies before powering up the EVM and running the software.

Table 2: Power Supply Requirements

Module	Supply	Current Rating
Motherboard	+20V	0.5 A
Motherboard	+5V ⁽¹⁾	0.5 A
Motherboard	-15V	0.5 A
ISL55180 VCCO	+5V ^(2, 3)	2.0 A ⁽⁴⁾
ISL55180 VEE	-3V ^(2, 3)	2.0 A ⁽⁴⁾

Notes:

- 1) The EVM +5V could also be used as the ISL55180 VCCO
- 2) Once the EVM operation is verified, the customer can adjust the VCCO, VEE supplies
- 3) Make sure the external supplies do not violate the ABS max section on the datasheet.
- 4) The VCCO and VEE current 2A requirements are required if all 8 channels are operating at maximum current load. If using a sub-set of channels then a smaller (i.e. 1 Amp) supply could be adequate. The program does not have the ability to measure the VCCO and VEE currents

1.2.2 PC Controller

To use the ISL55180 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 (a parallel port cable is provided)

1.2.3 DMM or Source Measurement Unit

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

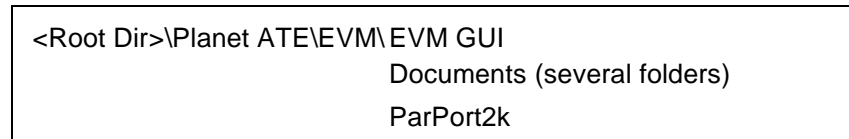
1.3 Software Installation

There are 2 steps to install the ISL55180 EVM demonstration program.

1. Install the ISL55180 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 ISL55180 EVM UIP Installation

To install the ISL55180 EVM software package, run the SETUP program on the distribution CD and follow the prompts. The **Elevate SemiconductorATE.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 ISL55180 EVM and Parallel Port software is installed, it may be required 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 ISL55180 EVM is shipped in a pre-configured state that allows a customer to evaluate the DPS Force Voltage/Measure Current (FV/MI), Ganging and other features.

Note: Any external equipment providing digital signals into the ISL55180 device should only be enabled after the ISL55180 EVM is enabled. Also, the external equipment should be disabled prior to disabling the ISL55180 EVM.

2.1 Caution

The ISL55180 DUT Power Supply (DPS) is capable of delivering a couple amps of current. Configuring the ISL55180 device and EVM into an extremely high power condition could cause permanent damage to the ISL55180 device, EVM components and/or external equipment.

2.2 Quick Start Instructions

2.2.1 Default Power Supply Option

1. Disable external power supply
2. Connect the power supplies cables (not provided) from the power supply to the Elevate Semiconductor EVM Motherboard and ISL55180 loadboard; refer to Figure 3.
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 2.3.
5. Setup Motherboard Jumpers; refer to Section 2.4
6. Ensure Jumpers E4 and E5 are installed on the loadboard.
7. Ensure Jumpers E2 and E3 are shorting pins 1 and 2 (towards back of board).
8. Set external power supply voltages and current limits.
9. Enable external power supply.
10. Run the Elevate Semiconductor GUI software; refer to Section 1.3.4 for details.
11. 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 2.3
 - b. Select the **Enable Supplies** check box
 - c. Hit the **Apply** button to power up the ISL55180 device.
 - d. The software will also measure the current consumption. Figure 2 illustrates the expected current readings.
12. At this point, the ISL55180 should be outputting the desired signal.

Figure 2: Expected Current Readings

Force Voltage - Measure Current (FVMI) Configuration

Revision: Europa Rev2, LB SN = 51, FVMI SN = 215

Reset: Must issue whenever power is cycled on board. Will put system into default state.

PLL Freq (MHz): PLL_CK: 62.500, CLK_REF: 25.000

Device Options: EVM Setup: FV/MI, Calibrate DAC, Calibrate Levels

Power Amplifiers:

Channel	Desired Voltage	Meas Voltage	Current (mA)	Power (mW)
Ch 1 (VCCO PS) (+0.0 to +13.0)	5.000	5.000	1.0	5.0
Chan 2 (VCC) (+3.3 to +15.0)	13.000	13.000	73.8	959.3
Chan 3 (VDD) (0.0 to +5.0)	3.300	3.299	53.9	177.9
Chan 4 (VEE) (-5.0 to +0.0)	-3.000	-3.000	61.0	183.0
Chan 5 (VOH) (+0.0 to +3.3)	3.300	3.300	2.2	7.4
Chan 6 (VF) (-10.0 to +15.0)	0.000	-0.000	0.0	0.0
Chan 7 (VREF) (+2.5 to +3.5)	3.000	3.000	0.0	0.0

Europa/Switcher EVM:

VCCOB (Ch3-0): 5.000, 4.987,

VCCOA (Ch7-4): 5.000, 4.987,

SYNC (KHz): 488.2813,

FSEL (divider): 128,

Total: 1332.7,

Perform Range Check, Servo Supplies

The **Reset System** will put the EVM and ISL55180 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.

2.2.2 Switching Regulator Supply Option

This option uses the ISL8540 Switching regulator to power the VCCO supply on the ISL55180

1. Disable external power supply
2. Connect the power supplies cables (not provided) from the power supply to the Elevate Semiconductor EVM Motherboard and ISL55180 loadboard; refer to Figure 3.
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 2.3.
5. Setup Motherboard Jumpers; refer to Section 2.4
6. **Remove Jumpers E4 and E5** from loadboard.
7. Ensure Jumpers E2 and E3 are shorting pins 1 and 2 (towards back of board).
8. Set external power supply voltages and current limits (VCCO must be at least 9V to enable the Switching Regulator).
9. Enable external power supply.
10. Run the Elevate Semiconductor GUI software; refer to Section 1.3.4 for details.
11. At the Force Voltage – Measure Current dialog box (refer to Figure 2 above):
 - a. Select the **EVM Setup** option based on the desired configuration, see Section 2.3
 - b. Select the **Enable Supplies** check box
 - c. Select the **Enable Switcher** check box
 - d. Hit the **Apply** button to power up the ISL55180 device.
 - e. The software will also measure the current consumption. Figure 2 illustrates the expected current readings.
12. At this point, the ISL55180 should be outputting the desired signal.
13. To change the switcher voltage, type in a voltage in the VCCOA or VCCOB text box and hit the **Apply** button. The regulator will output the closest approximate voltage.

2.3 Default Configuration Setup Options

The EVM has several default options for configuring for device and loadboard.

Table 3: ISL55180 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 DPS in three-state (high-Z). Opens all switches.
FV/MI	2.3.2 (default)	All Channels configured in FV/MI mode with I-Clamps disabled. VFA = 3.0V, IR5, Sel-FB = SENSE, Con-FS = 1 Ch#0 FORCE and SENSE connected to TEST_NODE
Ch#0/1 Ganging	2.3.3	All Channels (except Ch#1) configured in FV/MI mode with I-Clamps disabled. Ch#1 configured into FI-Slave mode Ch#0 VFA = 3.0V, IR5, Sel-FB = SENSE, Con-FS = 1 Ch#0 FORCE and SENSE connected to TEST_NODE Ch#1 FORCE connected to TEST_NODE

2.3.1 Remote Kelvin Sense

Caution should be used when configuring the feedback (SENSE) path to ensure the DPS does not become open loop. The software defaults the CPU-Sel-FB = 2 (SENSE) and Con-FS# = 1 (closed) to ensure the loop is closed. After connecting any external equipment to the FORCE/SENSE SMAs (or TEST_NODE), the user can then set Con-FS#=0 (open) to provide remote Kelvin sensing.

2.3.2 FV/MI Configuration

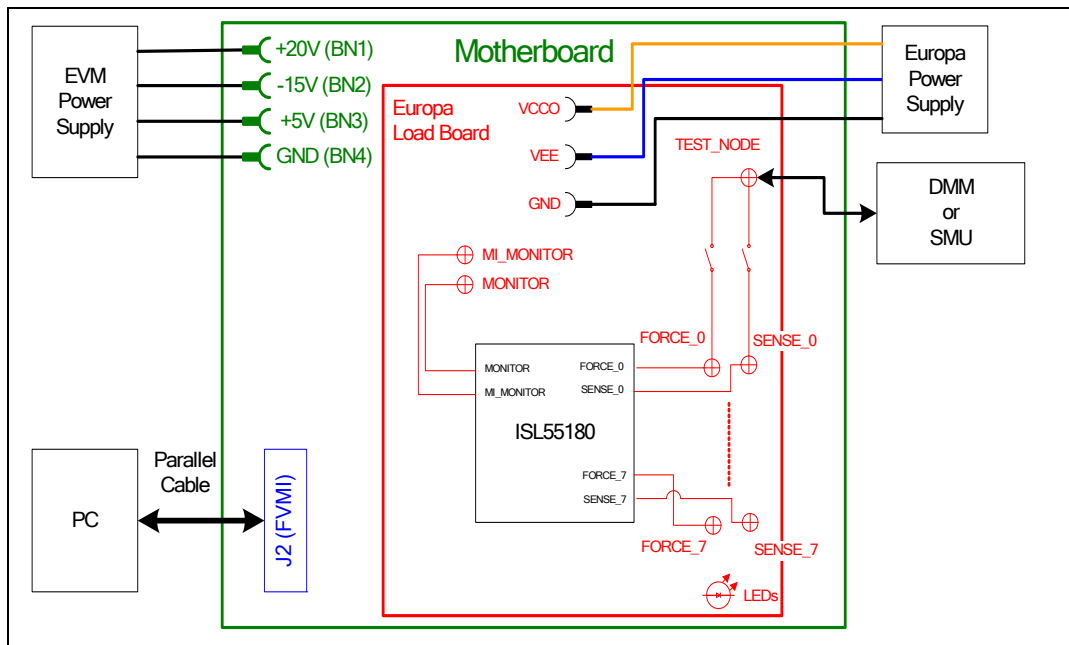
Figure 3 illustrates the recommended configuration for FV/MI (Force Voltage/Measure Current). After the configuration is completed, use the **Europa->Channel#0->Levels** dialog box to change the ISL55180 output levels. Use the **Europa Loadboard** dialog box to connect other channels to the TEST_NODE.

Both MI_MONITOR and MONITOR are configured to output Channel#0 MI-S

If using an external source measurement unit (SMU), the SMU should be configured in the opposite mode as ISL55180.

ISL55180	SMU
FV/MI	FI/MV
FI/MV	FV/MI

Figure 3: ISL55180 EVM FV/MI Simplified Block Diagram



2.4 Motherboard Jumper and SMA Definition

Table 4 lists the Motherboard Jumper/SMA definitions for the ISL55180 EVM.

Table 4: Motherboard SMA and Jumper Definitions (ISL55180 Input Signals)

TC#	Jumper	Usage	Configuration
TC30	E12	PLL_CK (Fsync)	Short Pin 1 & 2. towards back of board
TC29	E11	PLL_CK* (Fsync)	Short Pin 1 & 2. towards back of board
TC28	E14	TJ (V)	Short Pin 2 & 3. towards front of board
TC27	E15	EXT_MON_OE	Short Pin 1 & 2. towards back of board
TC26	E2	EN	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC25	E10	DATA_7	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC24	E9	DATA_6	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC23	E8	DATA_5	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC22	E7	DATA_4	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC21	E1	LB_RCK	Short Pin 1 & 2. towards back of board
TC20	E6	DATA_3	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC19	E5	DATA_2	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC18	E4	DATA_1	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC17	E3	DATA_0	Short Pin 1 & 2: source from latch Short Pin 2 & 3: source from SMA
TC16	E13	N/A	Don't care
TC15	E20	N/A	Don't care

The following table defines the ISL55180 output signals. These are always present at the motherboard SMAs.

Table 5: Motherboard SMA Definitions (ISL55180 Output Signals)

TC#	MB EVM
TC14	OT*
TC13	ALARM*
TC12	Unused
TC11	Unused
TC9	GANG7_OUT
TC8	GANG5_OUT
TC6	GANG3_OUT
TC5	GANG1_OUT

2.5 ISL55180 Loadboard Jumper Definitions

Table 4 lists the ISL55180 Loadboard Jumper definitions.

Table 6: ISL55180 Loadboard Jumper Definitions

Jumper	Description	Default Configuration
E1	Connect VFORCE	Installed
E2	VCCO Select	Pin 1 & 2. Select BN1
E3	VEE Select	Pin 1 & 2. Select BN2
E4	Switcher A Bypass	Installed (switcher bypassed)
E5	Switcher B Bypass	Installed (switcher bypassed)

2.6 ISL55180 EVM Menu and Dialog Boxes

Figure 5 illustrates the ISL55180 EVM menu options that provide access to the ISL55180 dialog boxes. For each ISL55180 register, there is a control field allowing the customer to have full control over the ISL55180 device. These screen shots show the default '*FV/MI*' configuration.

Figure 5: Device Configuration Menu Options

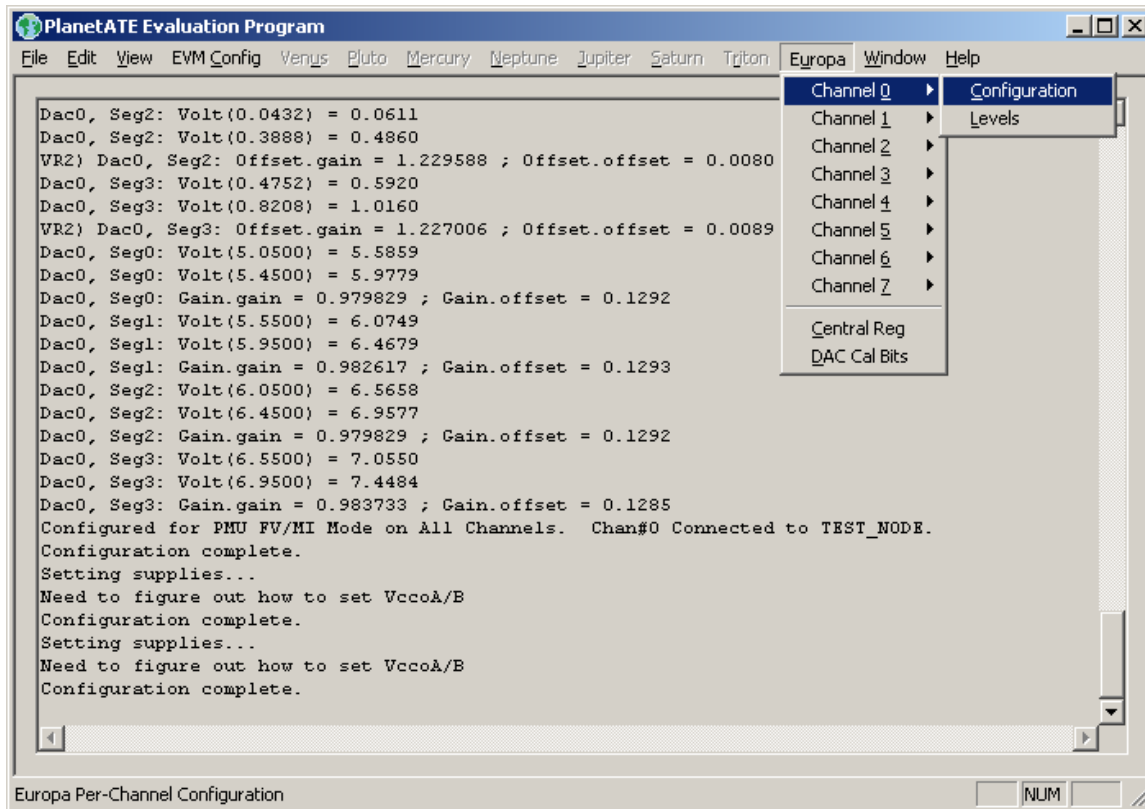


Figure 6: ISL55180 Configuration Dialog Box

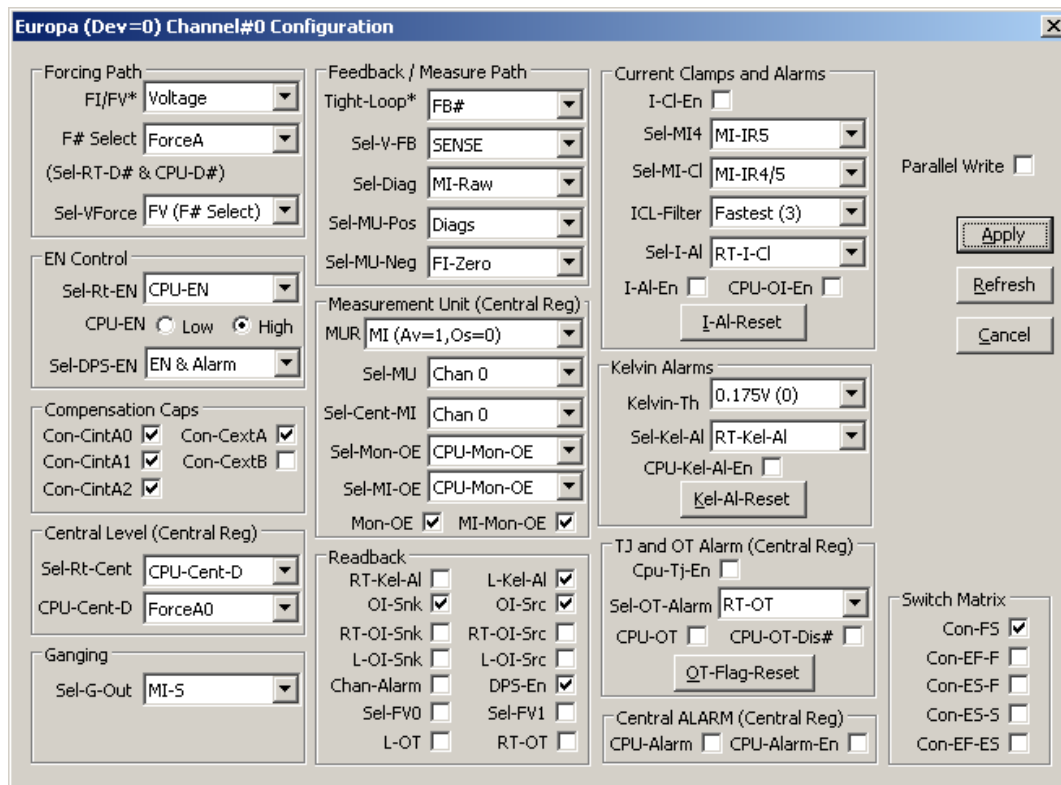


Figure 7: ISL55180 DC Levels Dialog Box

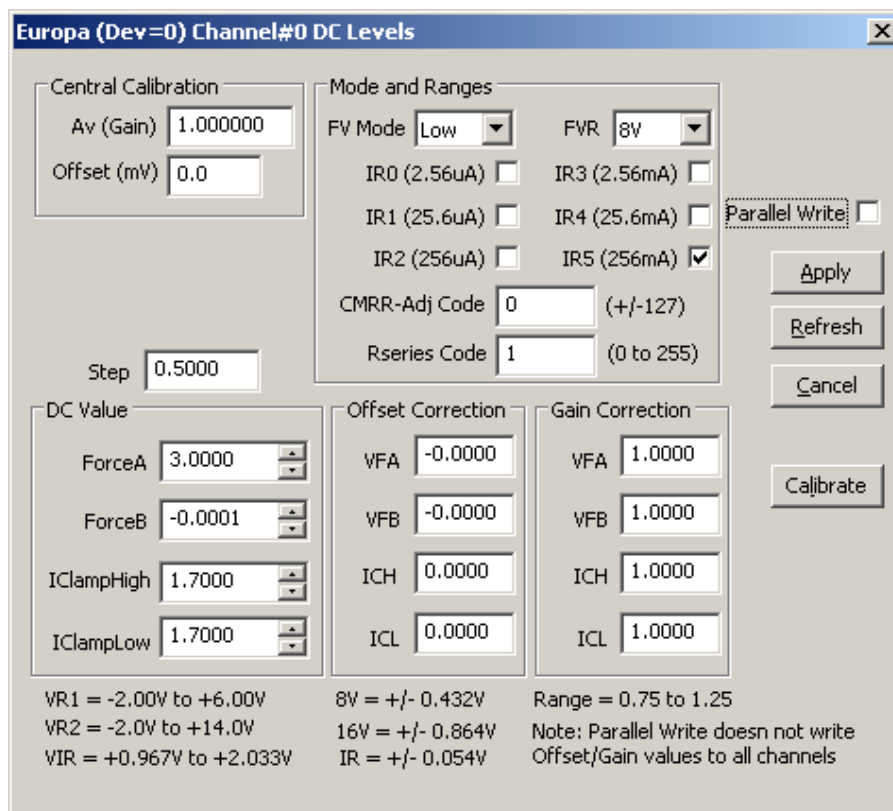


Figure 8: ISL55180 DAC Configuration Dialog Box

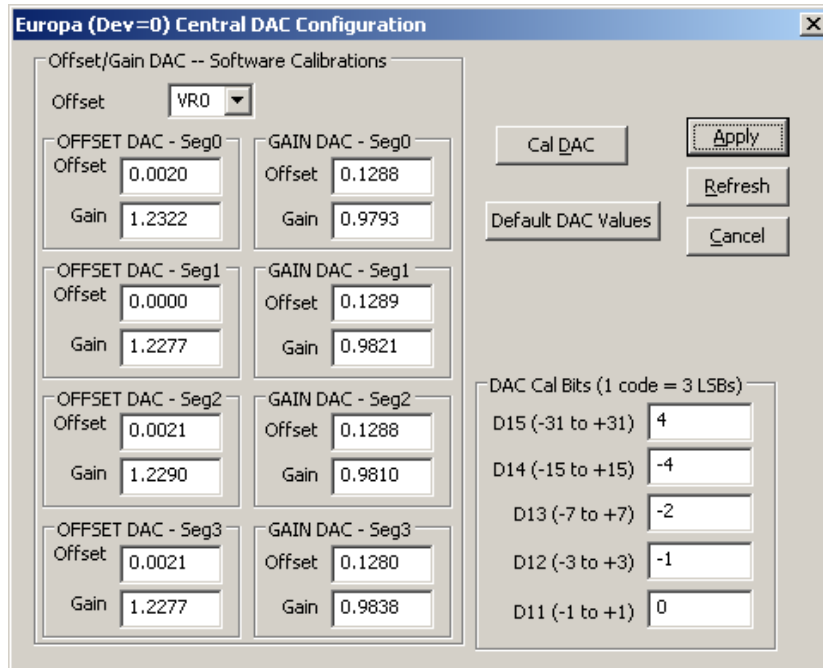
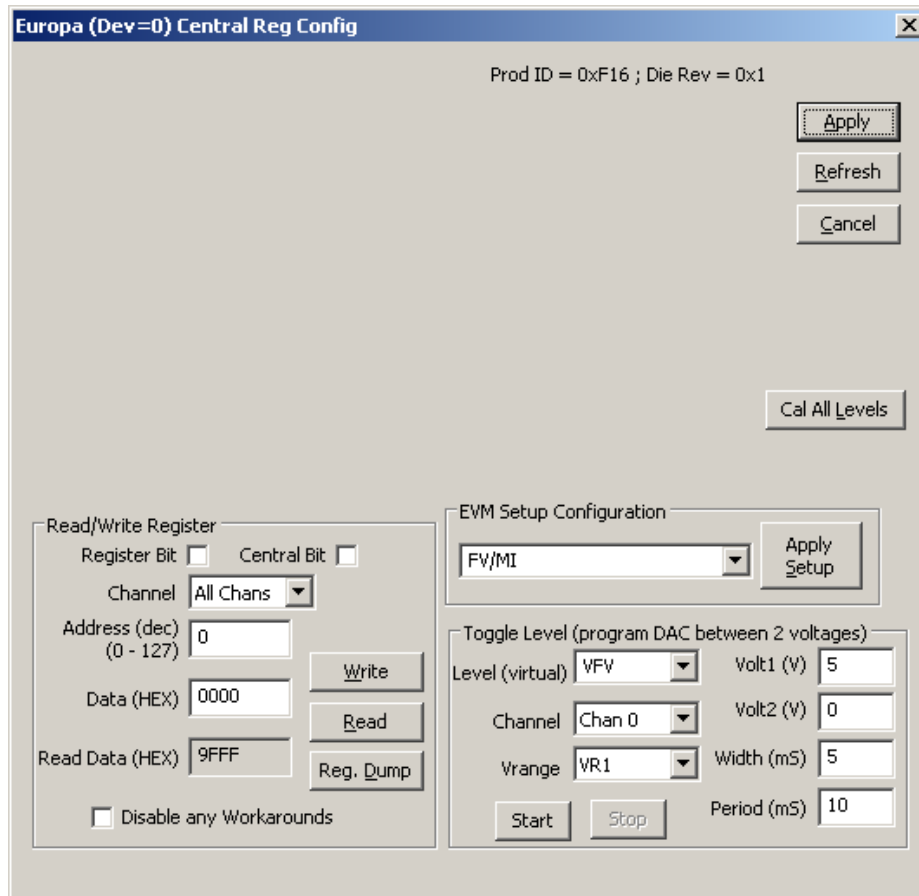


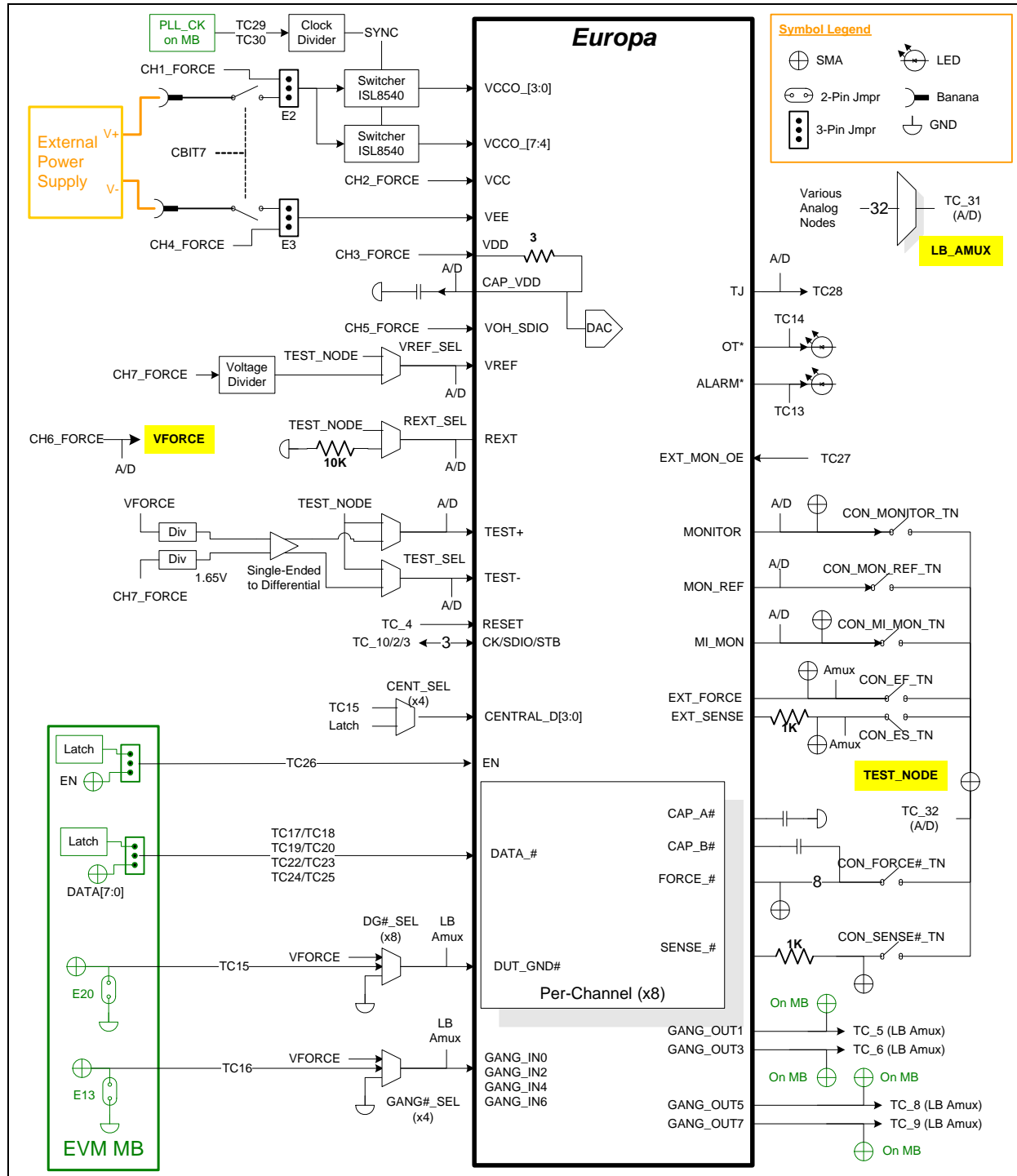
Figure 9: ISL55180 Central Register Dialog Box



3 ISL55180 EVM Loadboard Detailed Description

Figure 10 illustrates the ISL55180 EVM loadboard. Almost all of the circuitry is used to test, validate and demonstrate in the bench. Besides decoupling caps, the only external components required are the 10K resistor connected to REXT and the CAP_A, CAP_B, & CAP_VDD compensation caps.

Figure 10: ISL55180 EVM Detailed Block Diagram



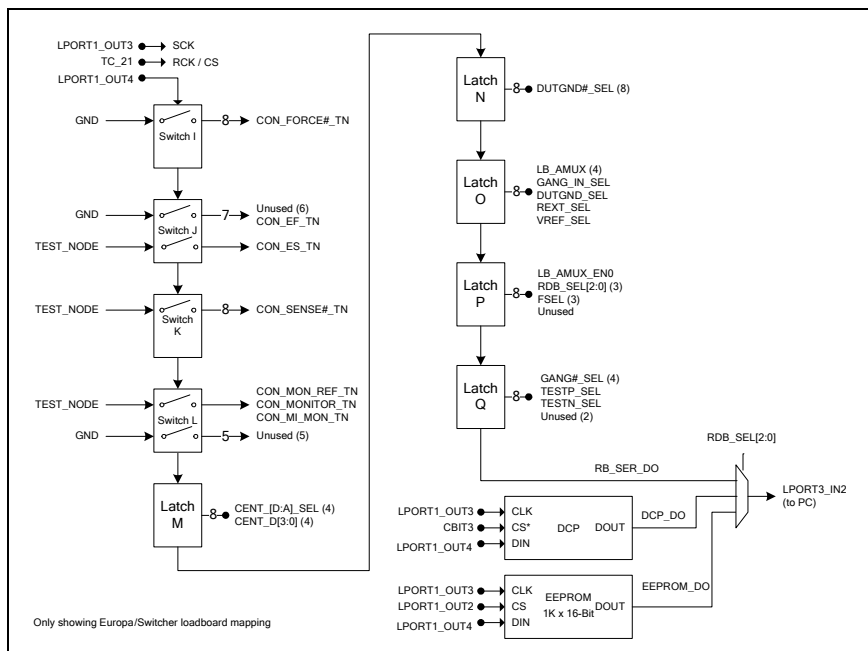
3.1 ISL55180 EVM Loadboard Controller

Figure 11 illustrates the ISL55180 EVM controller section. The ISL55180 EVM loadboard contains nine 8-bit latches (registers), a 16K EEPROM, and a Digitally Controlled Potentiometer (DCP). The Cbit1 to CBit7 are also used to control various relays, the C-Bit# are open-drain outputs used to control relays. The C-Bits originate from the Octal FVMI board.

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 DCP is controlled by LPORT1_OUT4/2 and LB_DATA3 signals originating from the motherboard.

The loadboard latches are labeled STB_I to STB_Q. This was named as an extension to the REG_A to REG_H Octal FVMI / Motherboard registers.

Figure 11: Controller Section Detailed Block Diagram



4 Document Revision History

Revision	Date	Description
A04	6/18/12	Updated several figures.
A03	2/27/12	Updated document.
A02	1/27/10	Add loadboard changes and switcher section
A01	9/24/09	Initial Draft. ISL55180 R1 and Europa/Switcher Rev A support