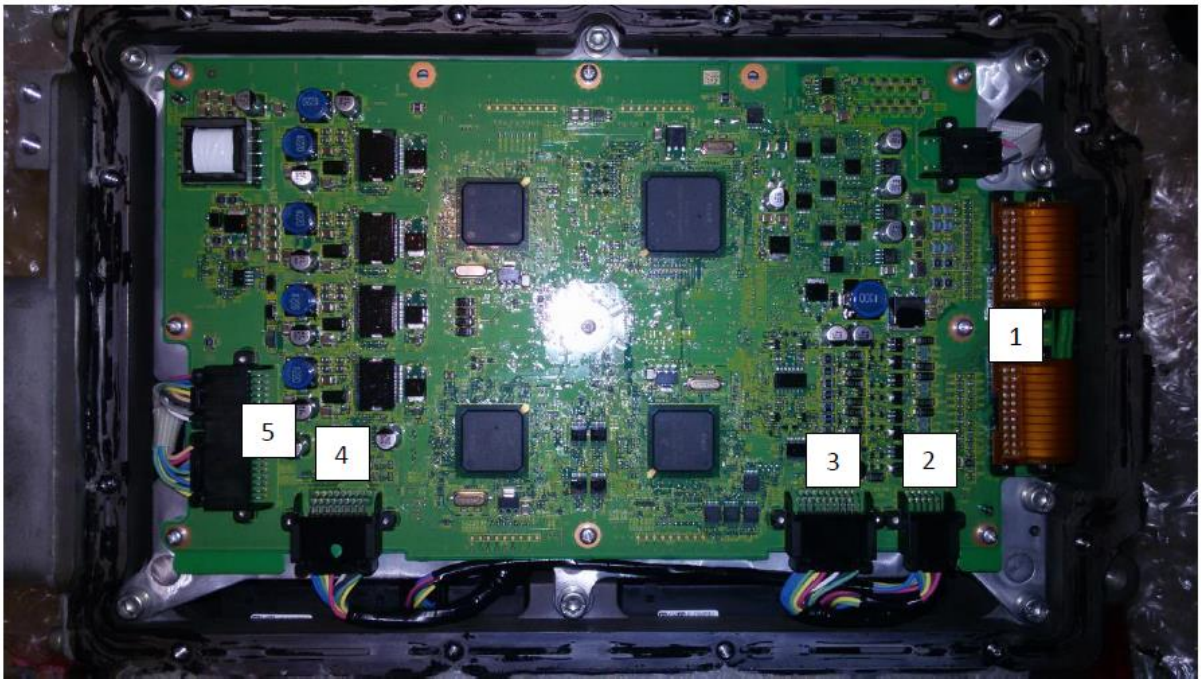
Chevy Volt and Opel Ampera
AUX Inverter Stage Reverse Engineering

By Tom de Bree

10/04/2018

Contents

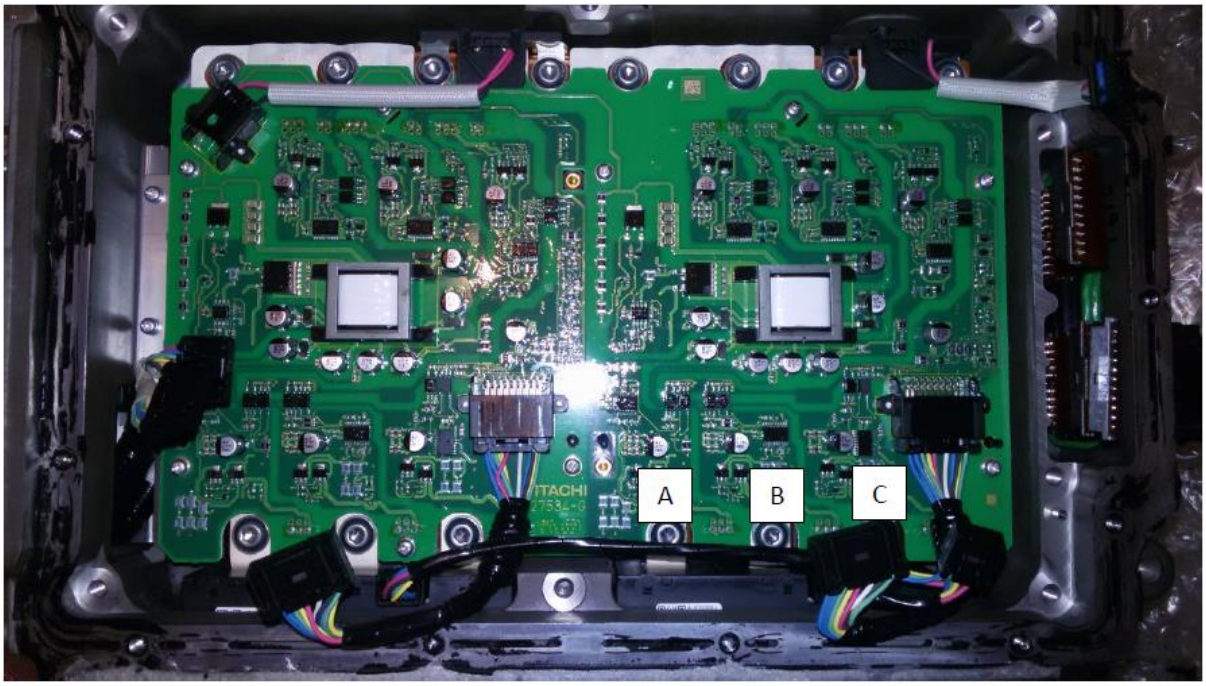
Main Board Overview



1. LV input header connectors
2. Current Sensor Connector
3. Power Stage 1 Connector
4. Power Stage 2 Connector
5. AUX Inverter Connector

Both the Power Stages share the single current sensor connector, each taking 5 pins.

Power Stages Board

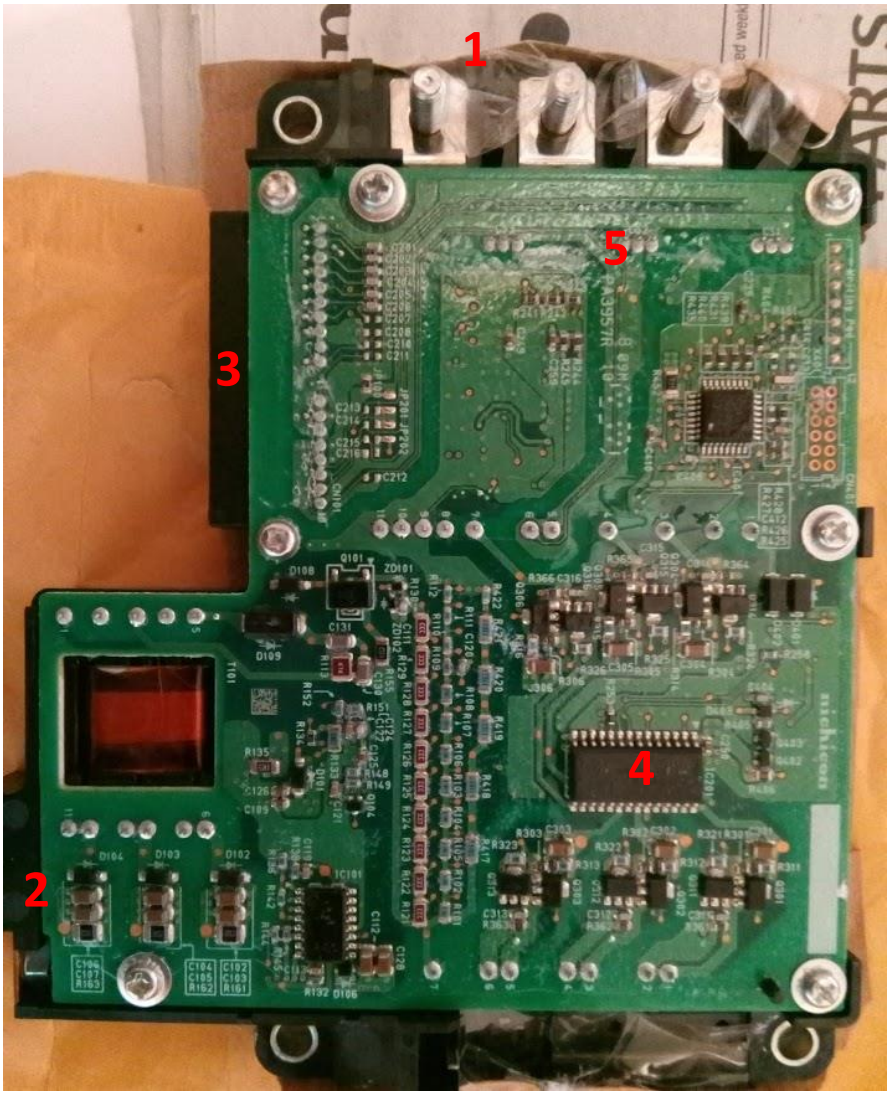


Each HV stage is standalone, only shared connection is the HV bus.
A few technical points about the stage design

1. HV bus is used to create the IGBT driver voltages
2. Requires roughly 30V to be operational
3. Optocoupler inputs, inputs are ***high when not active***
4. Fault feedback
5. Three temperature sensors

To control a bottom or top gate the corresponding wire needs to be pulled to ground.
System is thus ***Active LOW*** , do not apply HV before setting up any controller correctly.
A floating gate will be pulled to 5V by the Power Stage board.

AUX Inverter Board Overview



1. Out put terminals
2. HV input
3. LV connector
4. Driver Chip
5. Current Sensor Solder Pins

General comments AUX Inverter

- Drive stage is fully isolated, no need to provide isolation on the signals.
- Main driver chip is a auirs2336s from International Rectifier
- All the control signals are pulled high, so no need to do any additional pull ups.
- HV input needs to be at least 60V to work
- Current rating of driver stage unknown

LV Connectors

Current Sensors

Header S10B-MECK-2GA-A

Wire	Blue	Green	Yellow	Black	Red
Pin	1	2	3	4	5
Name	Cur C	Cur B	Cur A	GND	VCC
	2.85mV/A offset 1/2 VCC				5V

Power Stage

Header S18B-MECK-2GA-A

Wire	Green	Black	-	White	-	Red	Yellow	Green	Blue
Pin	1	2	3	4	5	6	7	8	9
Name	Temp B	GND		?		VCC	Top A	Top B	Top C
						5V	Pull to GND to Activate		

Wire	Yellow	Blue	-	-	-	-	Yellow	Green	Blue
Pin	10	11	12	13	14	15	16	17	18
Name	Temp A	Temp C					Bot A	Bot B	Bot C
							Pull to GND to Activate		

AUX Inverter

Header part Number - S18B-MECK-2GA-A

Header S18B-MECK-1GA-A

Wire	Yellow	green	blue	yellow	green	blue	grey	red	orange	
Pin	1	2	3	4	5	6	7	8	9	10
Name	Top A	Top B	Top C	Bot A	Bot B	Bot C		VCC		
Signal	Pull to GND for ON							5V		

Wire	white	grey	black	orange	yellow	green	blue	red
Pin	1	2	3	4	5	6	7	8
Name			GND		Cur A	Cur B	Cur C	VCC
Signal					current with 1/2 VCC ofset			5V

Current Ratio to be determined.