



VEBKO ONLINE HELP

The Connections Between the Switching Module and the Amplifier

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In the beginning, it was mentioned that the switching module is responsible for supplying power for the amplifier module. Two flats are used to establish the connection between the command of the micro and the amplifier module. In this section, the connection between the complete Main Switching and the front panel is established through this IDC. First, we explain the connections between the switching module and the amplifier. The switching module must supply the amplifier module with power through the output voltages.

In this section of the switching module, the external eight-pin phoenix has 12 volts, the phoenix in the middle of the GND and the next phoenix have -12 volts that in these cables, blue is -12, black is earth and red is 12 volts. These cables are responsible for supplying current phases of the amplifier with power. Before connecting it, we need to explain the amplifier module. The amplifier module, just like the switching module, consists of a middle section and two sides called incomplete and complete sides. There are differences between the complete and incomplete sides of the amplifier module.

On the complete side, every one of these modules which is called controller, is related to a current or voltage phase and this controller at the top is related to the VL1 phase and the other is related to VL2 while the one at the bottom is related to VL3. By looking at the front panel, you can see that VL1, VL2 and VL3 are in accordance with the GND. The current phases are in this section. IA1, IA2 and IA3 that are connected to IA1, IA2 and IA3 front panel through phoenixes and cables in relation to earth. In the incomplete side of the amplifier, there are five phases. This is the DC output voltage which is located here in the front panel. This section is the output voltage of group B. here IB1, IB2 and IB3 in the front panel are connected to IB1, IB2 and IB3 in relation to earth.

There is a difference between the incomplete and complete sides. As you can see, there are six phases in this section including three voltage phases and three current phases which have been explained before. On the incomplete side, there are five phases including one voltage phase of group B and one DC phase and three current phases of group B. Another difference is that on the complete side there is a fan controller module amplifier while there is no such thing on the incomplete side of this module. On the whole amplifier module, in addition to the main module which is the middle amplifier module, there are two mains on the two sides just like the switching module where the incomplete and complete sides are separated. In the amplifier module, after opening these screws we can separate these two mains and solve the problems of the module. Also, there are three sensors on every side of the module that are located on the output of the current phases. If we connect to the software, we can see the temperature of IA1, IA2 and IA3 sensors as well as IB1, IB2 and IB3 sensors which is the same temperature as the room temperature.

By drawing current from current phases, the temperature of these sensors rises. As soon as the temperature of the first sensor reaches 60 degrees, we get a Thermal error of the amplifier in the software. Now we connect the electricity that is being taken from the switching module side to the amplifier. If you place the amplifier in front of yourself like this, there are two phoenixes on the right side that are responsible for supplying VL1, VL2 and VL3 voltages and there are five phoenixes on the left side that are responsible for supplying IA1, IA2 and IA3 current phases. This black wire which

comes from the power of the phoenix in the middle is connected to the phoenix number one on the left side at the top. Two red wires that carry a 12 volts DC, are connected to this section. Also, the blue wire carrying -12 volts is connected to these phoenixes.

So, now we have connected the power of IA1, IA2 and IA3 current phases to the amplifier through the switching. In the next part, we connect the power of VL1, VL2 and VL3 voltage phases. As mentioned before, this phoenix here, the wire at the center of the GND and the left side of the red 300-volt wire and at the right side which is the blue -300-volt wire goes through resistances. We connect these two phoenixes to the power of the voltage phases. When we connect the switch, we must have 600 volts between the two ends of these phoenixes. So, in the first step, we took the power of current and voltage phases from the switching and connected it to the amplifier. As soon as switch number one is connected, the output of the voltages reaches here and enters the amplifier module through these cables. Also, from this part, a flat is connected to the amplifier module to connect the command of the micro and the SPI signals. Each of these two IDC Latches that are located on the right and left sides of the Main Switching module is related to one side of the amplifier module. If we connect this cable to this part, the commands will not be executed correctly.

If by initializing the VL1, a Self Calibration error will appear. The electricity for the complete side of the amplifier must be taken from the right side of the Main Switching. By injecting voltage into this side of the module and testing it, we need to take the flat from the left side of the switching module. When the device is assembled, both sides of the device are electrified simultaneously and we connect the flat. Just note that the flat that is connected to the complete side of the amplifier must come from the right side of the Main Switching. So far, have connected power to current and voltage phases as well as the flat that establishes the connections.

We turn the device on. Each of these controllers has a series of boot loaders that are put on the STM32 IC and when they are functioning properly, their LED blinks like this. When we connect to the software, usually we can see this earth error which appears if the related wire is not connected. We connect the earth wire and by clearing the error it disappears. Now, this part is electrified and the electricity reaches the amplifier module through these cables.

By looking at the monitor, you can see four temperatures including Sensor Ia1=24°C, Sensor Ia2=25°C, Sensor Ia3=25°C and Heatsink1 =25°C. By detaching one of these sensors, for example, Ia1, an error is displayed in the software which can be cleared by selecting Clear Error. The sensor we just detached displays zero-degree temperature. By reconnecting the sensor, 24 degrees is displayed in the software again. To view the heat sink sensor, we first need to turn off the device. It was mentioned that there are three sensors on every side of the module which are related to the currents and two sensors are related to the heat sink. This part is the heat sink and the sensor is located in this part of the heat sink and is connected to the Main by this pin header. Ib1, Ib2 and Ib3 and the sensor related to the heat sink number two are located in this part and connected to the Main by this pin header and its value is read by this Max1202 and displayed in the software. So, there are three sensors in this part and one sensor at the bottom and four more sensors in this part that are read by

this Max.

If current is drawn from any of these phases, these temperatures increase and as soon as the first temperature reaches 60 degrees a Thermal error of the amplifier will be displayed. Sometimes, any of these LN35s may have a problem in reading or this connection cable is damaged. This temperature displays, for example, Ia1 300 degrees as soon as the device is connected. This means that when the device is connected to the software, it displays an error because it has a temperature above 60 degrees and this error does not go away no matter how many times you clear the error unless the Thermal error is disabled in the software. But, even by doing this, some other problems may be caused. So, as soon as you notice this unusual temperature, you need to start looking for a solution to solve this problem.

We connect the flat cable that transfers the commands. As you can see, the temperatures are as follows: Temperature Sensor Ia1=25°C, Temperature Sensor Ia2=25°C, Temperature Sensor Ia1=25°C and Temperature Heatsink1 =25°C. Also, Temperature Sensor Ib1=0°C, Temperature Sensor Ib2=0°C, Temperature Sensor Ib3=0°C and Temperature Heatsink2 =0°C which are related to this side and since the flat is not connected to this section yet, zero is displayed as their temperature. Now we turn the device off and connect the flat of the side of the incomplete temperature to check them. When we want to check the incomplete side of the amplifier module, we need to connect the left side of the flat from the switching. Then, we turn the device on and this time temperatures of Ib1, Ib2, Ib3 and Heatsink2 must be displayed. So, if any of these temperatures is unusual and there is a Thermal error of the amplifier, we need to solve the problem considering the faulty sensor.

Sometimes, temperatures of sensors one, two, three and four are all wrong. The tin of this IC which is related to reading temperatures may have a problem or the IC itself may be damaged. But if only one of the temperatures is being displayed wrongly, probably this IC is healthy and it is possible that the LV35 sensor which can be seen easier by opening the modules, has a problem; also, it is possible that this cable which is connected from LN35 bases to this pin header has a problem.

We turn the device off and turn the module toward the complete side. If you enter the amplifier in any current or voltage phase, every phase of Va1, Va2 and Va3 voltages has two MOSFET, N and P. Also, current phases Ia1, Ia2 and Ia3, just like current voltages, have two MOSFET, N and P.

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