



This diagram illustrates the electrical schematic for a control system, divided into three main functional sections: Input Section, Micro Controller, and Voltage Regulator and Voltage Reference.

Input Section

The Input Section features two precision amplifiers, U1A and U1B (AD8629), configured as voltage followers. They process signals from ADCSIG1 and ADCSIG2 through a network of resistors (R1-R4, R8, R9) and capacitors (C1-C4). A bypass switch (JP5) is provided for the first amplifier. The output of the second amplifier is connected to a 3.3V supply via a 100nF capacitor (C5). A 7-position connector (J_KEYPAD1) is used for keypad inputs, with a note specifying the use of a Samtec ESW elevated PCB socket.

Micro Controller

The Micro Controller section centers around the STM32L496VGTx (U2). It shows the connection of various pins to power rails (+3.3V, GND, VSSA, VDDA), external components (resistors R5, R15, capacitors C6, C8-C15, C16, C23), and peripheral devices like the keypad (KEYPAD1-KEYPAD4) and an OLED display (OLED_RST, OLED_SDA, OLED_SCL). The microcontroller's pins are meticulously mapped to the external components and power rails.

Voltage Regulator and Voltage Reference

The Voltage Regulator and Voltage Reference section details the power management. It includes a 5V regulator (U3, LM4132AMF-3.3) and a 3.3V regulator (U4, TLV70233DBVR). The regulators are powered from a 5V input (VIN) and provide stable +3.3V output (VOUT) to the system. The schematic also shows the connection of various capacitors (C7, C9, C11, C17, C18, C21, C22) and inductors (L1, L2) for filtering and stability. A 3.3V supply is also shown connected to the microcontroller's VDDA pin.

Output Section

The Output Section shows the connection of the DAC outputs (DAC1, DAC2) to the system. It includes a 3.3V supply and a 100nF capacitor (C5) connected to the DAC outputs. The output section also shows the connection of the keypad (KEYPAD1-KEYPAD4) and the OLED display (OLED_RST, OLED_SDA, OLED_SCL) to the system.

Input Section

TO BYPASS:

- 1) Remove U1
- 2) Solder JP5, JP6, R1 and R2
- 3) Populate R3, R4 with 100R and C1, C2 with 100nF for FC=15KHz

J_KEYPAD1
Samtec ESW elevated PCB socket

8-position connector with 1 position removed.
To be used with:
Front-mounted keypad, non-shielded, non-backlit.
Grayhill-96AB2-102-F
http://www.grayhill.com/assets/1/7/Keypads_96.pdf

Micro Controller

U2
STM32L496VGTx

Voltage Regulator and Voltage Reference

U3
LM4132AMP-3.3

U4
TLV70233DBVR

Output Section

JOLED1
Conn_01x05

Sheet: /Control/
File: Control.sch

Title: System Detail

Size: A2
Kicad E.D.A. kicad (5.1.4)-1

Date:
Id: 2/2

Rev: C

Input Section

TO BYPASS:
 1) Remove U1
 2) Solder JP5, JP6, R1 and R2
 3) Populate R3, R4 with 100R
 and C1, C2 with 100nF for FC=15KHz

J_KEYPAD1
 Samtec ESW elevated PCB socket

8-position connector with 1 position removed.
 To be used with:
 Front-mounted keypad, non-shielded, non-backlit.
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Micro Controller

U2
 STM32L496VGTx

Voltage Regulator and Voltage Reference

U3
 LM4132AMP-3.3

U4
 TLV70233DBVR

Output Section

Passives footprint to be left empty
 if direct PCB connection is used.

Sheet: /Control/
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