POE Side
48V DC Input

Full Wave Rectifiers

Nominal 48VDC IN

Web Schematic: Some proprietary information has been withheld.
Non-isolated 5V Power Supply

10V-30V
Input

10/100 Ethernet Transformer

Transformer

10/100 Ethernet

Technologic Systems
Aug. 4, 2013
Battery-Backed SRAM

NV_RAM
Page Reg.

1MB
2MB or 4MB

NV_RAM

Battery for RTC and NVRAM

To RTC

RAM chip is not normally populated
Board ID = 8

Force Boot to SD card

RS-232 Transceiver

Console

RS-485 Transceiver

Right Angle Push Switch

LEDs
Four 12-bit DAC channels (0-10V Range)

12-bit DAC
0 to 2.5V levels

Gain = 4.15
Needs 2V of headroom for positive output swing
4 mA drain per op amp
13V/μs slew rate

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Technologic Systems
Aug. 4, 2013
Title: TS-8820 DAC and Op Amps
Rev: C
Designer
Sheet 5 of 18
Simultaneous Sampling

8 A/D channels

ADC 1

Simultaneous sampling of all 8 A/D inputs
Software selectable ranges
+/5V or +/-10V
200K samples per second
>1 Megohm input impedance

Allows up to 8 Thermistors

Title: TS-8820 Analog-to-Digital
Aug. 4, 2013
Technologic Systems

Rev: C Designer Sheet 6 of 18
Simultaneous sampling of all 8 A/D inputs
Software selectable ranges
+/-5V or +/-10V
200K samples per second
>1 Megohm input impedance
+12.5V Boost Regulator

Precision 2.5V Reference
Non-Isolated Inputs

with Pull-up Resistors

+40V tolerant

74HC14 provides 2.5V nominal thresholds
Non-Isolated Outputs
Sinks 1000 mA

74HCT04 provides level shifting to 5V levels
Isolated Inputs

32V tolerant

50 KHz Bandwidth

ISO_IN #1

ISO_IN #2

ISO_IN #3

ISO_IN #4

ISO_IN #5

ISO_IN #6

ISO_IN #7

ISO_IN #8
USB Power Switch

External
Two USB ports
Screw Terminals + 4 Relays
Opto-Isolated Power

and Isolated CAN

CAN Tranceiver

Technologic Systems

Title: TS-8820 Isolated Power and CAN

Rev: C  Designer  Sheet  15 of 18
Two 100-pin Module Connectors

- **Serial Ports**
  - USB
  - Ethernet

- **Left Connector**
  - Two 100-pin Module Connectors
  - BUS_DIR: 1 = NAND Flash, 0 = SD Card
  - OFF_BD_RESET# is an Output from the SBC used to reset all peripherals
  - Use 1.2K ohm resistor to OFF_BD_RESET# to strap logic low

- **Right Connector**
  - USB Ports
  - Ethernet
  - Console
  - BUS_DIR: 1 = NAND Flash, 0 = SD Card
  - OFF_BD_RESET# is an Output from the SBC used to reset all peripherals
  - Requires < 300 mA of 3.3V current

**Boot Strap**

<table>
<thead>
<tr>
<th>BUS_DIR</th>
<th>SBC Boot</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NAND Flash</td>
<td>BUS_DIR state is latched prior to OFF_BD_RESET# resettet</td>
</tr>
<tr>
<td>0</td>
<td>SD Card</td>
<td>BUS_DIR has a 12K pull-up resistor on the SBC module</td>
</tr>
</tbody>
</table>

**Notes:**
- BUS_DIR has a 12K pull-up resistor on the SBC module.