

Section VI – Monitor and Control System

Control System Overview (Insight)

The Insight control system is used for a variety of functions, the most important of which is ensuring that the transmitter continues to operate in a safe manner. The control system also allows the user to monitor and control the transmitter from both the front panel and the remote access port.

Five modules comprise the Insight control system. These modules work together to provide all the functions of the control system. The modules are: the user interface module, the coupler condition module, the RF conditioning module, the temperature sensor module, and the TxNET module. The operation of each module is outlined in the following sections.

User Interface Module

The primary function of the user interface module is, as the name suggests, providing the user interface for the control system. This circuit board is mounted to the front panel of the transmitter, directly behind the LCD display. The membrane switch on the front panel is also connected to the user interface module. These components together provide the user with the ability to monitor the transmitter from the front panel.

The following parameters can be monitored from the front panel:

- Forward (incident) power at the transmitter output.
- Reflected (reverse) power at the transmitter output.
- DC voltage of the transmitter power supply.
- DC current for each pallet in the transmitter.
- Temperature of the heat sink of the transmitter.
- The time since the transmitter was last shut down.

The hardware of the user interface module is based around a microcontroller (U112). This microcontroller interfaces directly with the LCD and the membrane switch to provide output and receive input from the user. The microcontroller also communicates with the coupler conditioning board over a controller area network (CAN) bus. This communication is facilitated by two ICs, U113 and U114, and passes through a CAT5 cable attached to connector J105. The communication link with the coupler conditioning module allows the user interface module to receive information about the forward power, reflected power, and temperature of the transmitter, as well as relay commands from the user to the rest of the system. If the transmitter includes more than one amplifier module, a second CAN connection will be present between the user interface module (J106) and the TxNET board to facilitate communication between enclosures.

Other elements of the user interface module are also controlled by the microcontroller. A buzzer (BZ101), a status LED (D113), and a relay to control the backlight of the LCD (RL101), are all controlled through a buffer (U116). In order for the user interface module to monitor the current draw of each pallet in the system, the DC supply wires pass through the user interface module

on their way from the power supply to the pallets. The DC enters through connector J101 from the power supply, and exits through J102 to go to the pallets. As the current passes through shunt resistors (R117, R118, R120, R121, R123, R124, R126, R127, R129, R130), the voltage drop is monitored by U101 to U105, buffered by U106 to U108, and sent to the analog to digital converter integrated into the microcontroller. There are five circuits for which the current is monitored by this system.

As the DC supply passes through the user interface module, it undergoes filtering to ensure that the supply to the pallets is as clean as possible. Each of the five circuits passes through a network of transient voltage suppressors, capacitors, and inductors. Each connection is also fused at the input to insure an over-current condition does not persist. The fuses are a replaceable mini blade type fuse with a 42V voltage rating, and a current rating depending on application.

Coupler Conditioning Module

The coupler conditioning module serves to monitor the output of the directional coupler which provides a voltage proportional to the forward and reflected power at the output of the transmitter. The coupler conditioning module also interfaces with each of the other boards in the control system, acting as the hub of communications for the system. Lastly, the coupler conditioning board sends and receives signals through the remote access port, via the TxNET board.

The analog signals produced by the coupler for forward and reflected power are passed onto the coupler conditioning module by connectors J206 and J207 respectively. Each signal is filtered by CLC networks, and buffered and amplified by the op-amp U214. The level of the forward signal can be adjusted by VR201, and the reflected signal by VR202. These two potentiometers can be used to fine tune the power readings of the transmitter if they go out of calibration. The analog signals are converted to digital by an analog-to-digital converter integrated into the microcontroller U202.

Aside from taking readings from the coupler, the microcontroller on the coupler conditioning module also interfaces with the RF conditioning module (through J201A) and the temperature sensor (through J201B). The microcontroller interfaces with the CAN bus using U203 and U204.

Through the CAN bus, the coupler conditioning board is able to communicate with the user interface module, and any other amplifiers that are in the system. The CAN bus is connected through J201C, and J201D if there are multiple amplifiers in the transmitter system.

The last task of the coupler conditioning board is to send and receive remote access signals to and from the TxNET board. Two analog outputs, proportional to forward and reflected power and produced by the digital-to-analog converter U212 after it receives input from the microcontroller. The analog outputs are then buffered by U211 before being sent through J203 to the TxNET board. J203, along with J204, also bring the digital inputs and outputs from the TxNET board to the coupler conditioning module. The digital signals are then connected to the microcontroller through the opto-isolators U205, U206, U207, U208, and U209.

RF Conditioning Module

The RF conditioning board is located at the RF input of the amplifier. Its main function is to act as a variable attenuator, so that the control system can add attenuation to the input of the amplifier in order to limit the output power of the transmitter. The RF signal comes in to the RF conditioning module through J302 before it passes through a manually variable attenuator made up of R305, VR303, and R307. The signal then passes through the digitally-controlled variable attenuator U302 before exiting through J303. The input for the digital attenuator comes from the coupler conditioning module through J304. The input signals are passed through the opto-isolators U303, U304, and U305 before being sent to the digital attenuator. In total, five control signals go to the digital attenuator, allowing for attenuations of up to 31dB in 1dB steps.

Temperature Sensor Module

The temperature sensor module is a small board mounted to the main heatsink of the amplifier. The main purpose of the temperature sensor module is to take temperature readings of the heatsink. The temperature sensor IC is U1 which, after it has taken a reading, relays the digital information to the coupler conditioning module through J1. Also passing through J1 is a driver disable signal coming from the coupler conditioning module. The temperature sensor module simply takes this signal and passes it through to J2, where it is connected to the driver pallet.

TxNET module

The TxNET module is simply a passive board that acts as an interface between the wiring on the inside of the amplifier enclosure and connections on the outside of the enclosure. The DB-25 connector for the remote port (J602) is attached to the TxNET module. The signals travelling through this port are connected to the coupler conditioning module through J601 and J603. The TxNET module also includes up to four straight through RJ45 connections: J604 to J605, J606 to J607, J608 to J609, and J610 to J611. These connections are only used on systems with multiple enclosures, to pass control signals between enclosures.

Remote Port

The remote port allows external control of the transmission system via the DB25. The functions of each pin on the remote port are indicated in the following table:

Pin Number	Description
1	Ground
2	Forward power sample ¹
3	Reflected power sample ¹
4	Carrier off ²
5	Carrier on ²
6	Increase carrier level (level must have been decreased) ²
7	Decrease carrier level (1dB increments) ²
8	Soft reset ²
9	Reset ²
10	Power supply fault flag ³
11	High temperature flag ³
12	High VSWR flag ³
13	Amplifier overdriven flag ³
14	+5Vdc
15	+3.3Vdc
16	Ground
17	Ground
18	N/C
19	N/C
20	N/C
21	N/C
22	N/C
23	N/C
24	N/C
25	N/C

Notes: 1. Analog output with voltage ranging from 0 to 5Vdc.

2. TTL level digital input, active on rising edge.

3. TTL level digital output, active high.

Fault Shutdowns

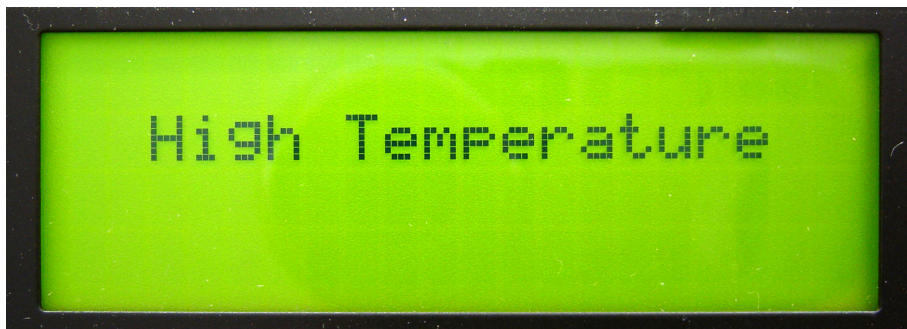
On the LCD (Liquid Crystal Display) the following messages may appear:



If you see this message, the system has been driven to a power level higher than it is rated for. This message will likely only appear momentarily, before the amplifier will add attenuation at its input to bring the output power to a safe level.



This message indicates that excessive reflected power has been detected at the output of the transmitter. Periodically, the amplifier will cycle on, and re-check for reflected power. If high reflected power continues, the transmitter will eventually shut down completely.



This message indicates that the transmitter is experiencing unsafe internal temperatures. Output power is reduced until a safe temperature is reached.

Monitor and Control System (Insight) Bills of Materials

Circuit: User Interface Module
Revision: 1.03

Designations	Qty	Description	Package	Manufacturer	Mfg. Part Number
U112	1	IC MICROCONTROLLER 256 BYTE RAM	64QFP	Texas Instruments	MSP430F135IPM
C106, C107, C117, C118, C128, C129, C141, C142, C148, C149, C163	11	CAPACITOR 0.01 uF 50V 10%	0805	Yageo	08052R103K9B20D
C108-116, C119-127, C130-140, C143-145, C161	33	CAPACITOR 0.1uF 50V 10%	0805	Yageo	08052R104K8B20D
C146, C147	2	CAPACITOR 33pF 50V 5%	0805	Panasonic	ECJ-2VC1H330J
R101, R104, R107 R110, R113	5	RESISTOR 2.7KΩ	0805	Yageo	9C08052A2701FKHFT
C162	1	CAPACITOR 1uF, 50V	0805	TDK Corporation	C2012Y5V1H105Z
R132	1	RESISTOR 37.4KΩ	0805	Yageo	9C08052A3742FKHFT
R133	1	RESISTOR 3.3KΩ	0805	Yageo	9C08052A3301FKHFT
R134, R135, R136, R137, R138, R139	6	RESISTOR 249KΩ	0805	Yageo	9C08052A2493FKHFT
R140, R141, R144 R145, R146, R147 R150, R151, R156	9	RESISTOR 10KΩ	0805	Yageo	9C08052A1002FKHFT
R142, R143, R148 R149, R154, R155	6	RESISTOR 1KΩ	0805	Yageo	9C08052A1001FKHFT
R152	1	RESISTOR 100Ω	0805	Yageo	9C08052A1000FKHFT
R119, R122, R125, R128, R131, R153	6	RESISTOR 100KΩ	0805	Yageo	9C08052A1003FKHFT
R158	1	RESISTOR 430Ω	0805	Yageo	9C08052A4300FKHFT
R160	1	RESISTOR 1.4KΩ	0805	Yageo	9C08052A1401FKHFT
R161	1	RESISTOR 27KΩ	0805	Yageo	9C08052A2702FKHFT
R162	1	RESISTOR 6.2KΩ	0805	Yageo	9C08052A6201FKHFT
R157	1	RESISTOR 4.7Ω	2010	Panasonic	ERJ-12ZYJ4R7U
R117, R118, R120 R121, R123, R124 R126, R127, R129 R130	10	RESISTOR 0.006Ω 1% 1W	2512	Vishay	WSL25126L000FEA
R159	1	POTENTIOMETER 10KΩ	4mm SMD	Bourns	3314G-1-103E
R102, R103, R105 R106, R108, R109 R111, R112, R114 R115	10	RESISTOR 20Ω 1W	2512	Panasonic	ERJ-1TYJ200U
RN101	1	RESISTOR NETWORK 10KΩ	SMT	Panasonic	EXB-A10P103J
F107	1	RESETTABLE FUSE, POLYFUSE, 2A	SMD	Raychem	MINISMDC200-2
F108	1	RESETTABLE FUSE, POLYFUSE, .5A	SMD	Raychem	MINISMDC050-2
L106, L107, L108, L109, L110	5	INDUCTOR 0.01uH	1210	TDK	NLV32T-010J-PF

Y101	1	6.00 MHz CRYSTAL	SMT	Citizen	HCM49-6.00
U111	1	IC SUPERVISOR 2.70V LOW	SOT23	Microchip Technology	MCP130T-270I/TT
U114	1	IC TXRX 3.3V CAN	8-SOIC	Texas Instruments	SN65HVD232D
U113	1	IC CAN CONTROLLER W/SPI	18-SOIC	Microchip Technology	MCP2510-I/SO
U115	1	IC REG SIMPLE SWITCHER	TO-263-5	National Semiconductor	LM2576HVS-5.0
U116	1	IC DARL TRANS ARRAY	16-SOIC	Texas Instruments	ULN2003ADR
U117	1	IC REG LINEAR LDO	SOT223	National Semiconductor	LM1117MP-3.3
U118	1	IC VOLTAGE COMVERTER	8-SOIC	National Semiconductor	LM2660M
U109, U110	2	OPTOCOUPLER DUAL CHANNEL	8-SOIC	Fairchild Semiconductor	MOCD211M
U101, U102, U103 U104, U105	5	IC CURRENT MONITOR	SOT23-5	Texas Instruments	INA168NA
U106, U107, U108	3	IC OP AMP SINGLE SUPPLY	8-SOIC	Texas Instruments	OPA2340UA
D101, D103, D105 D107, D109, D111	6	DIODE TVS 30V	D0214AA	Crydom	SMBJ30A
D102, D104, D106 D108, D110 D113, D115, D117	8	DIODE LED GREEN	1206	Lumex	SML-LX1206GC-TR
D114	1	DIODE SCHOTTKY	SMC	International Rectifier	30BQ060
D116	1	DIODE RECTIFIER 1A 200V	SMA	Diodes Inc.	S1D-13
D118	1	DIODE SCHOTTKY 5A 50V	SMC	Diodes Inc.	B550C-13 or B550C-13F
C152	1	CAPACITOR 10uF 16V TANTALUM	3528	Kemet	T491B106K016AS
C156-160	5	CAPACITOR 22uF 35V TANTALUM	D (SMT)	Kemet	T495D226K035ASE300
S101	1	SWITCH DIP 7 POSITION	SMT 0.1"	CTS	219-7MST
S102	1	HEADER 3POS 0.1"	Through Hole	AMP/Tyco	640452-3
RL101	1	RELAY SPST 5VDC	SMT	Omron	G6L-1F-DC5
L101, L102, L103, L104, L105	5	INDUCTOR 1.3uH	SMT	Panasonic	ETQ-P6F1R3LFA
C153, C154, C155	3	CAPACITOR 100uF, 10V	D (SMT)	Panasonic	ECE-V1AA101SP
U119	1	IC REG SIMPLE SWITCHER	TO-263-7	Texas Instruments	LM2679S-ADJ
C101, C102, C103, C104, C105, C150	6	CAPACITOR 100uF 63V	G (SMT)	Panasonic	ECE-V1JA101P
BZ101	1	BUZZER	SMT	CUI Inc.	CT-1205C
J107	1	CONNECTOR 14POS HEADER	Through Hole	AMP/Tyco	103308-2
J108	1	CONNECTOR SCREW TERMINAL	Through Hole	Keystone	7701
J105,J106	2	CONNECTOR MODULAR JACK 8 VERTICAL	Through Hole	AMP/Tyco	5556416-1
F101, F102, F103, F104, F105, F106	6	FUSE AND FUSE HOLDER 42V MINI	Through Hole	Littelfuse	02970xx.WXNV and 01530008Z
J103	1	CONNECTOR 5POS HEADER	Through Hole	AMP/Tyco	3-644695-5
J102	1	CONNECTOR, 2 PART 0.3" 10POS	Through Hole	Weiland	25.390.4053.0
J101	1	CONNECTOR 2 PART 0.3" 6POS	Through Hole	Weiland	25.390.3653.0
L111	1	INDUCTOR 150uH	S6	Talema	SWS-2.0-150
L112	1	INDUCTOR 33uH 5A 260kHz	Through Hole	Pulse	P0849NL
J104	1	16 POST HEADER	Through Hole	Samtec	TSW-116-18-T-S
C151	1	CAPACITOR 1000uF, 10V	G (SMT)	Panasonic	ECE-V1AA102P

Circuit: Coupler Conditioning
Revision: 1.04

Designations	Qty	Description	Package	Manufacturer	Mfg. Part Number
C201, C203, C204, C205, C208, C209, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C222, C223, C224, C225, C226, C227, C228, C229	24	Capacitor, ceramic, 0.01uF, 50Vdc, +/-20%	SMD 0805	Kemet	C0805C103K5RACTU
C202	1	Capacitor, ceramic, 0.1uF, 50Vdc, +/-20%	SMD 0805	Yageo America	C0805C104M5UACTU
C206, C207	2	Capacitor, ceramic, 33pF, 50Vdc, 5%	SMD 0805	Panasonic	ECJ-2VC1H330J
C210, C211	2	Capacitor, electrolytic, 100uF, 10V, +/-20%	SMD 'D'	Panasonic	ECE-V1AA101SP
D201, D202	2	Diode, TVS, 5.0Vdc, 600W, unidirectional	SMB	General Semiconductor	SMBJ5.0A-13
D203, D204	2	Diode, LED, red, 2.0V	SMD 1206	Lumex	SML-LX1206IW-TR
D205	1	Diode, rectifier, 200V, 1A	SMA	Diodes Inc.	S1D-13
D206	1	Diode, zener, dual, 10V	SOT-23	Diodes Inc.	AZ23C10-7-F
J201	1	Connector, modular, female, 4-port, 8-position, rt. angle	Through Hole	AMP/Tyco	557562-1
J202	1	Connector, header, IDC, 0.1" spacing, 14-pos	Through Hole	AMP/Tyco	103308-2
J203, J204	2	Connector, modular, female, 8-position, vertical	Through Hole	AMP/Tyco	5556416-1
J205	1	Connector, header, 3-position, 0.1", square post	Through Hole	AMP/Tyco	644695-3
J206, J207	2	Connector, header, vertical, 3-pos, 0.1" spacing	Through Hole	Molex	22-02-2035
K201	1	Relay, SPST, 5Vdc coil, SMT	SMT	Omron	G6L-1F-DC5
L201, L202, L203, L204, L205, L206, L207, L208, L209, L210, L211, L212	12	Inductor, 0.01uH, I _{max} =0.45A, DCR=0.13 omhs	SMD 1210	KOA	KL32TE010K
R201	1	Resistor, thick film, 5%, 100ohm, 1/8W	SMD 0805	Panasonic	ERJ-6GEYJ101V
R203, R204, R207, R208, R211, R212, R213, R214, R217, R218, R219, R220, R221, R222, R223, R224	16	Resistor, thick film, 5%, 1kohm, 1/8W	SMD 0805	Panasonic	ERJ-6GEYJ102V
R205, R206, R209, R210, R215, R216	6	Resistor, thick film, 5%, 10kohm, 1/8W	SMD 0805	Panasonic	ERJ-6GEYJ103V
RN201, RN202, RN204	3	Resistor network, 10kohm, 8-resistors, 10-terminations, bussed, 5%	SMD 2512	Panasonic	EXB-A10P103J
RN203	1	Resistor network, 1kohm, 8-resistors, 10-terminations, bussed, 5%	SMD 2512	Panasonic	EXB-A10P102J
S201	1	Switch, DIP, 7-position, SPST	SMD 0.1"	CTS	219-7MST
U201	1	IC, supervisor, 2.7V, internal pull-up resistor, open drain, active low	SOT-23	Microchip Technology	MCP130T-270I/TT
U202	1	IC, microcontroller, 16-bit, 16k X 8 program, 48 I/O, flash	64-QFP	Texas Instruments	MSP430F135IPM

U203	1	IC, CAN transceiver, 3.3V	SOIC-8	Texas Instruments	SN65HVD232D
U204	1	IC, CAN controller, industrial temp, 3 transmit buffers, 2 receive buffers	18-SOIC	Microchip Technology	MCP2510-I/S0
U205, U206, U207, U208, U209	5	IC, optoisolator, dual, transistor o/p, Vceo=30V	SOIC-8	Fairchild	MOCD211M
U210	1	IC, buffer, Darlington, array	SOIC-16	Texas Instruments	ULN2003ADR
U211, U214	2	IC, op-amp, dual, single supply	SOIC-8	Texas Instruments	OPA2340UA
U212	1	IC, DAC, dual, 8-bit, serial	SOIC-8	Texas Instruments	TLV5625CD
U213	1	IC, voltage reference, 2.50V, +/- 0.2%	SOT-23	National Semiconductor	LM4040BIM3-2.5
VR201, VR202	2	Potentiometer, 2kohm, 11-turn, 5mm, top	SMT	Murata	PVG5A202C01R00
Y201	1	Crystal, 6.000MHz	SMT	Citizen	HCM49-6.00

Circuit: RF Conditioning
Revision: 1.05

Designations	Qty	Description	Package	Manufacturer	Mfg. Part Number
C301, C306, C311	3	Capacitor, ceramic, 0.1uF, 50Vdc, +/-20%	SMD 0805	Yageo America	C0805C104M5UACTU
C302, C303, C305, C312, C320	5	Capacitor, ceramic, 0.01uF, 50Vdc, +/-20%	SMD 0805	Kemet	C0805C103M5RACTU
C304	1	Capacitor, ceramic, 0.022uF, 50Vdc, +/-10%	SMD 0805	Panasonic	ECJ-2VB1H223K
C307, C308, C310	3	Capacitor, ceramic, 1000pF, 50Vdc, +/-10%	SMD 0805	Kemet	C0805C102K5RACTU
C309	1	Capacitor, ceramic, 330pF, 50Vdc, +/-10%	SMD 0805	Panasonic	ECJ-2VC1H331J
C313, C314, C315, C316, C317, C318, C319	4	DNS	SMD 0805		
D301	1	Diode, TVS, 30V, 600W	SMB	Diodes Inc.	SMBJ30A-13
D302	1	Diode, LED, green, Vf=2.2V	SMD 1206	Lumex	SML-LX1206GW-TR
D303, D304, D305, D306, D307	5	Diode, LED, red, Vf=2.0V	SMD 1206	Lumex	SML-LX1206IW-TR
D308	1	Diode, ultrafast	SOT-23	Fairchild Semiconductor	MMBD914
D309, D310	2	DNS	TO-92		
F301	1	Fuse, resettable, miniSMD, Ihold = 0.14A, Itrip = 0.34A	Fuse-miniSMD	Littelfuse	MINISMDC014-2
J301	1	Connector, terminal block, header, 2-position, straight	PCB THT (0.2")	Wieland	25.350.3253.0
J301	1	Connector, terminal block, plug, 2-position, straight	-	Wieland	25.340.3253.0
J302, J303	2	Connector, SMA, PCB End Launch, 50-ohms	PCB End Launch	Johnson Components	142-0701-801
J304	1	Connector, modular, female, 8-position, vertical	PCB THT	Amp (Tyco)	5556416-1
L301	1	Inductor, 0.01uH	1210	TDK	NLV32T-010J-PF
PCB301	1	Printed circuit board, FR4, proto 2 or equivalent	-	Alberta Printed Circuits	PCB301
R301	1	Resistor, thick film, 5%, 620ohm, 1W	SMD 2512	Panasonic	ERJ-1TYJ621U
R302, R303	2	DNS			
R304, R312, R313, R318, R319, R322	6	Resistor, thick film, 5%, 1.0kohm, 1/8W	SMD 0805	Yageo America	9C08052A1001JLHFT
R305, R307	2	Resistor, thick film, 1%, 130ohm, 1/8W	SMD 0805	Yageo America	9C08052A1300FKHFT
R308, R309, R314, R315, R320	5	Resistor, thick film, 5%, 1.2kohm, 1/8W	SMD 0805	Yageo America	9C08052A1201JLHFT
R310, R311, R316, R317, R321	5	Resistor, thick film, 5%, 10kohm, 1/8W	SMD 0805	Panasonic	9C08052A1002JLHFT
R323	1	Resistor, 100ohm, 1/8W	SMD 0805	Yageo America	9C08052A1000FKHFT
R324	1	Resistor, 3.3ohm, 1/8W	SMD 0805	Yageo America	9C08052A3R32FGHFT
R325, R326, R327, R328, R329	5	DNS	SMD 0805		
VR301	1	Potentiometer, 5kohm	SMD 5MM	Murata	PVG5A502C01R00
VR302	1	DNS	SMD 5MM		

VR303	1	Potentiometer, 200ohm	SMT 5MM	Murata	PVG5A201C01R00
S301	1	Switch, DIP, 5-position, SPST, gold finish, sealed	CTS 219-5 SMD	CTS Corporation	219-5MST
U301	1	IC, voltage regulator, 5V output, 500mA	TO-252	National Semiconductor	LM78M05CDT
U302	1	IC, digital attenuator, 5-bit, 1dB LSB	SSOP-20	Skyworks (Alpha)	AA110-85
U303, U304, U305	3	IC, optoisolator, dual, transistor o/p, Vceo=30V	SOIC-8	Fairchild	MOC211M
U306	1	Directional coupler		Mini-Circuits	DBTC-20-4
U307	1	IC, power detector	TSSOP-16	Analog Devices	AD8362ARU
U308	1	DNS (replace with two 0805 0ohm resistors)			
U309	1	DNS	TO-243		

Circuit: Temperature Sensor
Revision: 1.02

Designations	Qty	Description	Package	Manufacturer	Mfg. Part Number
C701	1	CAPACITOR 0.1uF 50V 10%	0805	Yageo	08052R104K8B20D
J701	1	CONN MOD JACK 8-8 R/A PCB 50AU	SMT	Molex	44144-0003
J702	1	TERMINAL SCREW VERTICAL	PC MNT	Keystone	8191
U701	1	IC DIG TEMPERATURE SENSOR	8-MSOP	National Semiconductor	LM70C1MM-3

Circuit: TxNet
Revision: 1.02

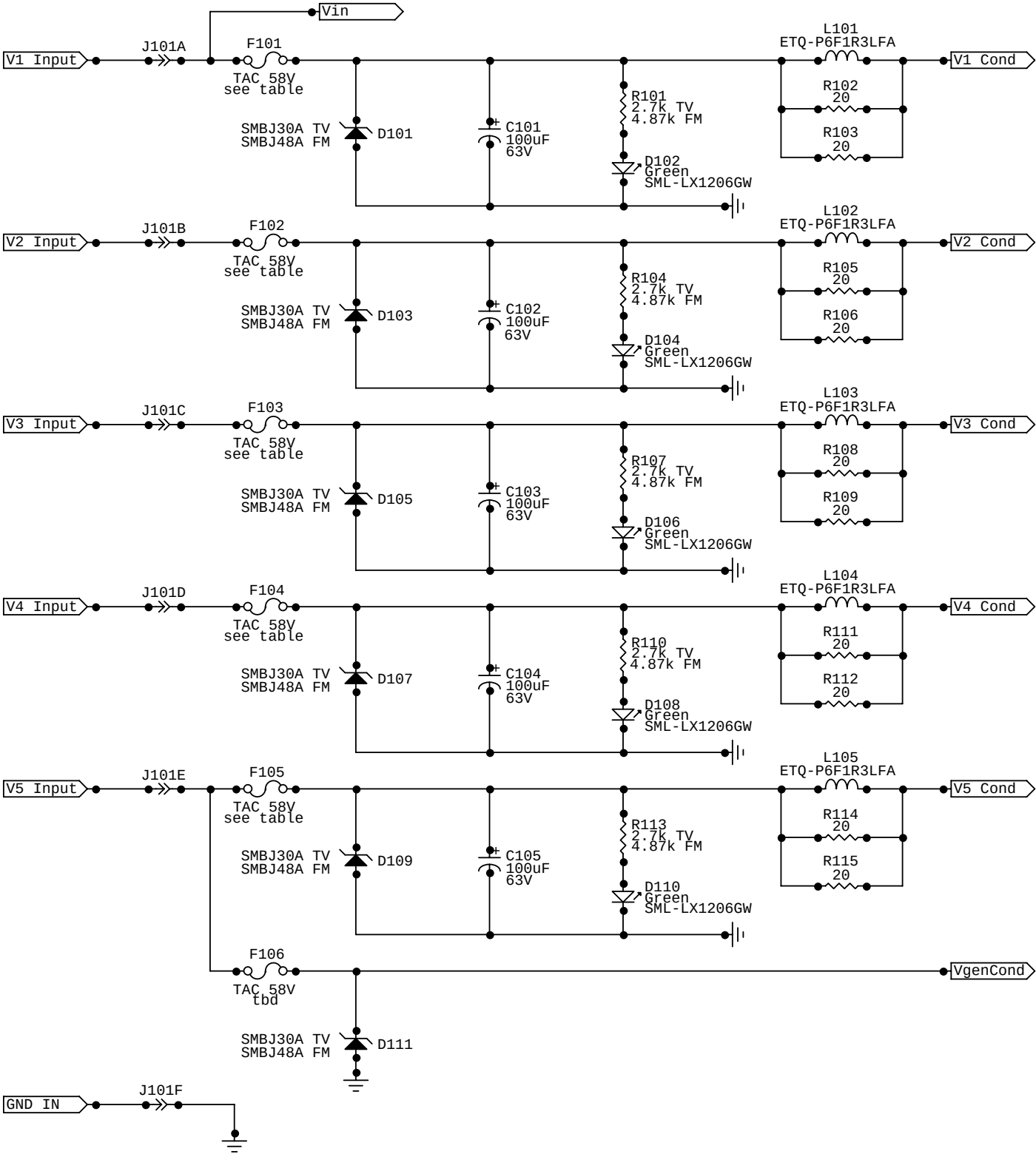
Designations	Qty	Description	Package	Manufacturer	Mfg. Part Number
F601, F602, F603, F604	4	Fuse, resettable, Ihold=0.14A, Itrip=0.34A, Vmax=60V	SMD	Tyco	MINISMDC014-2
J601, J603, J604, J605, J606, J607, J608, J609, J610, J611	10	Connector, modular, jack, 8- position, vertical, PCB mount		Tyco	5556416-1
J602	1	Connector, D-sub, 25 position, female, vertical, PCB mount		Kycon	K85-BD-25S-R

Insight System Schematics

The following pages contain the schematics for the Insight system.

User Interface Module

DC Supply Conditioning



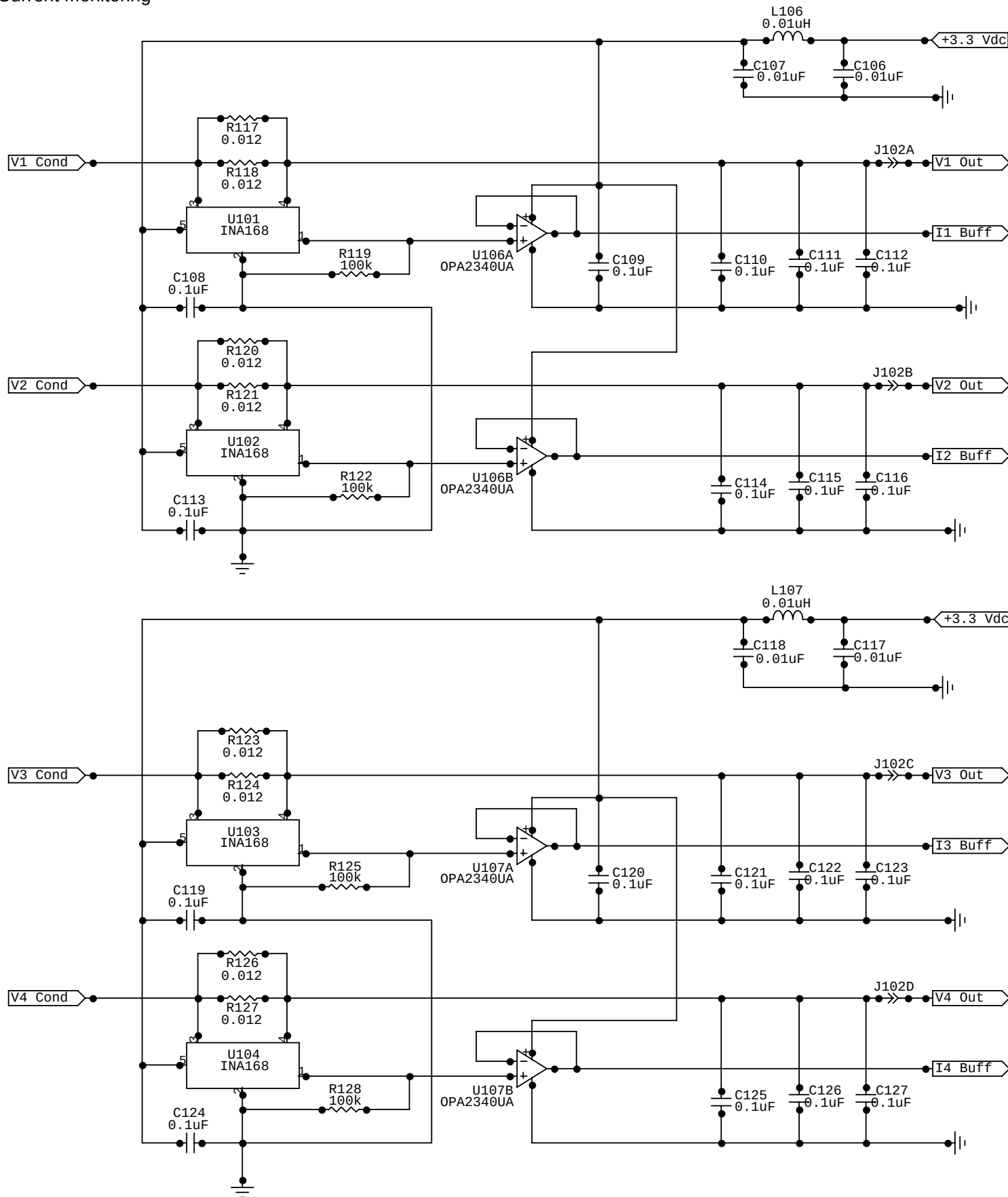
Fuse Table

PA5-UHF	2 A	PA25-VHF-L	4 A
PA10-UHF	3 A	PA25-VHF-H	5 A
P50-UHF	10 A	P200-VHF-L	15 A
P150-UHF	10 A/side	P200-VHF-H	15 A
U60LD UHF	3 A	P400-VHF-L	15 A/side
U200LD UHF	7.5 A/side	P400-VHF-H	10 A/side
P350-FM	15 A		
P750-FM	15 A/side		

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User Interface Module	
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User Interface Module

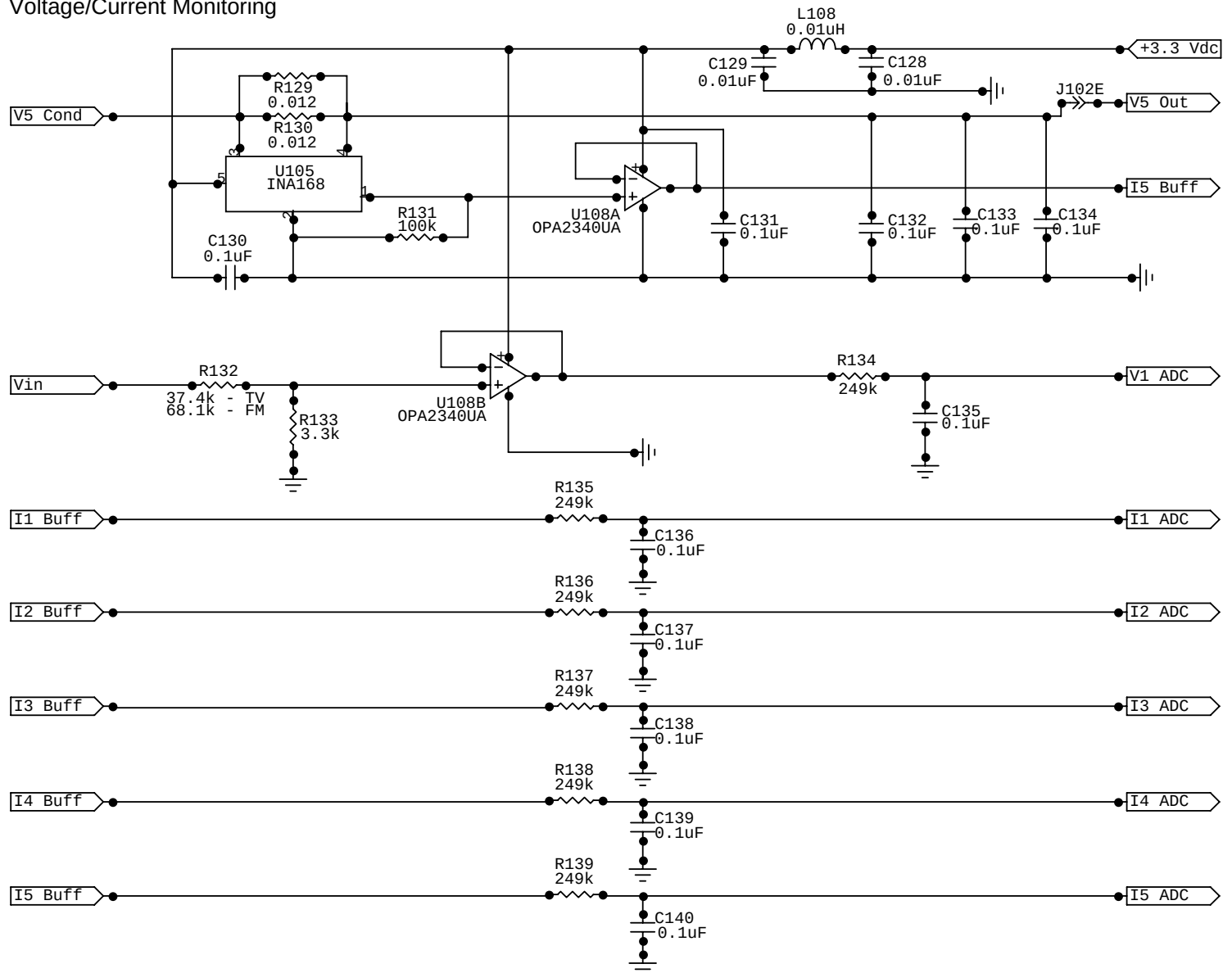
Current Monitoring



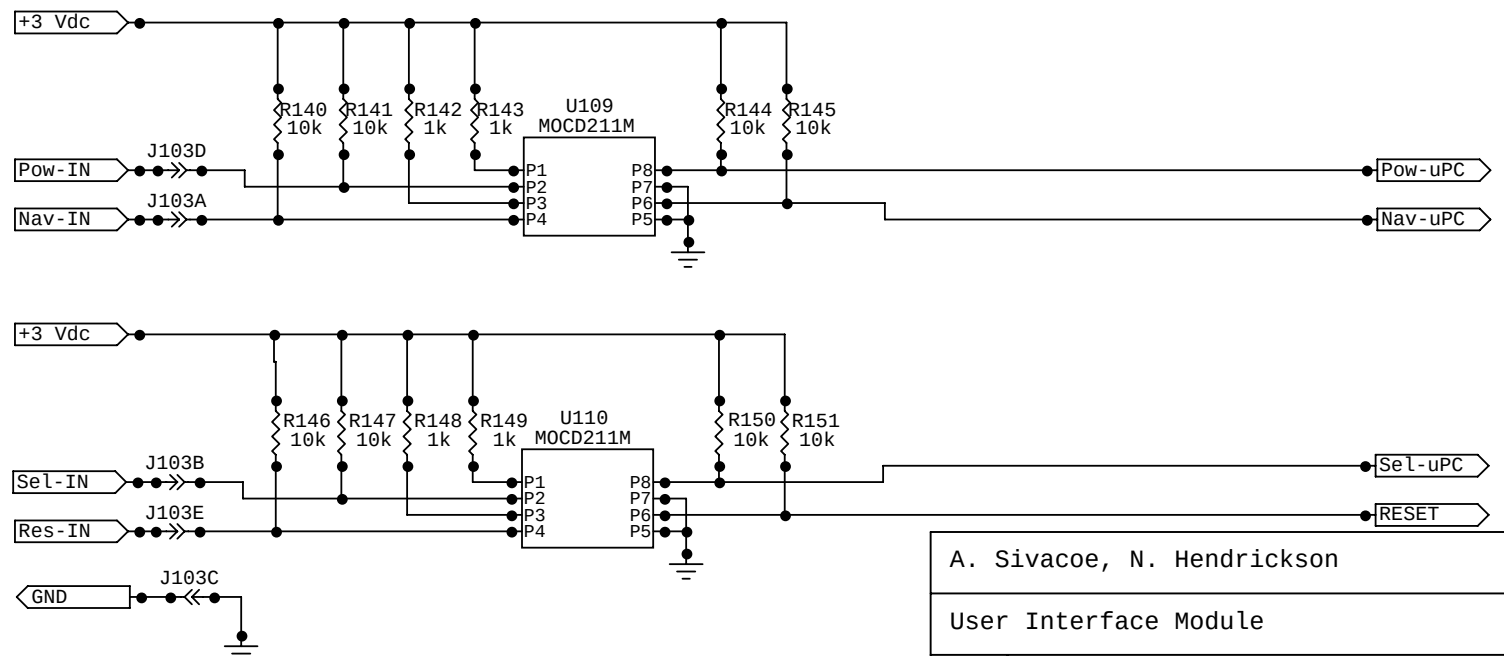
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User Interface Module	
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User Interface Module

Voltage/Current Monitoring

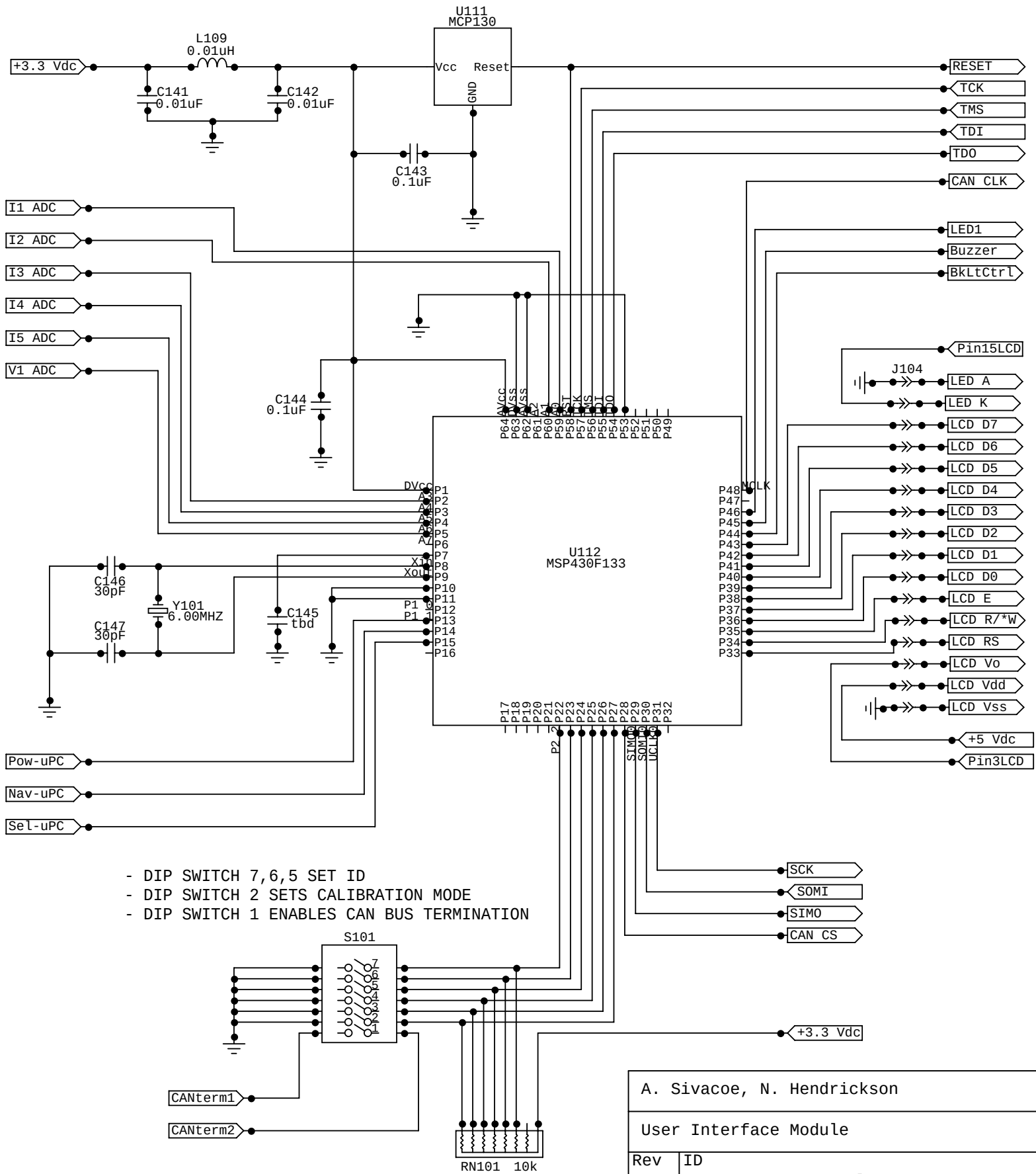


Membrane Switch Inputs



User Interface Module

Microcontroller



- DIP SWITCH 7,6,5 SET ID
- DIP SWITCH 2 SETS CALIBRATION MODE
- DIP SWITCH 1 ENABLES CAN BUS TERMINATION

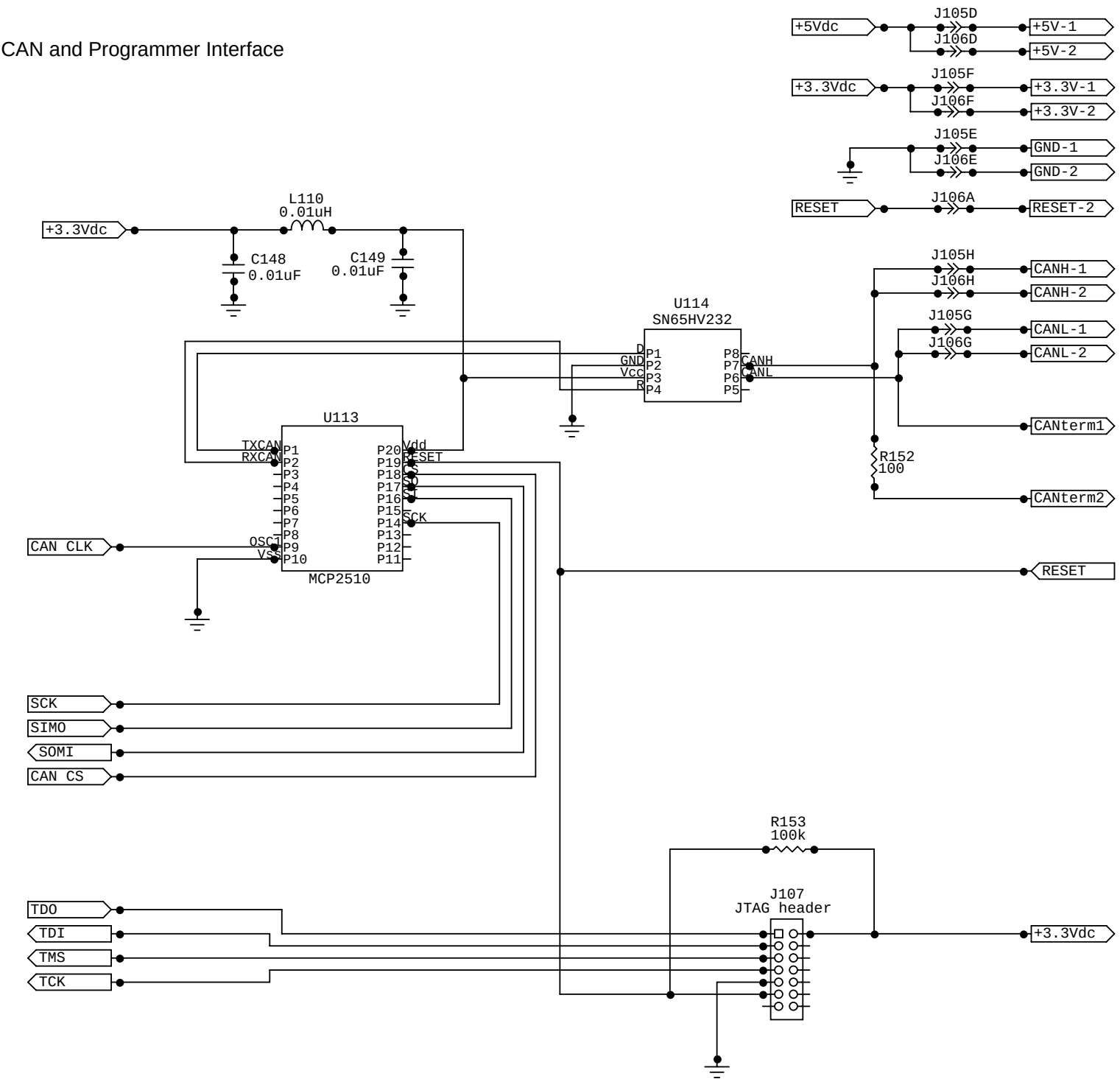
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User Interface Module

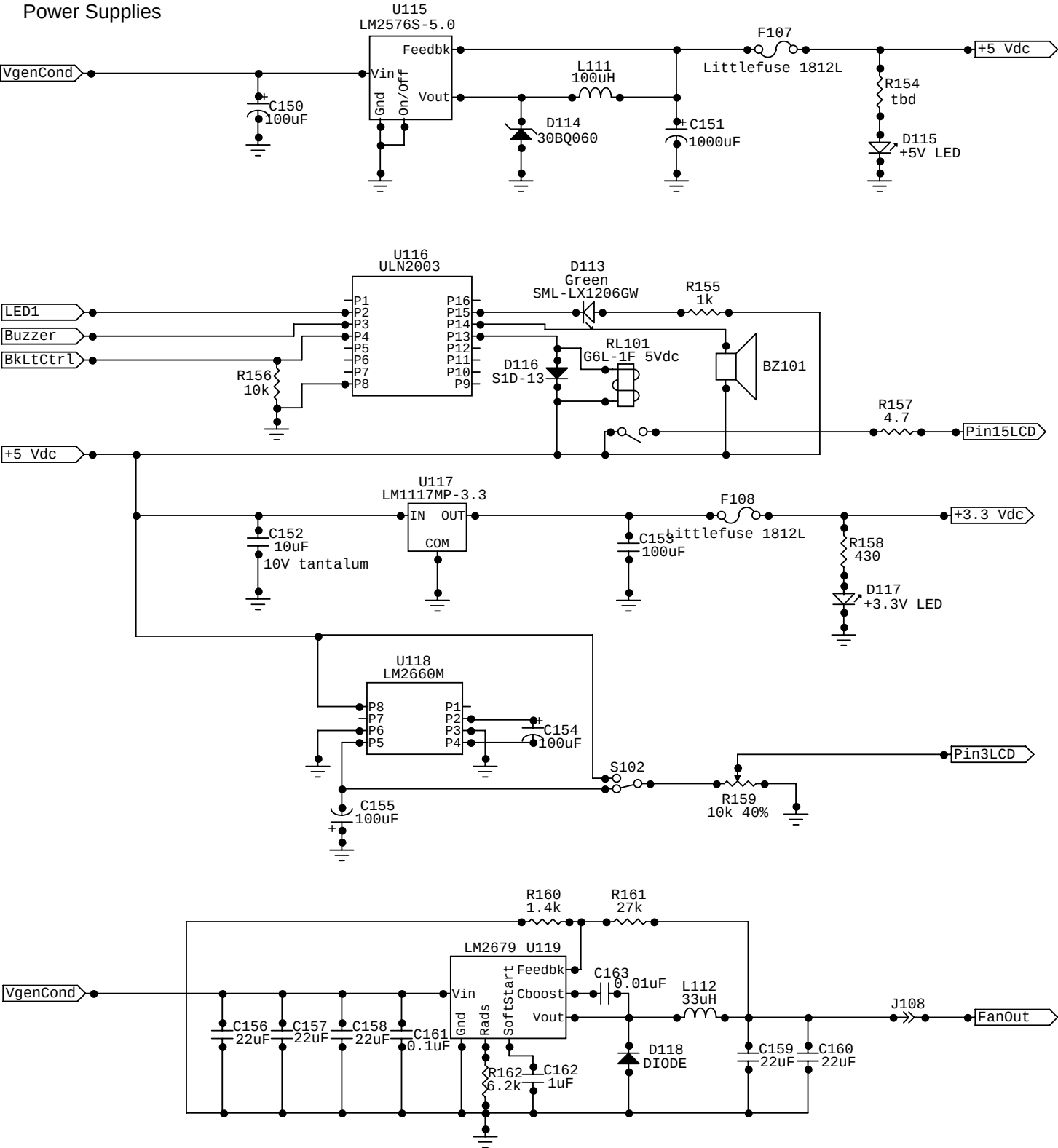
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User Interface Module

CAN and Programmer Interface



User Interface Module



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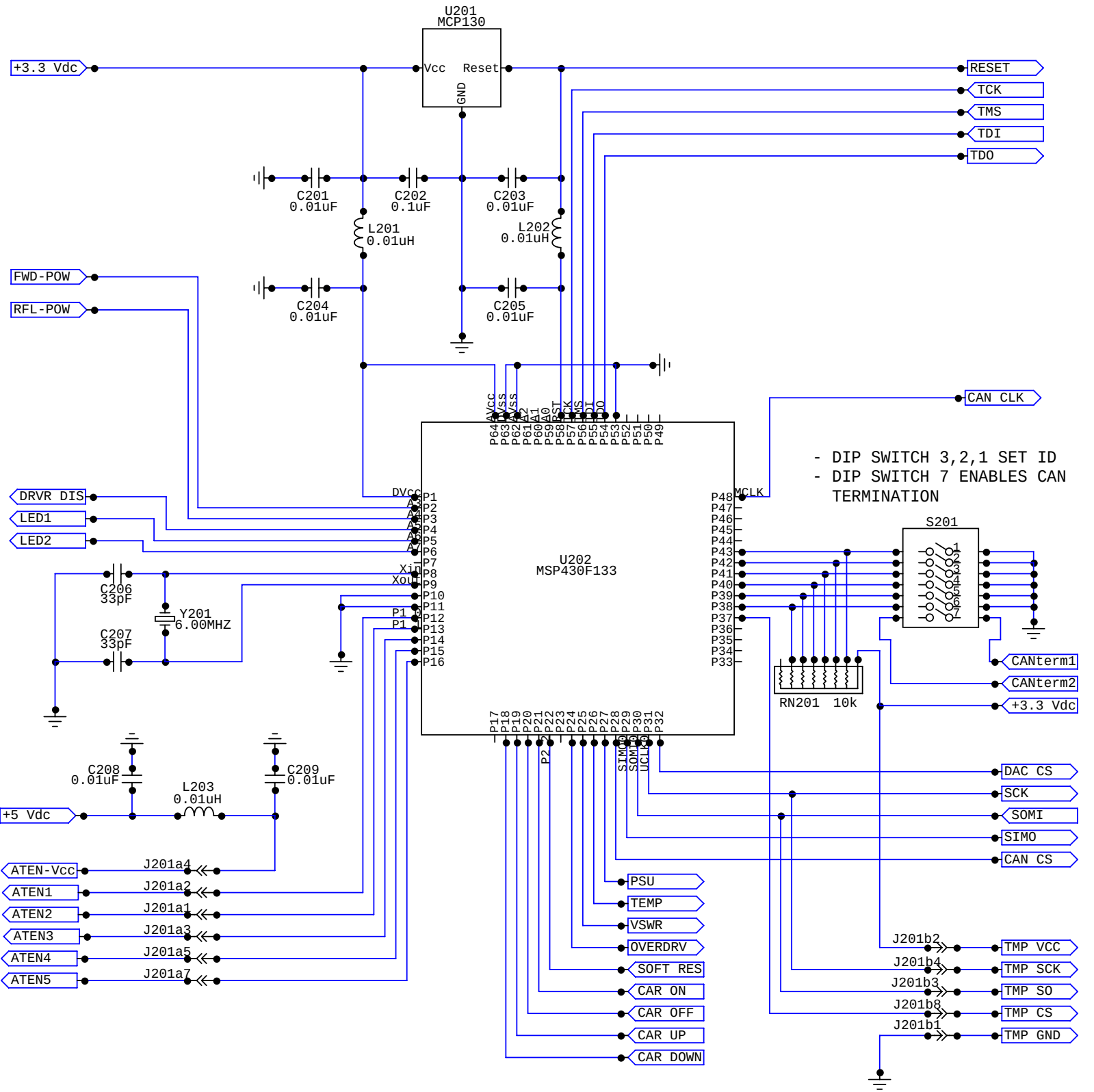
User Interface Module

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Coupler Conditioning Module

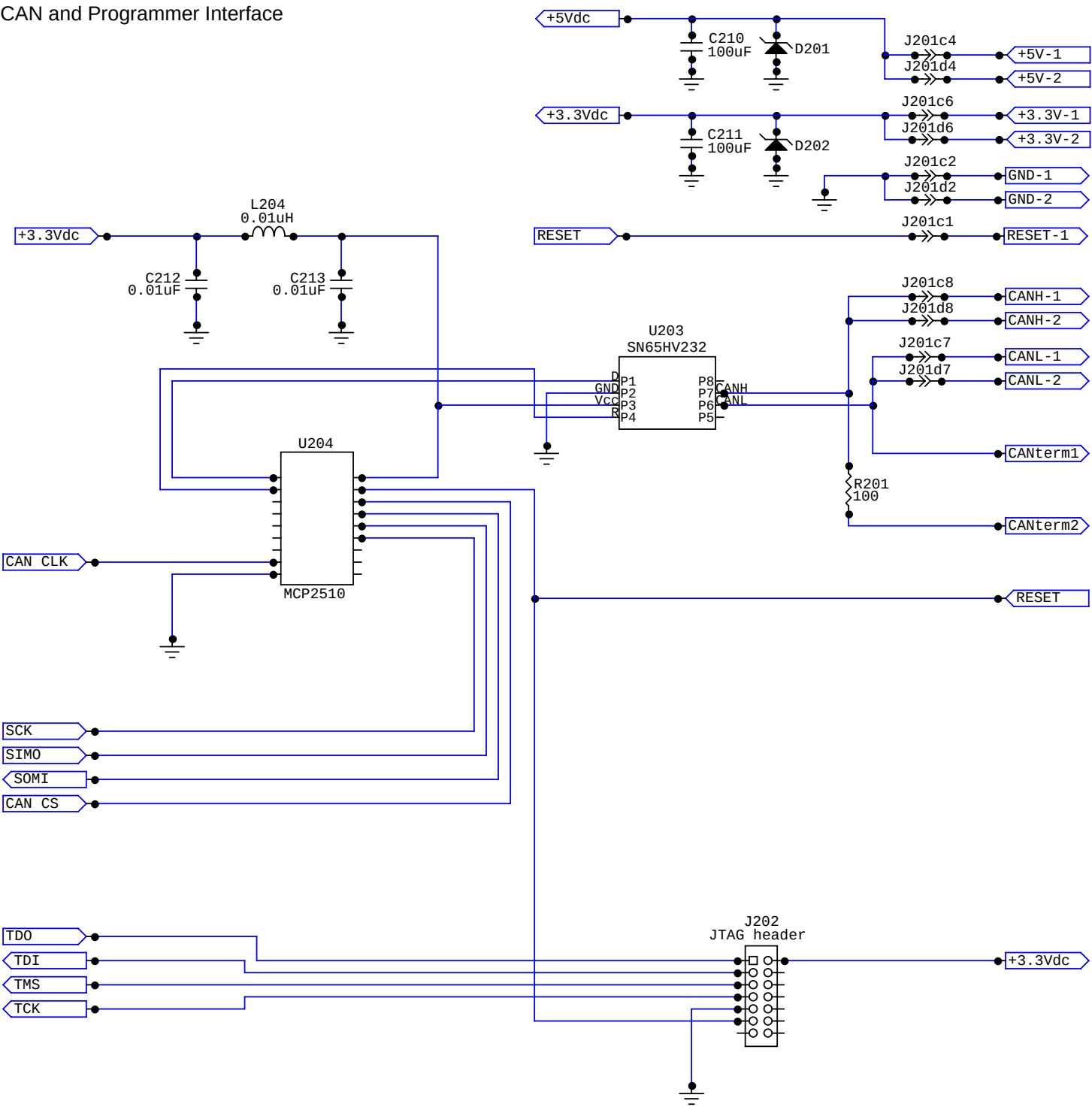
Microcontroller



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Coupler Conditioning	
Rev 1.04	ID Insight Control System
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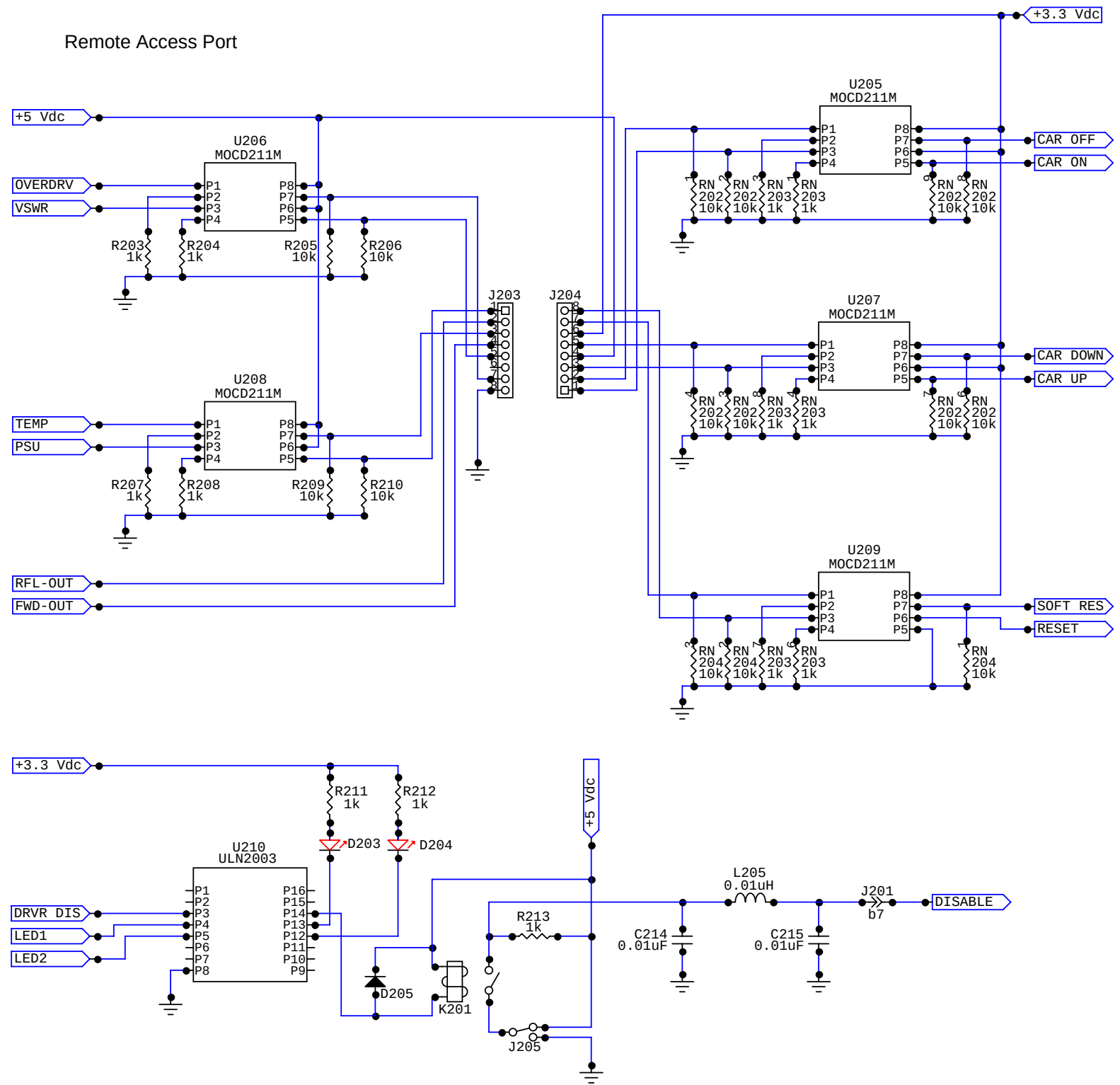
Coupler Conditioning Module

CAN and Programmer Interface

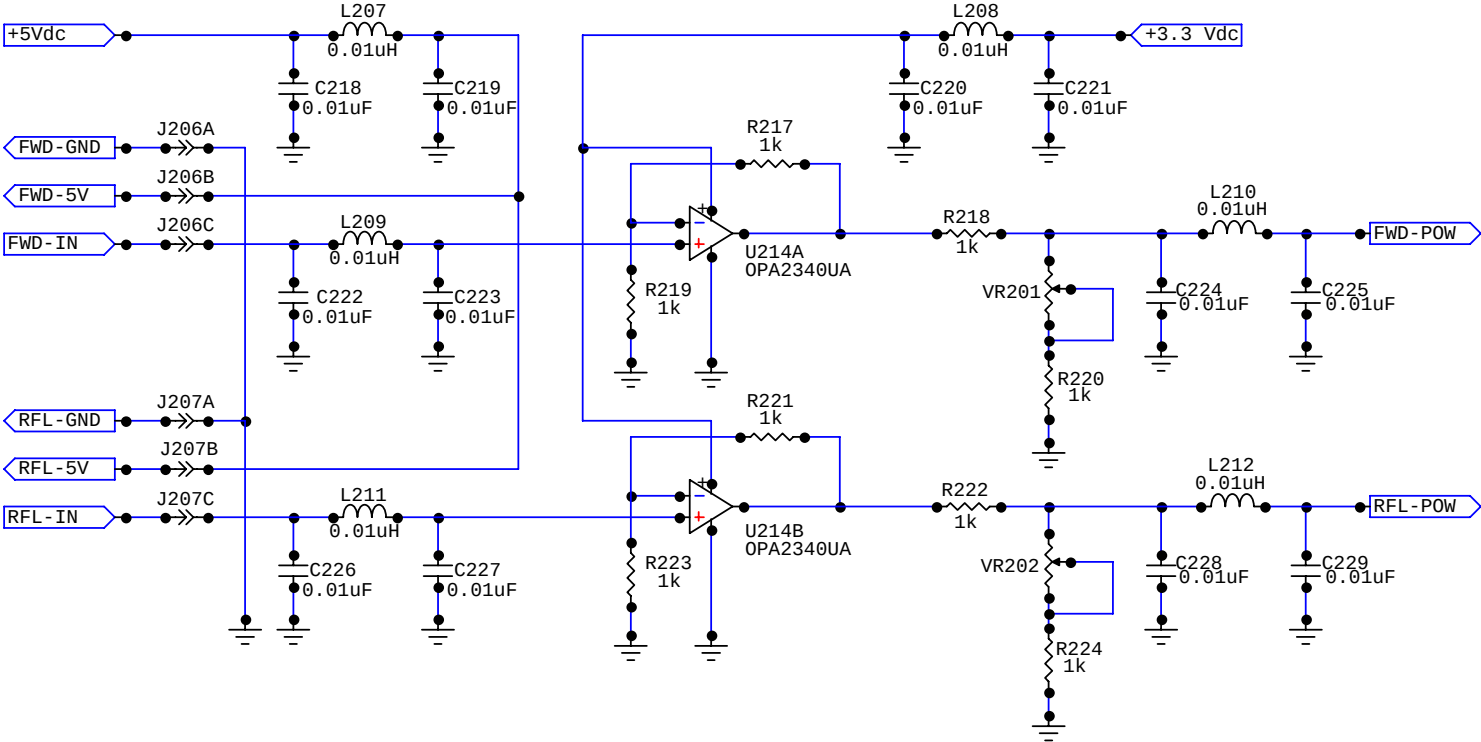
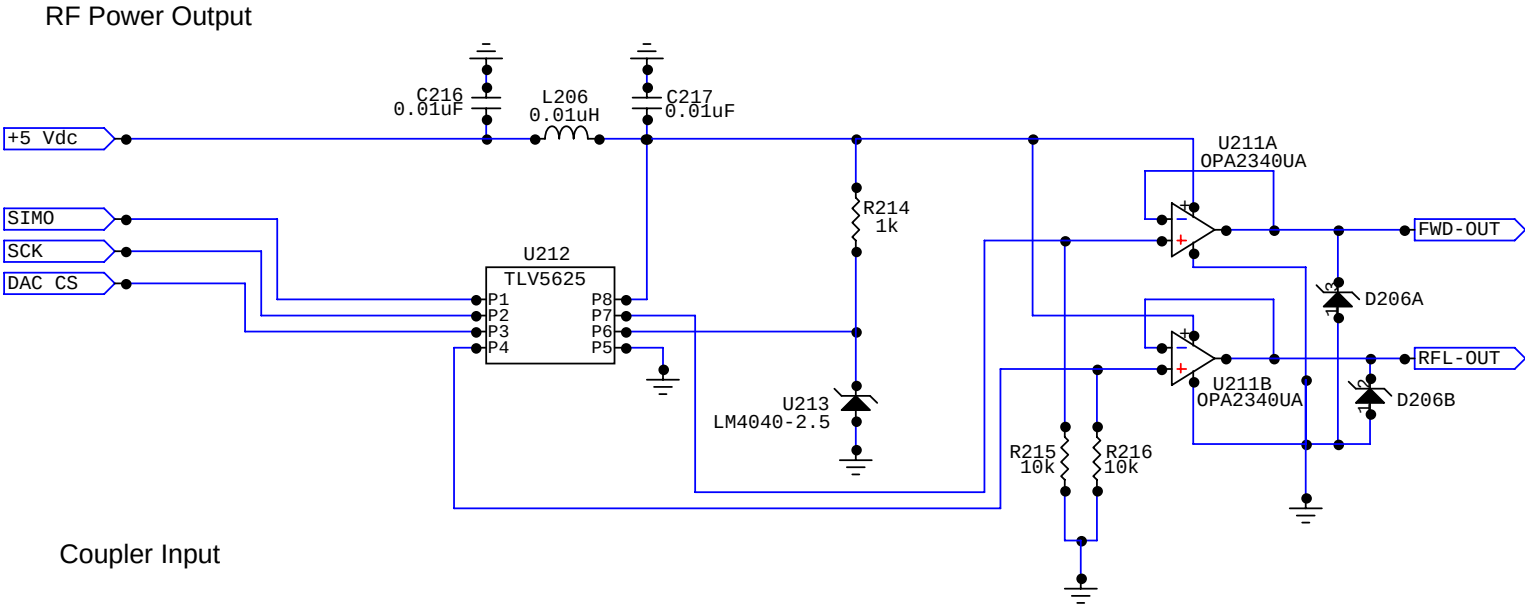


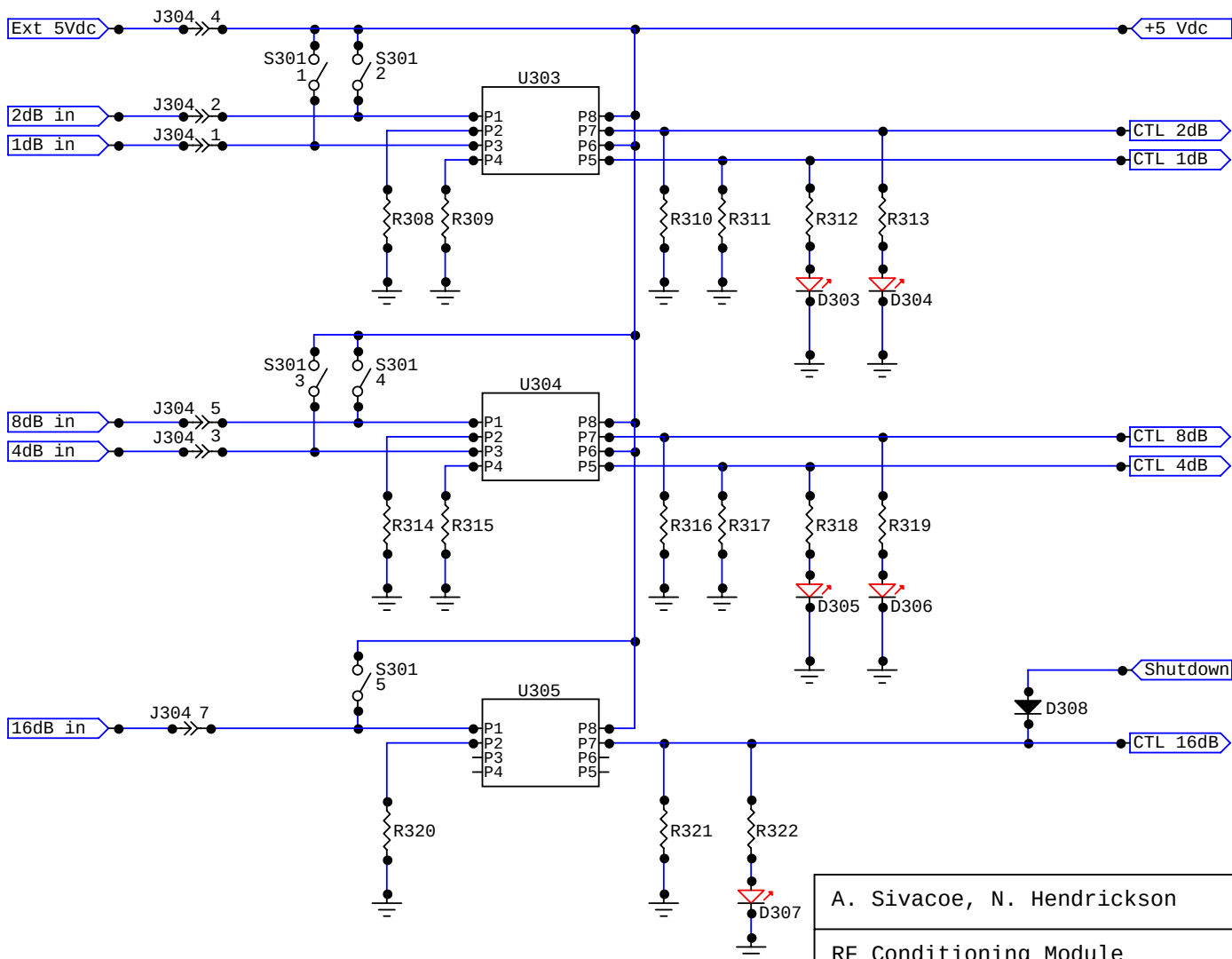
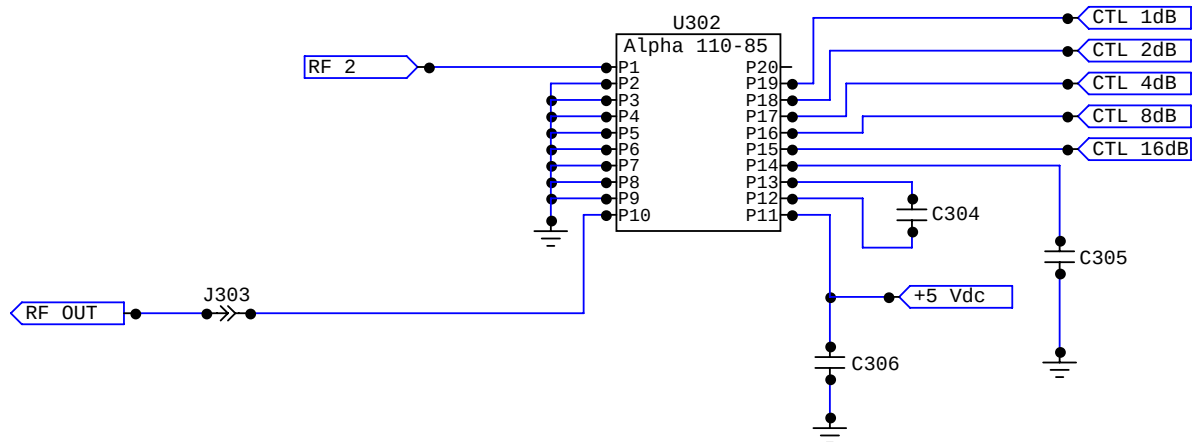
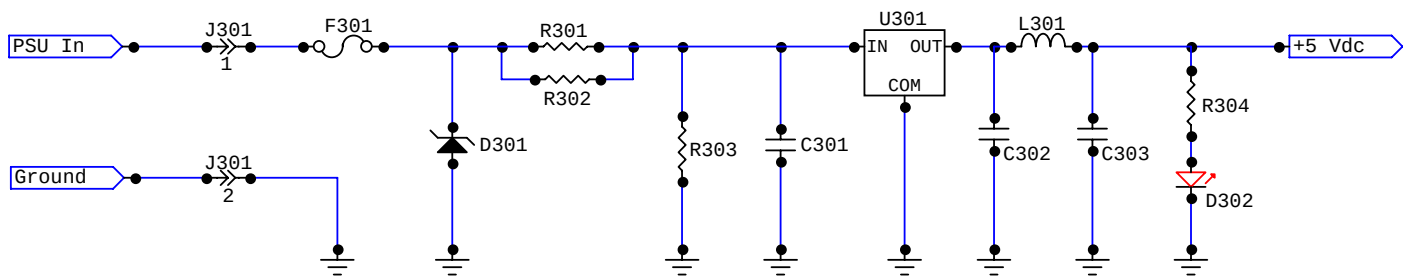
N. Hendrickson, A. Sivacoe	
Coupler Conditioning	
Rev 1.04	ID Insight Control System
Date: June 17, 2005	Page: 2 of 4

Coupler Conditioning Module

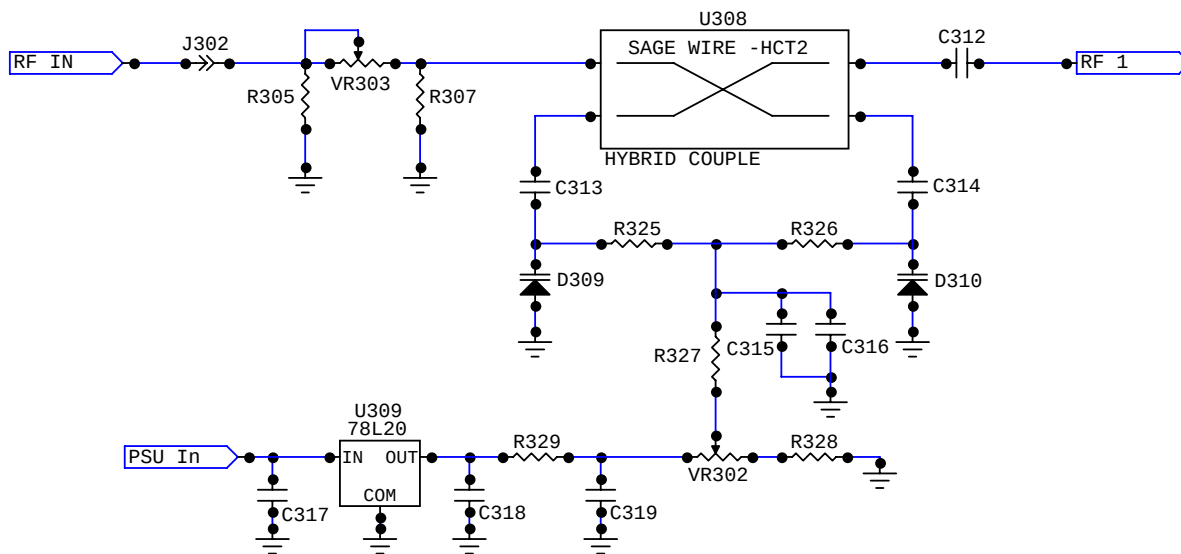
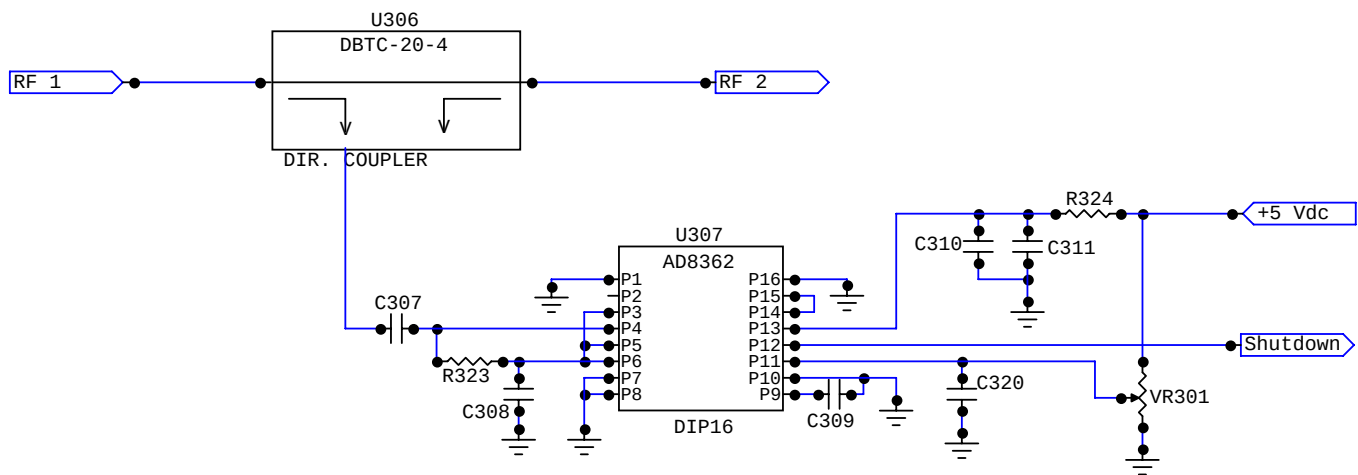


Coupler Conditioning Module





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RF Conditioning Module	
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Temperature Sensor

