ENERGIS 10IN Managed PDU

Main Board 1.1.0 Schematic Documentation

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Document number:	ENE-TDOC-Schematics-100
Document name:	ENE-TDOC-Schematics-100-Main-Board-1.1.0-Schematic-Documentation

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Revision:	1.0.0
Status:	Released
Date:	14.12.2025

Document status:	Internal - CE Technical File

This Technical File applies exclusively to ENERGIS 10IN Managed PDU, Hardware Revision 1.1.0, and corresponding firmware versions released for this hardware. Firmware versions are identified in the device user interface and are covered by this Technical File insofar as they do not change safety-relevant behavior. The Technical File is maintained in electronic form by the manufacturer and can be made available without undue delay. All documents listed herein are retained for at least 10 years after the last product has been placed on the EU market.

Revision History

A revision is a new edition of the document and affects all sections of this document.

Version	Date	Responsible	Modification
1.0.0	12.12.2025	David Sipos	Initial creation of the document

Contents

1. Introduction

This document provides general technical information related to the electrical schematics used within the ENERGIS 10-inch managed PDU system. It applies to all schematic diagrams associated with the product, including but not limited to the main control circuitry, display/interface connections, and auxiliary module interconnections.

1.1 Purpose

The purpose of this document is to support technical documentation, compliance activities, and internal reference by describing the general characteristics, intended use, and design context of the schematic diagrams. It does not describe firmware behaviour in detail and does not replace PCB layout files, manufacturing data, or test reports referenced elsewhere in the technical file.

This document is applicable to the schematic versions identified in the corresponding design documentation and engineering outputs. Any future revisions may require an update or extension of this document where relevant.

2. General Information

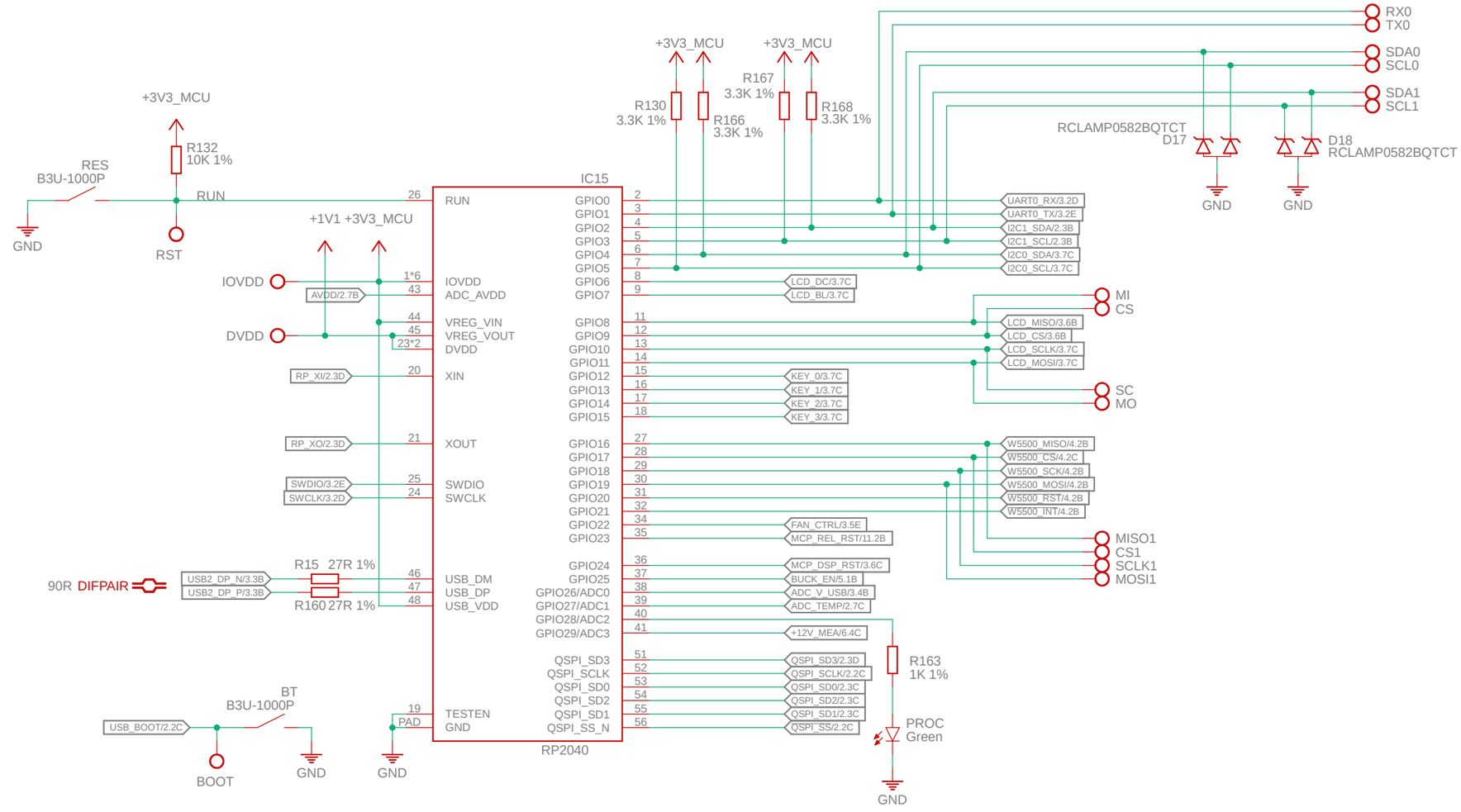
The schematics covered by this document represent the electrical design of internal components of the ENERGIS 10-inch managed PDU and are not intended to be used as standalone products. Each schematic defines the functional relationships between components and subsystems within the overall system architecture and is valid only when implemented in accordance with the product design and enclosure specifications.

The schematics are developed using standard electronic design principles and documented using industry-standard EDA tools. Component selection and circuit topology are based on performance requirements, availability, and compliance with applicable regulatory standards, including RoHS where applicable. All circuits are intended for indoor use within controlled environmental conditions as specified in the product documentation. The designs do not include provisions for user modification and are not intended for repair or alteration by the end user.

Detailed design data, including schematics, PCB layouts, manufacturing outputs, and validation results, are referenced in the Technical File Index and maintained as part of the overall technical documentation set.

3. ENERGIS_MainBoard_1.1.0 Schematics

RP2040 MICROCONTROLLER



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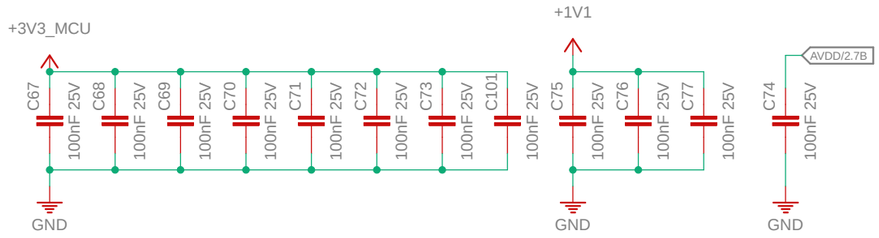

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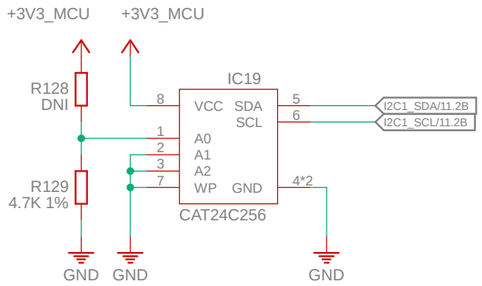
Size: A3	Date: not saved!
DvidMakesThings	Rev: 1.1.0
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU	Sheet: 1/11

PERIPHERALS

USER MEMORY



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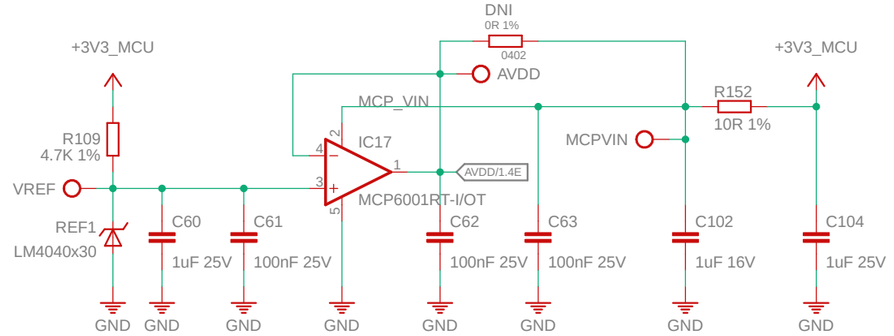
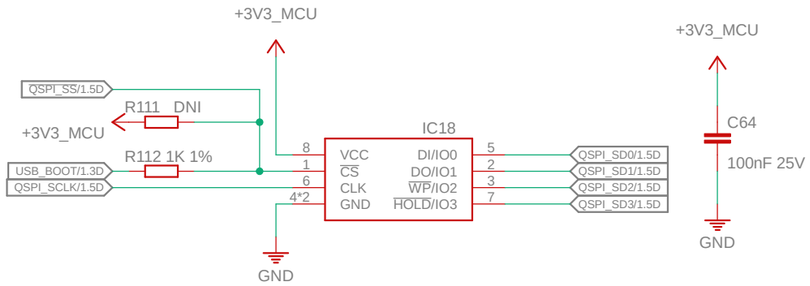


RP2040 FLASH



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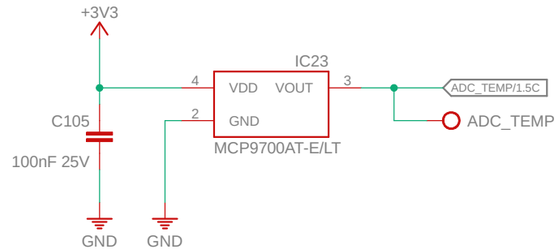
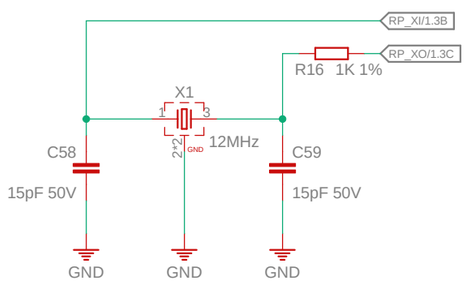


12MHZ CRYSTAL



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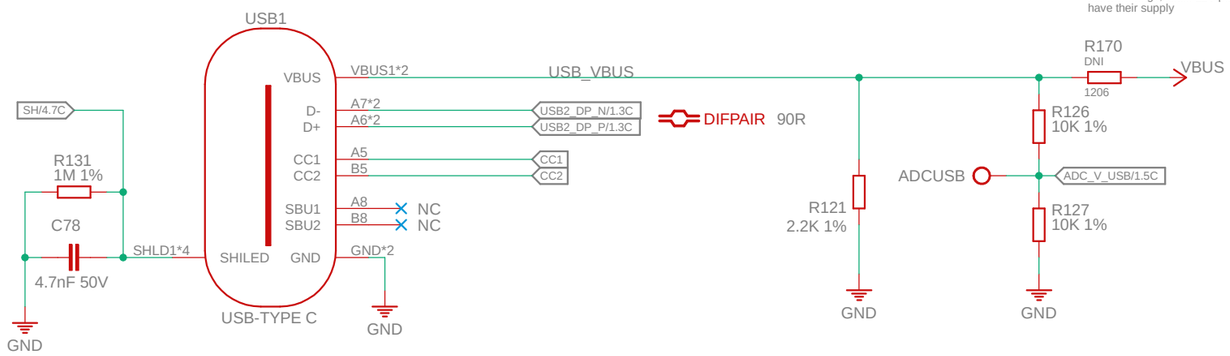
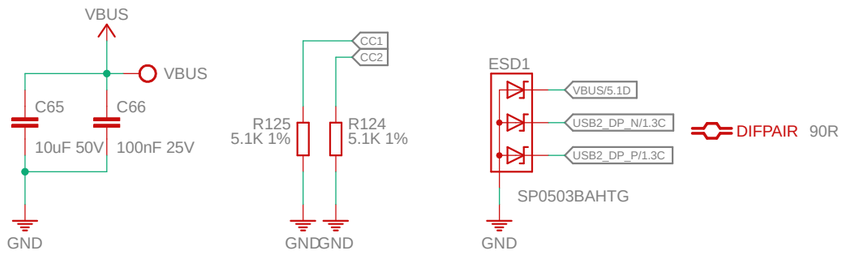
DvidMakesThings		
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU		Sheet: 2/11

CONNECTORS

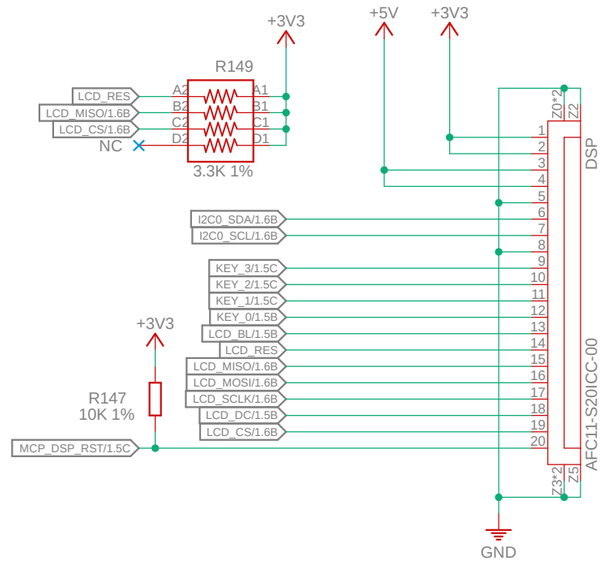
USB-C CONNECTOR



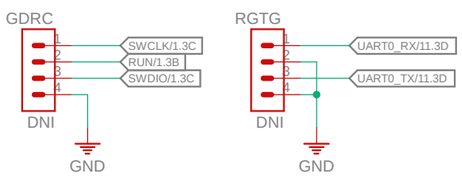
NOTE: v1.1.0 Change
USB 5V is now spearated by solder jumper.
Powering the board with pure 5V only introduced software bugs, since 12V powered parts don't have their supply



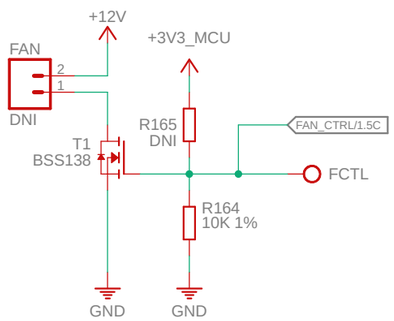
BOARD CONNECTOR



DEBUG CONNECTOR



FAN CONNECTOR



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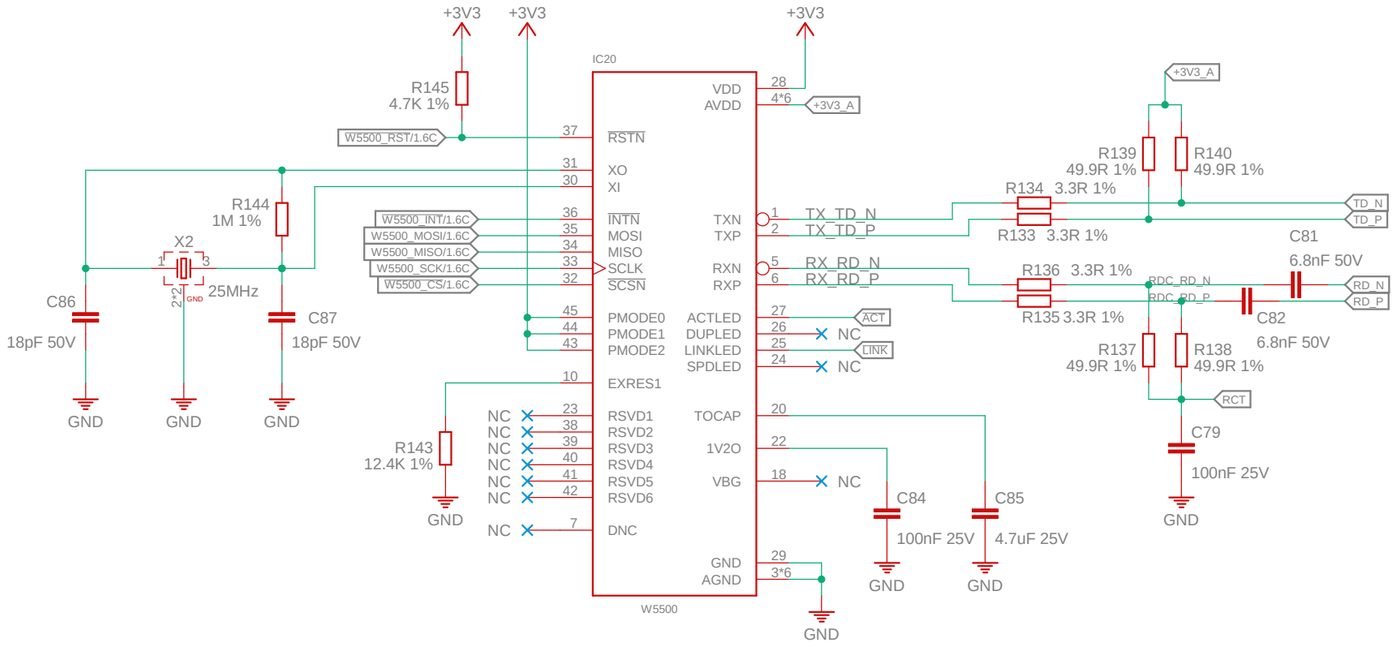
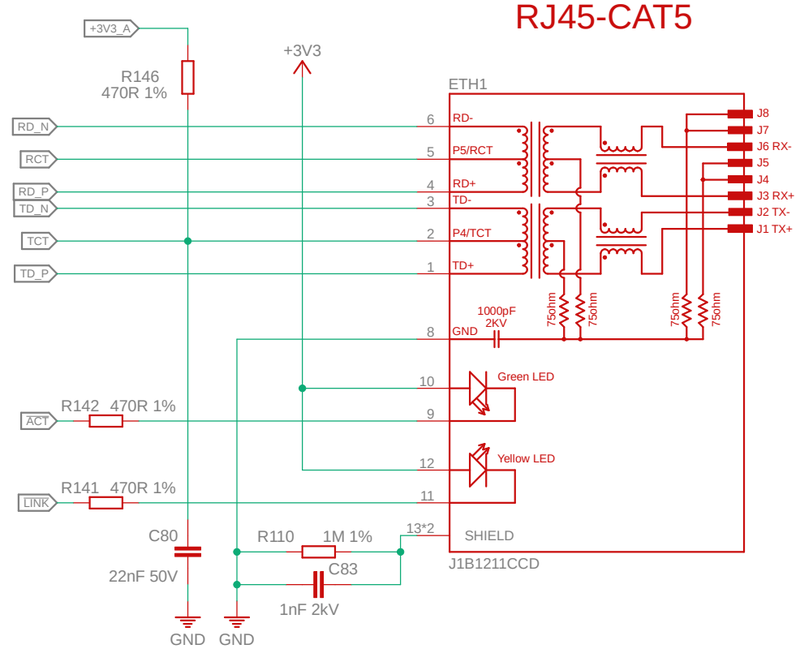
DvidMakesThings		
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU		Sheet: 3/11

W5500 ETHERNET CONTROLLER



RJ45-CAT5



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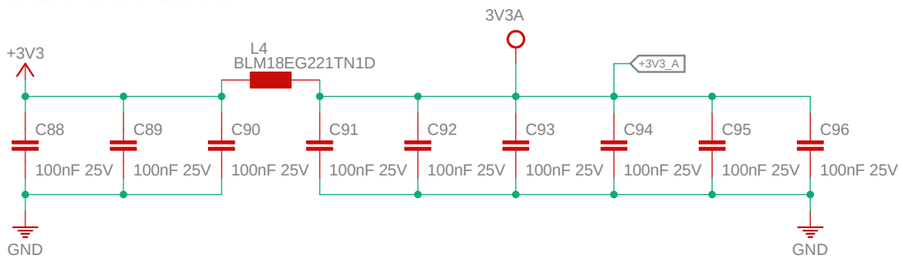

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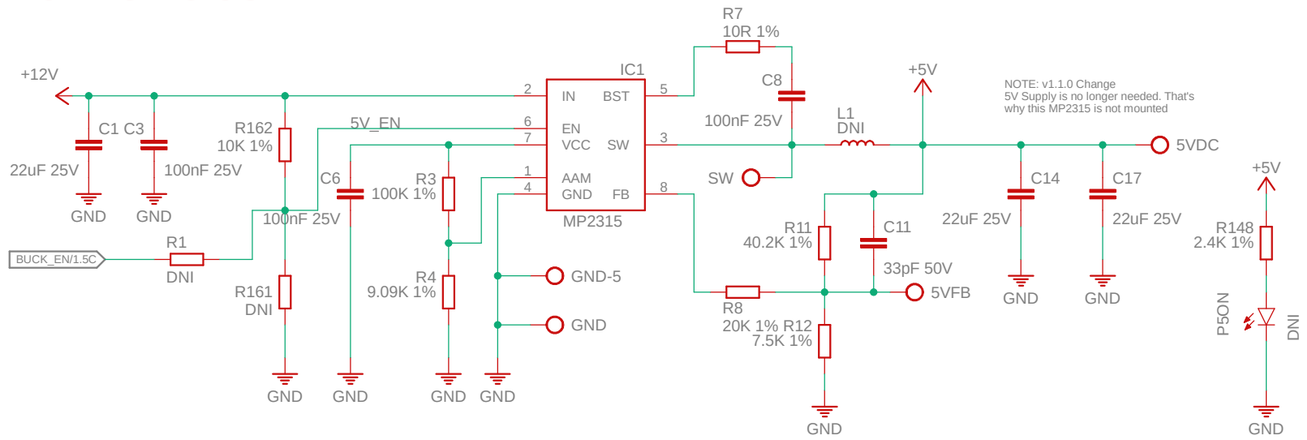
DvidMakesThings		
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU		Sheet: 4/11

POWER

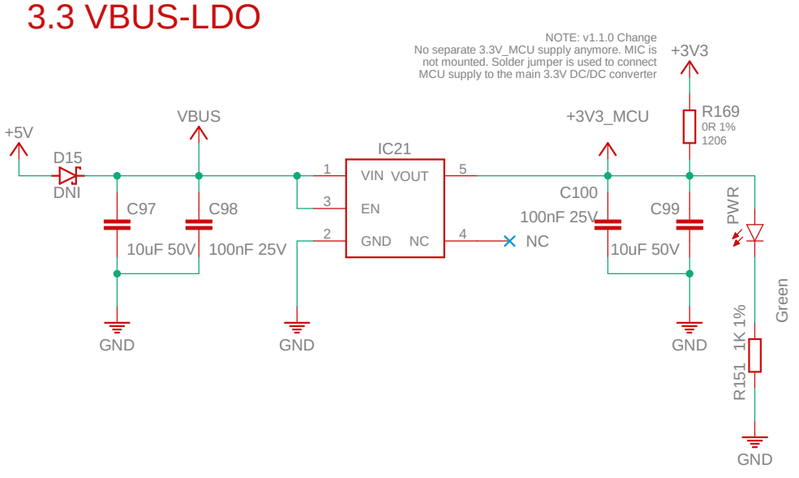
230VAC

12VDC

5V DC-DC CONVERTER



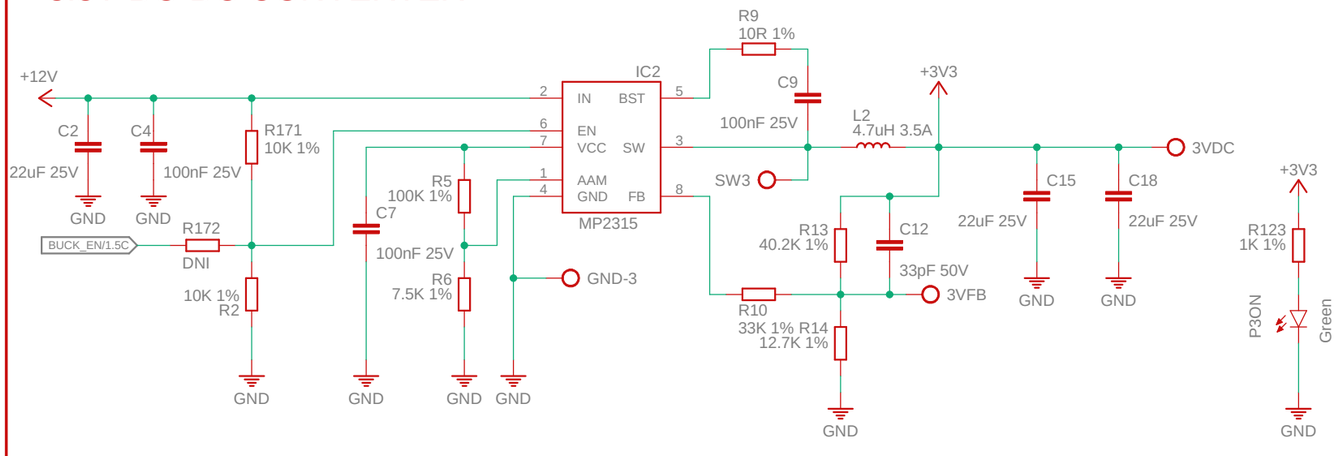
3.3 VBUS-LDO



USB-C 5VDC

3.3V DC-DC CONVERTER

ENABLE/DISABLE



MCU

PERIPHERALS

MCU

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Size: A3	Date: not saved!
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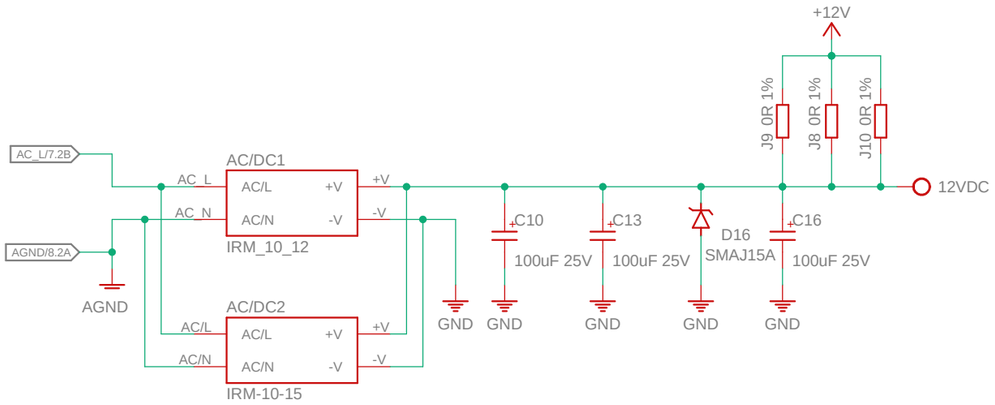
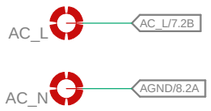
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU	
Rev:	1.1.0
Sheet:	5/11

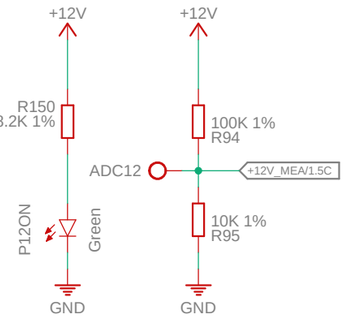
AC-POWER

12V - 10W FLYBACK CONVERTER



AC-INPUT





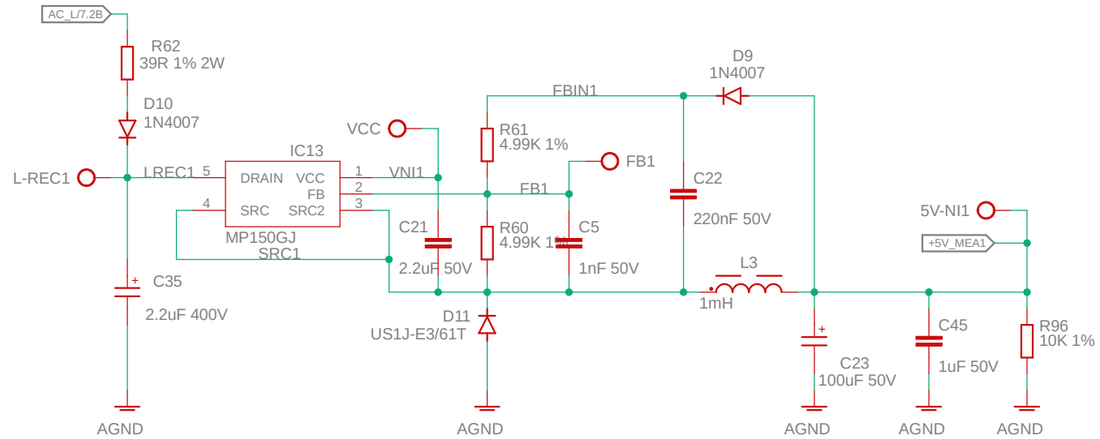
Design Note — 12 V supply (Mean Well IRM-10 series), universal 110 V/230 V AC

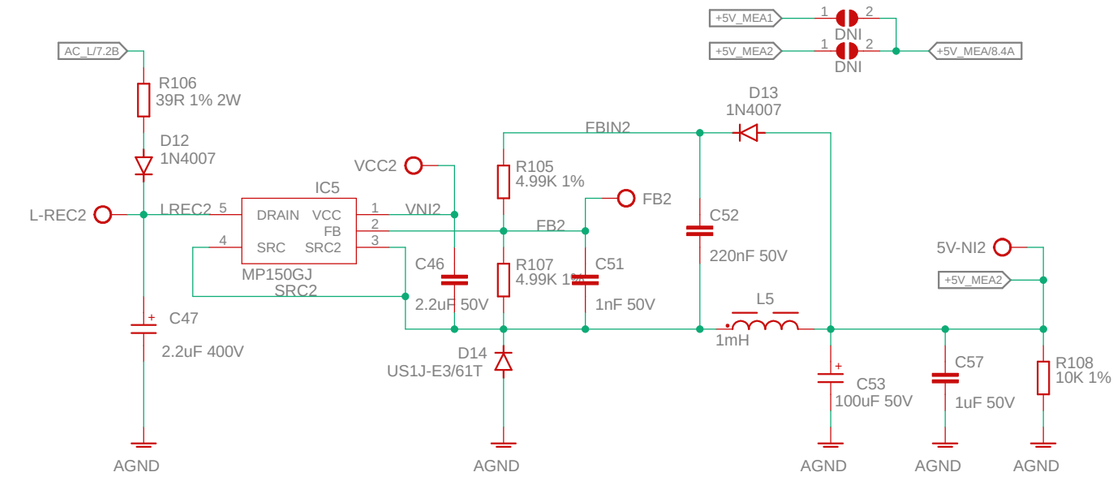
This schematic uses the Mean Well IRM-10 encapsulated AC-DC module (e.g., IRM-10-12) to produce 12 VDC. The IRM-10 series is specified for a wide input range of 85–305 VAC (47–440 Hz) and 120–430 VDC, meaning it operates from both ~115 VAC and ~230 VAC mains with no selector or changes to the circuit. Safety approvals (IEC/UL/EN 62368-1), Class II construction, and built-in EMI/EMC compliance are provided by the module.

Design Note — 5 V / 200 mA non-isolated supply (MP150), universal 110 V/230 V AC

This design uses MPS MP150 in high-side buck to generate 5 V/200 mA directly from rectified mains. MP150 integrates a 500 V MOSFET (Drain-to-Source rating 500 V), covering the ~325 VDC peak from 230 VAC and ~155 VDC from 115 VAC, so the circuit from 85–265 VAC (“universal input”).

5V 200MA NON-ISOLATED POWER SUPPLY





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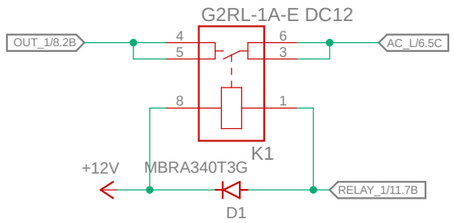
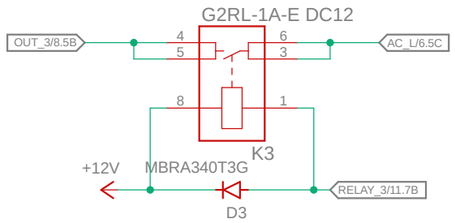
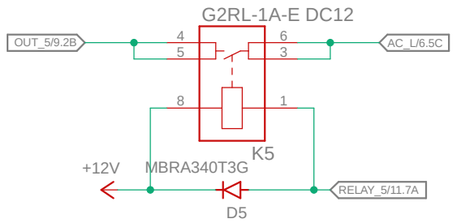
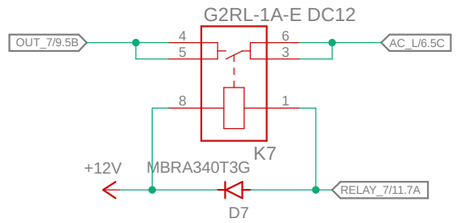
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU		Sheet: 6/11

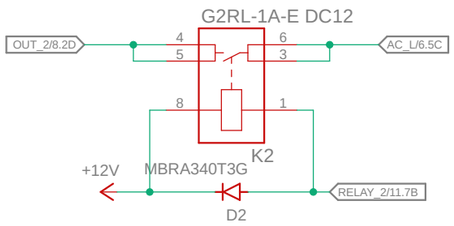
OUTPUT RELAYS

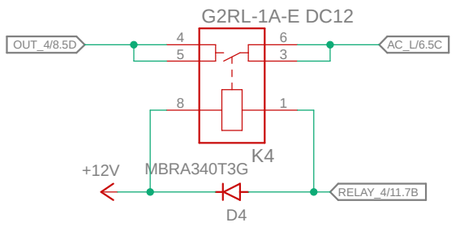


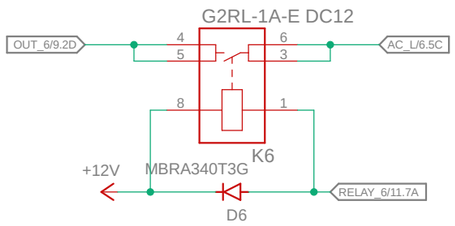


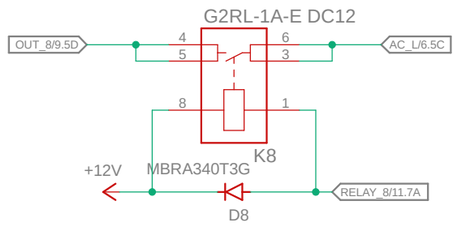


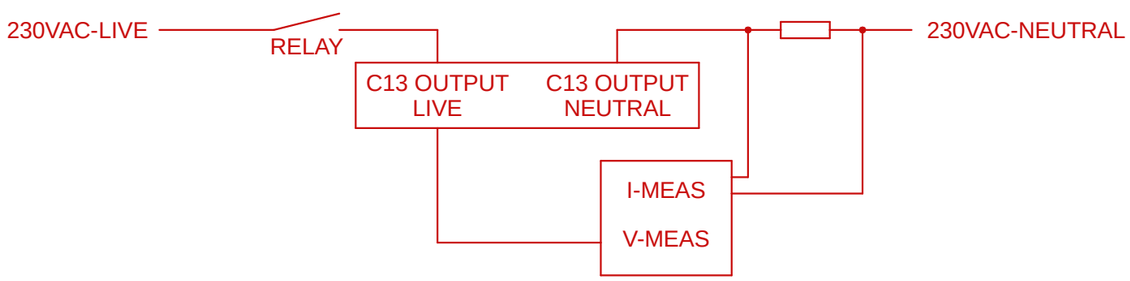












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DvidMakesThings

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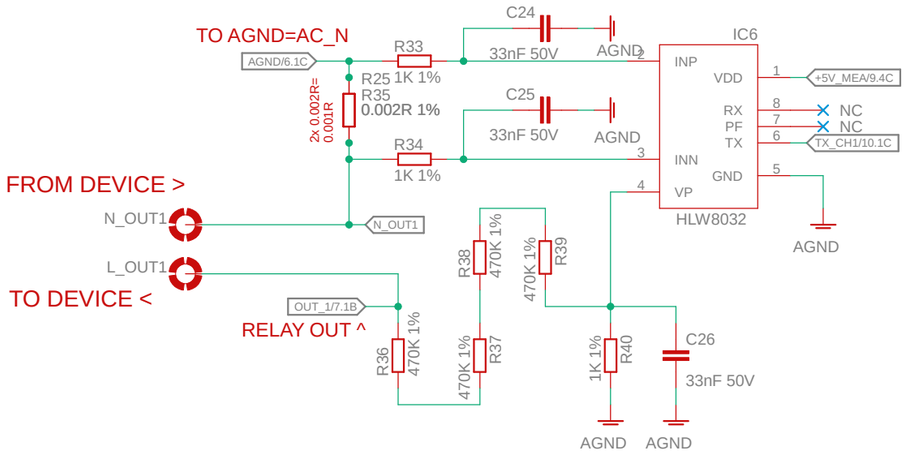
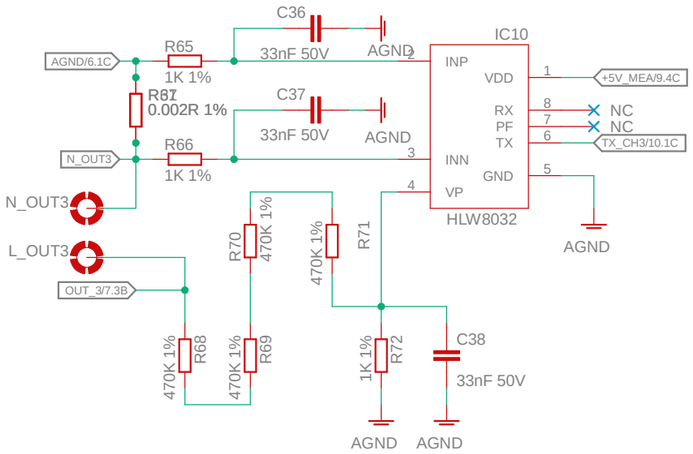
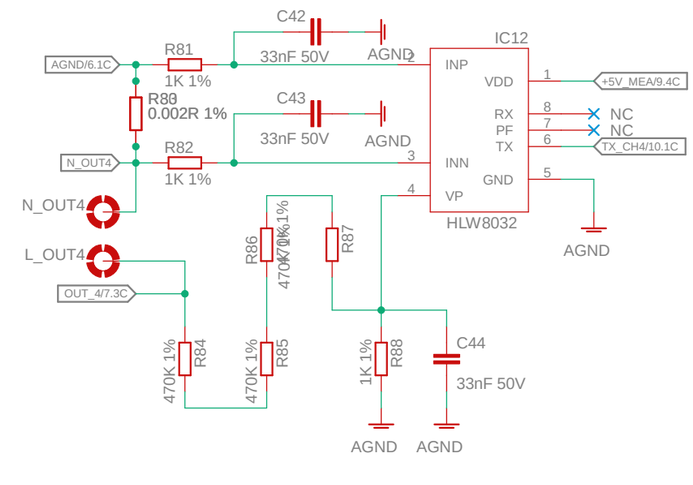
AC CHANNEL MEASUREMENT I.







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Main Board

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DvidMakesThings

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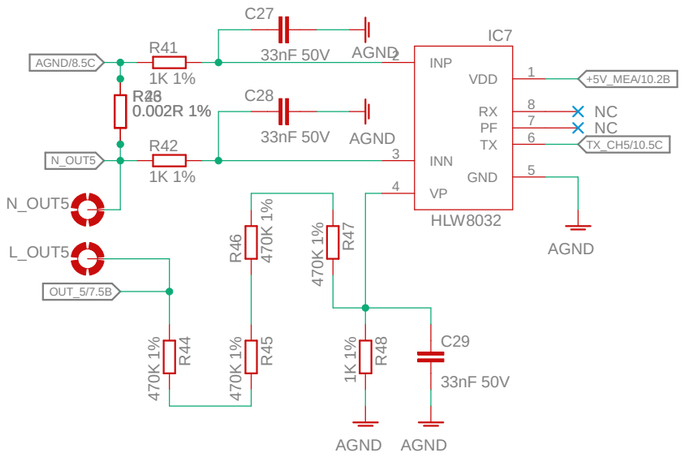
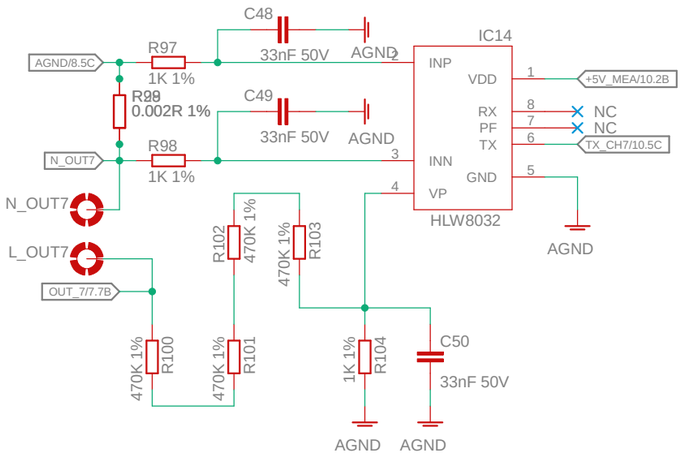
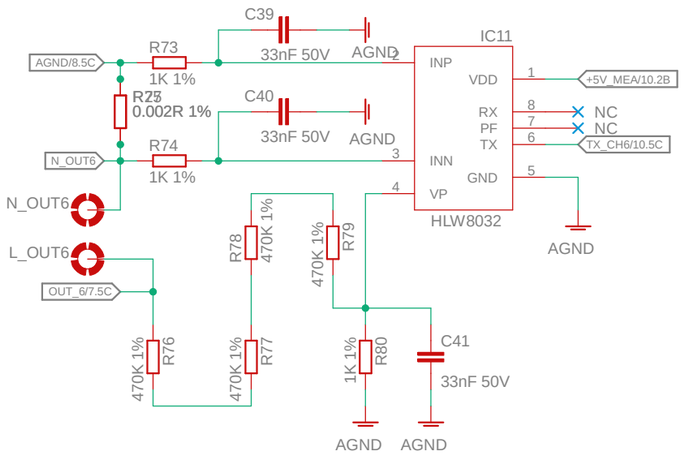
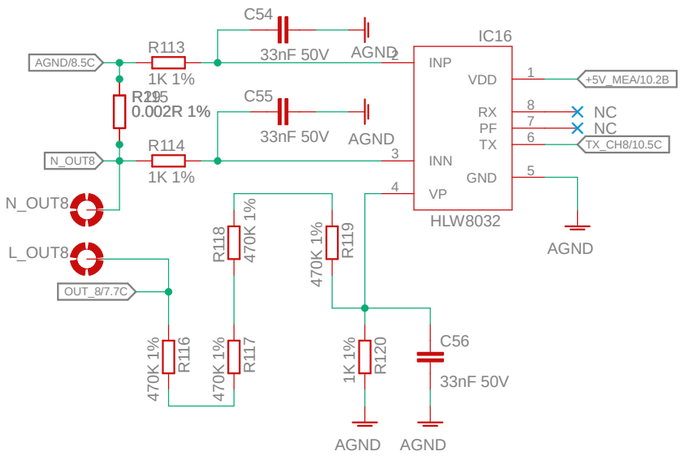
AC CHANNEL MEASUREMENT II.









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Size: A3 | Date: not saved! | Rev: 1.1.0

DvidMakesThings

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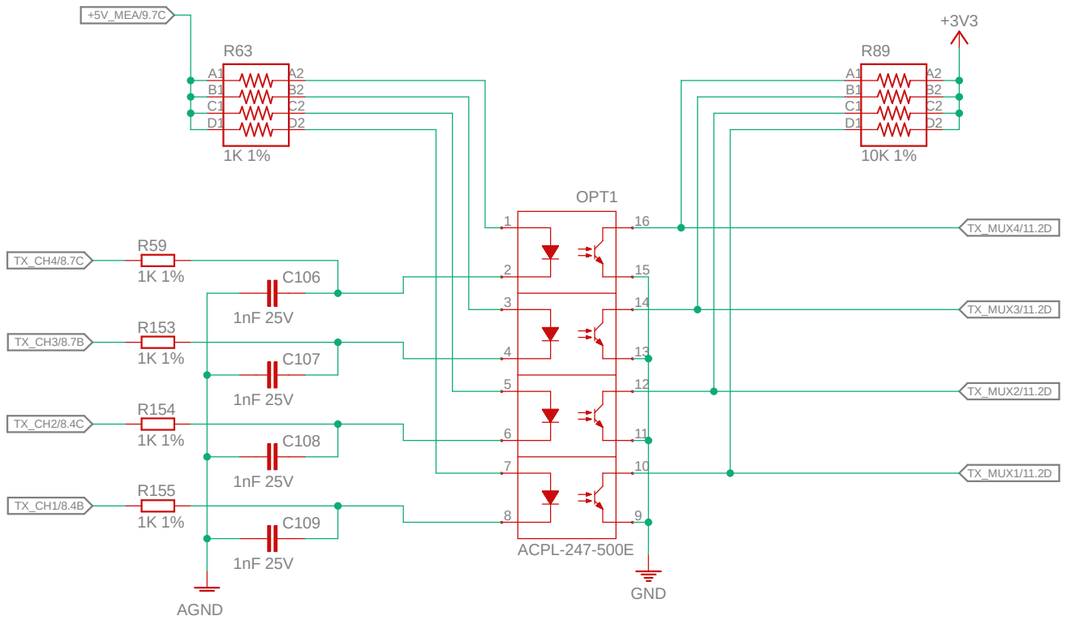
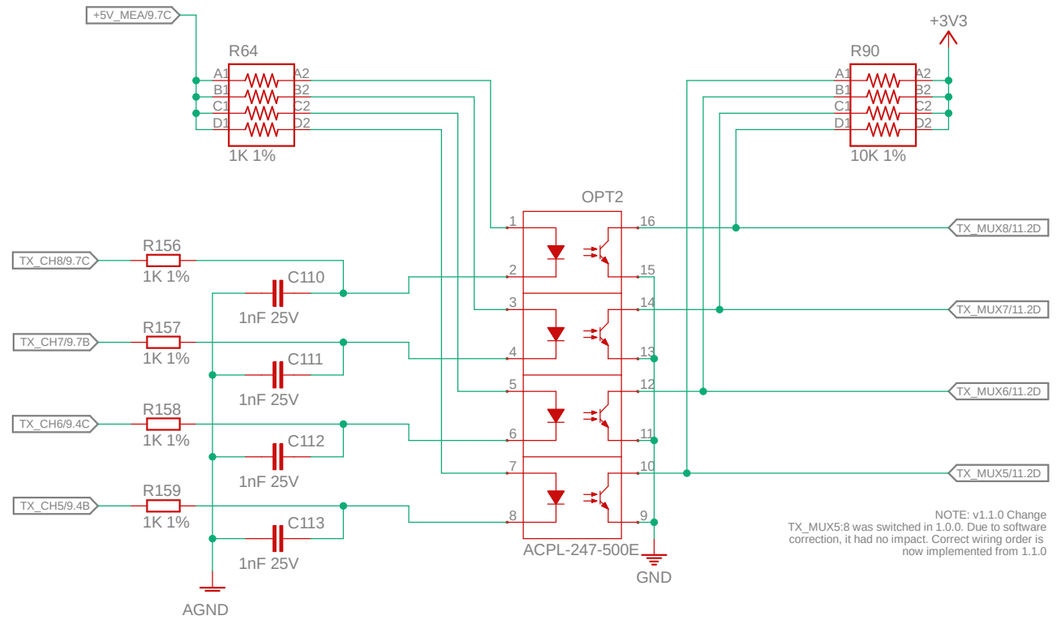
SERIAL OPTOISOLATOR





NOTE: v1.1.0 Change
TX_MUX5:8 was switched in 1.0.0. Due to software correction, it had no impact. Correct wiring order is now implemented from 1.1.0

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Size: A3	Date: not saved!	Rev: 1.1.0
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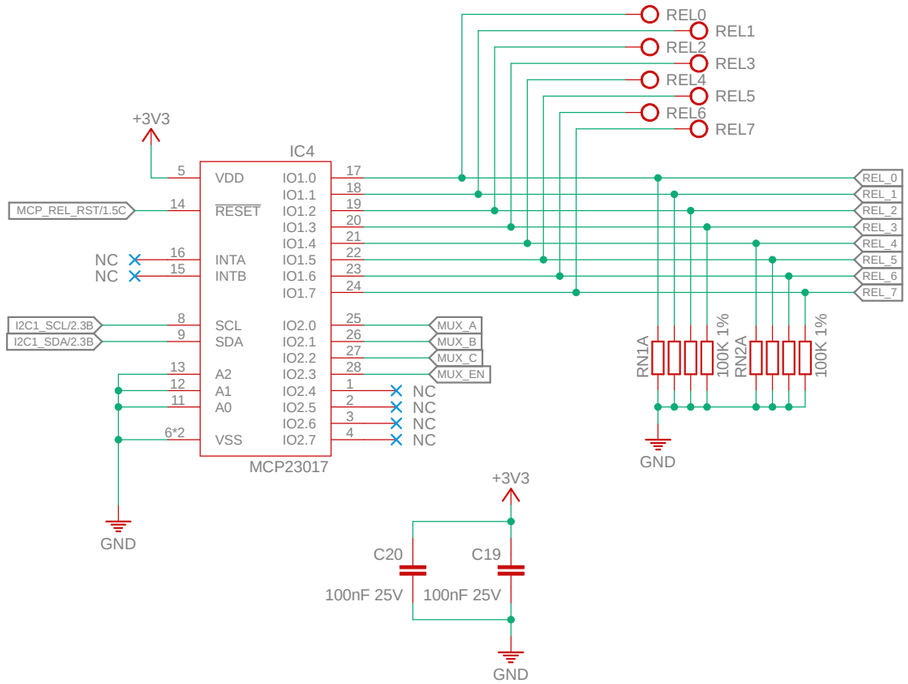
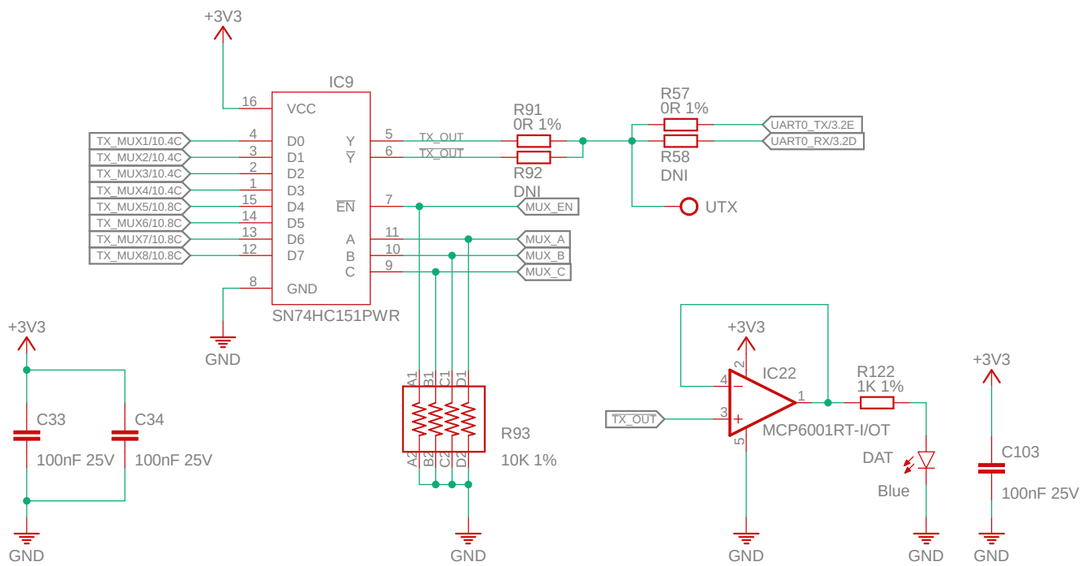
https://github.com/DvidMakesThings/HW_10-In-Rack_PDU		Sheet: 10/11

AC-MEASUREMENT SIGNAL PATH

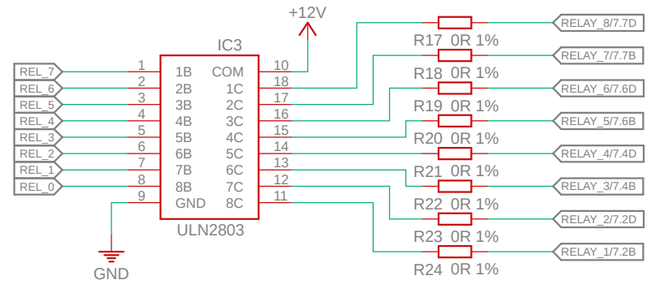
IO DRIVER

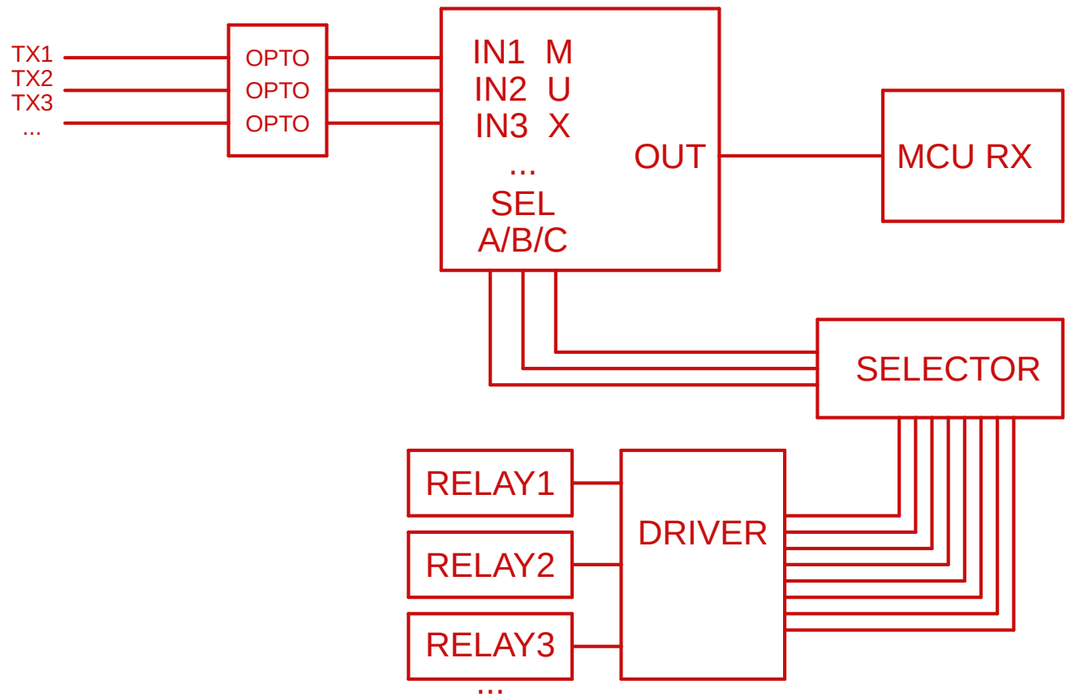


SERIAL MUX



ULN2803 RELAY DRIVER





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