NOTES:

THE SWITCH EXCLUSION CIRCUITY SHALL ONLY ALLOW ONE CONNECTION TO THE GROUND FAULT CIRCUIT AT A TIME. A CONNECTION TO A CALIBRATION TEST CIRCUIT WILL BE THE DEFAULT.

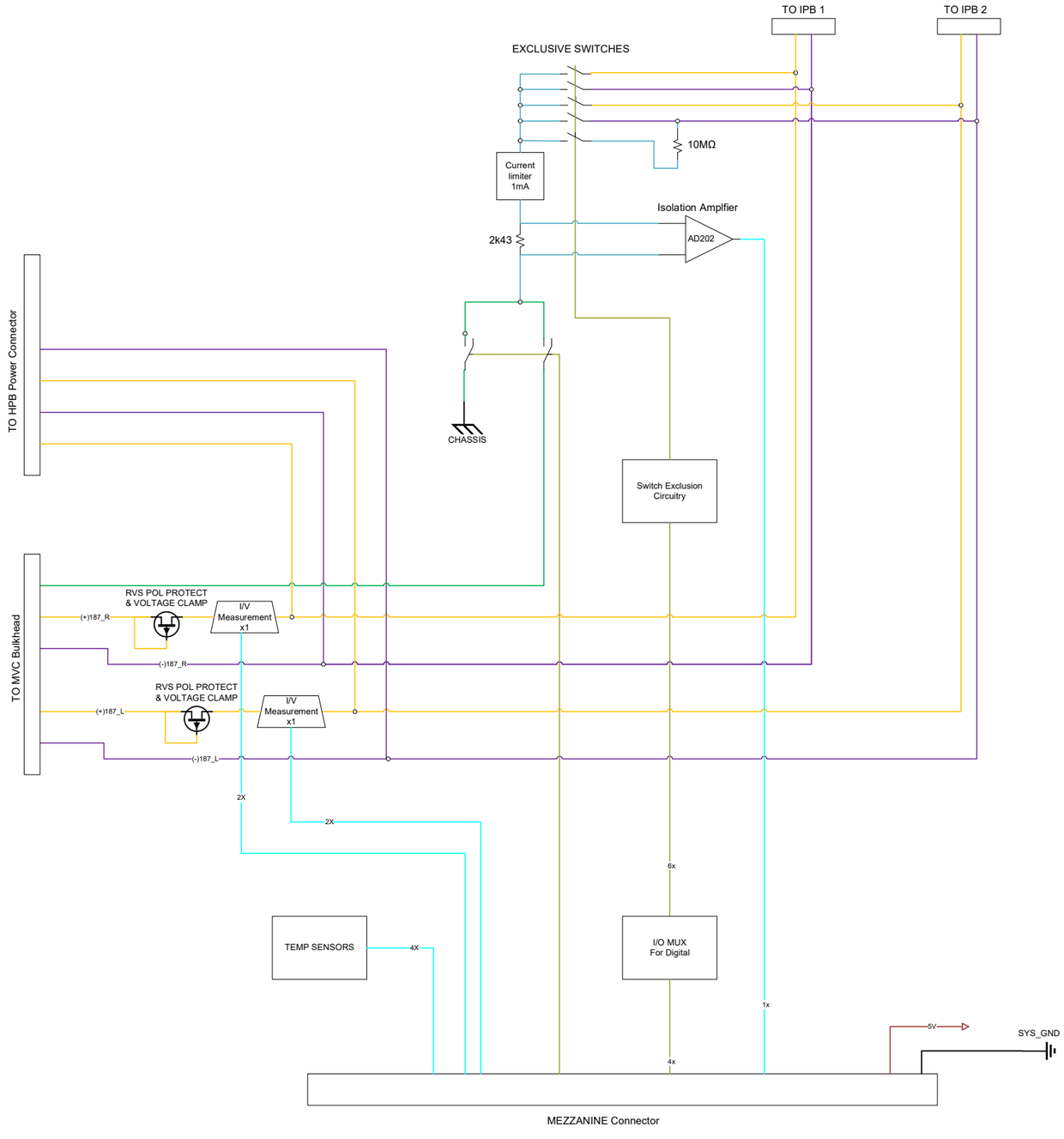
A TEST RESISTOR SHALL BE USED IN THE GROUND FAULT CIRCUIT TO VERIFY PROPER OPERATION BEFORE MAKING GROUND FAULT MEASUREMENTS.

THE REVERSE POLARITY AND VOLTAGE CLAMP CIRCUITRY SHALL CLAMP VOLTAGE AT 420V AND MINIMAL CURRENT SHALL FLOW WHEN POLARITY IS REVERSED.

BIPOLAR TVS DIODES SHALL BE USED TO PROTECT AGAINST ESD AND VOLTAGE SPIKES. THE BIPOLAR TVS DIODES VOLTAGE BREAKDOWN THRESHOLD SHALL BE AT LEAST 20V ABOVE THE VOLTAGE CLAMP

NO PART OF THE CIRCUIT SHALL HAVE NON-GALVANICALLY ISOLATION CONNECTION TO CHASSES AND SEA WATER GROUND EXCEPT AS NECESSARY FOR GROUND FAULT CIRCUITY. ANY GROUND FAULT CIRCUITY SHALL BE GALVANICALLY ISOLATED FROM SEA WATER OR CHASSIS WHEN NOT IN USE.

DIODES MUST BE PLACED IN POWER PATH BETWEEN INSTRUMENT CONNECTIONS AND ANY PATH THROUGH SUPPLY SIDE SEA WATER CLAMP CIRCUITY FOR GROUND FAULT CIRCUITY TO FUNCTION.



Key

- +185V
- -185V
- SEA_GND
- SYS_GND
- 24V
- 12V
- 5V
- ISO_GND
- ANALOG
- DIGITAL

PI:	T. MCGINNIS	APPLIED PHYSICS LABORATORY UNIVERSITY OF WASHINGTON 1013 NE 40TH ST. SEATTLE, WA 98105			
MANAGER:	-				
ENGINEER:	K. ZACK	TITLE: INPUT AND GROUND FAULT BOARD, IGB, BLOCK DIAGRAM, MARS			
DRAWN BY:	K.ZACK				
PRINT DATE:	8/14/2023				
PAGE CREATION: 12/14/2021		SIZE: D	CAGE CODE: 98514	DWG NO: 86252	REV 1.15
CAD FILE: MARS Block Diagrams.vsdx				SHEET 1 OF 5	

NOTES:

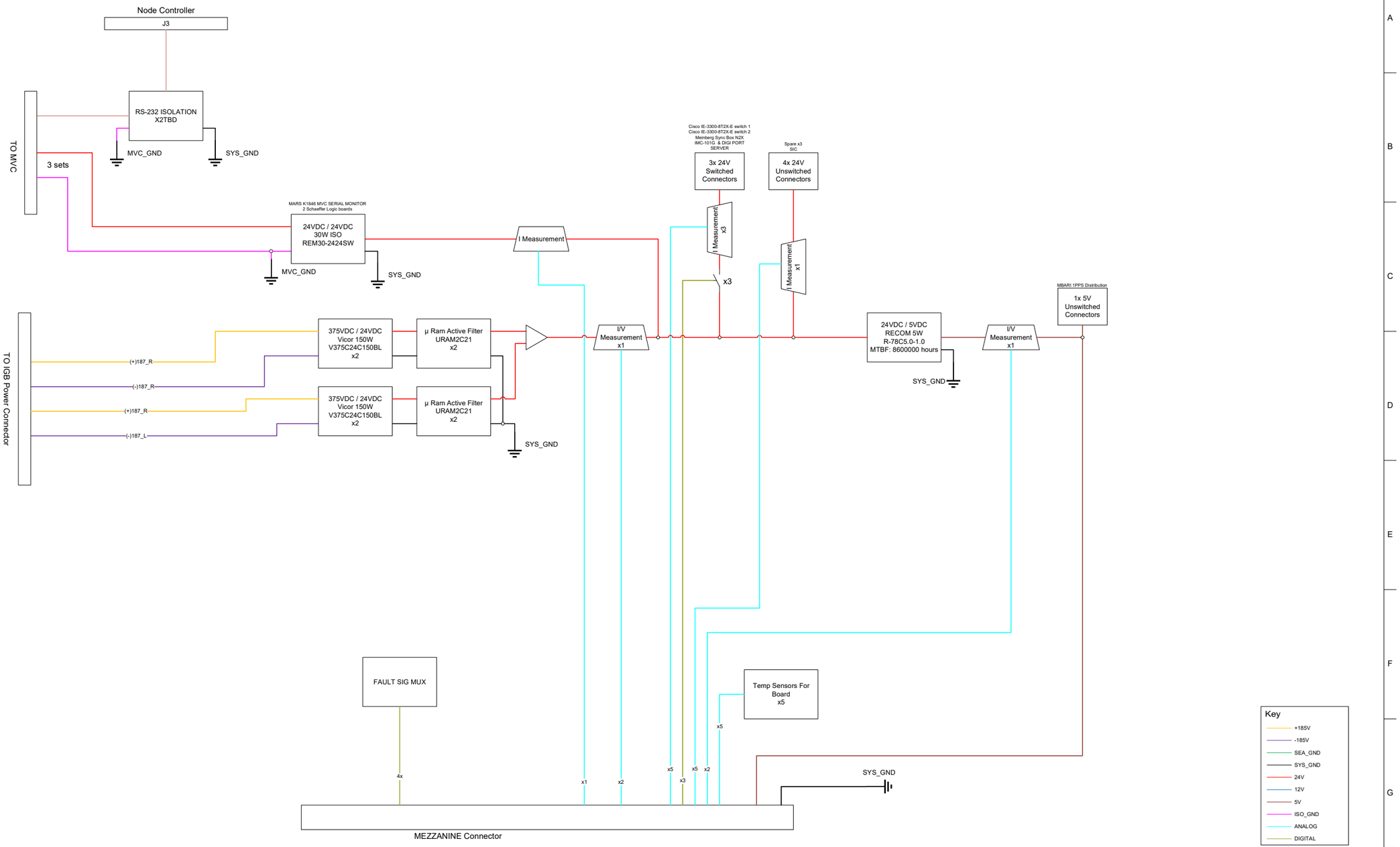
DIODES MUST BE PLACED IN POWER PATH BETWEEN INSTRUMENT CONNECTIONS AND ANY PATH THROUGH SUPPLY SIDE SEA WATER CLAMP CIRCUITY FOR GROUND FAULT CIRCUITY TO FUNCTION.

BEST PRACTICE EMI/EMC CIRCUIT MUST BE USED ON ANY SWITCHING DC-DC SUPPLIES.

SWITCHED CIRCUITS SHALL HAVE CURRENT MEASUREMENTS. NON-SWITCHED CIRCUITS WILL BE PART OF THE BUS MEASUREMENTS.

A RS-232 ISOLATION CIRCUIT SHALL BE PROVIDED TO COMMUNICATED WITH MVP BOTTLE

NO PART OF THE CIRCUIT SHALL HAVE NON-GALVANICALLY ISOLATION CONNECTION TO CHASSES AND SEA WATER GROUND.



PI:	T. MCGINNIS
MANAGER:	-
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PRINT DATE:	8/14/2023

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TITLE: HOTEL POWER BOARD, HPB BLOCK DIAGRAM, MARS

PAGE CREATION:	SIZE:	CAGE CODE:	DWG NO:	REV
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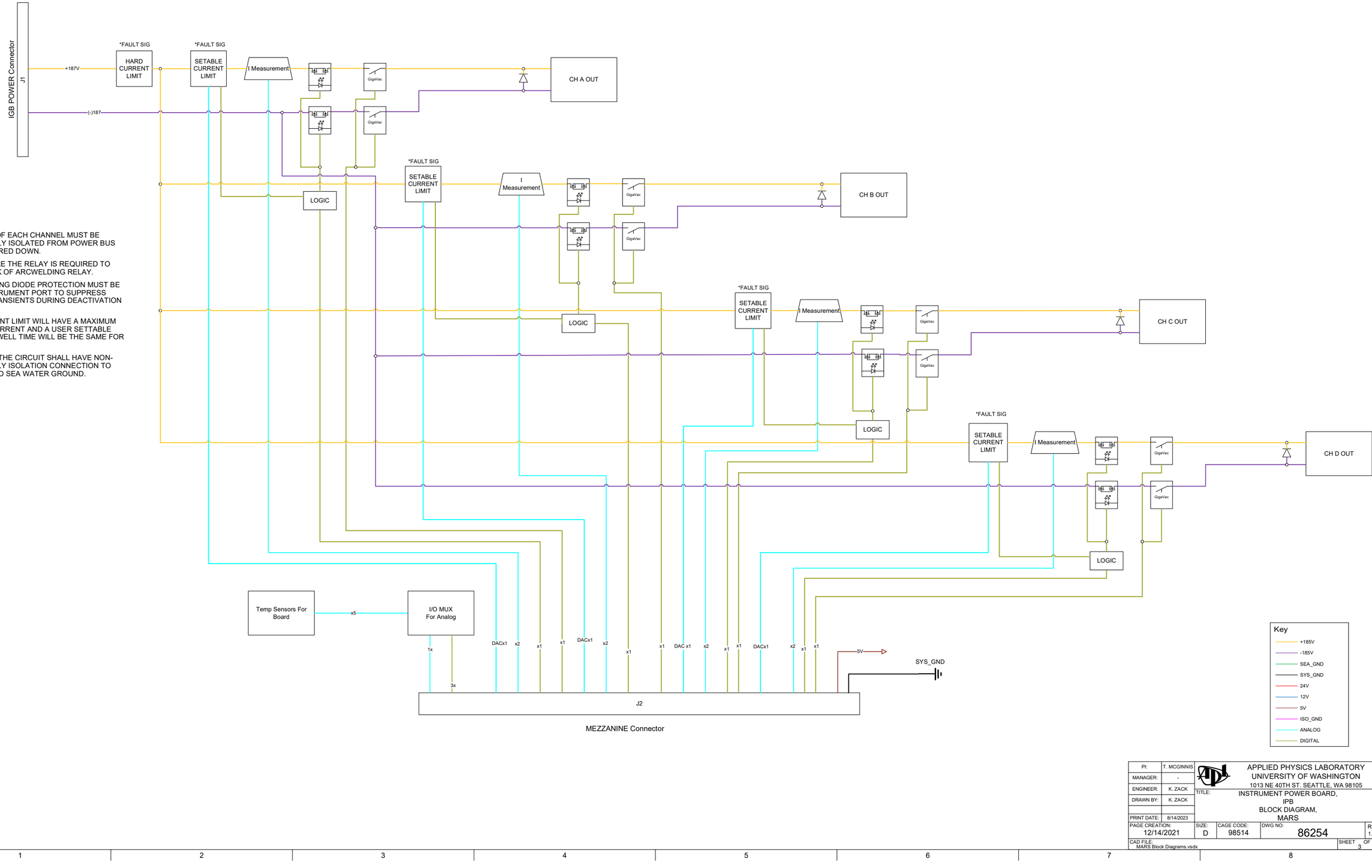
CAD FILE: MARS Block Diagrams.vsdx

SHEET 2 OF 5



NOTES:

BOTH LEGS OF EACH CHANNEL MUST BE GALVANICALLY ISOLATED FROM POWER BUS WHEN POWERED DOWN.

A SSR BEFORE THE RELAY IS REQUIRED TO REDUCE RISK OF ARCWELDING RELAY.

FREEWHEELING DIODE PROTECTION MUST BE ON ANY INSTRUMENT PORT TO SUPPRESS VOLTAGE TRANSIENTS DURING DEACTIVATION OF PORT.

EACH CURRENT LIMIT WILL HAVE A MAXIMUM ALLOWED CURRENT AND A USER SETTABLE CURRENT. DWELL TIME WILL BE THE SAME FOR BOTH.

NO PART OF THE CIRCUIT SHALL HAVE NON-GALVANICALLY ISOLATION CONNECTION TO CHASSES AND SEA WATER GROUND.

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TITLE: INSTRUMENT POWER BOARD, IPB
BLOCK DIAGRAM, MARS

SIZE:	CAGE CODE:	DWG NO:	REV
D	98514	86254	1.15

CAD FILE: MARS Block Diagrams.vsdx

SHEET 3 OF 5

OBSOLETE SEE OVERALL BLOCK DIAGRAM
(LEFT FOR HISTORICAL CONTEXT)

BULKHEAD

J1

J2

IPB 1

IPB 2

Samtech ESQ-132-14-G-D x2

Input and GF Board

Samtech ESQ-132-14-G-D x2

Hotel Power Board

Samtech ESQ-132-14-G-D x2

Mezzanine Breakout

CTI Xtreme I/O ADC-DAC 2
DAG003

CTI Xtreme I/O ADC-DAC 1
DAG003

VersaLogic BayCat
VL-EPM-31

PC104 POWER SUPPLY
VL-EPM-PS1

Cisco IE-3300-8T2X-E Switch 1

Cisco IE-3300-8T2X-E Switch 2

MBARI 1PPS Distribution

Meinberg Sync
1PPS

P1

P2

P3

P4

P5

P6

P7

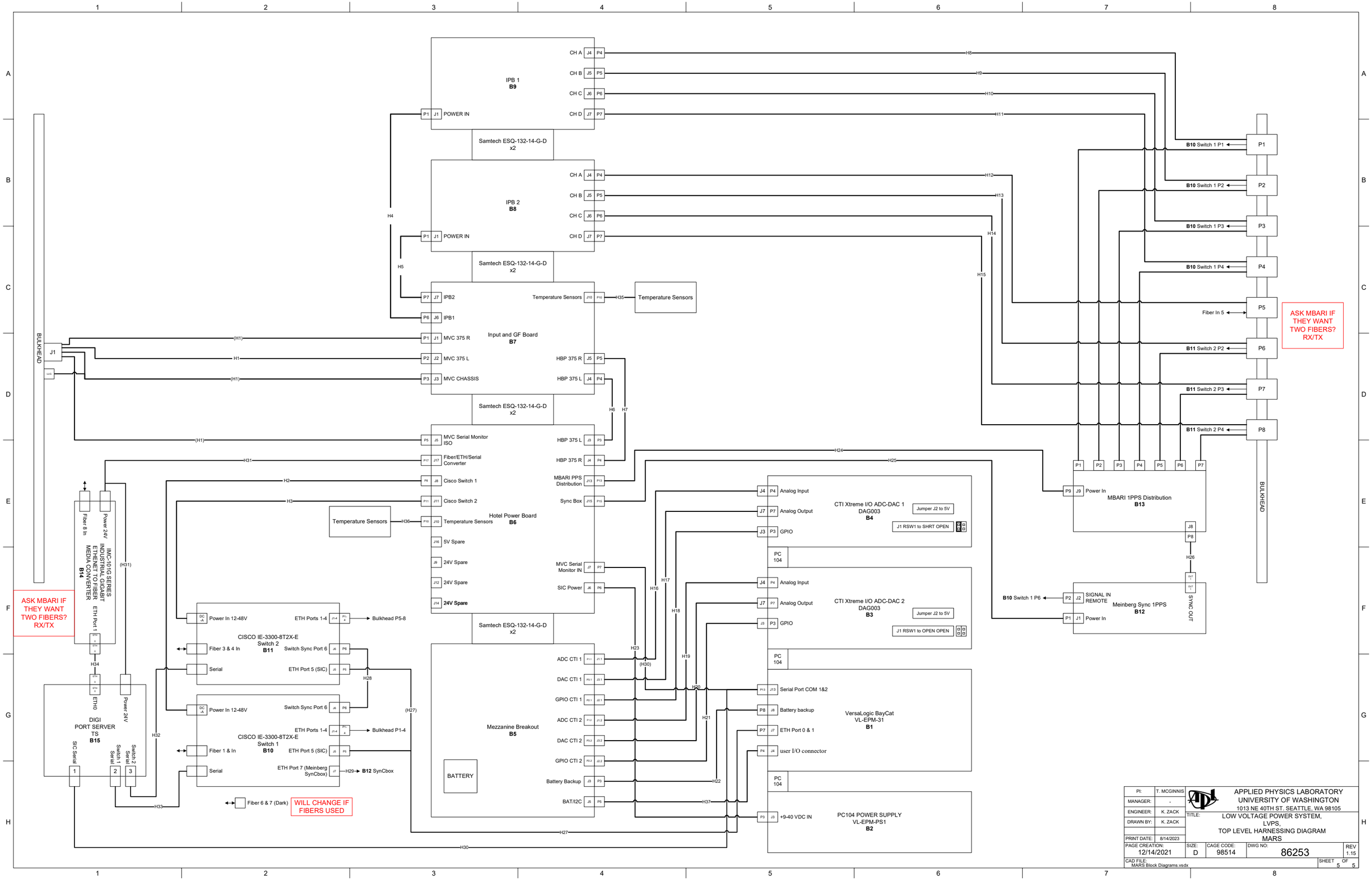
P8

BULKHEAD

Key

- +/-185V
- 1PPS
- 24V
- 5V
- ISO 24V
- FIBER
- RS232
- ANALOG
- ETHERNET

PI:	T. MCGINNIS	APPLIED PHYSICS LABORATORY UNIVERSITY OF WASHINGTON 1013 NE 40TH ST. SEATTLE, WA 98105			
MANAGER:	-				
ENGINEER:	K. ZACK	TITLE: LOW VOLTAGE POWER SYSTEM, LVPS, BLOCK DIAGRAM, MARS			
DRAWN BY:	K. ZACK				
PRINT DATE:	8/14/2023				
PAGE CREATION: 12/14/2021		SIZE: D	CAGE CODE: 98514	DWG NO: 86253	REV 1.15
CAD FILE: MARS Block Diagrams.vsdx				SHEET 4 OF 5	



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MANAGER:	-		
ENGINEER:	K. ZACK	TITLE: LOW VOLTAGE POWER SYSTEM, LVPS, TOP LEVEL HARNESSING DIAGRAM MARS	
DRAWN BY:	K. ZACK		
PRINT DATE:	8/14/2023		
PAGE CREATION: 12/14/2021	SIZE: D	CAGE CODE: 98514	DWG NO: 86253 REV 1.15
CAD FILE: MARS Block Diagrams.vsdx			SHEET 5 OF 5