

**DIGITAL CONVERSION ADDENDUM
FOR PORTABLE DIGITAL SCALER OPTION
(MODEL 3, 3A, 5, 12, 14C, 15, 16, & 18)
Revised
July 2024**

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LUDLUM MEASUREMENTS, INC
501 OAK STREET, P.O. BOX 810
SWEETWATER, TEXAS 79556
325-235-5494, FAX: 325-235-4672

LUDLUM MEASUREMENTS, INC.

501 OAK ST. / P.O. BOX 810
SWEETWATER, TEXAS 79556
Phone: 325-235-5494 800-622-0828 (USA)
Fax: 325-235-4672 E-Mail: ludlum@ludlums.com
Website: <http://www.ludlums.com> FEIN 75-1085764

**DESIGNER AND MANUFACTURER****OF***Scientific and Industrial
Instruments*

Digital Conversion Addendum July 2024

This unit has been modified to add a scaling digital readout in addition to its analog meter. The 5 ½ digit scaler readout can display counts up to “199999.” Any count greater than 199999 will generate an overflow and will be shown on the LCD display as a “←199999.”

When the unit is turned on, the following will be displayed on the LCD display:

- Test of all LCD segments
- Program number (example 36301)
- Program revision (example n02)
- The current setting of the count-time rotary switch (0.1, 0.5, 1, 2, or 10)
- “0” zero, indicating the unit is ready

The scaling time is selected by a rotary switch mounted on the bezel. The selections are 0.1, 0.5, 1, 2, and 10-minute counts. The count is started by depressing and releasing the button mounted at the end of the instrument handle. The scaling accuracy is 2% of reading or better. The count can be stopped by pressing and releasing the count button a second time.

When added to a unit with a window, or upper level discriminator control, the count is the result of the window setting. When the WIN switch is in the IN position, only the pulses within the window are counted. When the window is in the OUT position, all pulses are counted.

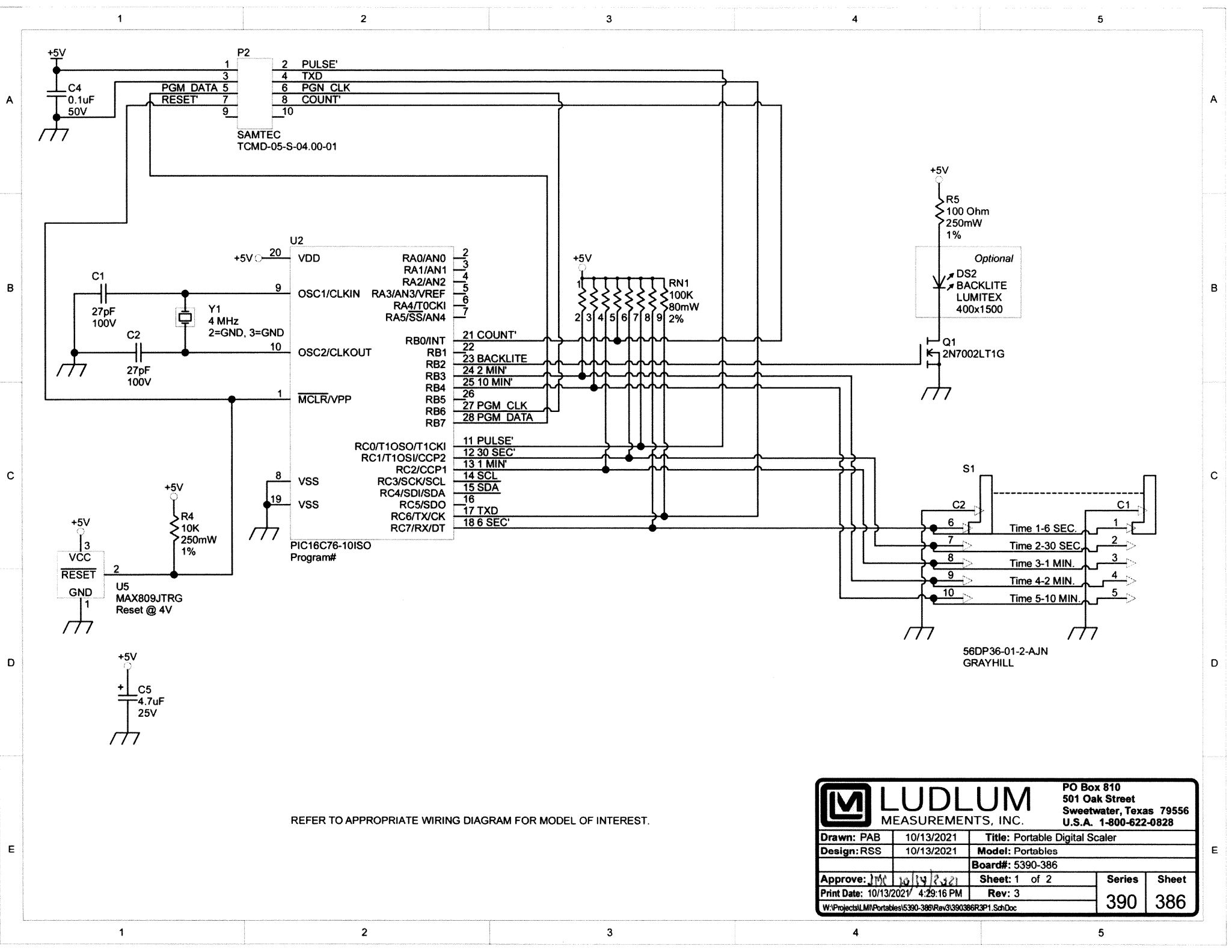
LUDLUM MEASUREMENTS, INC.

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Parts List

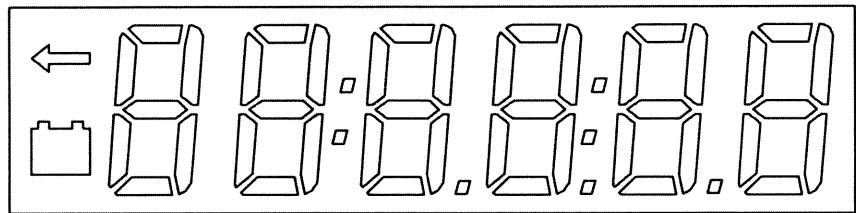
*	Portable Scaler Option	4464-114
Quantity	Description	Part No.
1	Knob	08-6601
1	RECPT-142-0701-406	13-8443
1	Meter-Zero Adjust	15-8065
2	Screw-2-56 X 1/8 FIL	17-8927
4	Screw-6-32 X 1 1/8 BH	17-8929
2	Screw-2-56 X 1/2 FIL HD	17-8960
2	Spacer-2-56 X .50 M-F	18-9112
2	Spacer-#4 X .250 NYL .187D	18-9180
2	Spacer-#4 X .156 1/4R ALUM	18-9899
2	Washer-#2 ITLW	20-9007
2	Washer-#4 ITLW	20-9008
1	Portable Bezel w/glass (Dig)	4464-125
1	Portable Digital Display Board	5390-386
1	Portable Digital Interconnect Board	5390-261
1	Portable Digital Meter Face	7464-124
1	Harness-Portable Scaler Option	8464-140
1	Digital Nameplate	9363-714



REFER TO APPROPRIATE WIRING DIAGRAM FOR MODEL OF INTEREST.

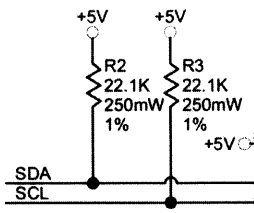
		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
		Drawn: PAB Design: RSS	10/13/2021 10/13/2021
Approve: [Signature] Print Date: 10/13/2021 4:29:16 PM	10/13/2021 4:29:16 PM	Sheet: 1 of 2 Rev: 3	390 386
W:\Projects\LMN\Portables\5390-386\Rev3\390386R3P1.Sch.Doc			

DS1
S-TEK GD-7427WP



1 Arrow
2 Battery
25 COM

6A 6B Digit6
6C 6D
6E 6F
6G
5A 5B Digit5
5C 5D
5E 5F
5G
Colon2
4A 4B Digit4
4C 4D
4E 4F
4G
DP3
3A 3B Digit3
3C 3D
3E 3F
3G
Colon1
DP2
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2E 2F
2G
DP1
1A 1B Digit1
1C 1D
1E 1F
1G

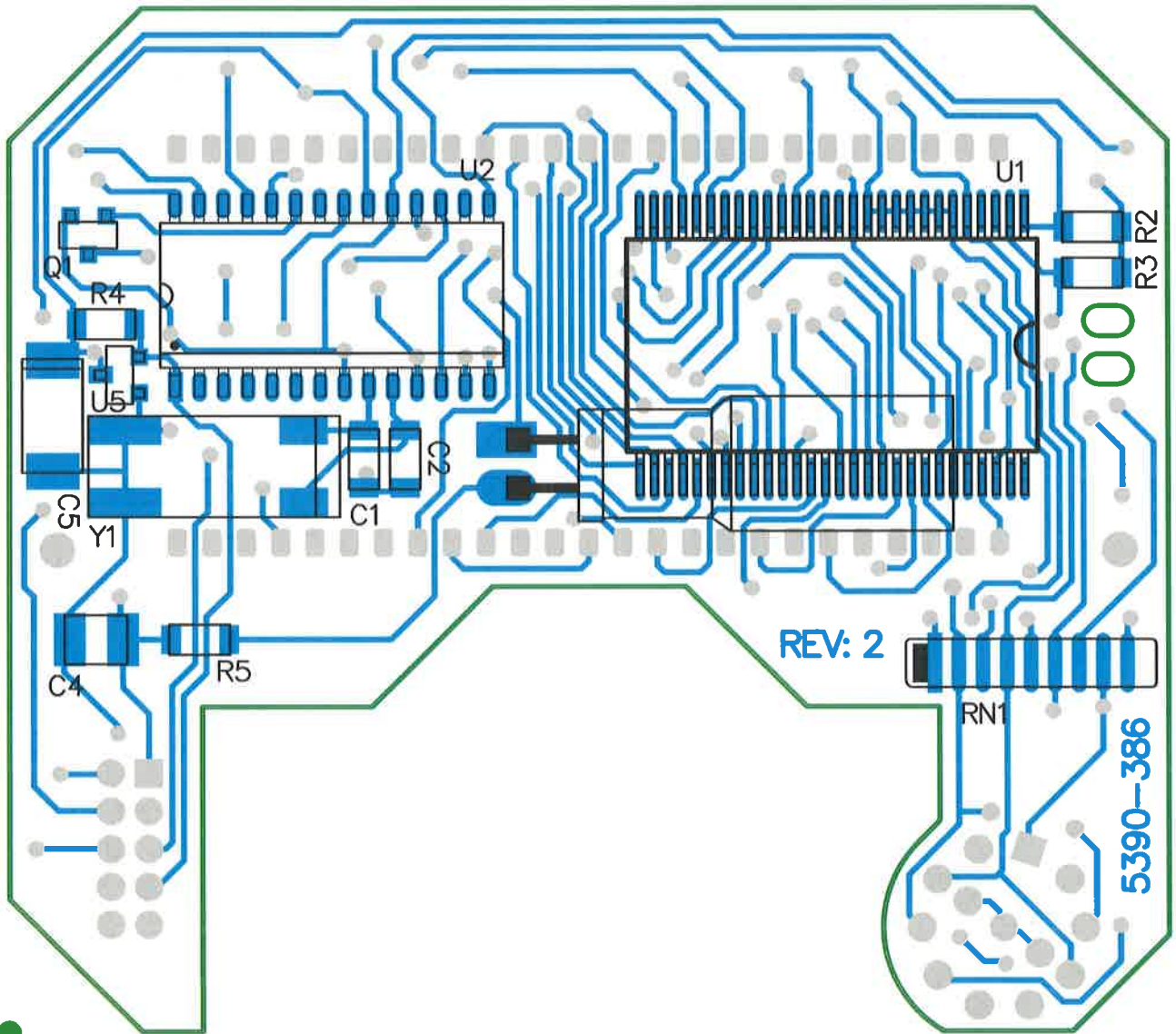


U1	5	VDD	S0	17	A1
	1	SDA	S1	18	B1
	2	SCL	S2	19	C1
	3	SYNC	S3	20	D1
	4	CLK	S4	21	E1
	6	OSC	S5	22	F1
			S6	23	G1
	7	A0	S7	24	A2
	8	A1	S8	25	B2
	9	A2	S9	26	C2
	10	SA0	S10	27	D2
			S11	28	E2
			S12	29	F2
			S13	30	G2
	13	BP0	S14	31	A3
	14	BP1	S15	32	B3
	15	BP2	S16	33	C3
	16	BP3	S17	34	D3
			S18	35	E3
			S19	36	F3
			S20	37	G3
	12	VLCD	S21	38	A4
			S22	39	B4
			S23	40	C4
			S24	41	D4
			S25	42	E4
			S26	43	F4
			S27	44	G4
			S28	45	A5
			S29	46	B5
			S30	47	C5
			S31	48	D5
			S32	49	E5
			S33	50	F5
			S34	51	G5
			S35	52	COLON
			S36	53	ARROW
			S37	54	ONE (MSB)
			S38	55	
			S39	56	

PCF8576CTD
PHILIPS SEMICONDUCTOR

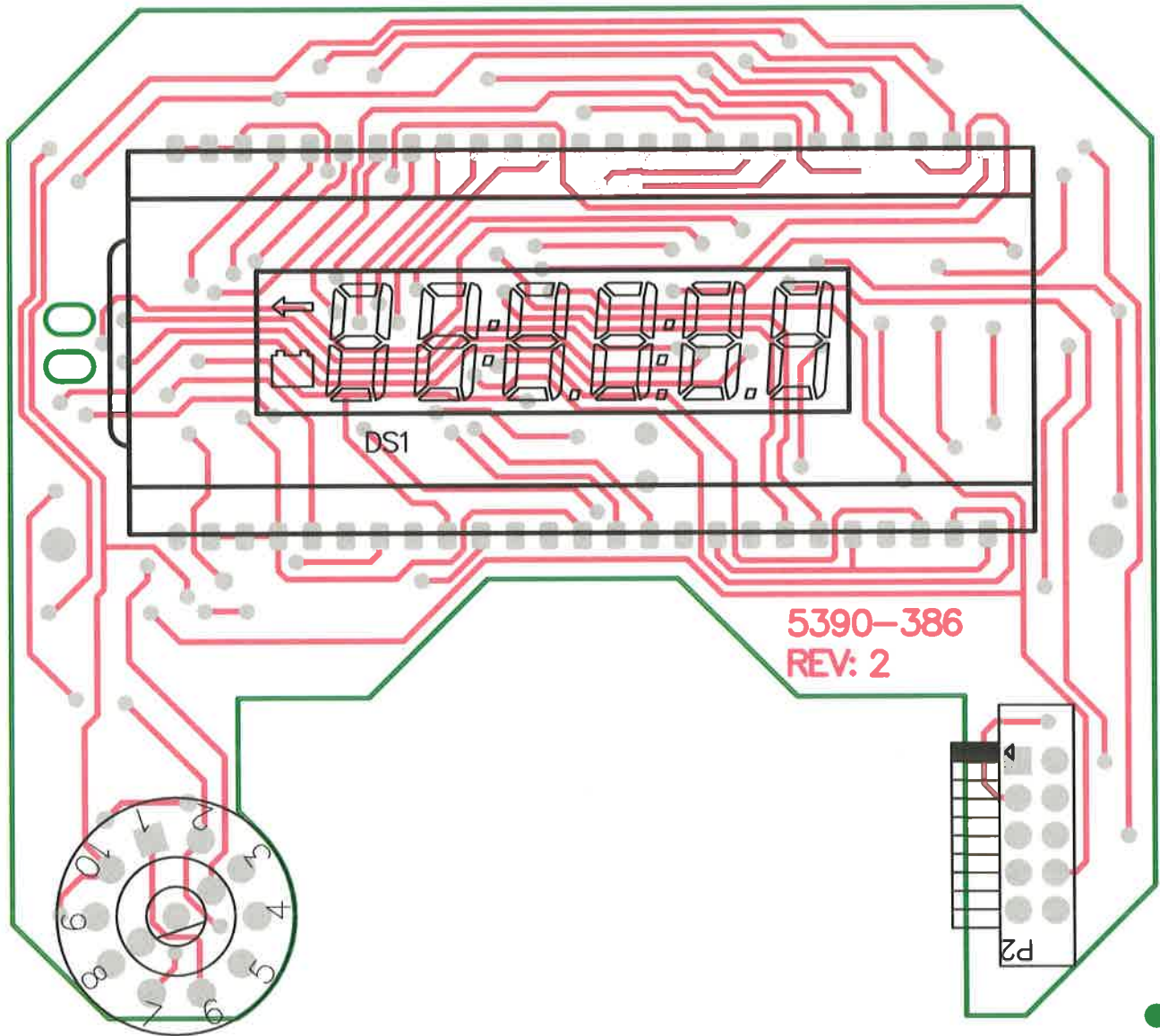
		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
		Drawn: PAB Design: RSS Approve: [Signature] Print Date: 10/13/2021 4:29:16 PM W:\Projects\LMN\Portables\5390-386\Rev3\390386R3P2.SchDoc	Title: Portable Digital Scaler Model: Portables Sheet: 2 of 2 Rev: 3

U2 PIC16C76
 MUST BE PROGRAMMED BY
 THE TECHNICIANS BEFORE
 PLACING ON BOARD




USE 7390-410 SPACER TO SET
 LCD SPACING WHEN SOLDERING.
 7390-410 IS 0.100" THICK.

		PO Box 810 501 Oak Street Sweetwater, TX 79556 U.S.A. 1-800-622-0828	
Title: Portable Digital Scaler			
Drawn: PAB	3/19/2020	Model: Portables	
Design: RSS	3/19/2020	Board#: 5390-386	
Approve: <i>JMT</i>	<i>3/19/2020</i>	Rev: 2	
PCBA Drawing		SCALE: 1.05	Series Sheet
Print Date: 8/17/2020	4:49:49 PM	Top Overlay	390 389
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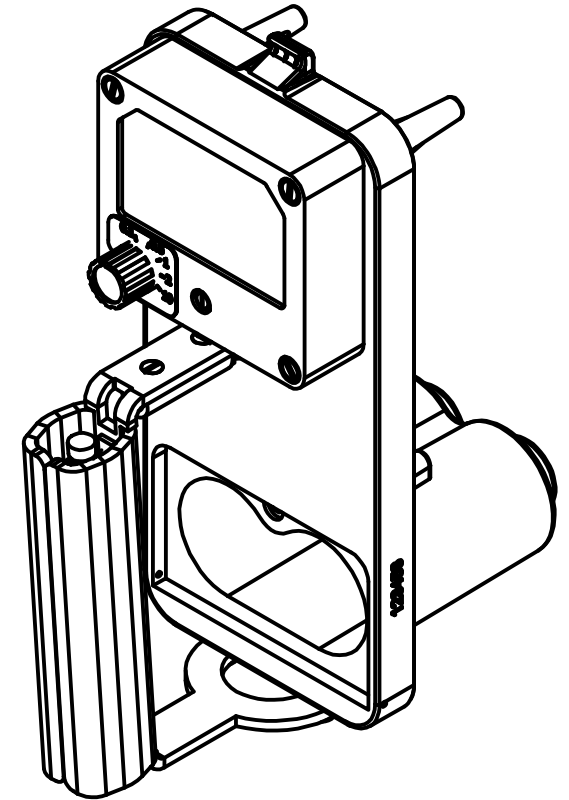
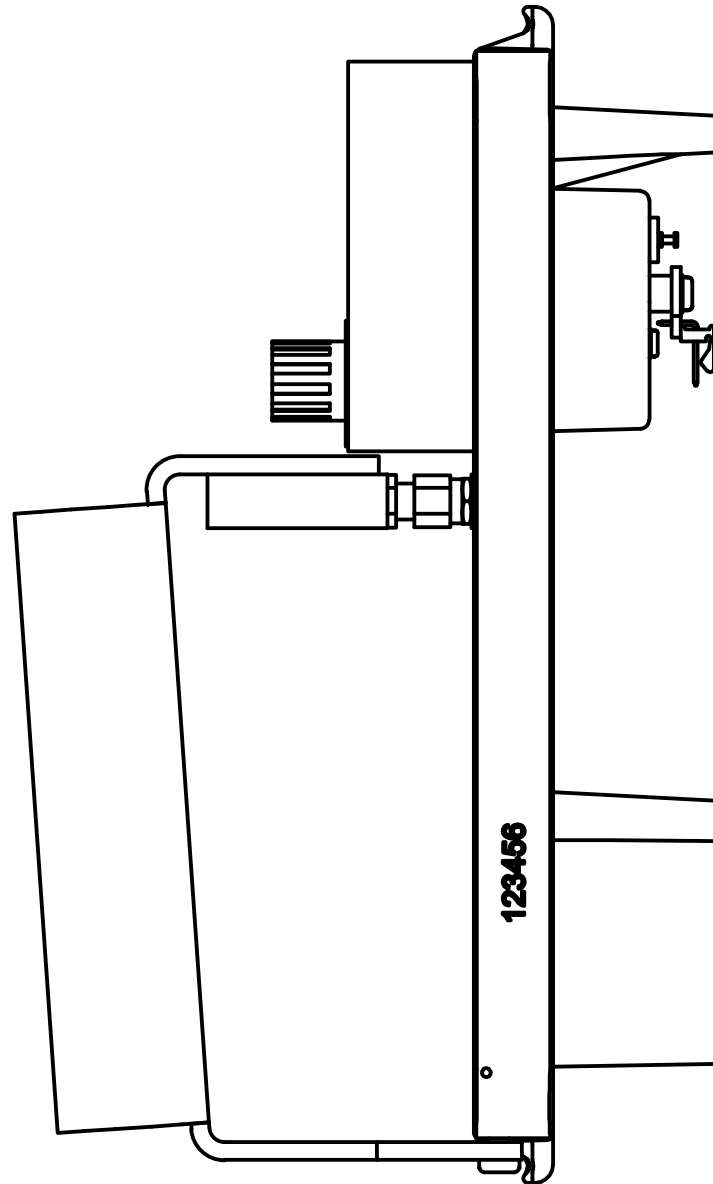
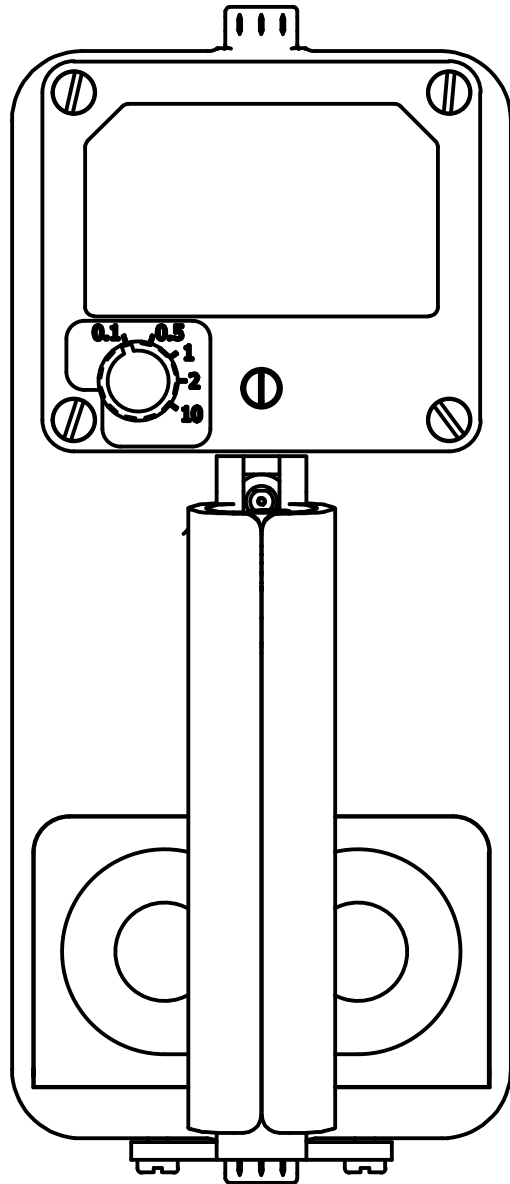



5390-386
REV: 2

 LUDLUM MEASUREMENTS, INC.		PO Box 810 501 Oak Street Sweetwater, TX 79556 U.S.A. 1-800-622-0828	
Title: Portable Digital Scaler			
Drawn: PAB	3/19/2020	Model: Portables	
Design: RSS	3/19/2020	Board#: 5390-386	
Approve: <i>JMS</i>	<i>28/19/2020</i>	Rev: 2	
PCBA Drawing		SCALE: 1.05	Series Sheet
Print Date: 8/17/2020 4:49:54 PM		Bottom Overlay	390 389
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REVISION HISTORY

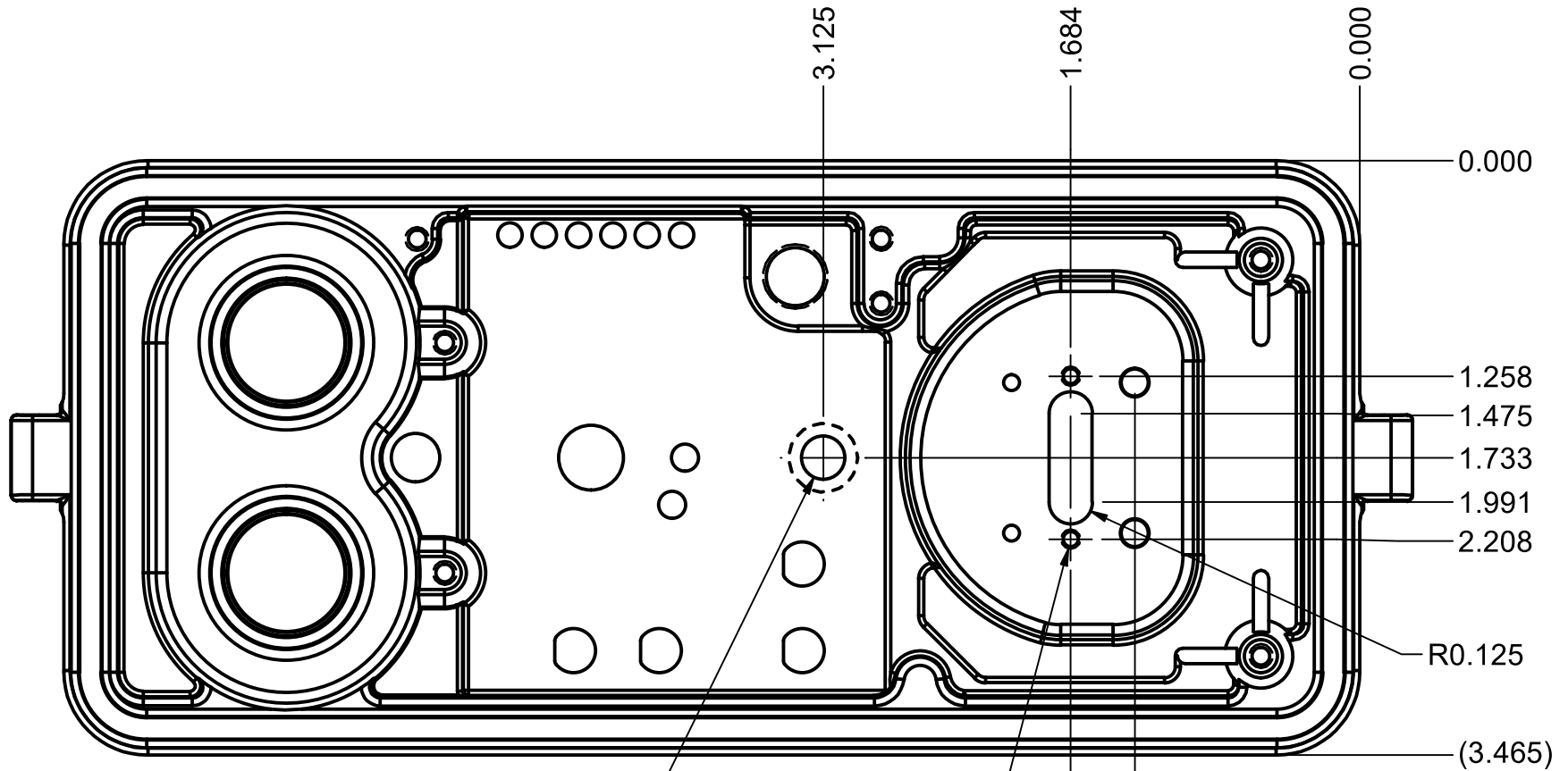
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2	ECF# 9490	07-02-24	ROH



DWN	DATE	DESIGN AUTHORITY	APP	DATE
ROH	07-02-24	JGWITT	WJM	7/10/2024
DWG NUM: 4464-114			SCALE: 3/4	
TITLE: PORTABLE SCALER OPTION				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23809		SERIES	SHEET	
		464	114	

STEP 1: REMOVE EXISTING METER FROM CASTING AND MACHINE CASTING PER DIMENSIONS BELOW.


REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	07-02-24	ROH



Ø0.250 THRU
MILL BOSS DOWN TO BE FLUSH
WITH INSIDE OF CASTING

2X Ø0.093 THRU
TAP 4-40 UNC

0.374

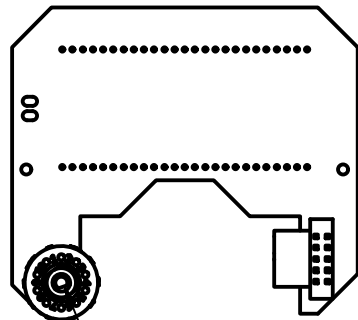
DESC: PORT. SCALER OPT. CASTING MOD				
MODEL NO.: --		PART NO.: 4464-114		
MAT'L.: PORTABLE CASTING				
MAT'L. NO.: --				SIZE: 1 EA
SAND CLASS: --	PAINT CLASS: --	COVERAGE CLASS: --	FINISH CLASS: --	CLEAN TYPE: --
FINISH: DEBURR AND CLEAN				
FINAL ASSY NO.: --				
DWN	DATE	DESIGN AUTHORITY	APP	DATE
ROH	07-06-24	JGWITT	WJM	7/10/2024
TOLERANCES:				SCALE: 1:1
UNLESS NOTED OTHERWISE				
MILL, LATHE, SHEETMETAL= ± 0.005				
BENDS ON SHEETMETAL PARTS= ± 0.010 ANGLES= ± 1.0°				
ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23809		SERIES 464	SHEET 114A	

STEP 1: REMOVE NUT AND WASHER FROM DISPLAY BOARD SWITCH.
 W/ SWITCH TURNED AS SHOWN, INSERT STOPS BETWEEN
 POSITIONS 1 AND 10 AND BETWEEN POSITIONS 5 AND 6.
 APPLY COVER STICKER AND TIGHTEN NUT AND WASHER ON SWITCH.

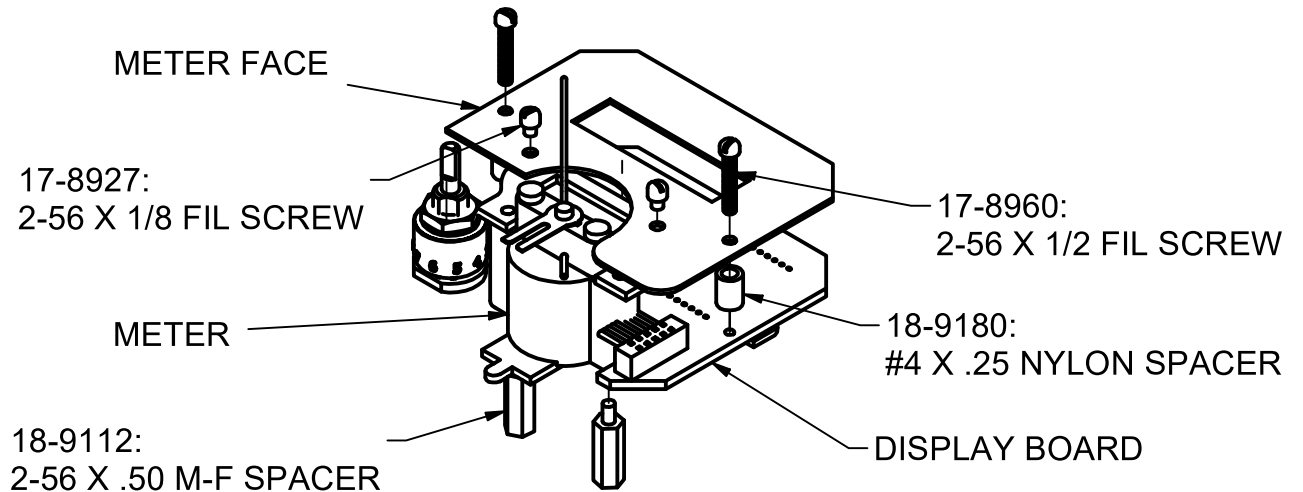
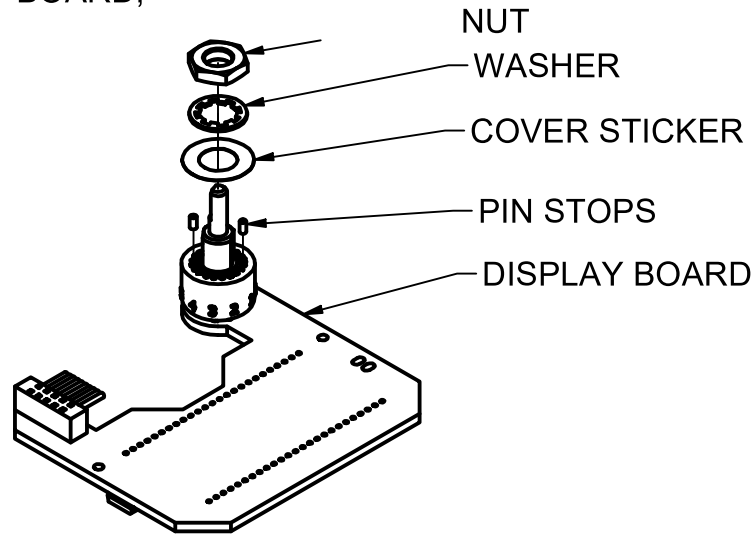
REVISION HISTORY


REV	DESCRIPTION	DATE	BY
1	VALID	09/01/05	PW
2	ECF# 1863	1/30/06	CMC
3	ECF# 9490	07-02-24	ROH

STEP 2: ASSEMBLE METER FACE, DISPLAY BOARD,
 AND SPACERS ONTO METER.



TURN SWITCH SO FLAT
 ALIGNS W/ POSITION 6



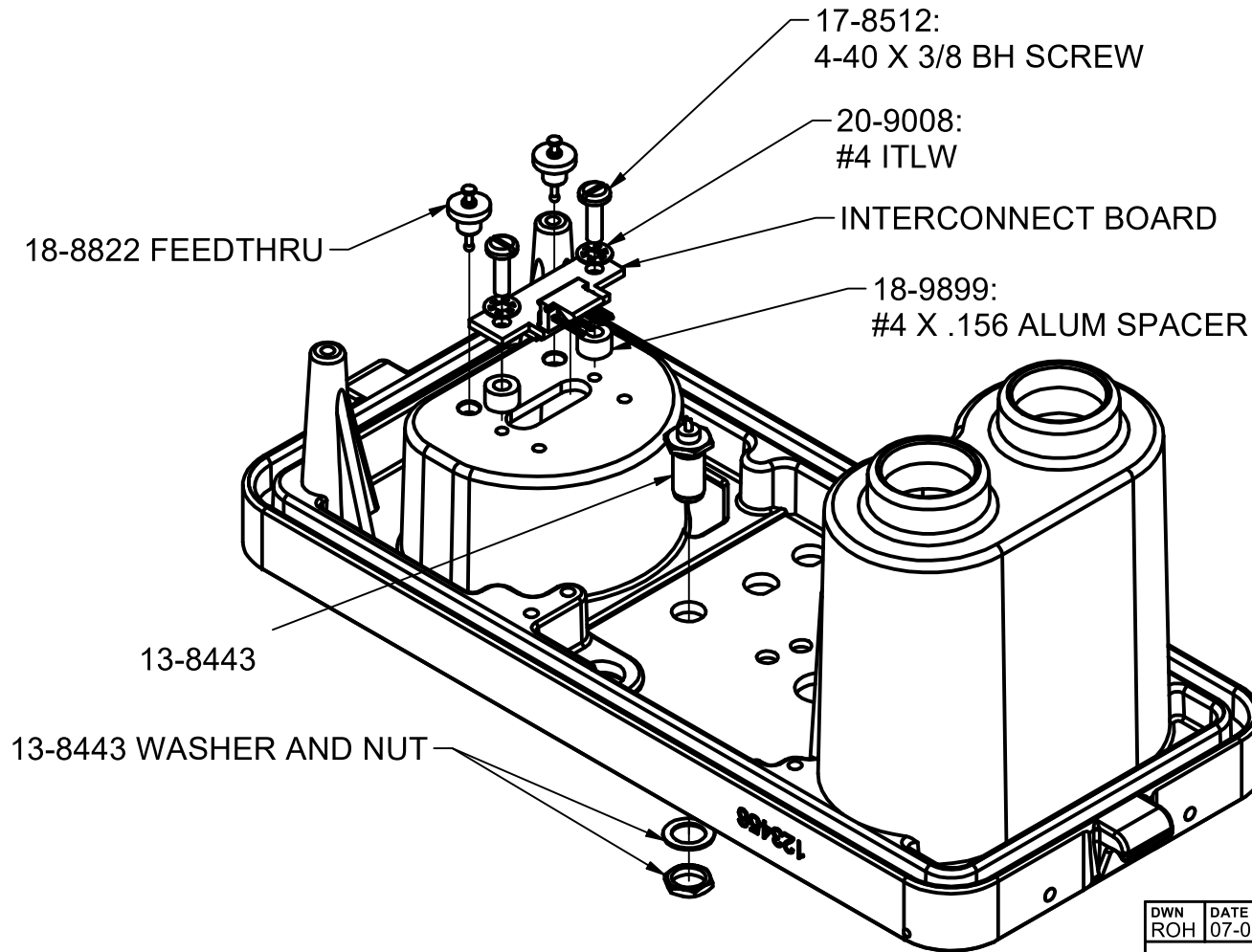
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DWG NUM: 4464-114			SCALE: 3/4	
TITLE: PORTABLE SCALER OPTION				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23609		SERIES 464	SHEET 114B	


STEP 3: ASSEMBLE INTERCONNECT BOARD, FEEDTHRUS, AND 13-8443 ONTO CASTING.

STEP 4: SOLDER GRN WIRE FROM 8464-140 ONTO 13-8442.

STEP 5: CONNECT MTA ON 8464-140 TO INTERCONNECT BOARD.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	03/13/06	PW
2	ECF# 9490	07-02-24	ROH



DWN ROH	DATE 07-02-24	DESIGN AUTHORITY JGWITT	APP WJM	DATE 7/10/2024
DWG NUM: 4464-114			SCALE: 3/4	
TITLE: PORTABLE SCALER OPTION				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23609		SERIES 464	SHEET 114C	

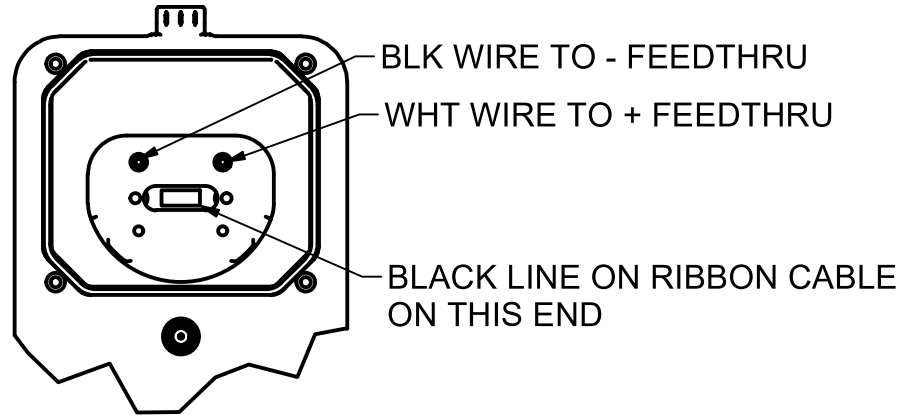
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	07-02-24	ROH

STEP 6: INSTALL BEZEL O-RING.

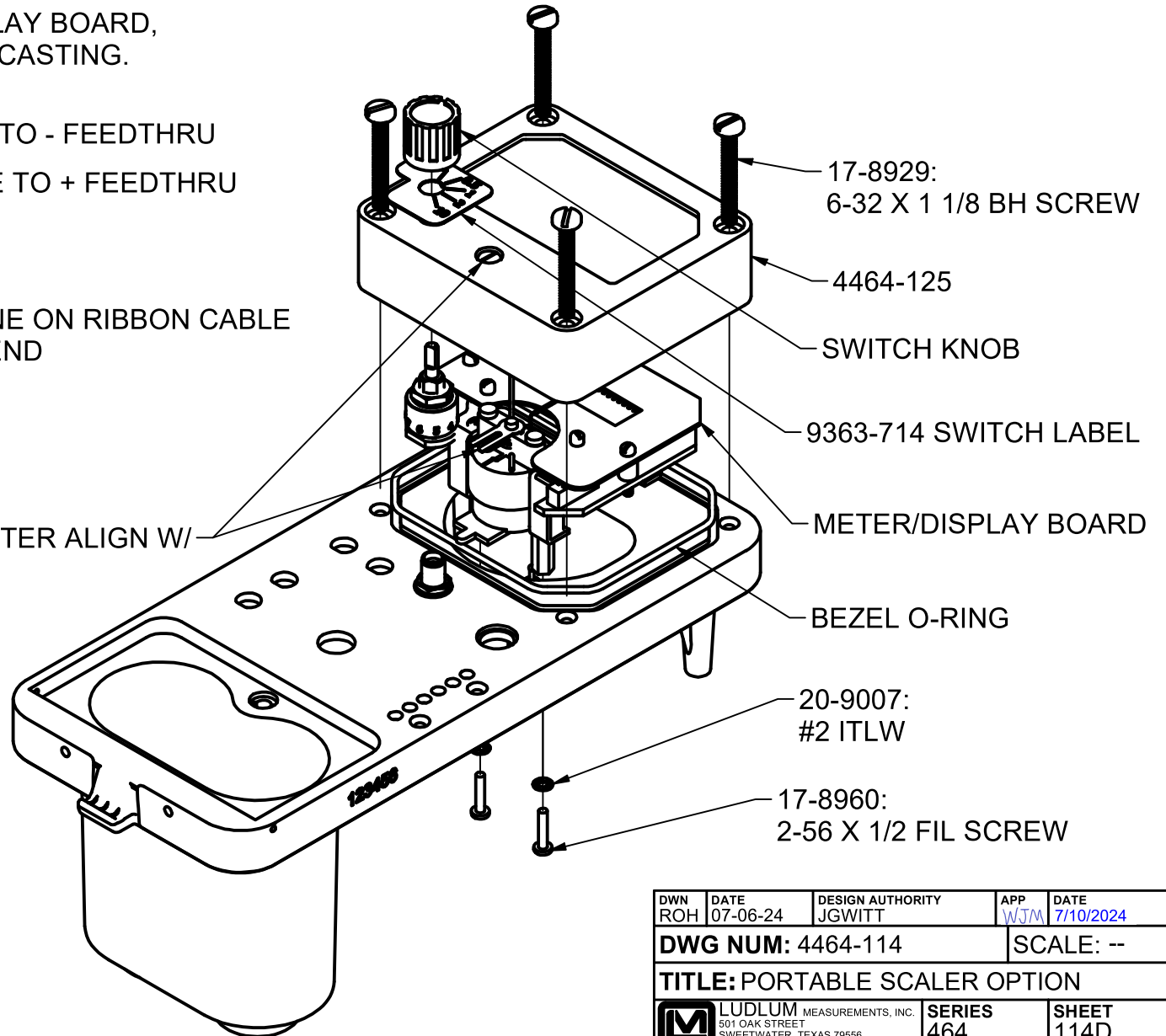
STEP 7: SOLDER METER WIRES TO FEEDTHRUS AND PLUG RIBBON CABLE FROM 8464-140 INTO INTERCONNECT BOARD.


STEP 8: ASSEMBLE METER/DISPLAY BOARD, LABEL, KNOB, AND BEZEL ONTO CASTING.



FEEDTHRU DETAIL

ENSURE ZERO FORKS ON METER ALIGN W/ ZERO ADJUST PIN ON BEZEL.



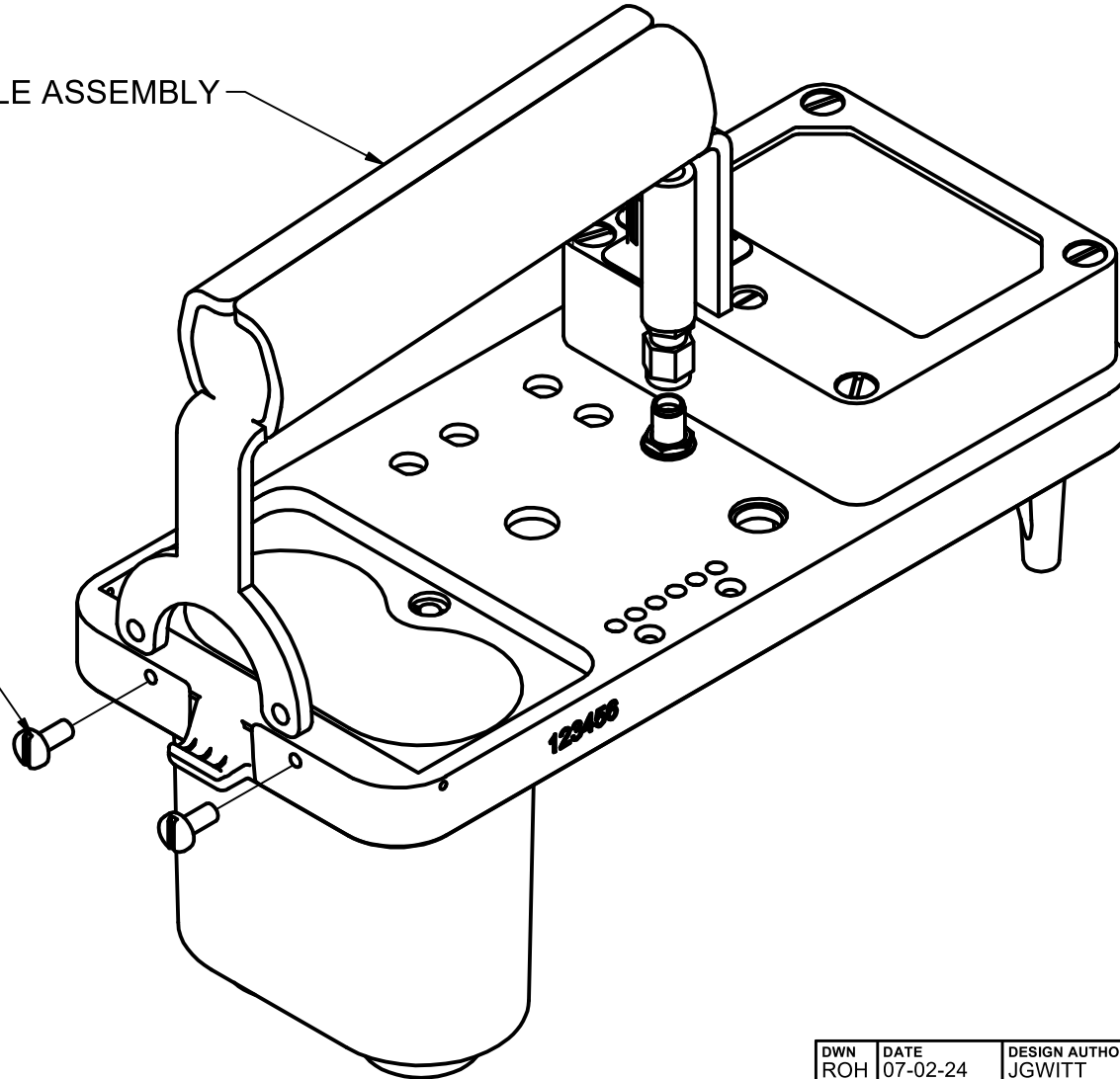
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DWG NUM: 4464-114			SCALE: --	
TITLE: PORTABLE SCALER OPTION				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23609		SERIES 464	SHEET 114D	


STEP 9: CONNECT HANDLE TO SMA RECEPTACLE ON CASTING.
 THEN INSTALL SCREWS IN END OF HANDLE.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	07-02-24	ROH

HANDLE ASSEMBLY

17-8519:
 6-32 X 5/16 BH SCREW



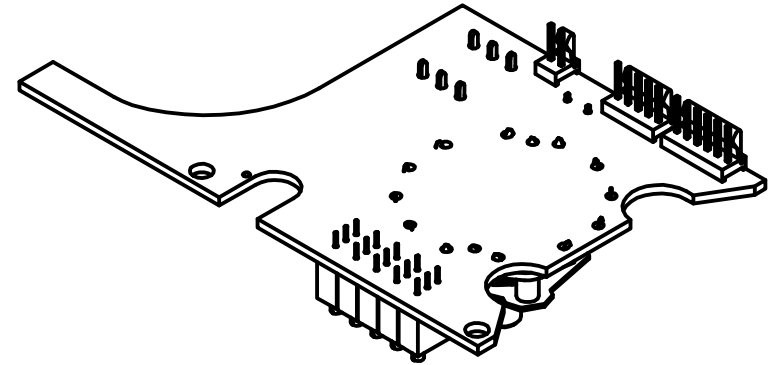
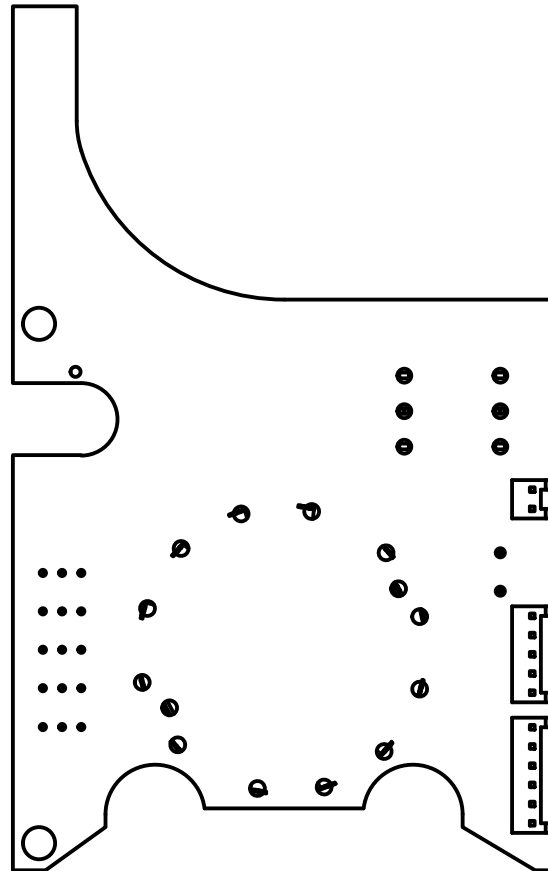
DWN ROH	DATE 07-02-24	DESIGN AUTHORITY JGWITT	APP WJM	DATE 7/10/2024
DWG NUM: 4464-114			SCALE: 3/4	
TITLE: PORTABLE SCALER MOD				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23809		SERIES 464	SHEET 114E	

FOR M 3, M 5, M 12, AND M 14C:
 SOLDER 13-8095 HEADER ON MAIN BOARD AS SHOWN.


TERMINATE RED, BLK, AND BRN WIRES OF 8464-140 INTO MTA 13-8171:
 PIN 1: RED
 PIN 2: BLK
 PIN 3: BRN

CONNECT 8464-140 MTA TO 13-8095 ON MAIN BOARD.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	07-02-24	ROH



13-8095 MTA HEADER

DWN ROH	DATE 07-09-24	DESIGN AUTHORITY JGWITT	APP WJM	DATE 7/10/2024
DWG NUM: 4464-114			SCALE: 1:1	
TITLE: PORT. SCALER MOD - M 3, 5, 12, 14C				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556 CAGE CODE: 23809		SERIES 464	SHEET 114F	