



TL103038

UNIVERSAL

AD

INSTALLATION

PROCEDURE



THIS DOCUMENT IS TO BE USED AS A GUIDE FOR MOUNTING THE RETARDER TO THE CHASSIS. REFER TO UNIVERSAL WIRING INSTALLATION PROCEDURE AS A GUIDE FOR INSTALLING CONTROL SYSTEM COMPONENTS.



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SECTION 1 PRE-INSTALLATION PREPARATION

1.1 RECOMMENED TOOLS

- Transmission Jack
- Hand held calculator
- Tape measure
- Standard assortment of mechanics hand tools
- ½" Heavy duty drill or frame drill
- Vehicle hoist, pit, or floor jack with stands
- Electronic angle meter (e.g. SPI Pro 360)

1.2 REQUIRED PARTS

Obtain the following parts prior to beginning the installation.

- Telma AD Retarder
- Flange Yokes (QTY 2)
- Universal Outside Mounting Kit – TIK03000 including:

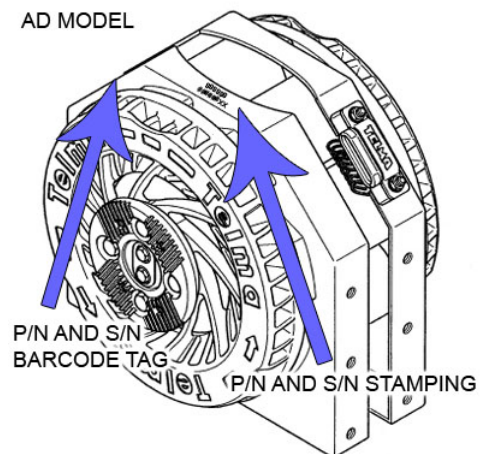
<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
JZ100280	SIDE PLATE FASTENERS	1
JZ1007XX-60	TELMA MOUNT KIT	1
TIB03104	CHASSIS BRACKET	2
TIB03105	LEFT SIDE RETARDER BRACKET	1
TIB03106	RIGHT SIDE RETARDER BRACKET	1
TIB03107	1/4" x 2" SQUARE WASHER	4
TIF05025	HEX FLANGE CAP SCREW 5/8-18UNF X 2"	10
TIF05026	GRIP FLANGE LOCK NUT 5/8-18UNF	10

1.3 REQUIRED INFORMATION

Submit an installation drawing request online via the Telma technical web page. Follow TIL103020 Driveline Pre-Installation Measurement Guide to obtain the necessary chassis information and measurements prior to submitting the installation drawing request. It is essential that an installation drawing is obtained for each individual vehicle prior to installation.

1.4 IDENTIFY RETARDER

Retarders are identified by their Part Number and Serial Number. These numbers are found on the barcode tag (Figure 2) and are also stamped into the top of the retarder (Figure 1). The Part Number is two letters followed by 6 numbers (Example: XX#####). This Part Number is labeled as "ref" on the barcode tag as shown below. The Serial Number is labeled as "n⁰" on the barcode tag and is composed of a series of 6 or more numbers.



SECTION 2 RETARDER INSTALLATION



PROCEED WITH CHASSIS PREPARATION ONLY AFTER OBTAINING INSTALLATION DRAWING FROM TELMA.

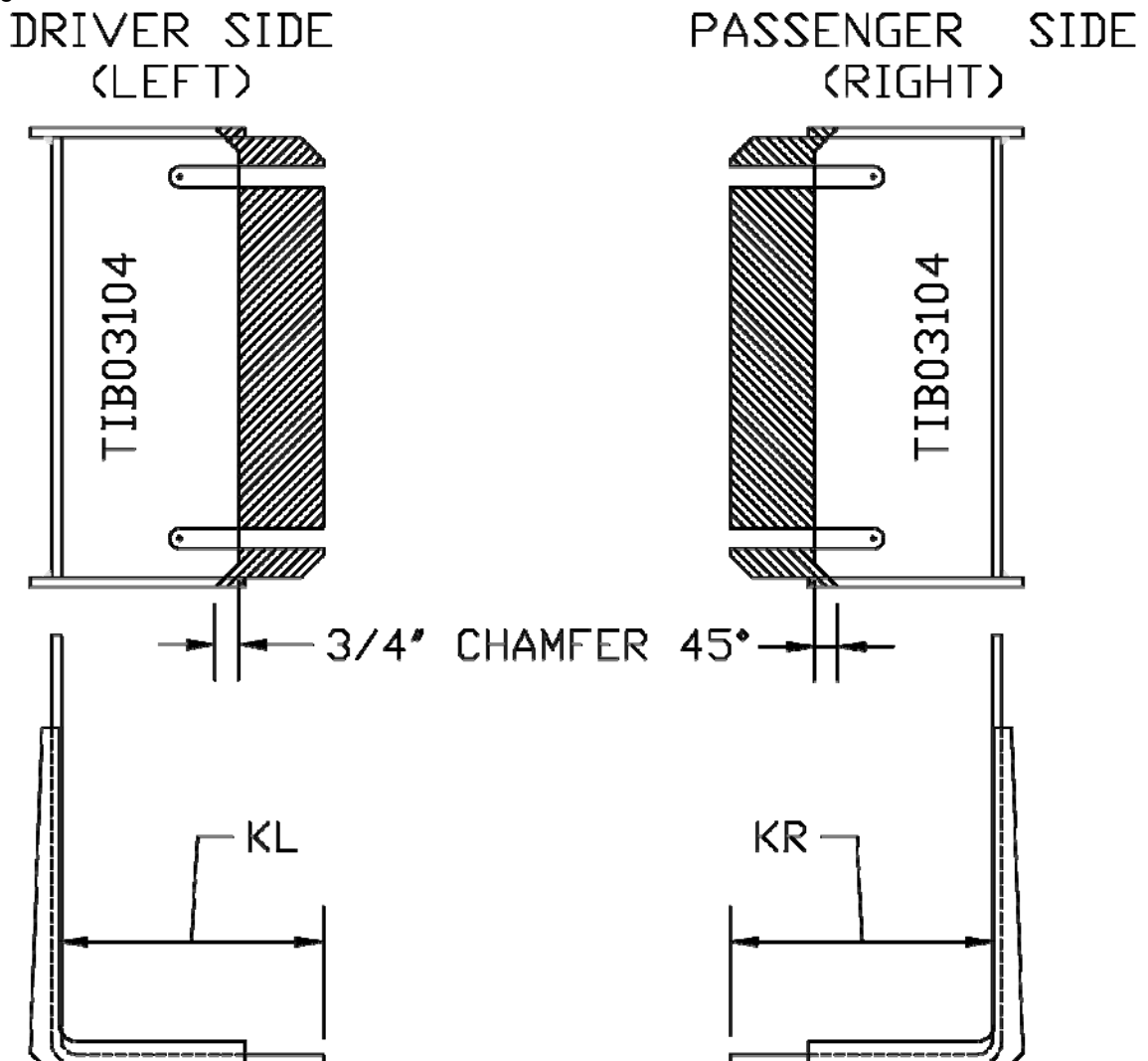


2.1 CHASSIS PREPARATION

- Remove the complete drive-shaft assembly after measurements have been taken.
- Identify any components in the chassis that may interfere with the retarder and/or mounting hardware.
- Keep all components at least 1/4" away from the retarder bracket.

2.2 TRIM THE CHASSIS BRACKETS

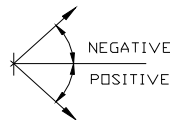
- Trim the short side of each chassis bracket to the dimension KL and KR. This will be found in the installation drawing. Make a 3/4" chamfer on the corners of the trimmed bracket.



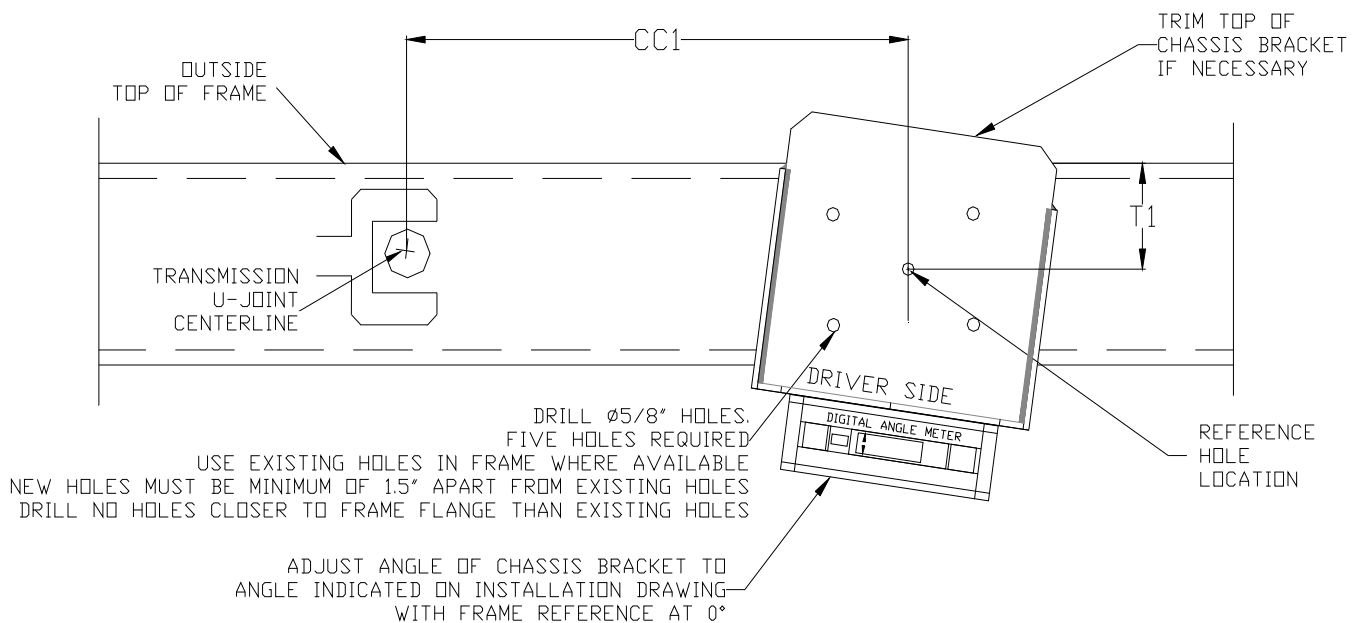
TRIM LEFT AND RIGHT SIDE CHASSIS BRACKETS TO DIMENSIONS SHOWN ON INSTALLATION DRAWING

2.3 INSTALL THE CHASSIS BRACKETS

- Locate the dimensions for the reference hole on page 1 of the installation instructions.
- Mark the position for the reference hole dimension T1 from the outside top of the frame and dimension CC1 from the center of the transmission u-joint.
- Drill a single 5/8" hole in the frame at the reference hole position.
- Align the reference hole drilled in the chassis bracket with the reference hole in the frame and assemble with a 5/8" bolt.
- Adjust the angle of the bracket to the angle indicated on page 1 of the installation instructions with the frame reference of zero degrees and tighten the bolt. Note the chassis bracket angle may be positive or negative.



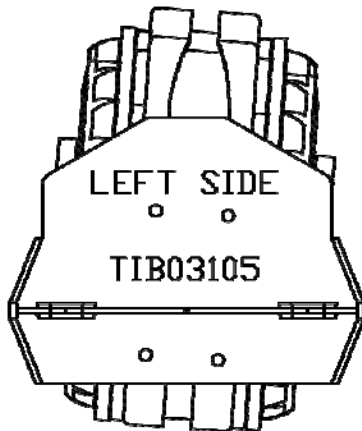
- Drill four 5/8" holes in each chassis bracket and frame rail evenly distributed across the chassis bracket. Use existing holes in frame where available. New holes must be a minimum of 1 1/2" apart from existing holes. Do not drill any holes closer to frame flange than existing holes. Keep new holes away from fuel and brake lines.
- Secure chassis bracket with bolts (TIF05025) and nuts (TIF05026) included with kit. Tighten the 5/8" bolts to 150 lb-ft.



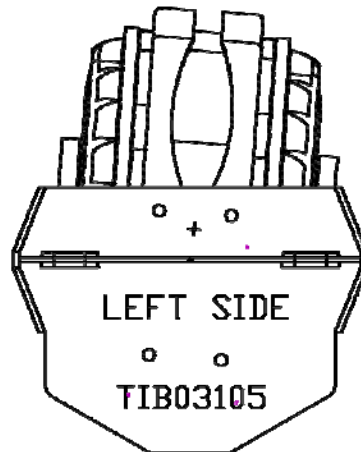
- Recheck chassis bracket angle after bolts are installed and tightened.

2.4 ASSEMBLY OF THE RETARDER BRACKETS AND MOUNTS

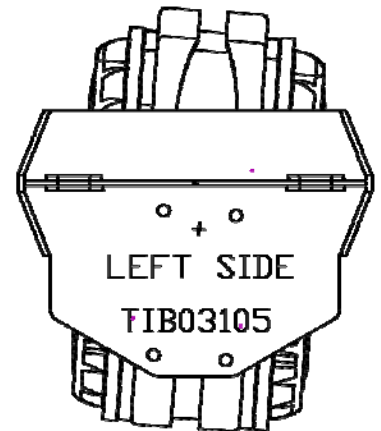
- Identify the driver's side of the retarder. To do so, orient the arrow of the red sticker on the retarder towards the axle with the red sticker on the left (driver's side). The connecting block should be on the top of the retarder.
- Identify the retarder brackets. The brackets are identified by the part number stamped into the outside center of the bracket. The left (driver's side) bracket is part number TIB03105. The right (passenger side) bracket is part number TIB03106.
- Locate the correct mounting position for the retarder brackets. Refer to your installation drawing. The brackets must be installed in the position indicated on the installation drawing.



POSITION 2



POSITION 3

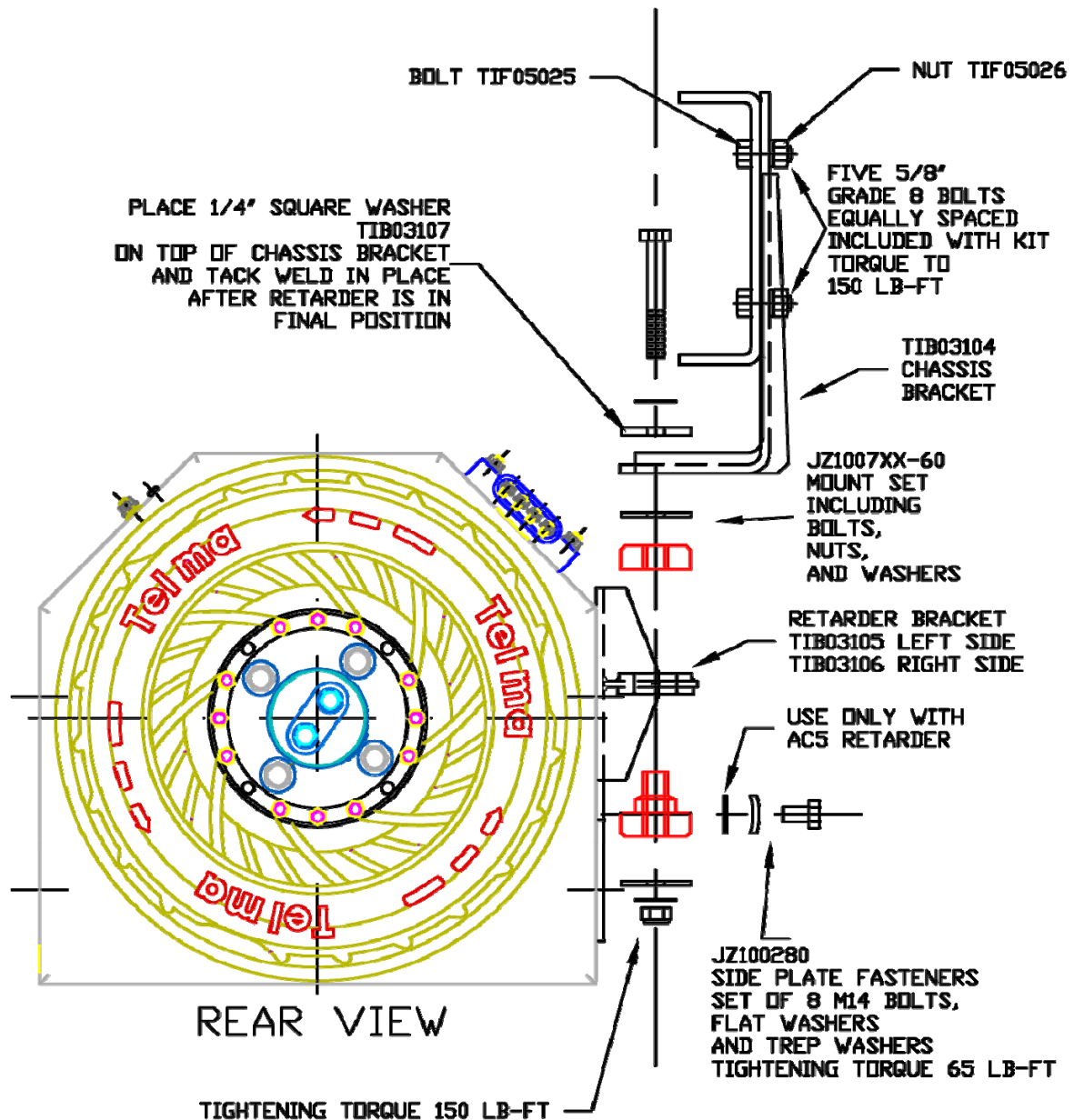


POSITION 4

- Install the brackets onto the retarder using fastener set JZ100280. Disregard the flat washer included in the JZ100280 fastener set as this flat washer is not used on the AD model retarders. Recheck to be sure that the brackets are installed in the correct position with the left (driver's side) bracket TIB03105 installed on left side of retarder and the arrow on the red sticker pointing towards the axle.
- Tighten the M14x2.0x30mm bolts (class 8.8) to 65 lb-ft

2.5 INSTALL THE RETARDER IN THE CHASSIS

- Lift the retarder on to a transmission jack and position it under the vehicle between the frame rails.
- Assemble the mounts to the brackets with the female portion of the mounts on the top side of the brackets. Install the male parts of the rubber mounts into the 1 5/8" holes in the brackets from the bottom.
- Place one 2-3/4" diameter 5/8" flat washer on the top. Lift the retarder into position.
- Place the 1/4" square washer on the top side of the chassis bracket. Place the spring washer on top of the square washer. Insert bolt.
- Place one 2-3/4" diameter 5/8" flat washer, spring washer, and all metal lock nut on the bolt and tighten to 150 lb.-ft ($\pm 10\%$).
- Tack weld 1/4" square washer in place after tightening mounts.



2.6 DRIVE SHAFT MODIFICATION AND INSTALLATION

- Install the flange yokes on the coupling flanges of the Telma. If flange yoke nuts are not supplied you will need to obtain grade 8 all metal lock nuts to install the flange yokes. Refer to chart below for thread size.
- Tighten lock nuts to specified torque in cross pattern. Refer to chart below for torque specifications.

DRIVELINE SERIES	E APPROXIMATE DISTANCE ACROSS LUGS	D APPROXIMATE BEARING DIAMETER	NUT DIAMETER AND THREAD PITCH	NUT TIGHTENING TORQUE (LB.-FT.)	FLANGE INDEX (LAST 3 DIGITS OF RETARDER PART NUMBER)	TELMA PART NUMBER	SPICER PART NUMBER
1350	3 7/8"	1 3/16"	7/16"-20	63-75	154	TIF01082	3-2-119
1410	4 7/16"	1 3/16"	7/16"-20	63-75	154	TIF01083	3-2-159
1410	4 7/16"	1 3/16"	1/2"-20	97-116	155	TIF01080	3-2-429
1480	4 7/16"	1 3/8"	1/2"-20	97-116	155	TIF01081	3-2-479
1480	4 7/16"	1 3/8"	3/8"-24	40-48	158	TIF01086	3-2-499
1550	5 1/4"	1 3/8"	1/2"-20	97-116	155	TIH05017	4-2-669
1550	5 1/4"	1 3/8"	3/8"-24	40-48	158	TIF01088	4-2-689
SPL 90/100	5"	1 5/8"	3/8"-24	40-48	158	N/A	90-2-19
1610	5 5/16"	1 7/8"	3/8"-24	40-48	158	TIF01091	5-2-279
1610	5 5/16"	1 7/8"	3/8"-24	40-48	152	TIF01090	5-2-629
SPL 140	5"	1 15/16"	3/8"-24	40-48	152/157*	N/A	140-2-19*
1710HR	6 3/16"	1 15/16"	3/8"-24	40-48	152	TIF01093	6-2-749-1
1710HR	6 3/16"	1 15/16"	7/16"-20	63-75	157	TIF01094	6-2-779-1
1760HR	7"	1 15/16"	7/16"-20	63-75	157	TIF01095	6.3-2-19-1
SPL 170	6 7/16"	2 3/16"	7/16"-20	63-75	157	N/A	170-2-19
1810HR	7 1/2"	1 15/16"	7/16"-20	63-75	157	TIF01097	6.5-2-329-1
SPL 250	6 7/16"	2 3/8"	7/16"-20	63-75	157	N/A	250-2-49-1



TAKE MEASUREMENTS FOR DRIVELINE LENGTHS PRIOR TO MODIFICATION OF SHAFTS. REFER TO INSTALLATION DRAWING L1 AND L2. MEASUREMENTS SHOULD BE CLOSE IF THE INSTALLATION IS CORRECT.



- A slip assembly is required on each side of the Telma. The slip position should be at center of slip travel when the shaft is installed.
- Refer to OEM and Spicer guidelines for proper drive shaft manufacture, balance, straightness, and critical speed limits.
- Shaft lengths over 50" should use 4" tubing.
- Install modified driveline.

SECTION 3 POST-INSTALLATION PROCEDURE

3.1 POST INSTALLATION CHASSIS MEASUREMENTS

- Obtain TL103032 Retarder Installation Checklist from Telma Technical webpage.
- Locate the measurement template that corresponds to your driveline layout.

If the vehicle is built with:

- One shaft in front of retarder, one shaft behind retarder, follow page 2 of TL103032
 - One shaft in front of retarder, two shafts behind retarder, follow page 3 of TL103032
 - One shaft in front of retarder, three shafts behind retarder, follow page 4 of TL103032
 - Two shafts in front of retarder, one shaft behind retarder, follow page 5 of TL103032
 - Three shafts in front of retarder, one shaft behind retarder, follow page 6 of TL103032
 - Two shafts in front of retarder, two shafts behind retarder, follow page 7 of TL103032
- Record chassis measurements on worksheet.
 - Use an electronic angle meter with 0.1° accuracy.
 - Always zero angle meter on chassis rail before taking measurements.
 - Measure transmission, retarder, and axle angles on clean machined surface of yoke.
 - Compare post installation measurements recorded on worksheet to the dimensions specified on the installation drawing. Contact Telma technical support at 800.797.7714 or send an email to engineering@telmacse.com if your post install measurements do not correspond to the drawing issued. Warranty could be denied if the Telma installation does not match the drawing issued.

3.2 CONTROL SYSTEM AND WIRING

After verifying that the retarder is installed in the correct position, and the driveline measurements match those specified on the installation drawing, it is time to begin the electrical installation. Obtain the universal wiring installation procedure from the Telma technical webpage. For Telma control systems that will be communicating with the vehicle via J1939, use TL103037 Universal Wiring Installation Procedure TRCM J1939. For non-CAN applications use TL103024 Universal Wiring Installation Procedure TRCM no CAN. Be sure to use the correct guide as the wiring diagrams differ based on the application. If you have any questions regarding which guide is right for you, visit www.telmausa.com, send an email to engineering@telmacse.com or call Telma technical support at 800.797.7714.