



Installation Manual InSight GLS 410 with EPM (External Power Module) LandStar Remote Antenna EPM Aluminum Roof Trailer

Kit Number: IST1AL-M1

Description: IST GLS 410 EPM Land Star Aluminum Roof

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SkyBitz, Inc.
22455 Davis Drive
Suite 100
Sterling, VA 20164
Phone: 1-866-875-9248
Fax: 703-478-3301
www.skybitz.com

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6,243,648, 6,480,788, 6,560,536, 6,725,158, 7,010,066 and 7,020,190.

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Revision History

Date	Change	Author	Rev
03/11/2010	Initial Release	D Parks	0.1
03/19/2010	Fixed GLS 400 references	D Parks	0.2

Forward

The purpose of this manual is to provide the installer with the proper installation techniques required to install the SkyBitz GLS 410 Remote Antenna with EPM System. This manual describes how to install this configuration on a variety of LandStar aluminum roof trailers:

Required SkyBitz Components

- SkyBitz GLS410 Mobile Terminal (**MT**)
- SkyBitz Borrom Feed Remote Antenna (**RAB**)
- External Power Module (**EPM**)
- Aluminum Roof Mounting Brackets (**XTB**)

Failure to follow all instructions in this manual will void the product warranty.

Following the installation conditions and procedures, in the order indicated in this manual, is necessary to ensure the SkyBitz Remote Antenna will form a safe, secure and water tight bond to the roof of the trailer.

CAUTION!

This installation procedure only pertains to ALUMINUM ROOF TRAILERS! Do not install the SkyBitz Remote Antenna on any fiberglass or composite roof trailer. Failure to follow these installation procedures could result in the remote Antenna Assembly separating from the vehicle resulting in possible injury or death! Call SkyBitz Customer Service before making any deviations from this Installation Procedure.

Important!

Should you have any questions or concerns regarding the Mobile Terminal installation process, contact SkyBitz Customer Support.

SkyBitz Customer Service (866) 875-9248

Customercare@SkyBitz.com

Contact SkyBitz prior to any deviations from the installation of the MT as described in this manual. SkyBitz will not be responsible for any loss or damage caused by improper Hardware installation.

SkyBitz GLS 410 EPM System Configuration

Introduction

The GLS 410 Configuration allows for a stealthy installation with only the SkyBitz Remote Antenna exposed on the roof of the trailer. The EPM provides

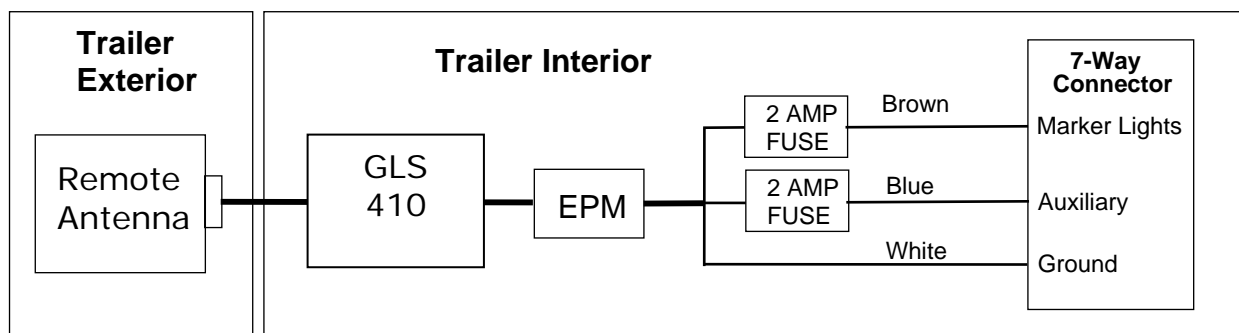
the tethered status of the trailer and a secondary source of power to the Mobile Terminal (MT).

This procedure covers the Installation of the **SkyBitz GLS 410 Mobile Terminal (MT)** and **Remote Antenna (RAB)** as well as the **SkyBitz External Power Module (EPM)**. The **Aluminum Roof Mounting Brackets (XTB)** and the **EPM** get bonded to the inside front wall of the trailer with 3M VHB (Very High Bond) adhesive tape. The installation is hidden from view behind the interior front wall plywood.

The **MT** and **EPM** are to be mounted just above the trailer 7-Way connector on the interior front wall of an aluminum roof trailer. The Remote Antenna is mounted to the aluminum roof on the road side, just above the MT and 12 inches back from the front nose of the trailer. This forward location helps to keep the **RAB** in view of the satellites when the trailer is backed up to a warehouse. The road side location is also less susceptible to damage from low hanging tree branches.

The **EPM** power cable is routed through the back of the trailer 7-Way power connector. The **EPM** ring terminals attach to the Auxiliary (Blue), Marker Lights (Brown) and Ground (White) connections. The cable ends are color coded to match the trailer wiring for easy installation. The **EPM** has self resetting protection fuses installed close to the connection terminals.

GLS 410 Remote Antenna EPM Configuration Block Diagram



Installation of the GLS 410 Remote Antenna with EPM System on an Aluminum Roof Trailer

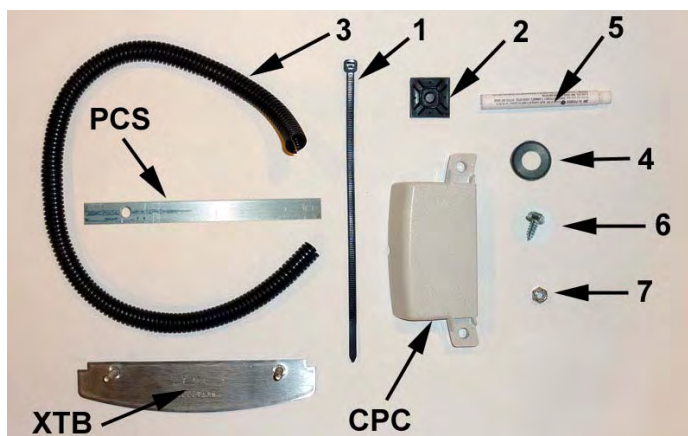
The following describes the proper materials and steps required for installing the MT System on an Aluminum Roof Trailer. There are slight variances to the installation that are specific to each brand of trailer. Strict adherence to the following procedures is paramount to ensuring a secure, safe, and reliable installation.

Tools Required for Installation

- Drill
- Drill Bits, 7/16", 13/16", 5/32"
- Wire Cutters
- RTV silicone sealant
- 5/16 open end wrench
- 3/8" drive socket wrench set
- Fish Tape
- Measuring Tape
- Clean, lint-free towels or paper towels
- Medium Duty abrasive pad (Preferred Product - 3M Scotch-Brite)
- 70% Isopropyl Alcohol/water solution

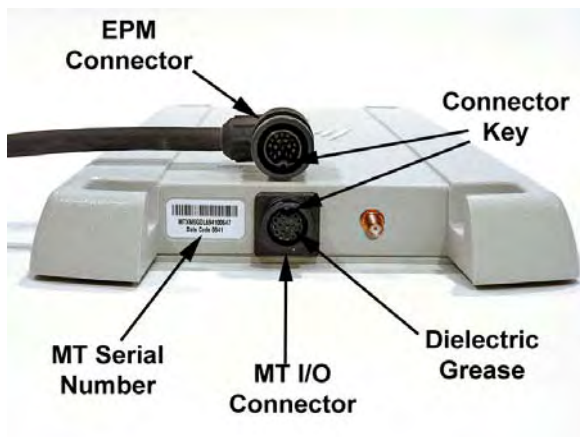
Parts List for Installation Components and Hardware

Item	Item Description	Part Number	QTY
Components			
MT	SkyBitz Remote Antenna Mobile Terminal	GLS410	1
RAB	SkyBitz Remote Antenna, Bottom Feed	CANT000002	1
XTB	Aluminum Roof Mounting Bracket	CBKTA00072	2
PCS	Power Cable Spacer	CBKTA000076	2
CPC	Connector Protection Cover	SKYBO1057	1
EPM	External Power Module	CMODB00018	1
Hardware			
1	Cable Tie, 7.5", UV	CPKGA00002	15
2	Cable Tie Mount, Adhesive, VHB	CPKGA00005	10
3	Split Loom, Plastic, 1/4" ID	CHDW0053A0	36"
4	Grommet, rubber, 3/8" ID, 11/16 OD, 1/1	CHDW0054A0	2
5	3m Primer 94, .66ml Ampule	CPRMA10001	3
6	Screw, Sheet metal, Plated, #10 x 1/2" Long	CHDWA00085	2
7	Locknut, SS, Nylok, 10-24	CHDWA10002	4



Configure the Mobile Terminal, EPM, and Bracket Assembly

1. **Start by recording the GLS 410 Serial Number!**
2. Begin by removing the GLS 410 I/O connector cap. Grasp the MT I/O connector cap by the lock ring and turn it counter-clockwise to unlock the cap. Pull the connector cap straight back from the MT I/O connector to remove it.
3. Carefully connect the EPM connector to the Mobile Terminal by aligning the connector key and pushing the EPM connector into the MT I/O connector. Grasp the connector by the LOCK RING ONLY and turn only the lock ring clockwise until you feel resistance, then continue to turn it 1/8 turn past this detent to lock it in place.



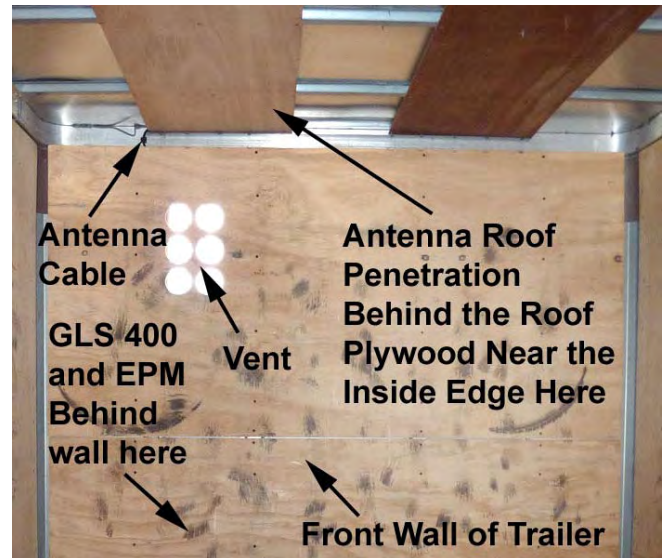
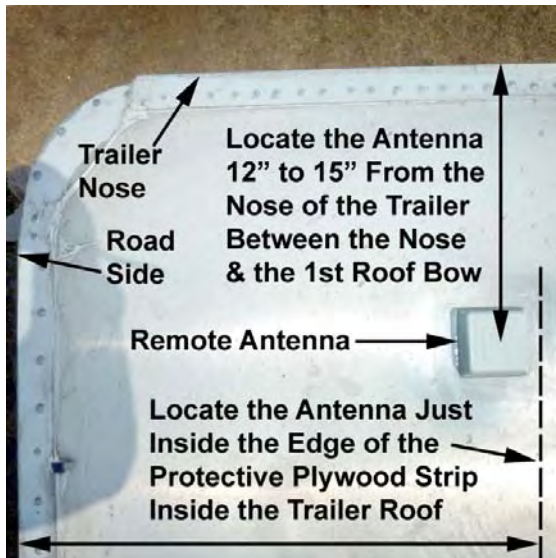
4. Lash the EPM cable to the side of the GLS 410. Insert a cable tie (Item #1) into the slot on the side of the GLS 410 near the connector and secure the EPM Cable to the MT.



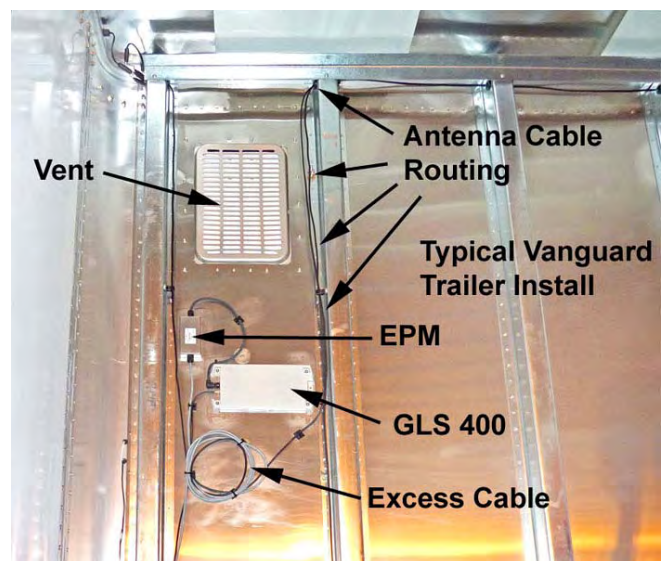
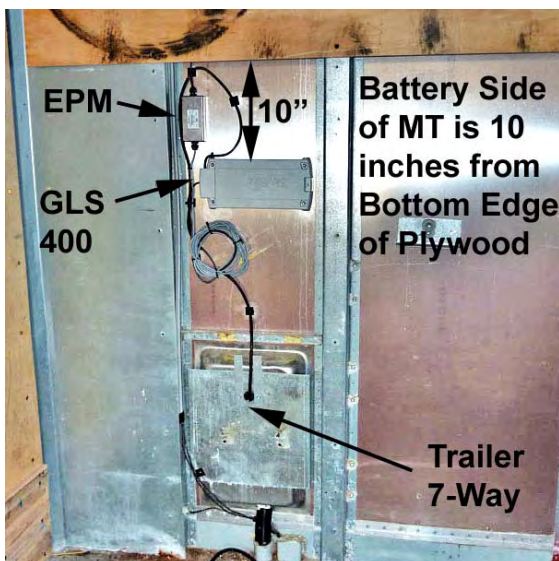
5. Install the XTB to each end of the MT. Align the XTB to the end of the GLS 410 and insert the studs into the bottom of the MT. Fasten the XTB to the MT using a lock nut (Item #7). Repeat on the opposite end of the MT.

Mounting Location of the Antenna, MT, and EPM

Skybitz Component Location Guide



The Remote Antenna is located on the exterior of an aluminum roof trailer. The antenna is positioned 12 to 15 inches from the nose (front) of the trailer. The antenna position from the roadside of the trailer is determined by the position of the protective roof liner strip inside the trailer. The Antenna must be located such that the cable penetration through the roof is an inch or two inside the edge of the roof liner.



The MT and EPM are located on the inside front wall of the trailer behind the plywood. On plywood front walls the MT is mounted with the Battery Door facing up and 10 inches from the bottom of the edge of the upper sheet of plywood. This allows access to the battery door for battery replacement. The EPM is mounted vertically and to the left side of the 7-way bay just above the MT.

Installation Environment

CAUTION!

- DO all installations in a clean, dry, and properly prepared environment. Temperature should be maintained above 32°F for a minimum of 30 minutes before and after installation!
- DO NOT attempt to install the Remote Antenna in the rain or fog, or if signs of snow, ice or condensation are evident on the trailer roof. It is extremely important that the mounting surface be clean and dry prior to installing the unit.

Installation of the Remote Antenna

1. Measure and mark the location for the Remote Antenna assembly. This will be 12 to 15 inches from the nose of the trailer and about 2 inches in front of the first roof bow. The antenna mounting location is 30 to 36 inches from the road side edge of the trailer roof. Typical locations for various trailer manufacturers are as follows:

Great Dane = 12 inches from the nose and 32 inches from the road side

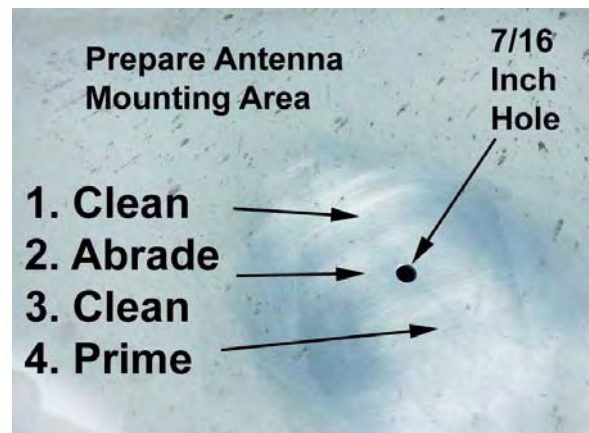
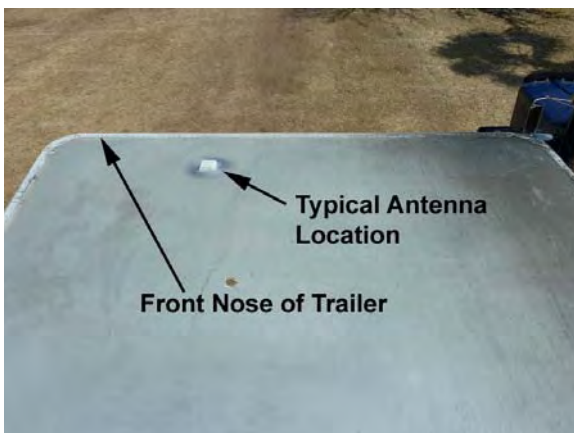
Vanguard = 15 inches from the nose and 35 inches from the road side

Hyundai = 12 inches from the nose and 32 inches from the road side

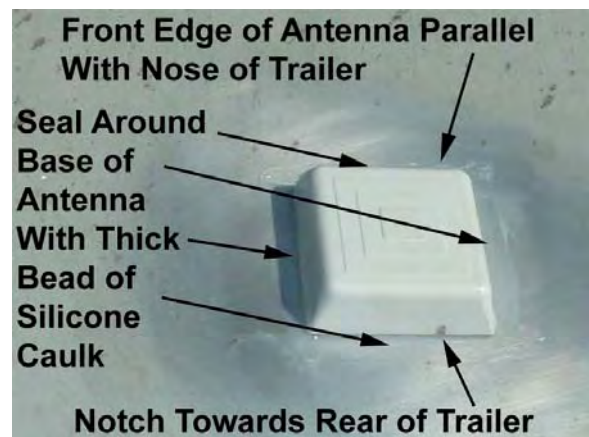
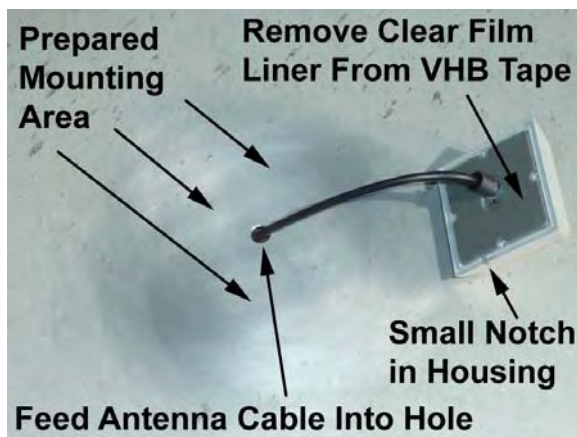
The mounting location should be relatively flat allowing the base of the antenna to contact the trailer roof completely.

Confirm all clearances and ensure that there are no roof bows or obstructions in the penetration location before drilling the hole in the roof!

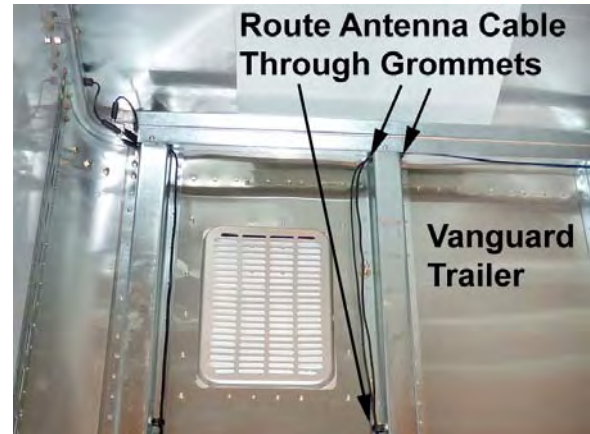
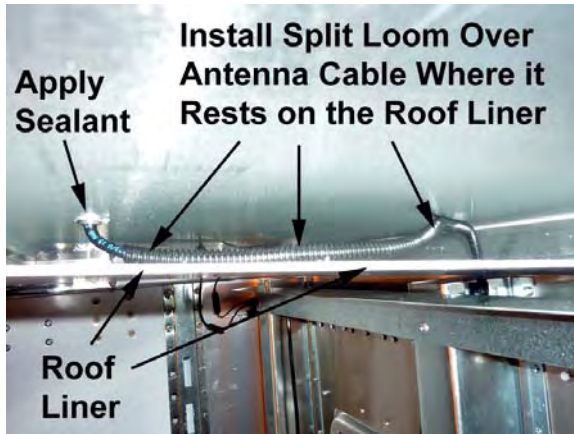
2. Drill the 7/16 inch diameter hole for the Antenna cable penetration. Clean and de-burr the hole.



3. Wipe the Antenna mounting area clean with the alcohol solution. Ensure any dirt, films, oils, waxes, release agents, or other contaminants are removed from within the mounting areas.
4. Use the Scotch-Brite pad to abrade the area where the Antenna will make contact with the roof. Using a circular motion will increase the bonding of the primer and adhesive. A light abrasion of the surface will do the job as it is not necessary to completely remove all surface oxidation.
5. Wipe the abraded surface down using the alcohol cleaning solution and a clean towel. Repeat the cleaning again with a new clean towel until the clean towels show no sign of any remaining contamination. Thoroughly wipe the surface dry with another clean towel. ***Be diligent as this is the most important step to acquiring a secure bond of the adhesive!***
6. Apply the 3M Primer 94 (Item #5) to the cleaned and abraded roof surface in the area the Antenna will be placed. Allow the primer at least 2 minutes to dry completely.



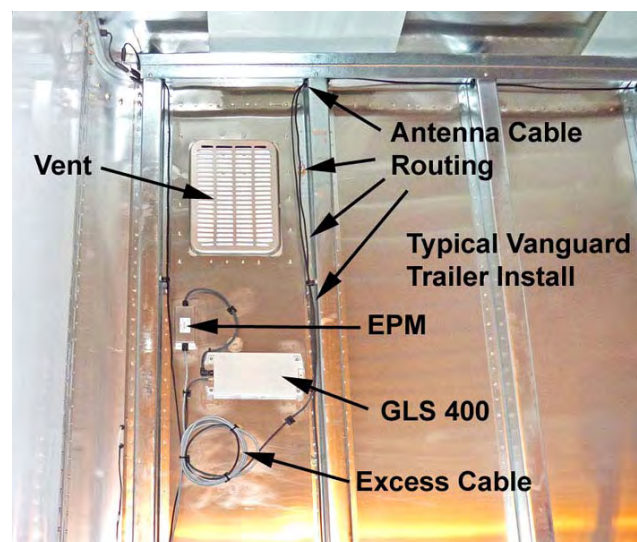
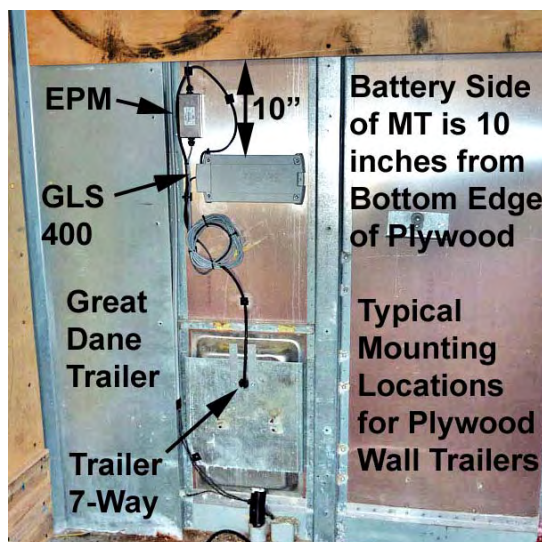
7. Install the Antenna Assembly. Feed the Antenna cable through the hole being careful not to touch the prepared roof mounting surface. Remove the clear backing tape from the bottom of the Antenna to expose the VHB adhesive. ***Be careful not to touch the exposed adhesive surface as any contamination will impede the bond strength.*** Orient the Antenna with the small notch in the housing towards the rear of the trailer and the front edge parallel with the nose of the trailer. Carefully place the Antenna assembly on the roof within the cleaned and primed location. ***Firmly push down on the top of the Antenna.*** Verify a bond has been obtained between the Antenna assembly and the roof by pulling up on the Antenna assembly.
8. Clean the base of the antenna with the alcohol solution and allow it to dry completely. Apply a thick continuous bead of RTV sealant around the entire base of the Antenna.
9. Inside the Trailer apply the silicone adhesive around the cable penetration.



10. Install a length of split loom over the length of antenna cable that rests on the protective roof liner and any place the cable transitions over a sharp edge as it's routed down towards the GLS 410.

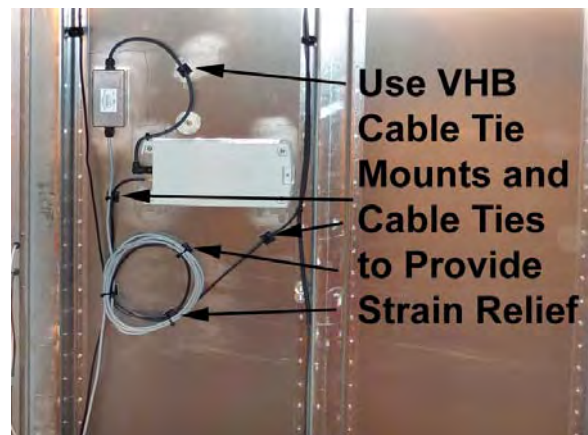
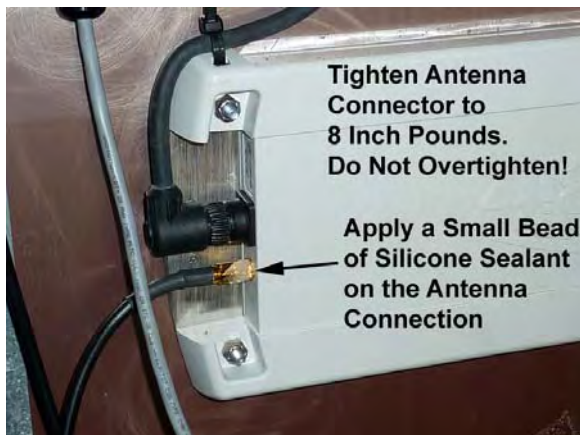
Installation Procedure for the GLS 410 and EPM

1. Install the GLS 410 and EPM. The GLS 410 and EPM will be mounted in the wall behind the plywood in the same bay as the trailer 7-way connector. If the inside front wall of the trailer is plywood (Great Dane, Hyundai), the lower section will need to be removed. If the inside front wall of the trailer is a single piece composite (Vanguard, Hyundai) the entire wall will need to be removed.



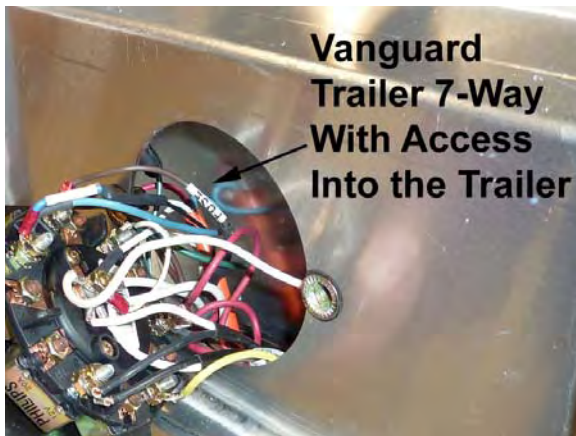
2. Mark the mounting locations for the GLS 410 and the EPM on the trailer wall.
3. Wipe the mounting area clean with the alcohol solution. Ensure any dirt, films, oils, waxes, release agents, or other contaminants are removed from within the mounting areas.

4. Use the Scotch-Brite pad to abrade the area where the VHB tape will make contact with the wall. Using a circular motion will increase the bonding of the primer and adhesive. A light abrasion of the surface will do the job as it is not necessary to completely remove all surface oxidation.
5. Wipe the abraded surface down using the alcohol cleaning solution and a clean towel. Repeat the cleaning again with a new clean towel until the clean towels show no sign of any remaining contamination. Thoroughly wipe the surface dry with another clean towel. ***Be diligent as this is the most important step to acquiring a secure bond of the adhesive!***
6. Apply the 3M Primer 94 (Item #5) to the cleaned and abraded surface in the area the VHB will make contact. Allow the primer at least 2 minutes to dry completely.
7. Remove the clear backing tape from the GLS 410 Brackets to expose the VHB adhesive. ***Be careful not to touch the exposed adhesive surface as any contamination will impede the bond strength.*** Carefully place the GLS 410 on the wall as shown within the cleaned and primed location. ***Firmly push down on the EPM.*** Visually verify a bond has been obtained between the EPM and the wall.
8. Remove the clear backing tape from the EPM to expose the VHB adhesive. ***Be careful not to touch the exposed adhesive surface as any contamination will impede the bond strength.*** Carefully place the EPM on the wall as shown within the cleaned and primed location. ***Firmly push down on the EPM.*** Visually verify a bond has been obtained between the EPM and the wall.
9. Connect the Antenna to the GLS 410. Coil and dress the excess antenna cable so the antenna cable is cleanly routed to the GLS 410 without any stress on the cable. Thread the antenna connector on the GLS 410 connector and tighten to 8 inch pounds. Apply a small amount of silicone sealant to the antenna connection as show.

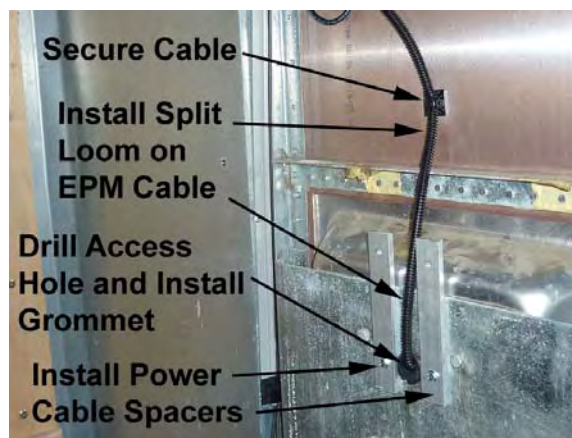


Installation Procedure for the 7 Way Power Connection

1. The EPM power cable will be routed into the trailer 7-way connector box such that the cable is not exposed to the exterior of the trailer. The Vanguard and Hyundai trailers have an access port into the trailer 7-way box from inside the trailer. The Great Dane trailer does not have an access port so an access hole will be drilled into the back of the 7-way connector box.

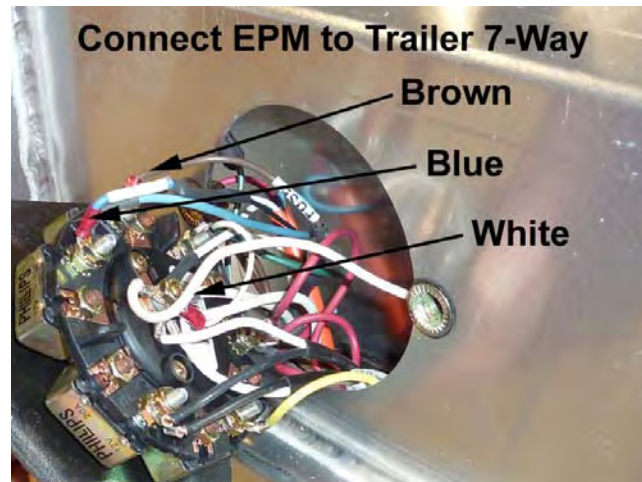


2. From the outside remove the 7-Way connector body cover to expose the trailer power connections. If there is a hole allowing access into the trailer then fish the ring lug end of the EPM cable out of the 7-Way connector body access hole. If there is no access to the inside of the trailer, after the removal of the 7-way body, proceed to step 3 otherwise proceed to step 6.
3. An access hole will be needed in the back of the trailer 7-way box. Verify no obstructions are present and drill a 13/16 inch hole into the upper center of the box. Install a rubber grommet (Item #4) into the hole.



4. If there is no space between the rear of the box and the wall of the trailer a spacer is required to keep the EPM cable from getting pinched. Install the two ¼ inch thick Power Cable Spacers (CPS) with the sheet metal screws (Item #6) as shown.

5. Route the EPM cable between the spacers and through the grommet into the trailer 7-way box. Install a piece of split loom over the EPM cable where it goes into the grommet and anywhere it transitions over exposed metal edges. Secure the EPM cable to the trailer wall with the VHB tie mounts and cable ties.
6. Connect the EPM power cable ring lug terminals to the 7-way connections matching the colored markers to the trailer wire colors. Ensure the connections are tight and no connections are causing a short circuit.



7. Use the cable ties to secure the EPM Power cable to the existing trailer wiring to provide strain relief. Carefully feed the trailer wiring back into the trailer or connector box and secure the 7-Way connector body cover to the trailer.
8. Gather up the any excess EPM Power cable and secure it inside the trailer with VHB tie mounts and cable ties. Be sure to keep the cable away from any sharp edges to prevent the possibility of a short circuit.
9. Reinstall the inside front wall of the trailer.
10. **Complete the Installation Registration form in the back of this manual!**

Installation Registration

To view GLS data sent from the newly installed Mobile Terminal, it must be registered at the SkyBitz Data Center.

To register your newly installed SkyBitz Mobile Terminal **online** please log on to SkyBitz InSight at <https://insight.skybitz.com> and follow the instructions under Configure Assets.

You Mobile Terminal registration can also be forwarded by **e-mail** to customercare@SkyBitz.com, by **fax to (703)-478-3301** or by calling **SkyBitz Customer Support at 1-(866)-875-9248**.

The required information is as follows:

Date of Install:	
Company Name:	
Trailer Number/Asset ID:	
Mobile Terminal Serial Number:	