



USER GUIDE

Q3920 3G TO 4G RETROFIT GUIDE

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The equipment covered in this manual has been tested and found to comply with the limits for Class A digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

DOCUMENT HISTORY

Version	Release Date	Sections Changed	Details of Change
A	JAN 2022		Initial Release
A.1	JAN 2022		Added note on pages 1-1 & 1-9 to instruct the user to upgrade software once new 4G kit has been installed. Added software upgrade procedure (Section 1.3).

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NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, notes, cautions, and warnings are frequently used to direct the reader's attention to specific information. Use of the three terms is defined as follows:

WARNING

WARNING
INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY. WARNINGS ALWAYS TAKE PRECEDENCE OVER NOTES, CAUTIONS, AND ALL OTHER INFORMATION.

CAUTION

CAUTION
REFERS TO PROPER PROCEDURES OR PRACTICES WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN A POTENTIALLY HAZARDOUS SITUATION AND/OR POSSIBLE DAMAGE TO EQUIPMENT. CAUTIONS TAKE PRECEDENCE OVER NOTES AND ALL OTHER INFORMATION, EXCEPT WARNINGS.

NOTE

NOTE
Generally used to highlight certain information relating to the topic under discussion.

If there are any questions, contact Siemens Mobility, Inc. Application Engineering

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

Static electricity can damage electronic circuitry, particularly low voltage components such as the integrated circuits commonly used throughout the electronics industry. Therefore, procedures have been adopted industry-wide which make it possible to avoid the sometimes invisible damage caused by electrostatic discharge (ESD) during the handling, shipping, and storage of electronic modules and components. Siemens Industry, Inc. has instituted these practices at its manufacturing facility and encourages its customers to adopt them as well to lessen the likelihood of equipment damage in the field due to ESD. Some of the basic protective practices include the following:

- Ground yourself before touching card cages, assemblies, modules, or components.
- Remove power from card cages and assemblies before removing or installing modules.
- Remove circuit boards (modules) from card cages by the ejector lever only. If an ejector lever is not provided, grasp the edge of the circuit board but avoid touching circuit traces or components.
- Handle circuit boards by the edges only.
- Never physically touch circuit board or connector contact fingers or allow these fingers to come in contact with an insulator (e.g., plastic, rubber, etc.).
- When not in use, place circuit boards in approved static-shielding bags, contact fingers first. Remove circuit boards from static-shielding bags by grasping the ejector lever or the edge of the board only. Each bag should include a caution label on the outside indicating static-sensitive contents.
- Cover workbench surfaces used for repair of electronic equipment with static dissipative workbench matting.
- Use integrated circuit extractor/inserters tools designed to remove and install electrostatic-sensitive integrated circuit devices such as PROM's (OK Industries, Inc., Model EX-2 Extractor and Model MOS-40 Inserter (or equivalent) are highly recommended).
- Utilize only anti-static cushioning material in equipment shipping and storage containers.

For information concerning ESD material applications, please contact the Technical Support Staff at 1-800-793-7233. ESD Awareness Classes and additional ESD product information are also available through the Technical Support Staff.

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SECTION 1

Q3920 EOT 3G TO 4G CONVERSION

1 Q3920 EOT 3G TO 4G CONVERSION

The following procedure provides step-by-step instructions to convert the Q3920 EOT from 3G to 4G operation.

NOTE

NOTE

After installing the 4G Antenna Assembly kit, the user must upgrade the MCM firmware to the latest version (Z224-9VA88-A01 Revision S). Refer to Section 1.3 of this document for instructions.

Contact Siemens Technical Support to request the latest version of this software.

1.1 Components Required

1.1.1 Materials

The 3G to 4G conversion uses the Siemens part number: Z927-01145-0000.

1.1.2 Tools

Standard electronic hand tools will be used to perform the conversion procedure.

1.2 Procedure to Perform Q3920 EOT 3G to 4G Conversion

The 3G to 4G conversion is a simple procedure which should take approximately 15 minutes to perform. The steps to complete the conversion are as follows:

STEP 1

Remove the rear eight (8) cover screws, as shown in Figure 1-1, to gain access to the antenna assemblies and the modem circuit board.

STEP 2

Remove the eight (8) mounting screws holding the Electronic Box assembly to the EOT chassis as shown in Figure 1-1.

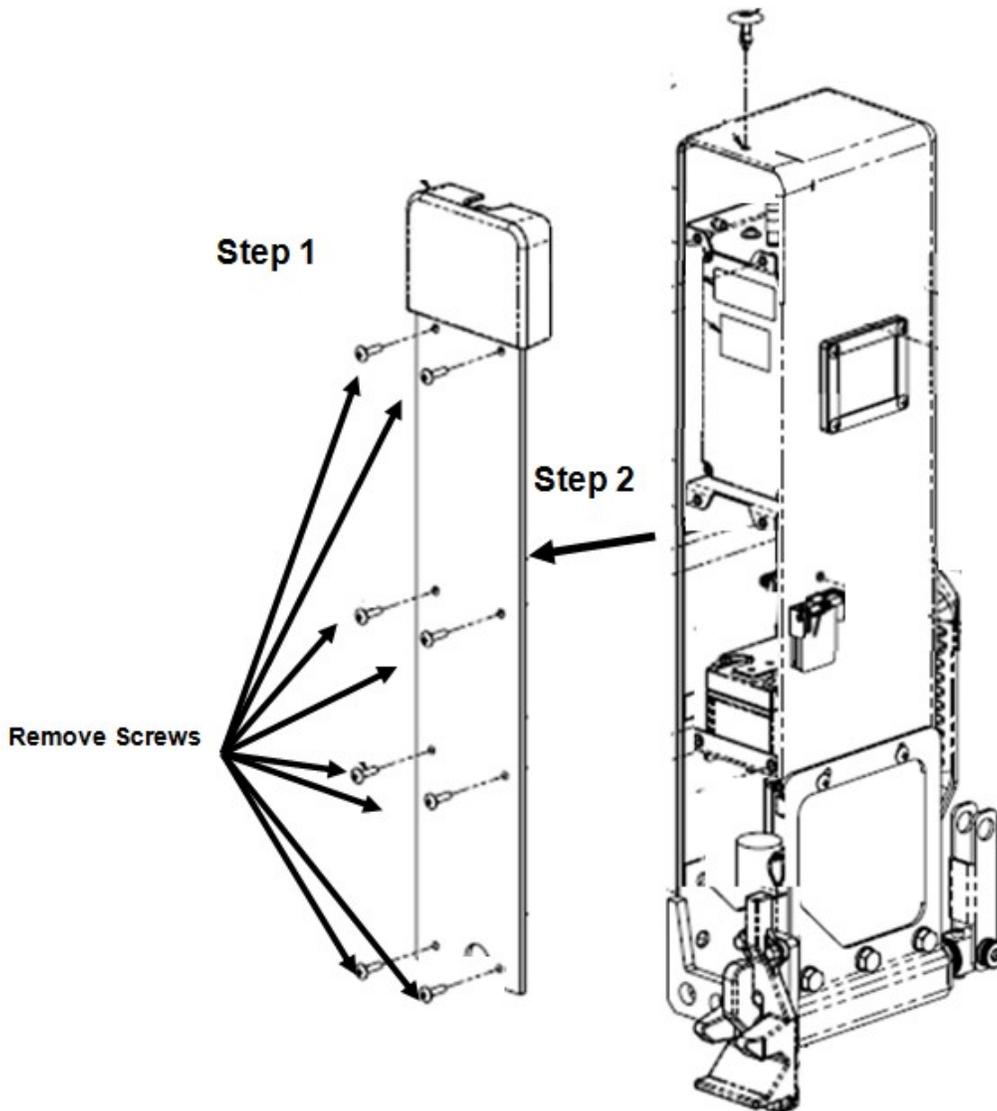


Figure 1-1 Open EOT Rear Panel

STEP 3

Remove the twelve (12) screws holding the Electronic Box assembly to the EOT chassis as shown in Figure 1-2.

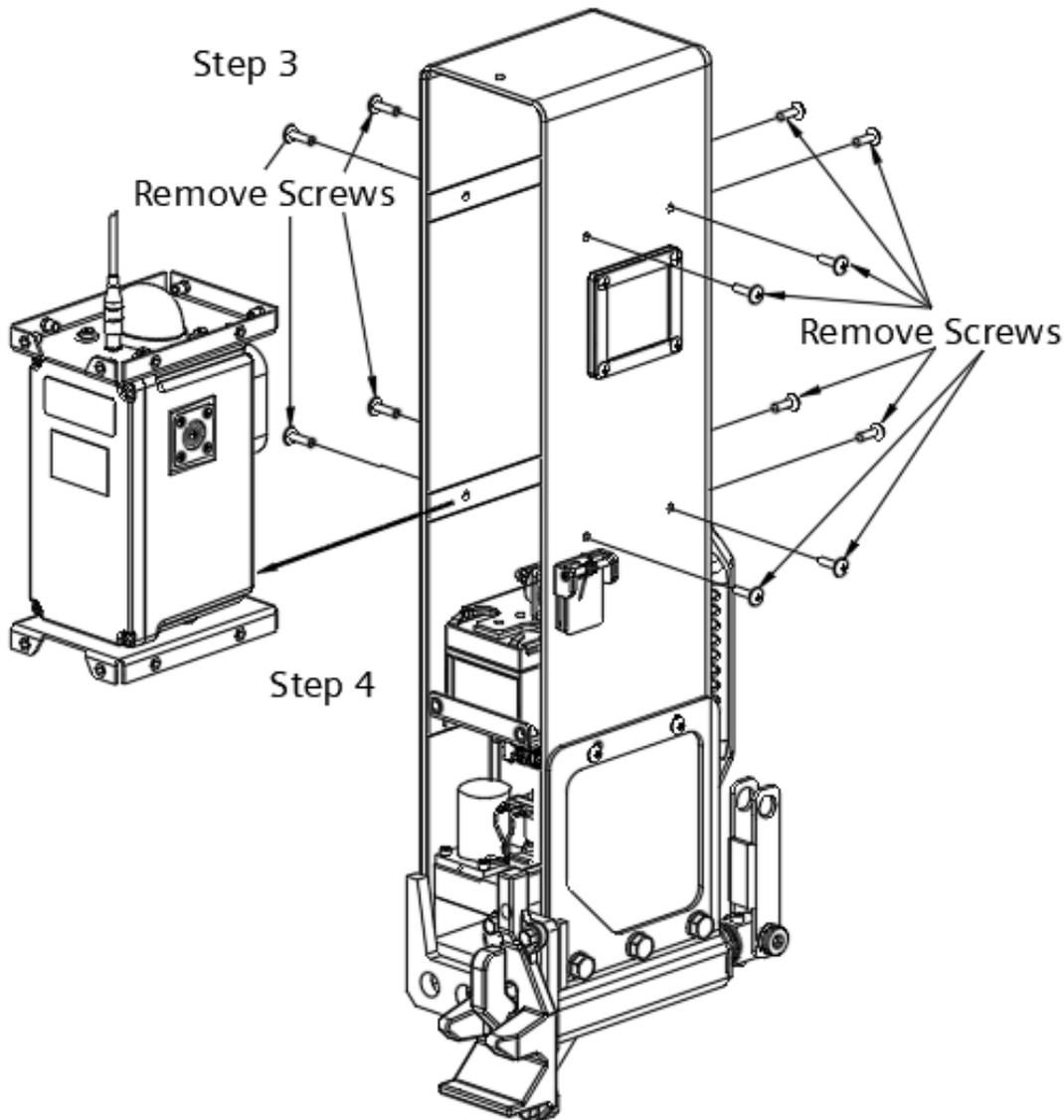


Figure 1-2 Remove Electronic Box Assembly from EOT Chassis

STEP 4

Remove the Electronic Box assembly from the EOT as shown in Figure 1-2.

STEP 5

Remove the rear panel from the Electronic Box assembly, as shown in Figure 1-3, to gain access to the components to be replaced.

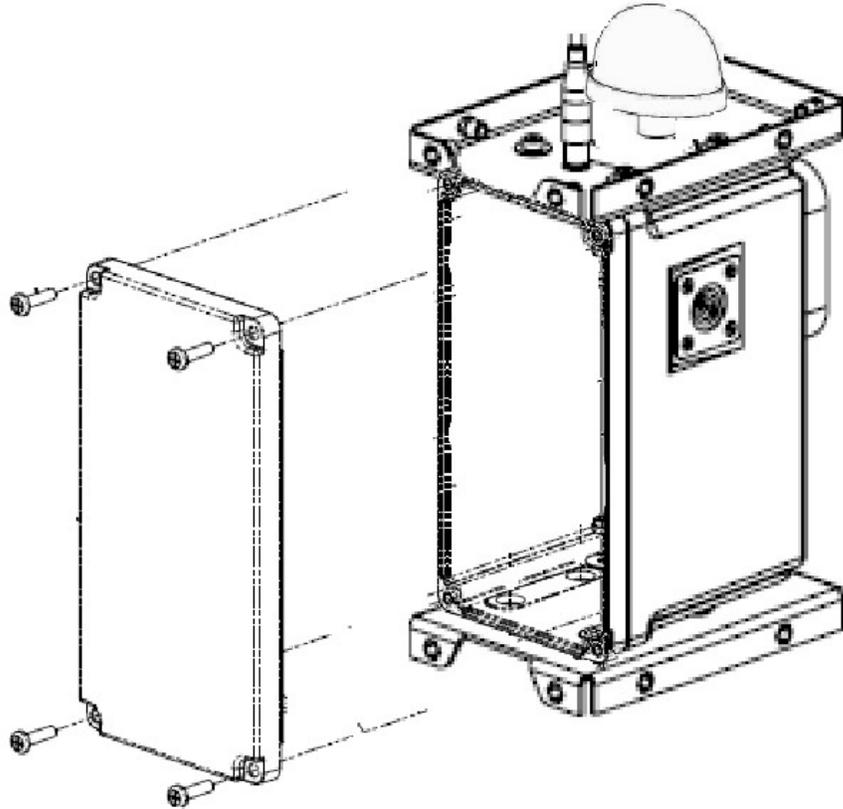


Figure 1-3 Open Electronic Box Assembly Rear Panel

STEP 6

Remove the 3G Antenna assembly from the module by loosening the Antenna and removing the assembly as shown in Figure 1-4.

STEP 7

Remove the mounting hardware, shown in Figure 1-4, that will be used to install the new 4G Antenna Assembly.

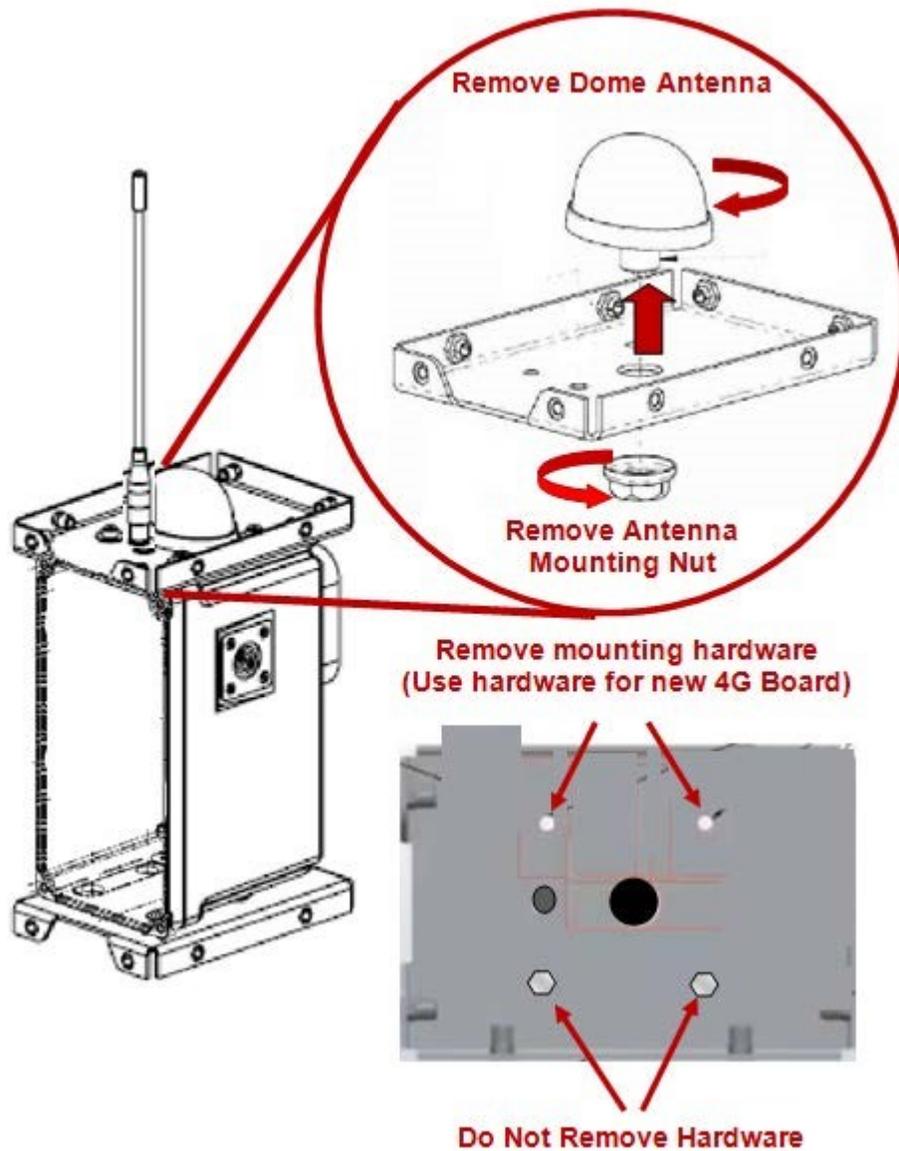


Figure 1-4 Removing 3G Antenna Assembly

STEP 8

Remove the entire PCBA assembly from the electronic box, in order to remove and replace the 3G module, as shown in Figure 1-5.

STEP 9

Install the new 4G board using the same hardware from the 3G assembly as shown in Figure 1-5.

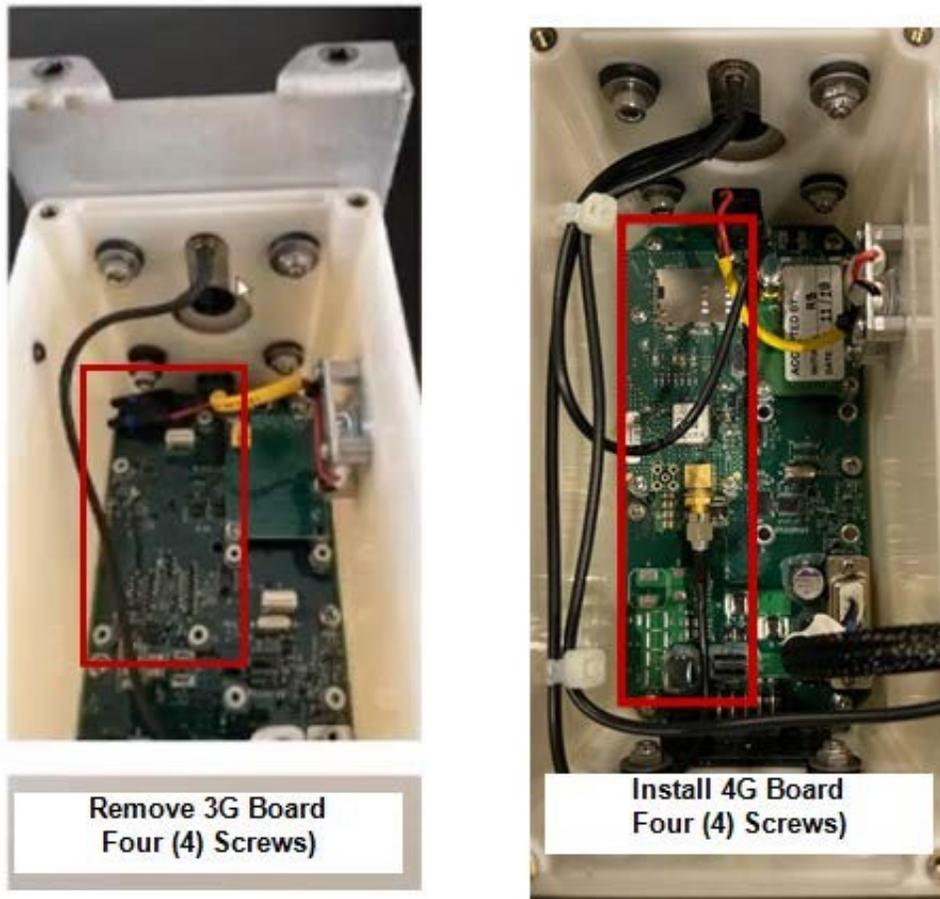


Figure 1-5 Remove entire PCBA to replace the 3G Board with the 4G Board

STEP 10

Mount the new 4G antenna assembly kit on the Radio Assembly by reversing the hardware mounting and securing the new assembly from the inside of the box, as shown in Figure 1-6.

STEP 11

Route the antenna wires through the hole used to mount the dome antenna as shown in Figure 1-6.

STEP 12

Fold the radio antenna and slide the antenna into the clamp to hold the antenna in place, as shown in Figure 1-6.

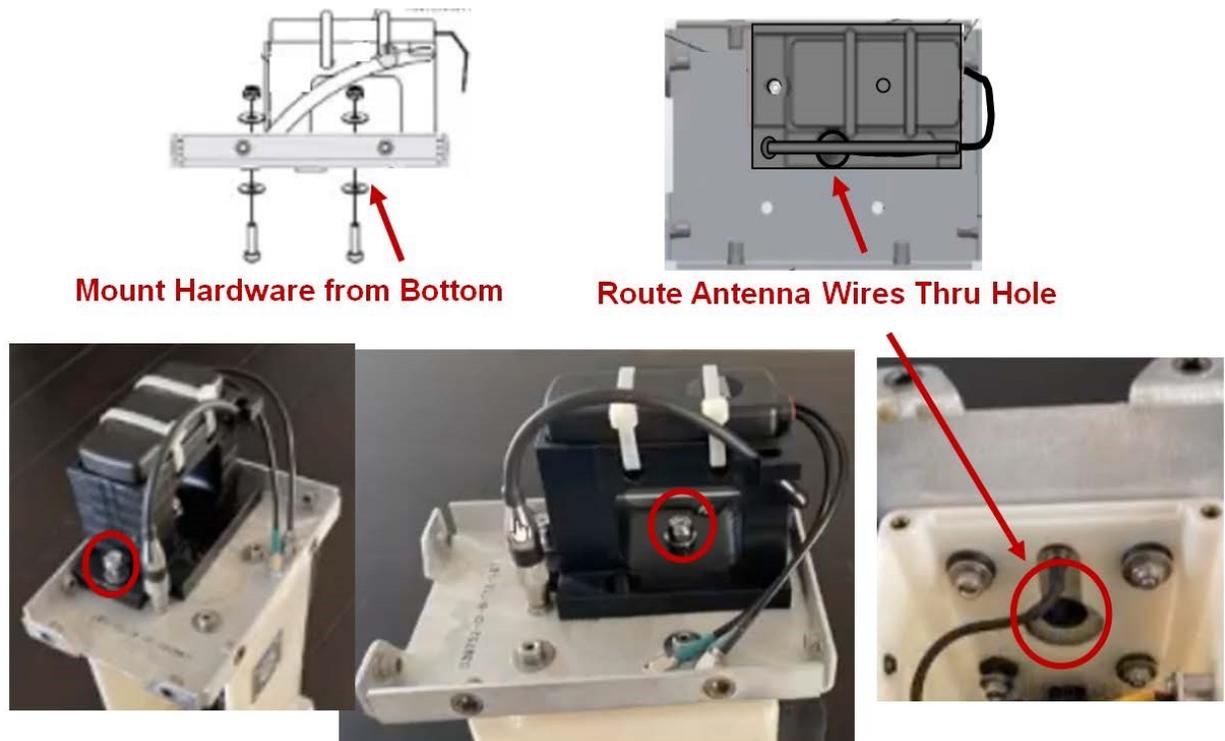


Figure 1-6 Installing the 4G Antenna Assembly

STEP 13

Reassemble the Electronic Box assembly into the EOT chassis, securing the twelve (12) screws holding the assembly, as shown in Figure 1-7.

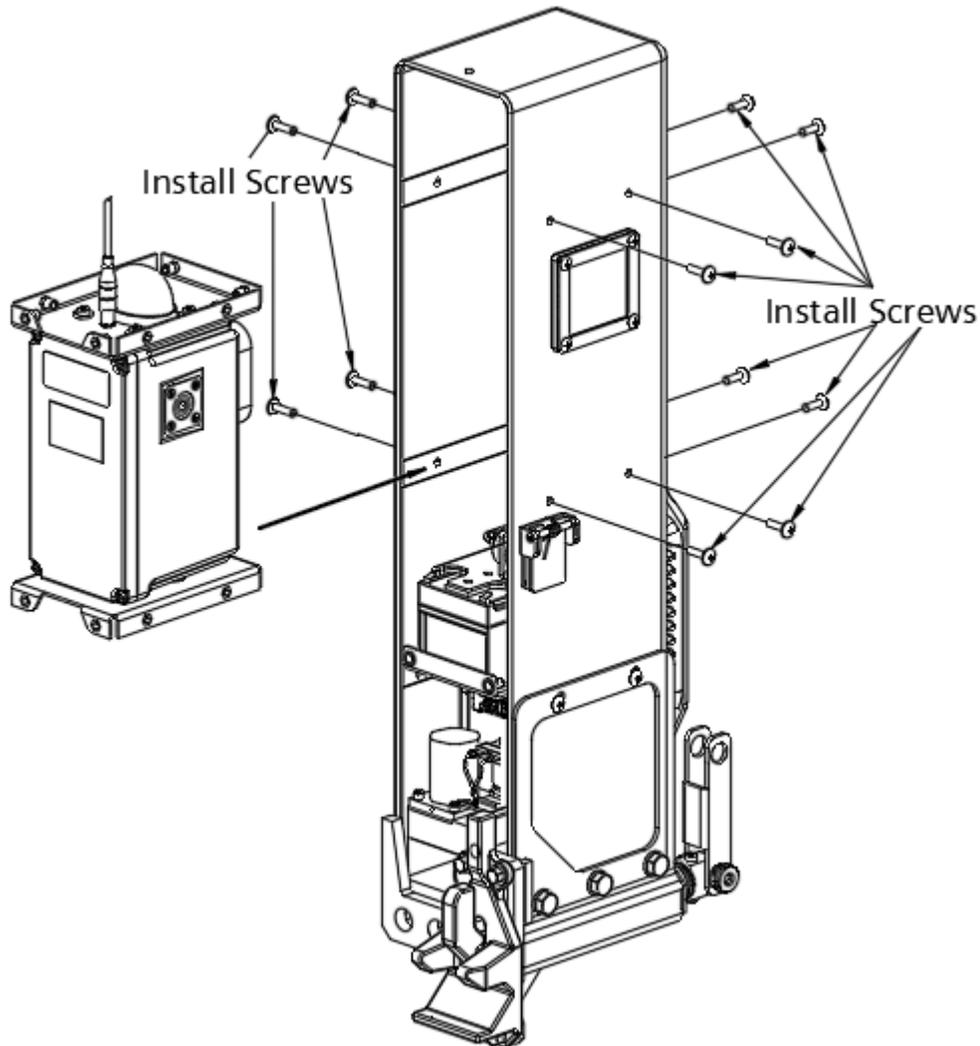


Figure 1-7 Installing the Electronic Box Assembly into the EOT Chassis

STEP 14

Reinstall the EOT Chassis Rear Panel Assembly as shown in Figure 1-8.

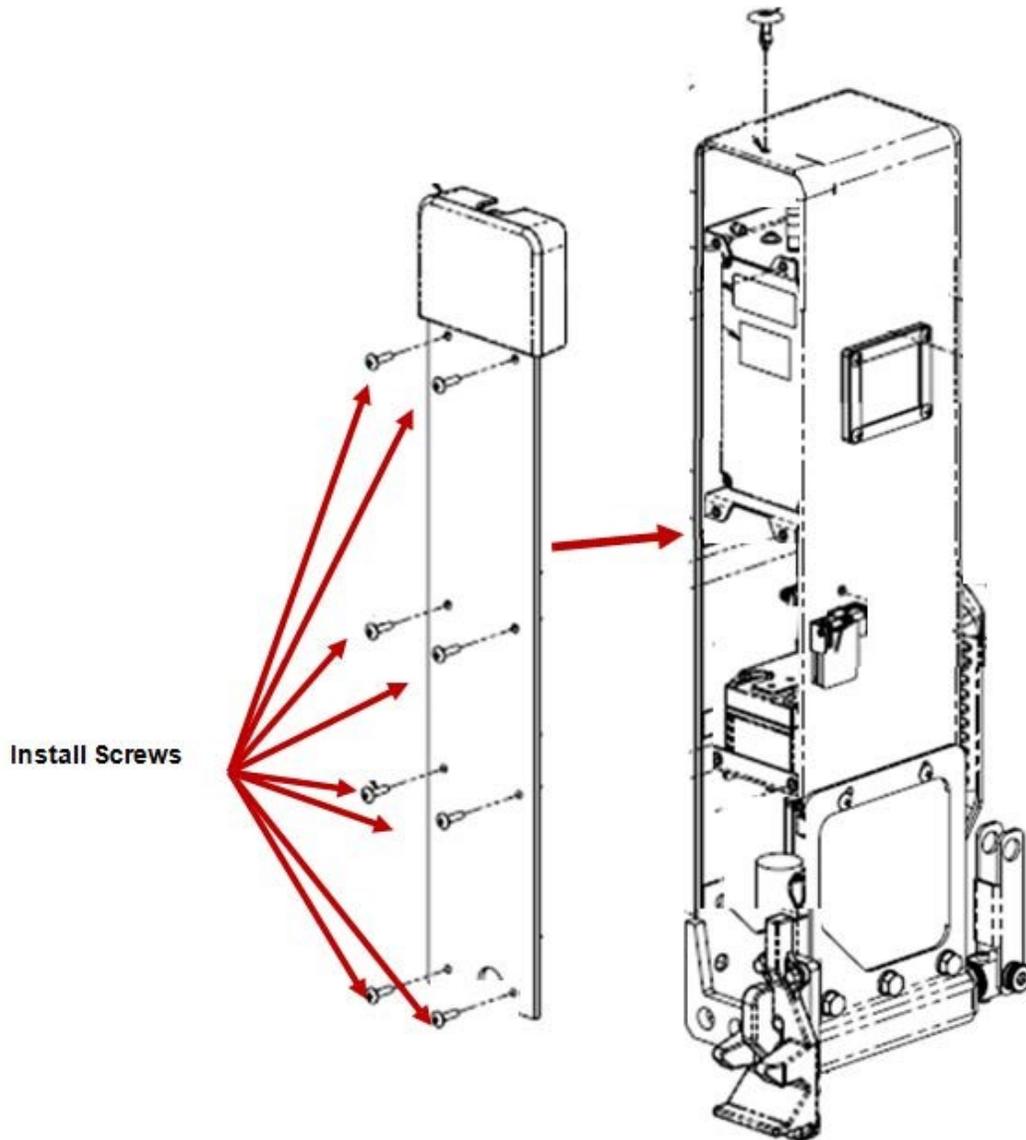


Figure 1-8 Reinstalling the EOT Chassis Rear Panel

NOTE

NOTE

After installing the 4G Antenna Assembly kit, the user must upgrade the MCM firmware to the latest version (Z224-9VA88-A01 Revision S). Refer to Section 1.3 of this document for instructions.

Contact Siemens Technical Support to request the latest version of this software.

STEP 15

Test EOT and verify proper operation per Railroad and/or Agency standards.

1.3 Procedure to Upgrade 9VA88 Software in the Q3920 EOT

1.3.1 PUMP Utility Configuration

Open the 16371 Product Upgrade Monitor Program (PUMP) utility on the test PC.

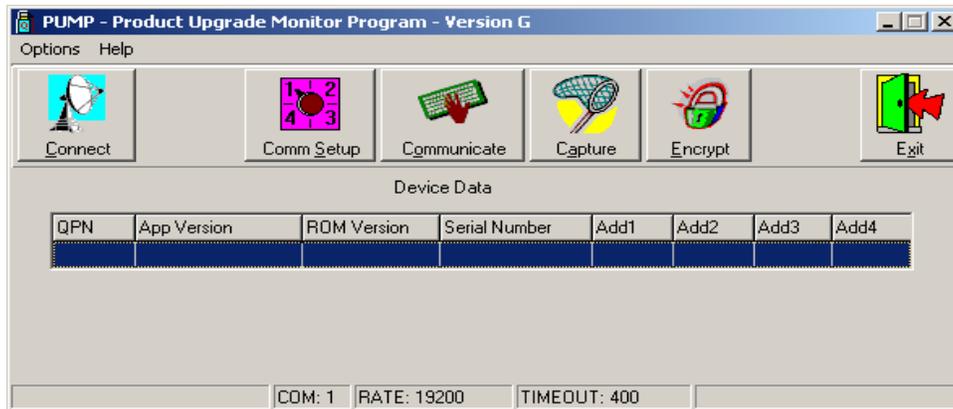


Figure 1-9 Product Upgrade Monitor Program (PUMP) Utility Screen

Upon opening, if all the buttons shown in the above screenshot are not displaying on the 16371 screen, then the user will need to perform the following steps to enable the extra functions.

1. Exit the 16371 program.
2. Go to the Windows start menu and select “run”. The window below should display.

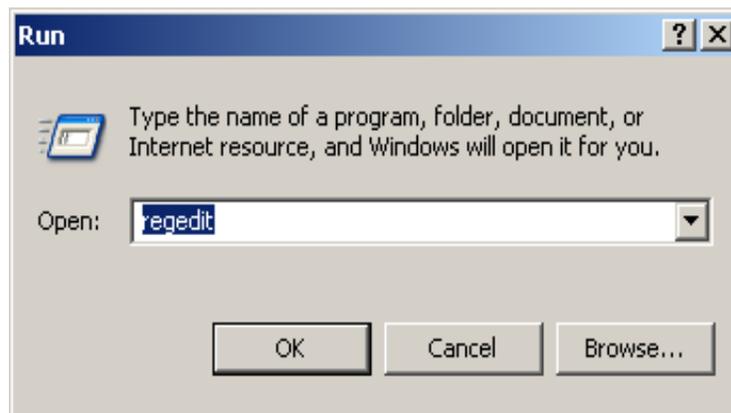


Figure 1-10 Run Window

3. In the Run window type “regedit”. The registry editor should display.

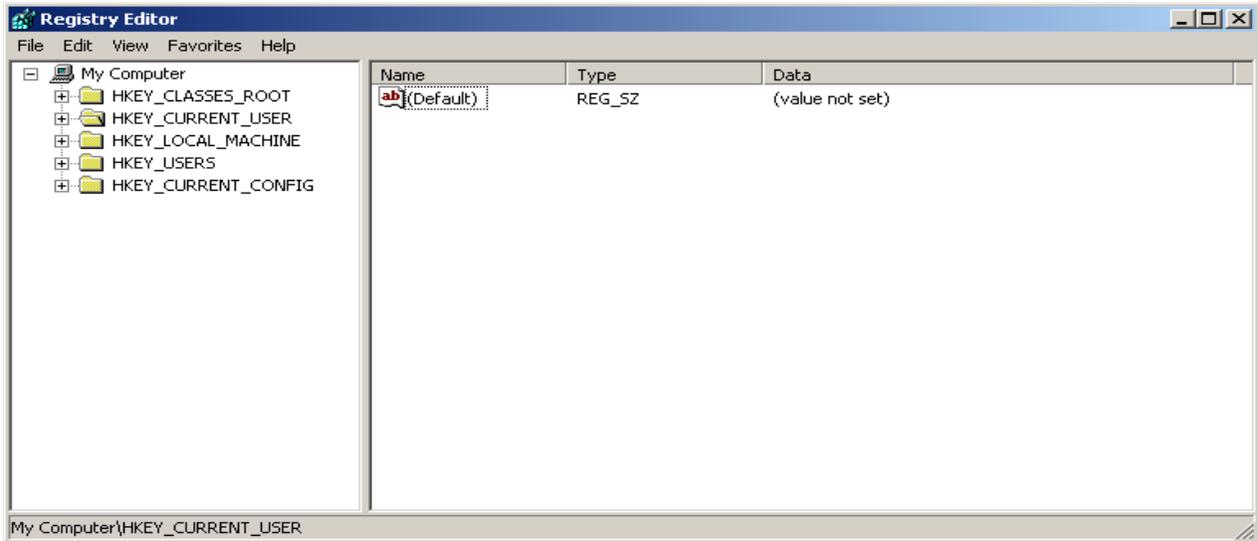


Figure 1-11 Registry Editor Window

- In the registry editor, navigate to HKEY_CURRENT_USER>Software>Quantum Engineering>Pump.

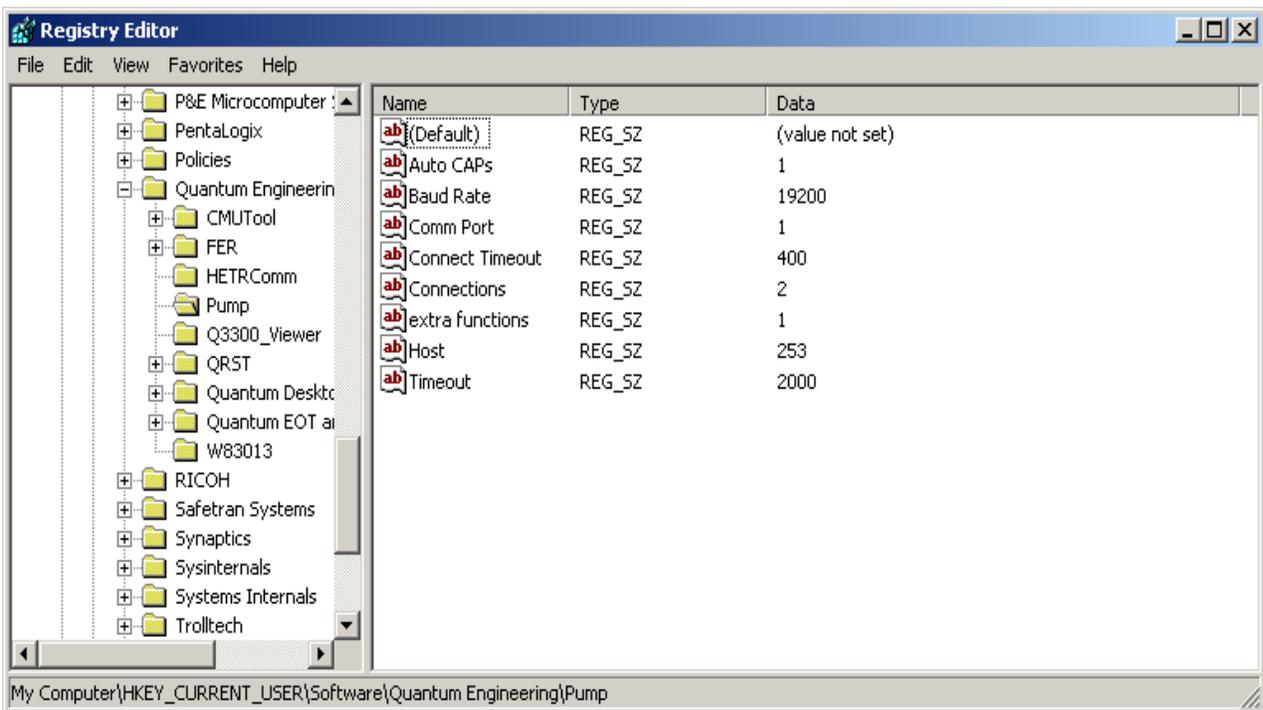


Figure 1-12 Registry Editor Navigation

- Using the mouse, right click and select “New> String Value”. Name the new string “extra functions”. Using the mouse, right click and select “Modify”. The window below will display.

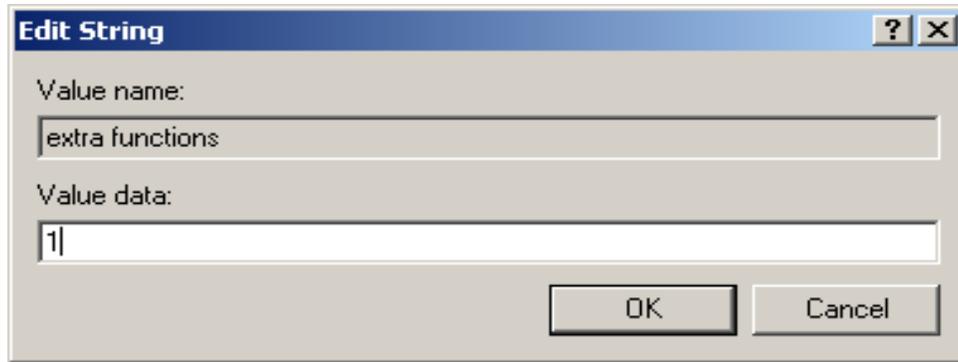


Figure 1-13 Edit String Window

6. Enter a “1” for the value data and select “OK”.
7. Now close the Registry Editor and open the 16371 utility. The extra buttons should now display.

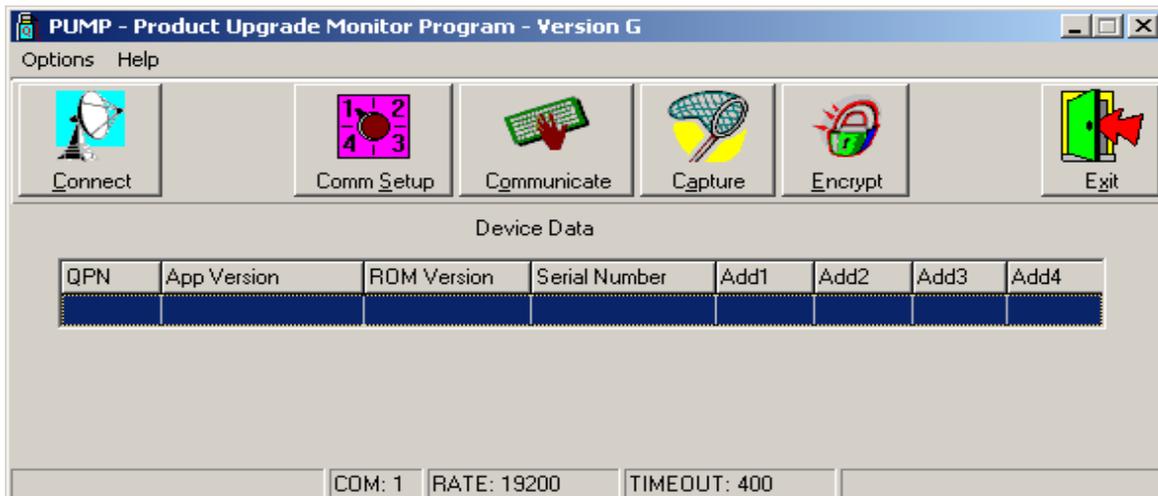


Figure 1-14 PUMP Utility Screen with all Functions Displaying

1.3.2 Set EOT to “True Colors” to Load New Software

1. Click on the “Comm_Setup” button in the PUMP utility window.
2. Configure the communication settings as shown below and then exit the Comm_Setup window.

NOTE

NOTE

The Comm Port should be set to the communication port of the PC being used. The setting may differ from COM1.

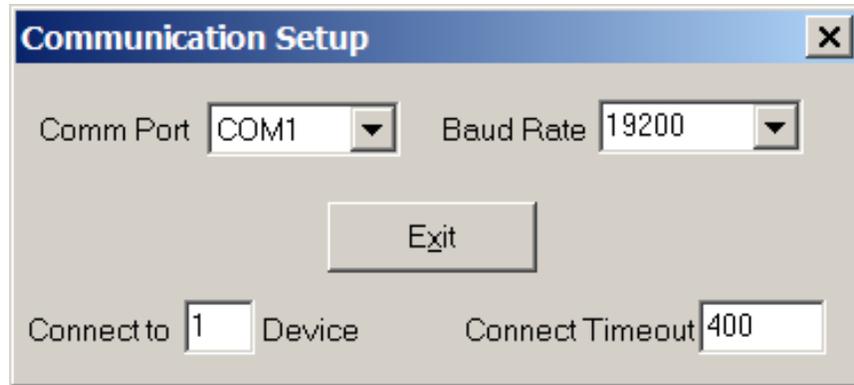


Figure 1-15 Communication Setup Window

- Next, click on the Connect button on the PUMP Utility to connect to the UUT. Once the QPN, App version, ROM version, and serial number fields are populated with data on the PUMP Utility screen, the UUT is connected.

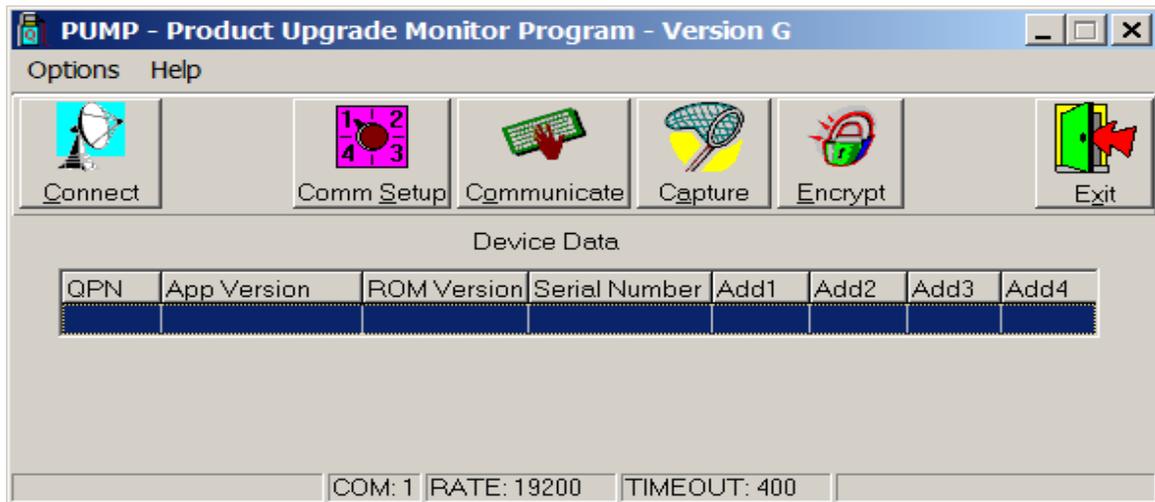


Figure 1-16 PUMP Utility Screen Fields to Populate Data

- Once connected to the UUT, click on the “Communicate” button in the PUMP Utility screen to open the communicate window. The communicate window will display as shown below.

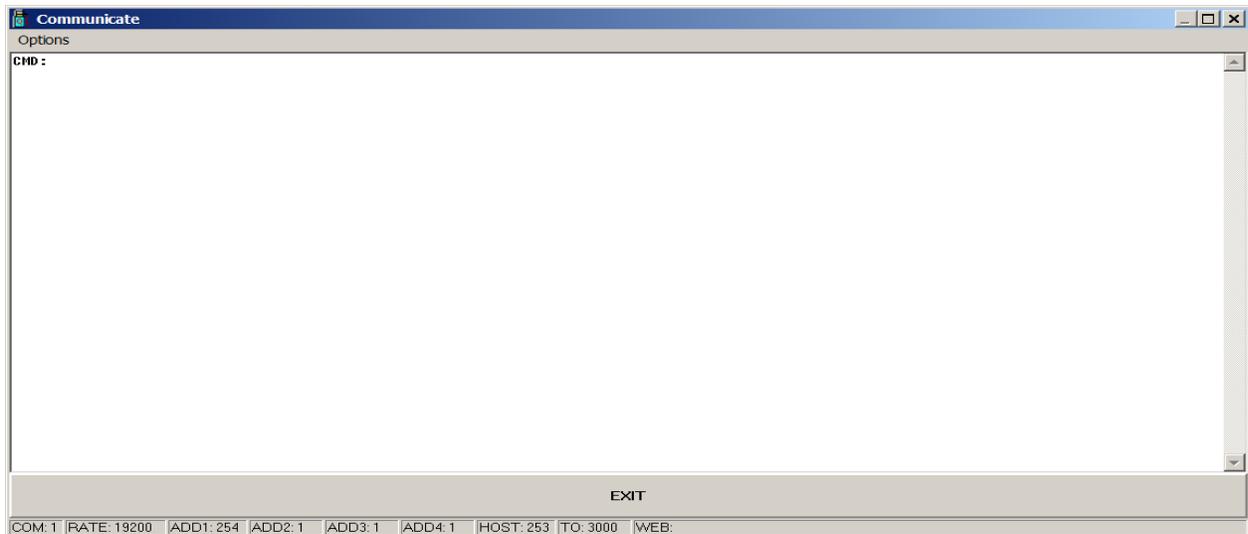


Figure 1-17 Communicate Window

5. At the “cmd:” prompt type 1,S,E and press <ENTER> to enable true colors. Verify a reply of “true colors enabled”.
Exit out of the “Communicate” window.
6. In the PUMP utility click on the “Communication Setup” button.
Change the “Baud Rate” to 115200 and exit.

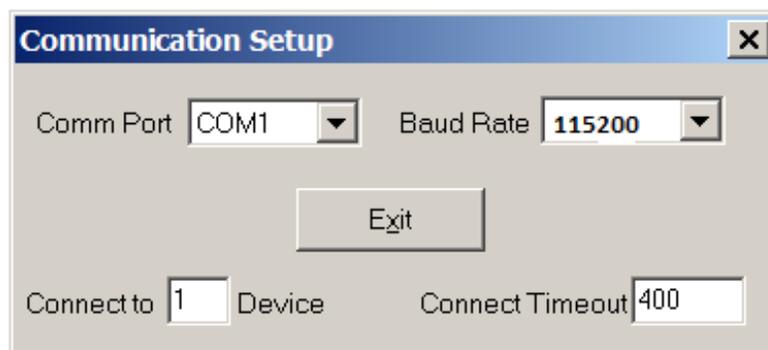


Figure 1-18 Communication Setup Window

7. In the PUMP Utility click on the “Connect” button.
8. Verify the PUMP Utility connects to the UUT. The App Version displayed now should be the 9VA88.
9. In the PUMP utility select Options> Upload. Navigate to the location of the new version of the 9VA88 software. Select the 9VA88 file and Click on “OPEN”.
The program should now display a “gas” gauge showing the progress of the software upload.
Once the software is uploaded the EOT should reboot. Once the unit reboots the baud rate defaults back 19200.

1.3.3 Verify Successful Software Upload

1. Configure the PUMP utility “Communication Setup” as shown in the figure below.



Figure 1-19 Communication Setup Window

2. In the PUMP utility, click on the “Connect” button. Verify the PUMP utility connects to the UUT.
3. In the PUMP utility, click on the “Communicate” button. Verify a text window with a “cmd:” prompt appears.
At the “cmd:” prompt type 1,S,E and press <ENTER> to enable true colors. Verify a reply of “true colors enabled”.
4. Exit out of the “Communicate” window.
5. In the PUMP utility, click on the “Communication Setup” button. Change the “Baud Rate” to 115200 and exit.
6. In the PUMP utility, click on the “Connect” button. Verify the PUMP utility connects to the UUT.
7. In the PUMP utility, click on the “Communicate” button. Verify a text window with a “cmd:” prompt appears.
At the “cmd:” prompt type V and press <ENTER> to verify the revision level of the application and bootloader loaded on the UUT. Verify a reply of 9VA88-X; 9VA87-X, where X is the software revision.
The version of the 9VA88 software should match the version just loaded. This completes the procedure.

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