



TS-DTU Noise Suppression Cables

TS-DRK

Installation Guide

Overview

Reports indicate that at a few ISD installations, equipment such as canopy and cooler lights can generate excessive electrical noise that affects the DTU communications quality. Franklin Fueling Systems has developed a new series power cable for the TS-DTU that has noise suppression capabilities. These CARB-approved cables, for use with the “Remote” DTUs installed in the dispensers, contain ferrite beads that suppress the noise while still allowing the data to pass. Most installations function normally with the standard cables included with the current TS-DRK Dispenser Retrofit Kits and future TS-DRK will also contain these new cables.

This guide will help determine if installation of the noise suppression power cables will resolve an issue you might be experiencing. It will also provide installation instructions.

This assumes that the Console DTU has established communication with the Remote DTUs but quality is low, and many DTU alarms have been generated as a result.

Identifying the Situation

Explanation of a “Remote DTU is Offline” alarm

A “Remote DTU is Offline” alarm is generated when the Console DTU does not get a complete communication response from the Remote DTU after a period of up to two minutes. The alarm will clear when the communication response has been reestablished.

An incomplete or no response from the Remote DTU can be caused by a few things and does not always indicate a communication problem. Further explanation is discussed in Alarms Examples of this document.

1. Dispenser is powered down. A Remote DTU is powered from the dispenser power. If the dispenser was powered down for any reason it will result in a “Remote DTU is Offline” alarm. See Figure 1.

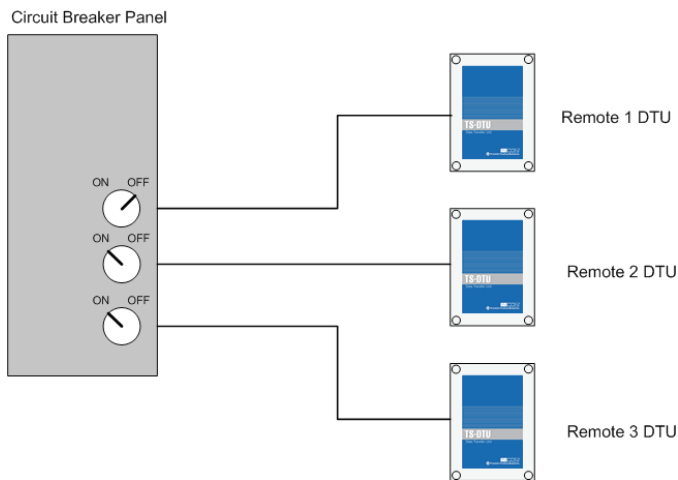


Figure 1: Example of Dispenser 1 (Remote 1 DTU) Shutdown

2. Console DTU is powered down or disconnected from the Console. The Console DTU transfers the Remote DTU data to the console. If this Console DTU loses communication either due to being powered down or disconnects from the bus, then all the Remote DTUs will issue the “Remote DTU is Offline” alarm. In conjunction, you should also see a “Console DTU Module Mismatch” alarm. See Figure 2

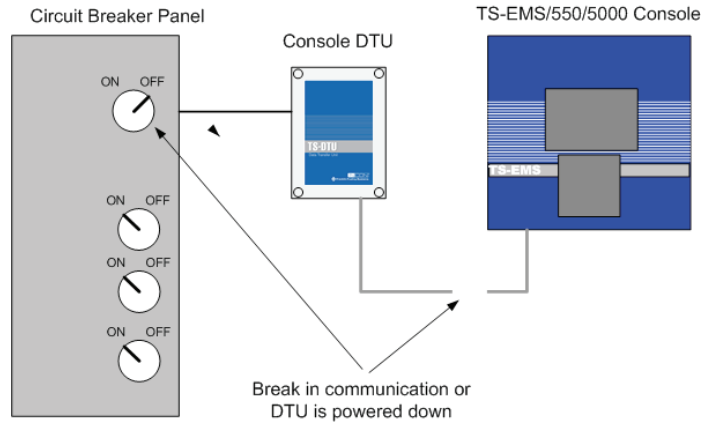


Figure 2 - Console DTU powered down or lost communication

3. Remote signal strength is not strong enough. If the Remote DTU signal has been attenuated (loses strength) then the Console DTU may not be able to reliably read the incoming data. This is a common issue when there are power line filters installed inside the dispenser as they try and filter the signals as if it was noise. See Figure 3.

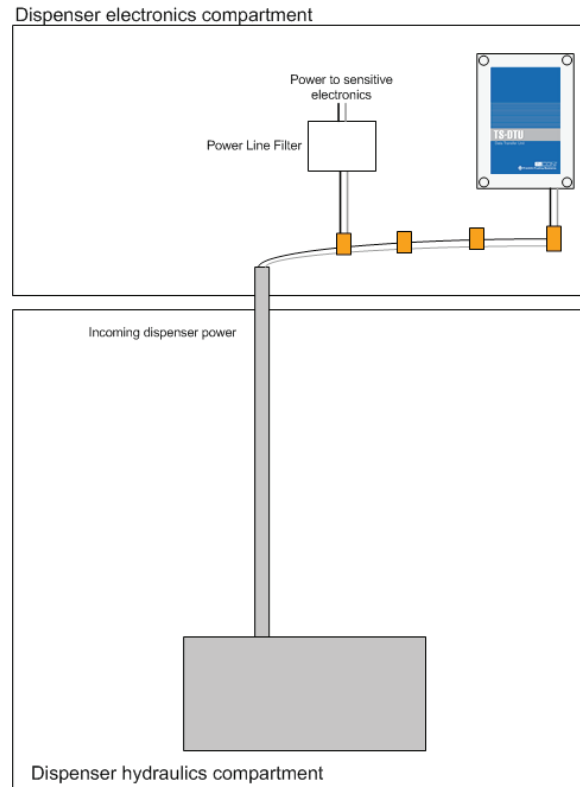


Figure 3 - Power Line Filter loading DTU signal

Determine if Replacing the DTU Cables Will Solve Communication Issues.

1. Print a system alarm report for this year. This report will show the occurrences of the alarms.

From the Web Page: System->Reports, select Alarm History->Year 2009

From the LCD: Click the print button then Alarm History button.

2. Check the quality of the DTU communication.
 - a. Make sure the Console DTU is at version 0.9.8. The remote DTUs may be at 0.9.6 or 0.9.8.
 - b. Turn off all the canopy lights and other lighting circuits that may be turn on during the night time hours.
 - c. Begin logging the DTU Quality using the TSA Upgrade Tool. See Exhibit B for details on setting up the tool to log DTU quality. The DTU quality may also be checked on the diagnostics web page. If you use the web page then you will need to refresh the page to update the values. See Figure 4.

- d. The quality should average >70. The occasional dip will be ok but should average rather high. If the DTU Quality averages above 70 then proceed to step E, otherwise proceed to step G.
- e. Turn on all the canopy lights and other lights that may be on during the night time hours.
- f. See if the quality begins to drop below the threshold of 70. If so then you may need the DTU cables, otherwise proceed to step G.
- g. You will need to analyze the Alarm Report more closely to determine if the alarms are being generated by other problems. Proceed to the Alarm Examples section of this document.

Remote DTU		Software Version	DLL Version	Quality	Transmitted	Blocked	Failed	Received	Malformed
1		0.9.6	2.41.70	100	21335	3	3	1207783	0
2		0.9.6	2.41.70	100	13452	1	2	852594	0
3		0.9.6	2.41.70	100	18097	2	4	1086458	0
Network Blocks									
Transmitted		Blocked		Failed		Received		Malformed	
744		0		0		14		0	
Network Packages									
Blocked		Garbled		Too Large		From Other Network		Out of Memory	
0		0		0		0		0	

Figure 4 - DTU Quality Web Page

Alarm Examples

Examples NOT indicating a need to replace the DTU Cables

1. Multiple “Remote DTU is offline” alarms occur at the same time (Refer to Figure 1).

By noting the time all the Remote DTUs went offline, it is clear that these were caused by some power loss either manually or the console shutdown the dispensers (Figure 5).

TS-DTU 4	Remote DTU is offline	System	Alarm	07/12/2009	11:49:29	07/12/2009 12:01:45
TS-DTU 3	Remote DTU is offline	System	Alarm	07/12/2009	11:49:29	07/12/2009 12:01:45
TS-DTU 2	Remote DTU is offline	System	Alarm	07/12/2009	11:49:29	07/12/2009 12:02:06
TS-DTU 1	Remote DTU is offline	System	Alarm	07/12/2009	11:49:29	07/12/2009 12:02:06

Figure 5: DTU Offline Alarms, not an indication of needing new cables

2. ISD alarm 1 to 2 minutes before the “Remote DTU is offline” alarm occurs. (Refer to Figure 2).

The result of an ISD Vapor Collection Failure alarm is that the console shuts off power to the dispenser. In Figure 2, Dispenser 3 generated an VRM Failure alarm for both its fueling point and shutdown the dispenser. A minute and half later, “Remote DTU is offline” alarm was generated because the DTU did not have power.

Disp 5-6 VFM	VFM Missing	VRM	Alarm	02/08/2009	00:03:38	02/08/2009 05:55:56
TS-DTU 3	Remote DTU is offline	System	Alarm	02/08/2009	00:01:32	02/08/2009 05:55:56
Fueling Point 6	Weekly Vapor Collection Failure	VRM	Failure	02/08/2009	00:00:01	02/09/2009 13:03:20
Fueling Point 5	Weekly Vapor Collection Failure	VRM	Failure	02/08/2009	00:00:01	02/09/2009 13:01:10

Figure 6: DTU Alarm Caused by VRM Collection Alarm

3. Console DTU Alarm was generated minutes before a DTU alarm

If the Console DTU went into alarm near the same time, within a few minutes of the Remote DTU is Offline, then the alarms was from the Console DTU problem.

Examples indicating a need to replace the DTU power cables

1. Repeated Remote DTU alarms at different times (> 1-3 minutes)

Remote DTU alarms that occur with the same DTU

TS-DTU 3	Remote DTU is offline	System	Alarm	01/28/2009 12:47:44	01/28/2009 12:50:11
TS-DTU 3	Remote DTU is offline	System	Alarm	01/28/2009 11:45:23	01/28/2009 11:45:44
TS-DTU 2	Remote DTU is offline	System	Alarm	01/28/2009 10:58:27	01/28/2009 13:02:06
TS-DTU 2	Remote DTU is offline	System	Alarm	01/28/2009 10:04:32	01/28/2009 10:57:03

Figure 7: DTU Alarms Separated by Time

2. Remote DTU Alarms only occur at night time

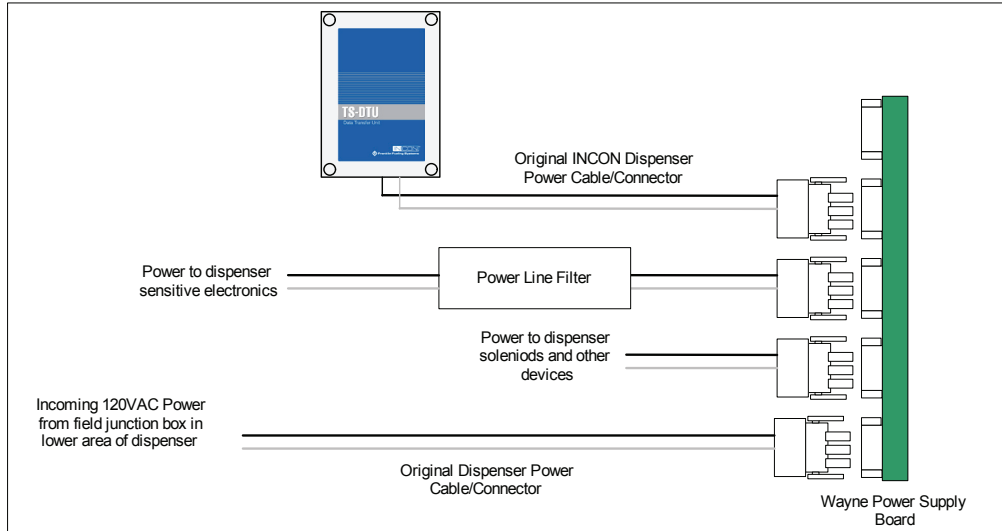
Finding a trend that shows the “Remote DTU is offline” alarm usually occurs at night or the same time certain lights are on may mean some interference. If possible try recording the DTU quality over a 24-hour period to see if the DTU drops during the nighttime hours.

Installation

A new Noise Reduction DTU cable may need to be installed if there seems to be low DTU Quality problems. This cable consist of two ferrites (magnetic rings) that isolate loading issues from either power line filters or switching power supplies. This cable is to be installed at the incoming power connection so it isolates all the electronics in the dispenser.

Note: Take special notice that the power to the DTU does not go through the ferrites, it should branch before the ferrites.

Original Installation Method



New Installation Method

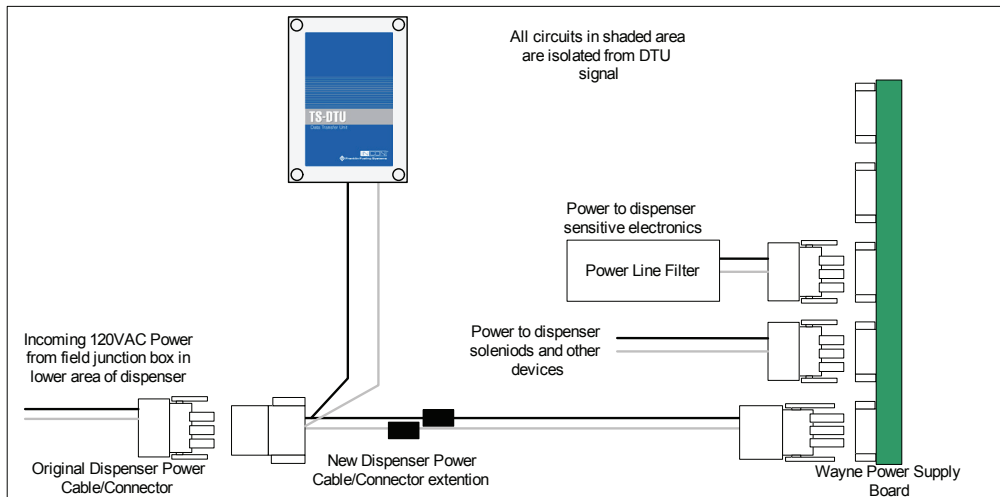
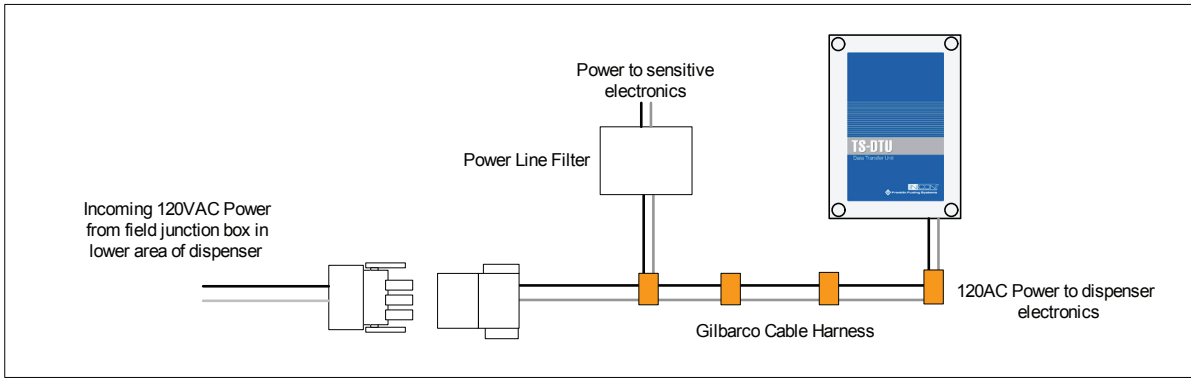


Figure 8: DTU Power Cable Installation in Wayne Dispenser

Original Installation Method



New Installation Method

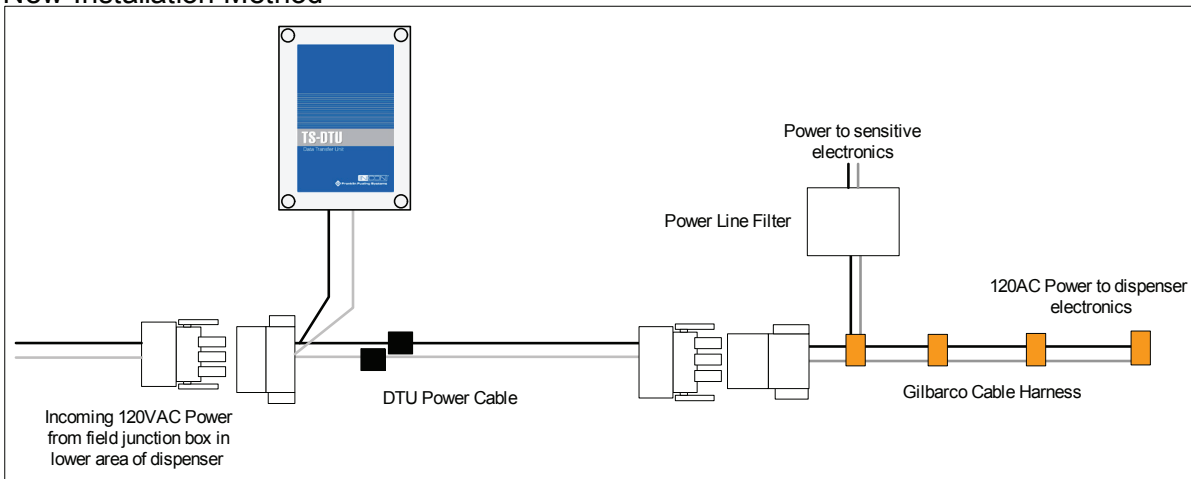


Figure 9 : DTU Power Cable in Gilbarco Dispenser

Verification

Verify the DTU cable fixed the problem by going through the following steps.

1. Turn on all the Canopy lights and other lighting circuits that may be turn on during the night time hours.
2. Begin logging the DTU Quality using the TSA Upgrade Tool.
3. The quality should average >70. The occasional dip will be ok but should average rather high. If the DTU Quality averages above 70 then the cables fixed the problem, otherwise contact Technical Service.

Exhibit A

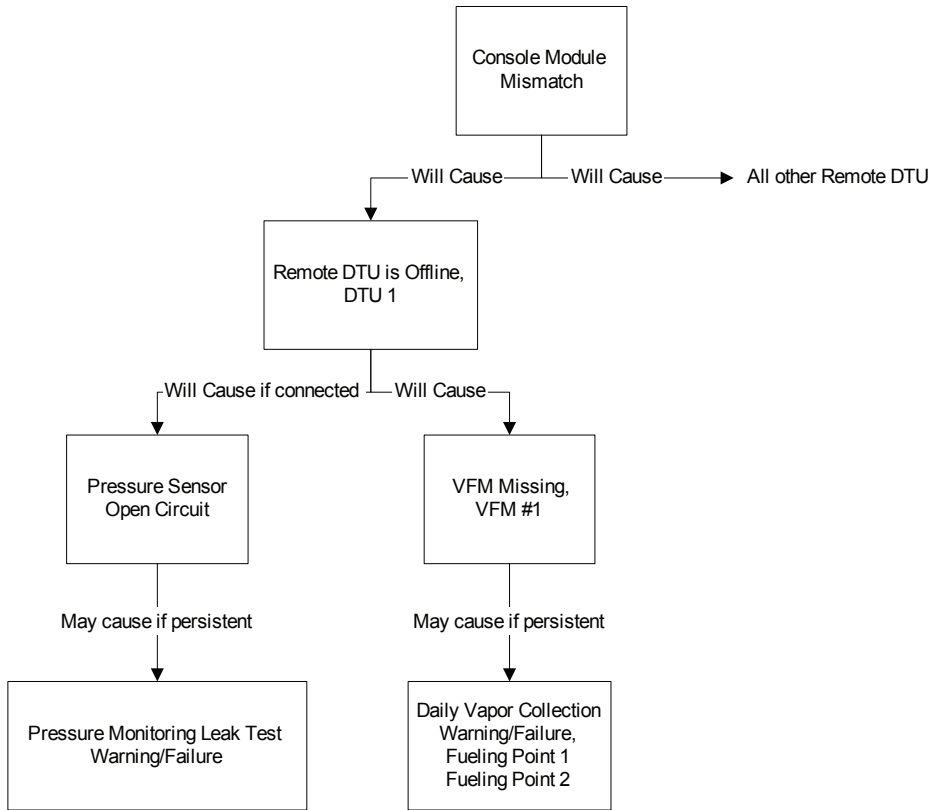


Figure 10: Hierarchy of DTU Alarms

Exhibit B

Steps to Start Using TSA Upgrade Tool for logging DTU Quality

The feature of the TSA Upgrade Tool (Figure 11) allows technicians to either poll the console for the most current signal quality value or log on a continuous basis

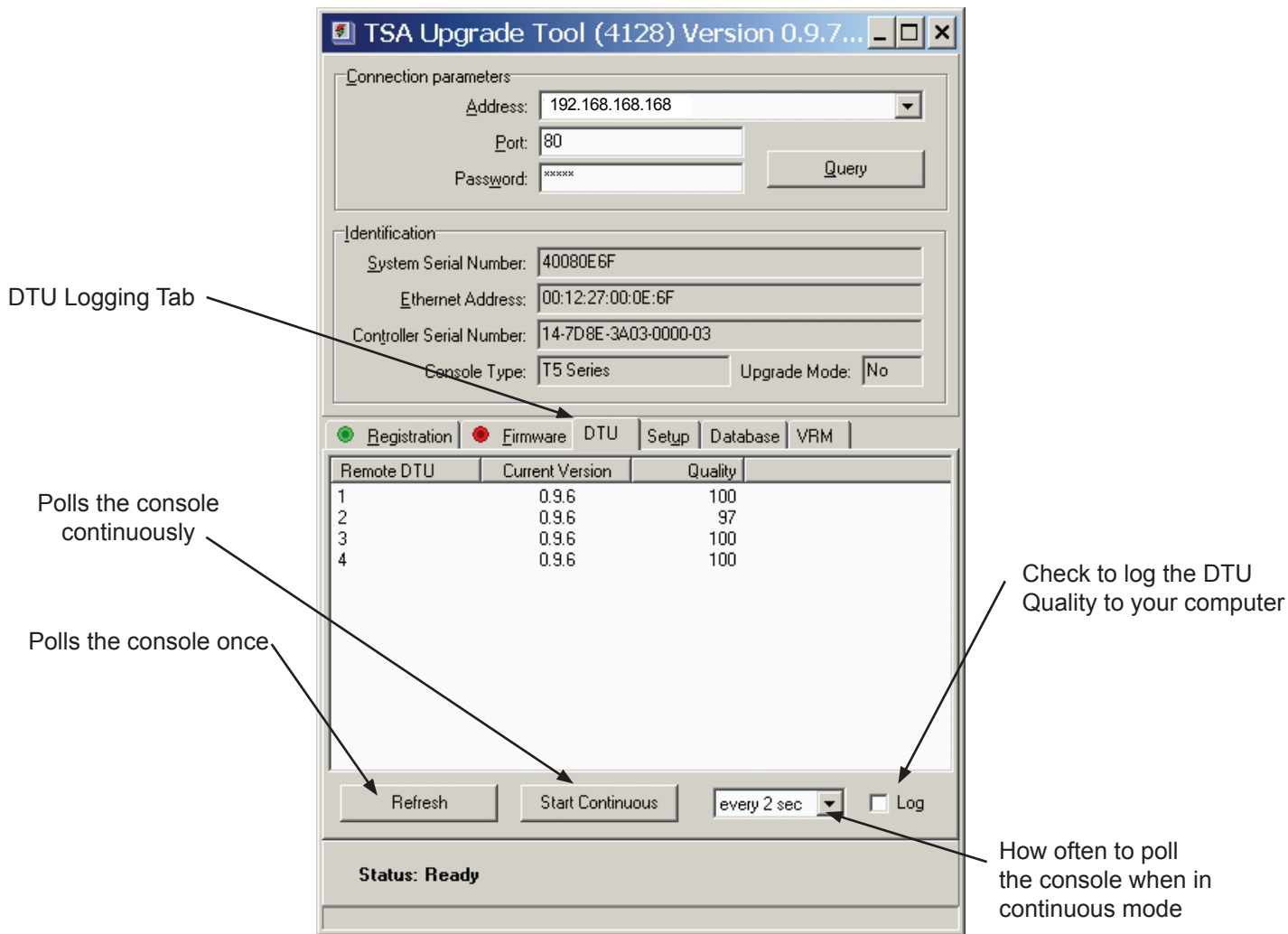


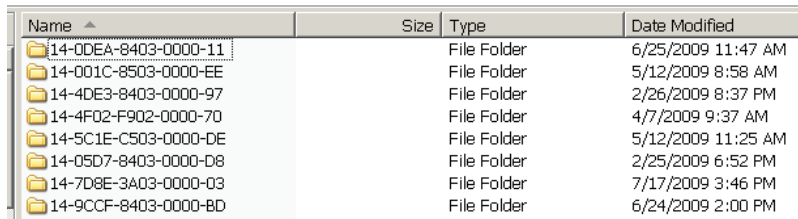
Figure 11; TSA Upgrade Tool

Retrieving DTU Quality after logging to your file.

The DTU quality is stored in the following directory:

My Documents\TSA Upgrade Tool\

Within this folder, there should be folders with names containing various number and letters. See Figure 12.

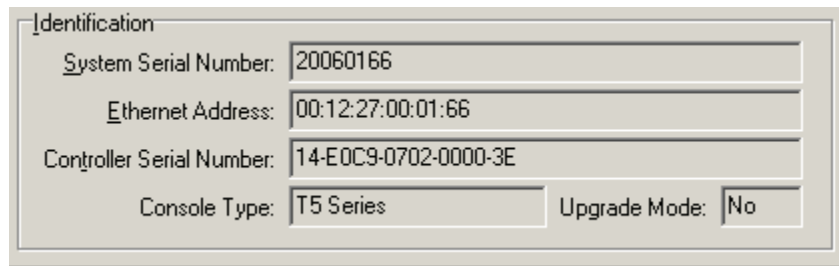


Name	Size	Type	Date Modified
14-0DEA-8403-0000-11		File Folder	6/25/2009 11:47 AM
14-001C-8503-0000-EE		File Folder	5/12/2009 8:58 AM
14-4DE3-8403-0000-97		File Folder	2/26/2009 8:37 PM
14-4F02-F902-0000-70		File Folder	4/7/2009 9:37 AM
14-5C1E-C503-0000-DE		File Folder	5/12/2009 11:25 AM
14-05D7-8403-0000-D8		File Folder	2/25/2009 6:52 PM
14-7D8E-3A03-0000-03		File Folder	7/17/2009 3:46 PM
14-9CCF-8403-0000-BD		File Folder	6/24/2009 2:00 PM

Figure 12: TSA Upgrade Tool Folder

These folders are named after each console that the TSA Upgrade Tool has connected to. The name of each folder is the Controller Serial Number which can be found on the TSA Upgrade Tool while connected.

1. Find the Controller Serial Number for the current site. Record this number.



Identification	
System Serial Number:	20060166
Ethernet Address:	00:12:27:00:01:66
Controller Serial Number:	14-E0C9-0702-0000-3E
Console Type:	T5 Series
Upgrade Mode:	No

Figure 13: Controller Identification

2. Find the folder with the same name in the TSA Upgrade Tool directory.
3. Find the file name "dtu-status-log.txt"
4. Open the text file with either notepad or Microsoft Excel.
5. Examine the information for indications of problems mentioned in this document.

If you still have questions, contact FFS Technical support (800-984-6266).

INCON[®]



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