

## AtlasIED Application Note

# Updating Titan Frames to Use with GLOBALCOM

Ver 1.0 29 November 2018

### Background

GLOBALCOM (and GCK) requires some additional objects in the Titan T9160 amplifier firmware that were not needed to work with older 520ACS controllers. Newer firmware will work with both the older 520ACS and GLOBALCOM controllers. Customers who are updating their systems from 520ACS to GLOBALCOM and wish to retain their existing Titan frames will need to insure that the firmware is recent enough to support it, and update it if necessary.

Previous policy for updating a Titan frame for GLOBALCOM was always to replace the CPU module and the CobraNet CM-1 module. This operation requires removing the frame from the rack, taking the top off and carefully removing and replacing boards inside the unit. Then, one has to put it all back together and replace all the rack/field wiring to the frame. This was straightforward and provided one solution that works for any vintage of Titan frame: old, middle-aged or new. This document describes how one can determine whether a firmware update is absolutely needed or not, and if so in which cases can this easily be done in the field over the network rather than by replacing the CPU module. The network update procedure is also covered in this document.

Besides the T9160, this document also applies to a similar product, the T9116DSP, sometimes called a Zone Output Processor or ZOP. Updating ZOP firmware requires a couple of extra steps which are mentioned in this application note.

The next section explains how to evaluate the existing Titan firmware version, and the section after describes how to update the firmware over the network. These steps/procedures reference back to information in Appendices A and B. It is recommended that the reader peruse the whole document before going back to actually attempt to do any of the procedures. That way, they will be familiar with the Appendices and better know when they need to refer back to them.

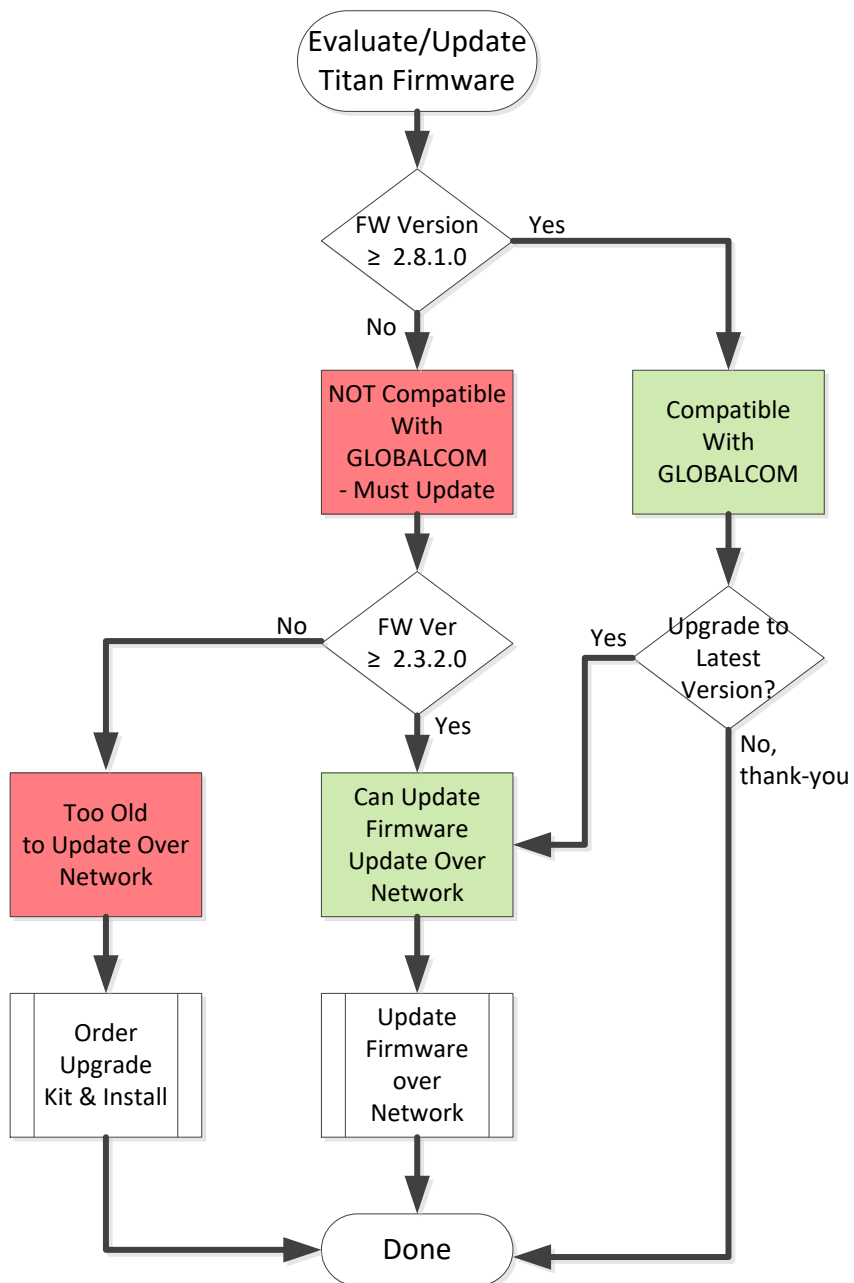
### Evaluating the Current Firmware Version

The decision tree for evaluating and updating your Titan firmware is shown in the flowchart below. Support for GLOBALCOM started with version 2.8.1.0 in October 2011. If you have that version or later, updating is not required although you may wish to update anyway to take advantage of bug fixes over the last 7+ years.

Firmware older than that *might* still be updateable over the network, provided it isn't *so old* that the CPU module has an old bootloader on it. The latest bootloader went on with application firmware version 2.3.2.0 about 10 years ago as of this writing. Frames that are too old should be updated the current approach of replacing the CPU module and CM-1 module.

Two possible approaches for determining the firmware version on existing Titan frames are covered at the end of this application note in Appendix A. Appendix B explains the firmware versions.

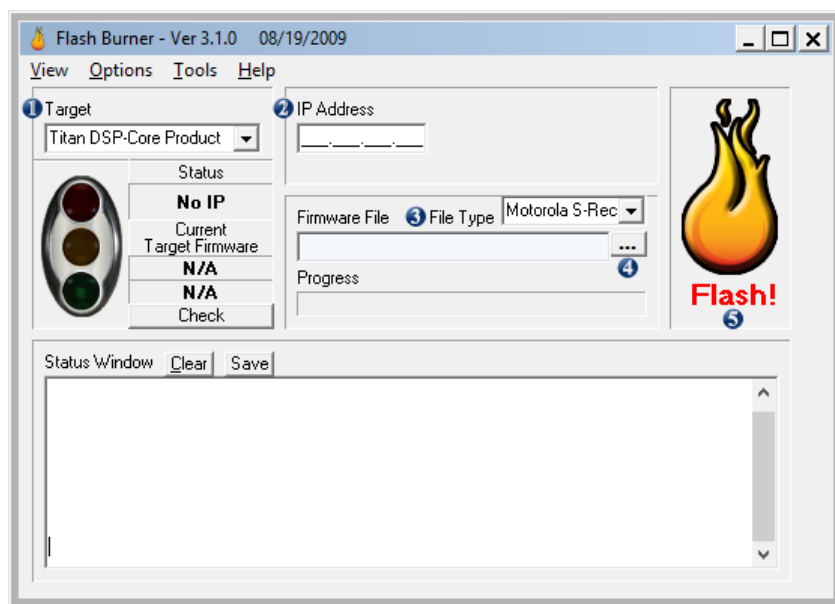
If one must order the upgrade kit or wishes to use this approach rather than doing network updates, there is a procedure document that ships with the upgrade kits. However, if one wishes to review this procedure in advance, it is available in Zendesk. The document is *IEDT9160 Upgrade Instructions*, document #1101N. (Search for IEDT9160 to quickly find it.)



## Updating Titan Firmware over the Network

The first step is getting the proper version of the firmware file(s) (with file extension .A79) onto your local system, such as a GLOBALCOM controller (IP100 series). There are different versions to cover variations in Titan hardware. You want to be sure to put the correct version of the latest firmware on each Titan frame. See Appendix B for a complete listing of firmware versions and what hardware variations they apply to.

The main tool for updating the Titan firmware over the network is FBurner.exe. This tool is located on a GLOBALCOM system in the C:\IED\Tools\Titan folder. One should run the latest version found (usually 3.1.0). Simply double-click FBurner3\_1\_0.exe to launch the application. The window one should see is as shown below.



The little blue circled numbers that appear on the user interface indicate the steps to follow when using this tool. For this situation, it is useful to insert a step between ② and ③. This extra step insures that one is talking to the frame on the network and retrieves the current firmware version which is used to determine which version of the latest firmware to apply to this frame (as explained in Appendix A and listed in Appendix B).

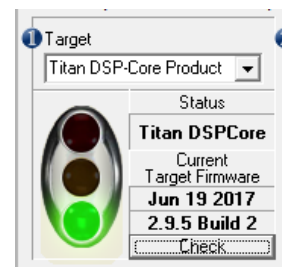
① Select product family – *Leave at the default “Titan DSP-Core Product”*

② Fill in IP Address of the frame

<Insert Step> Check the current firmware version by clicking on the [Check] button. The bottom-most box shows the version, with the last digit split out. In the example shown at right, this would also be expressed as version 2.9.5.2 .

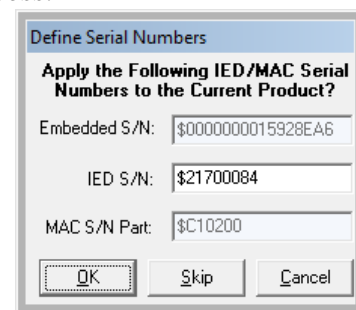
③ Select file type – *Leave at the default “Motorola S-Rec”*

④ Locate the correct version of the latest firmware file on your local system by clicking on the [...] button to bring up an open dialog box. Be sure to only select a file with extension .A79 (Motorola S-Rec format) and appropriate to the frame’s hardware.



- 5 Click on the big flame icon to start the firmware update process.

Soon after this process starts, it will read in the frame's current serial number and present the prompt shown at right. For frames being updated, you should just click on the [OK] button (or hit the [Space] bar or [Enter] key on the keyboard) to allow the update to continue with the existing serial number.

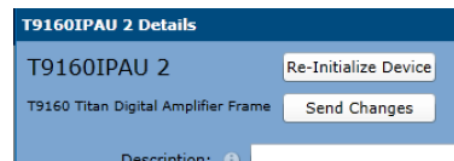


The dialog box is titled "Define Serial Numbers" and contains the text "Apply the Following IED/MAC Serial Numbers to the Current Product?". It has three input fields: "Embedded S/N:" with the value "\$0000000015928EA6", "IED S/N:" with the value "\$21700084", and "MAC S/N Part:" with the value "\$C10200". At the bottom are three buttons: "OK", "Skip", and "Cancel".

Now, the FBurner program will go through its 14 steps, showing progress along the way. The traffic light on the left will show green or yellow status depending on whether it is actively doing something or waiting on the frame to come back up after a reset operation in the process. *This process will take about seven (7) minutes, so be patient.*

At the end, the program retrieves the new firmware version and verifies it is correct. If you want to manually confirm the version, you will need to click on the [Check] button again at this point.

Of course, after this update the Titan frame is at factory defaults on all internal properties except network configuration. (It will retain IP address, subnet mask and default router settings.) If one had already configured this frame from GLOBALCOM/GCK, then one should go back into the System Management Center (SMC), open the device and click on the [Re-initialize Device] button in the upper-left corner of the device settings window.



The window is titled "T9160IPAU 2 Details" and shows "T9160IPAU 2" and "T9160 Titan Digital Amplifier Frame". It has two buttons: "Re-Initialize Device" and "Send Changes". At the bottom, it says "Description: [icon]".

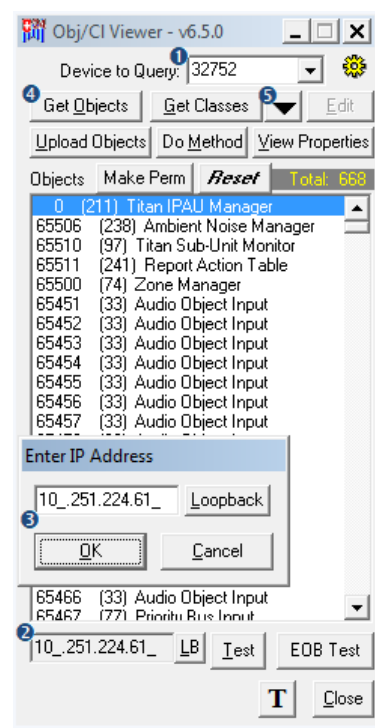
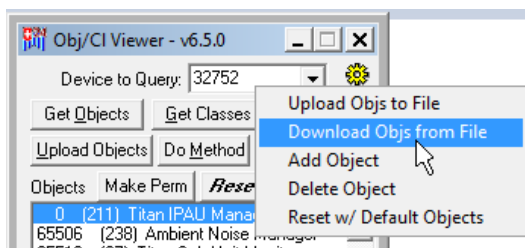
## Additional Steps for T9116DSP (ZOP)

If the Titan frame is the T9116DSP, Zone Output Processor (ZOP), then one needs to reload the objects/settings using the ViewProp tool. Note, this step does not apply to other versions of Titan DSP (T9016DSP, T9032DSP), only the ZOP version which has an object set very close to that of a T9160 frame.

The first step is to get a copy of the file “T9116ZOP.iob” and load it onto the local system, for easy access from the ViewProp tool.

The ViewProp.exe tool should also be in C:\IED\Tools\Titan. Double-click it to run and following the steps shown in the graphic below. (Note, the circled numbers do not appear on the ViewProp program window like on FBurner, but are only shown in this document for instructional purposes.)

- ❶ Enter 32752 into the Device to Query edit box.
- ❷ Click on the IP address box to bring up the pop-up box.
- ❸ Enter the frame’s IP Address and click on the [OK] button in the pop-up.
- ❹ Click on the [Get Objects] button to verify communications with the frame
- ❺ Bring up the special operations menu button by clicking on the [▼] button. This should bring up the menu shown below.



Select “Download Objs from File” menu option. This should bring up an Open dialog box where one locates the local copy of the T9116ZOP.iob file and clicks on the [OK] button.

ViewProp will first prompt whether to delete all objects first. You should select [Yes].

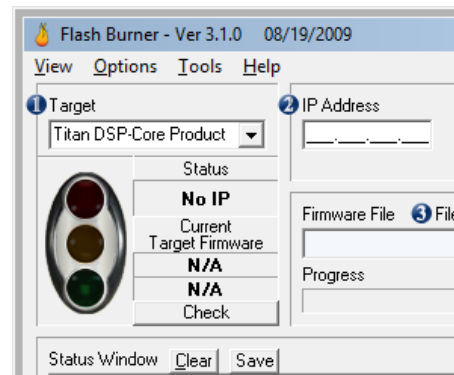
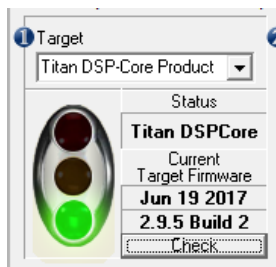
After the objects are downloaded *successfully*, click on the [Make Perm] button to save these new objects to non-volatile flash memory. If the download operation has errors, one can get back to the original T9160 objects by clicking on the [Reset] button instead of the [Make Perm] button.

## Appendix A: Determining Titan Firmware Version

There are two commonly used ways to determine the Titan firmware version, with FBurner or with ViewProp. Both tools are located on an AtlasIED controller in C:\IED\Tools\Titan, and on some Enterprise servers/computers in a similar location.

### FBurner Method

Run FBurner and fill in the IP address (indicated by ②). Click on the [Check] button. One should see the version just above the [Check] button. If it says “Build”, take the number after “Build” and append it to the others with a period to get the whole number, e.g., version 2.9.5.2 in the example shown. If there is no “Build”, then the final digit of the version is zero, e.g., version 2.8.1.0.

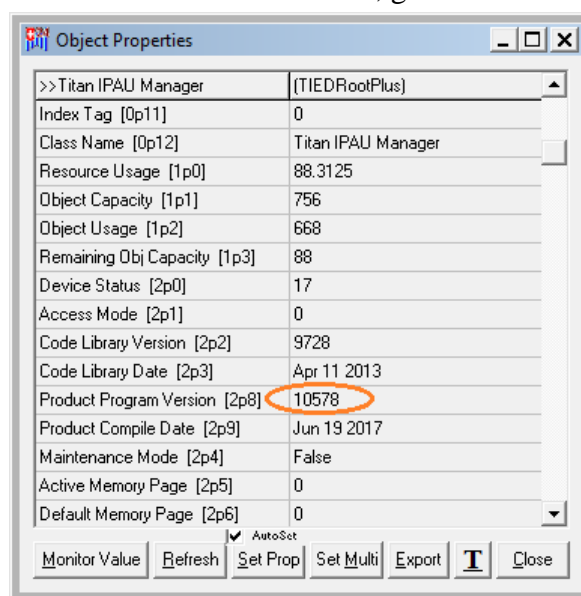


### ViewProp Method

This method is only recommended for advanced users or if one is using ViewProp for other purposes anyway. In summary, one goes through steps ① to ④ as described in the section above for T9116DSP frames to get communications established with the frame. That is, go as far as retrieving the list of objects from the frame. Now double-click on the first object (Titan IPAU Manager). Optionally, click on the [T] button to retrieve the property descriptions. Scroll down to property Product Program Version [2p8] and read the value.

Now, one needs to convert this value from decimal to hexadecimal, such as with the Windows calculator in *Programmer Mode*. One then assumes periods between the hex digits. For example, the key versions from the flowchart on page 2 are:

[2p8]	FW Version
10578	2.9.5.2
10256	2.8.1.0
8992	2.3.2.0



## Appendix B: Versions of Titan Firmware

There have been two primary changes to Titan hardware over its life, with firmware adjustments to work with these variations: (1) old and new Relay Boards and (2) old and new CobraNet CM-1 Modules. The CM-1 module change-over happened near the end of 2010 and the relay board change-over happened in the Spring of 2013. The table below indicates what is supported by each version of Titan firmware. In this manner one can be sure to apply the correct version of the latest firmware, which comes in three variations to support 3 of the 4 possible combinations of old and new boards/modules.

Version	Old CM-1	New CM-1	Old Relay	New Relay
2.7.6.0 and earlier	●		●	
2.8.1.0 – 2.8.7.0				
2.9.0		●	●	
2.9.x.1 (x = 1..5)				
2.9.1		●		●
2.9.x.2 (x = 1..5)				
Latest*				
2.9.5.1		●	●	
2.9.5.2		●		●
2.9.5.3	●		●	

\*As of this Application Note authoring date

### Consequences of Loading the Wrong Version of Firmware

Mixing up old and new revision of **Relay Board support** is a non-critical mistake. The primary difference between the two is the level of the monitor/test points that physically reside on this board, like amplifier Voltage and speaker current readings. The different firmware applied different correction factors so the readings obtained from the board would always agree with an external piece of test equipment that might be used to check readings. With the wrong correction factors loaded, the frame's internal supervision (auto testing) will still function since this testing is always done as a *relative* difference from "truth" (System Set Levels). But the readings just won't agree with any external test gear.

Mixing up old and new **CobraNet module** support is a critical mistake. It will be manifest in that paging audio will only be heard about every 8<sup>th</sup> announcement. That is because the announcement controller cycles through the CobraNet receivers in a round-robin fashion, and the old and new modules only agree in their internal routing structure on receivers 2 and 10, out of the 16 available receivers. The correctly-matched Titan firmware loads the correct routing table into the module, so audio gets routed from the correct receiver every time.



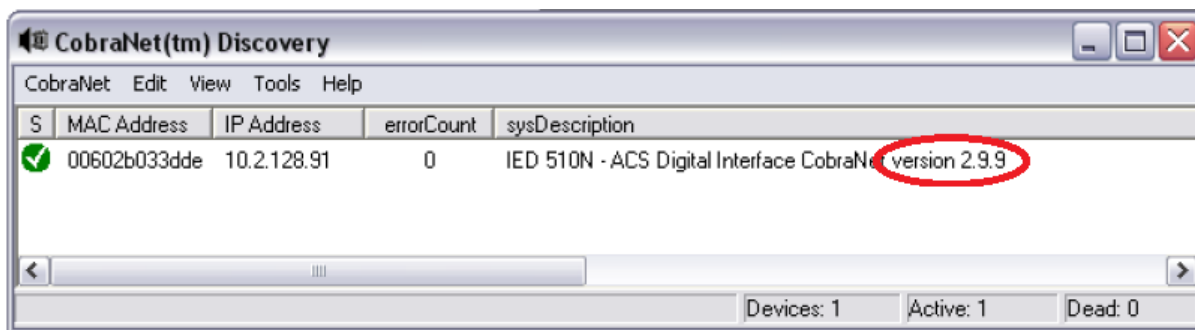
If you believe that the wrong version of firmware got loaded in regards to CM-1 module support, one can verify old vs. new CM-1 modules without opening the Titan case. The CM-1 modules have two different versions of CobraNet firmware loaded:

- Old CM-1 Modules have firmware versions 2.9.x
- New CM-1 Modules have firmware versions 2.21.x

This version information is displayed at the end of the sysDescription field that appears in CobraNet Discovery. Simply run CNDisco and wait for it to discover and populate the fields. Then one can see the version as shown in the screenshots below.

*Note: The modules report as being IED 510N in sysDescription since the same firmware is used in both the original 510N product and the Titan products.*

### Old CM-1 Module



### New CM-1 Module

