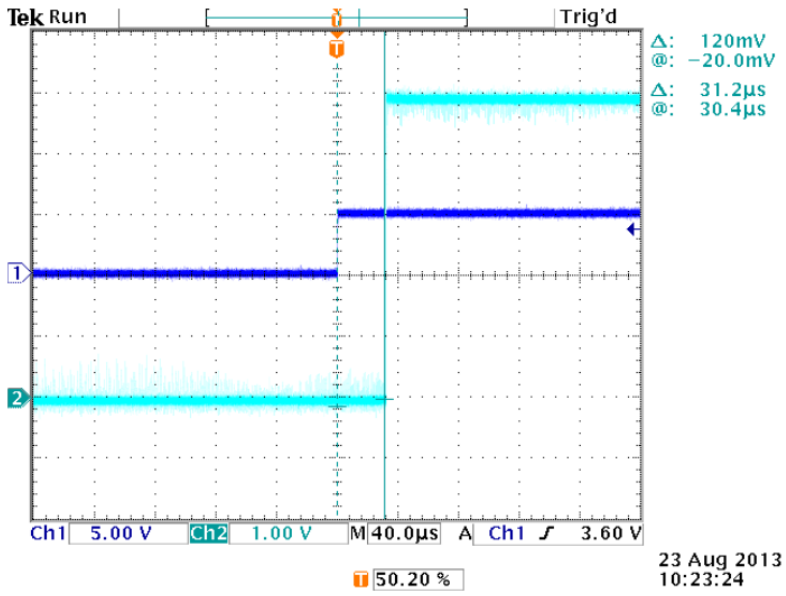
Procedure for adjusting the time shift that can occur using modulated IRIG on V1610/1210 cameras.

We have been informed that occasionally the IRIG time generators modulated side can have errors of as much as 40 µs. This would not normally be a huge issue except where you might be using IRIG to synchronize your cameras.

On the V1610 and V1210 cameras this error can be calibrated and fine tuned to only be a few nano seconds off.

To perform the calibration you must have an IRIG generator that has both modulated and un-modulated outputs, the camera, a two channel oscilloscope and a PC controller that is capable of telneting into the camera.

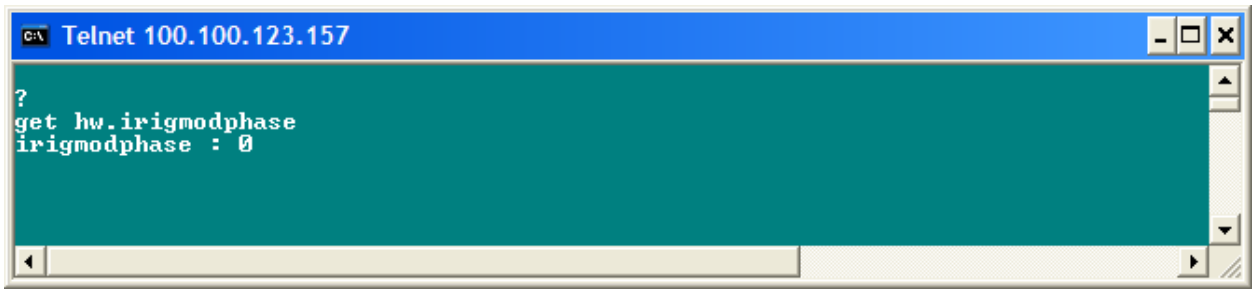
Power up the IRIG time generator and the camera. Attach the modulated IRIG signal from the generator to the IRIG time input on the camera and confirm that you are seeing IRIG time being set in the camera. An “S” should be seen in the time stamp in PCC or on the “On Screen Display” in the video output. Attach the IRIG output of the camera to channel one on the scope. Connect the un-modulated IRIG output of the generator to channel two of the scope.



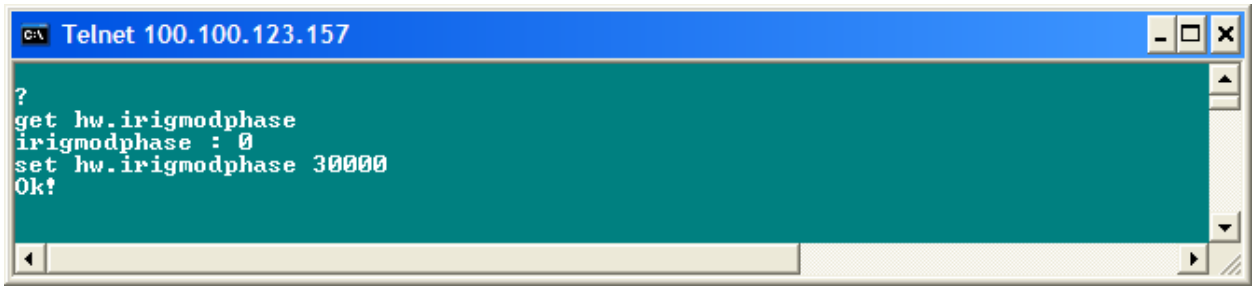
hw.irigmodphase 0

Set channel 1 to 5 volts/div and set channel 2 to 1 volt/div. Set channel 1 position to the center graticule and channel 2 to two below this. Set the trigger to a midpoint on channel one and the time base to 40 µs. The display on the scope should look similar to this. In this case there is about a 30 µs error.

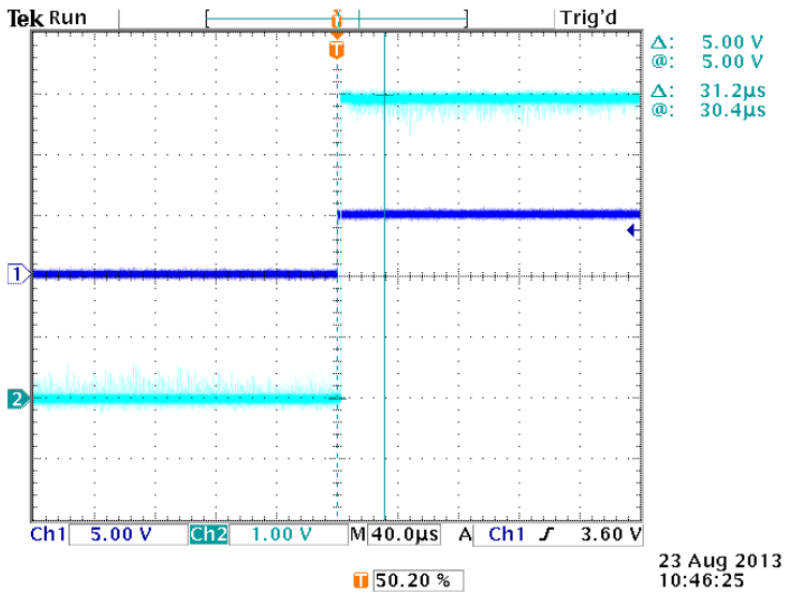
On the PC controller, open a **CMD** window and telnet into the camera with the command : ***telnet 100.100.xxx.xxx 7115***, where xxx.xxx is the IP address of the camera you are working with. Once the telnet session is open you will see a blinking cursor and at this point what you type in will not display. To get it to a point where it will display what you type in, press the ***Enter*** key. This will return a "**?**". Type in, without the quotes, "***get hw.irigmodphase***" and press enter. Everything you enter here is going to be lower case. If the camera has never been calibrated in this fashion, it will return a value of zero.



Given what was seen on the scope before we have a 30 µs error. To correct this, enter a value of 30000 into the hw.irigmodphase variable. In the **CMD** window type in, without the quotes, "***set hw.irigmodphase 30000***" and press enter. It will return an "**OK!**".

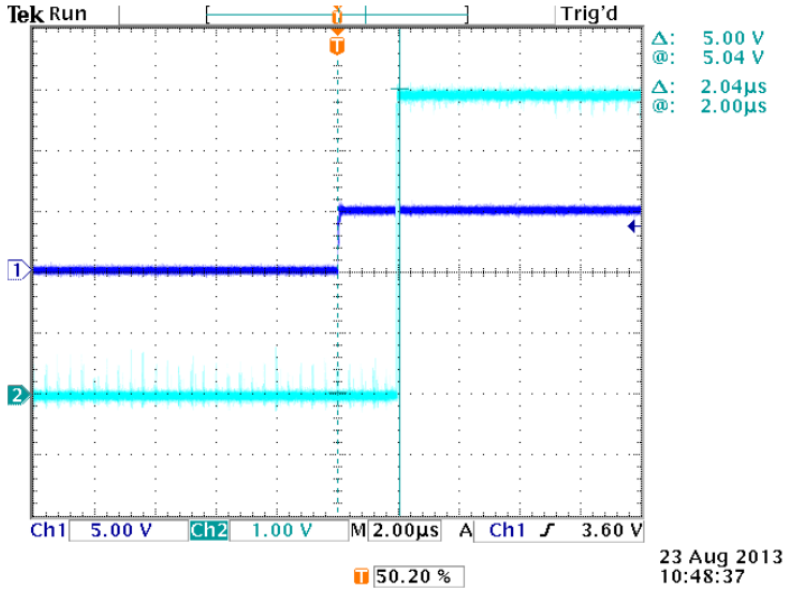


To make this change effective in the camera and to see the change on the scope you must wait about 10 seconds for the change to save in the camera and then power cycle the camera. The results are shown below.



hw.irigmodphase 30000

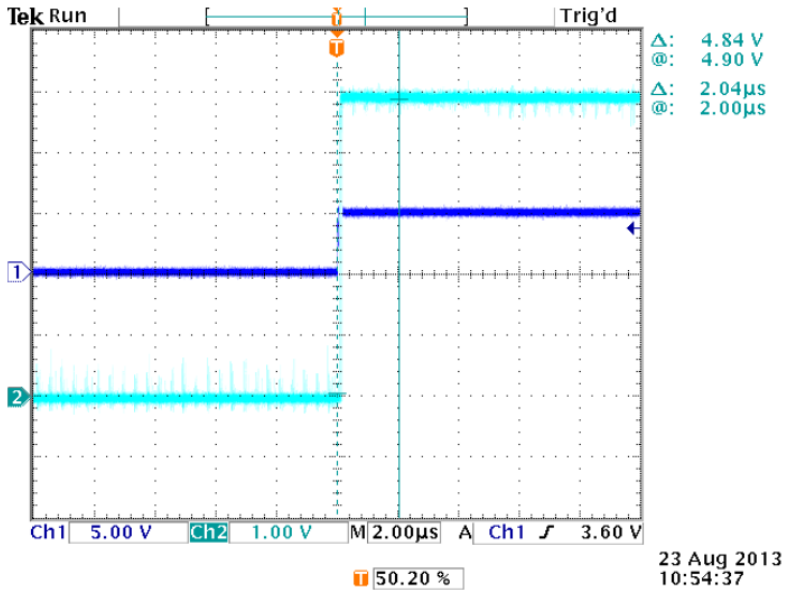
While the change that you made looks good it can be fine tuned even more by zooming in with the scope to 2 µs/div. This shows a 2 µs error still remains.



hw.irigmodphase 30000

This can be further fine tuned by telneting back into the camera the same way as before and entering in the **CMD** window, without the quotes, "***set hw.irigmodphase***

32000" and press enter. It will return an "***OK!***". Once again to make this change effective in the camera and to see the change on the scope you must wait about 10 seconds for the change to save in the camera and then power cycle the camera.



hw.irigmodphase 32000

As shown on the scope the error is now less than 1 µs. This should be adequate for most situations. If more accuracy is needed you can zoom in further with the scope and repeat the process. On my camera, I ultimately ended up with a hw.irigmodphase 32350.

If the error is the other way you can enter a negative value in hw.irigmodphase to shift it to the right rather than the left.

This process should be done to all V1610 and V1210 cameras that are to be used with an IRIG generator and experimentation will need to be done to determine how much variance there is in the different generators. If it is shown that there is very little difference in the generators, this process only needs to be done on one camera and then the hw.irigmodphase value can be applied to the rest of the cameras without performing the entire procedure.

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