

QUICK START GUIDE

USING PFX ON AN I.MX6 SABRELITE

BY BRETT BAUMBERGER





Brett Baumberger

Brett Baumberger, Senior Applications Engineer at ASSET InterTech has over 30 years of experience in developing, debugging, testing embedded systems and product support. Brett has a proven history of solving complex problems in embedded systems hardware, software and systems integration. Brett has been a presenter at the Embedded Systems Conference. Prior to coming to ASSET InterTech, Brett held positions at Motorola, Hewlett-Packard, and Wind River Systems. Brett graduated from Mississippi State University with a Bachelor's Degree in Computer Engineering and from Jackson County Community College with an Associate's Degree in Electronics Technology.

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Introduction

This guide is intended to take the user through the steps needed to run PFX tests on a i.MX6 SabreLite board. PFX is short for all our Processor-based test products as detailed in the below section.

Software Setup

The computer needs one of the following products installed and licensed depending on the action desired:

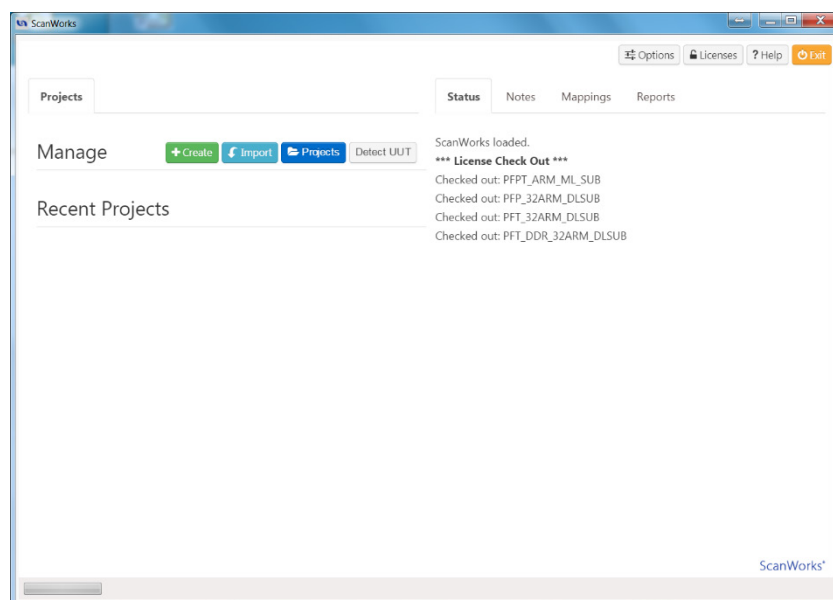
- ScanWorks® Processor-based Fast Programming for ARM 32-bit Processors
- ScanWorks® Processor-based Functional Test for ARM 32-bit Processors
- ScanWorks® Processor-based Functional Test DDR for ARM 32-bit Processors

Hardware Setup

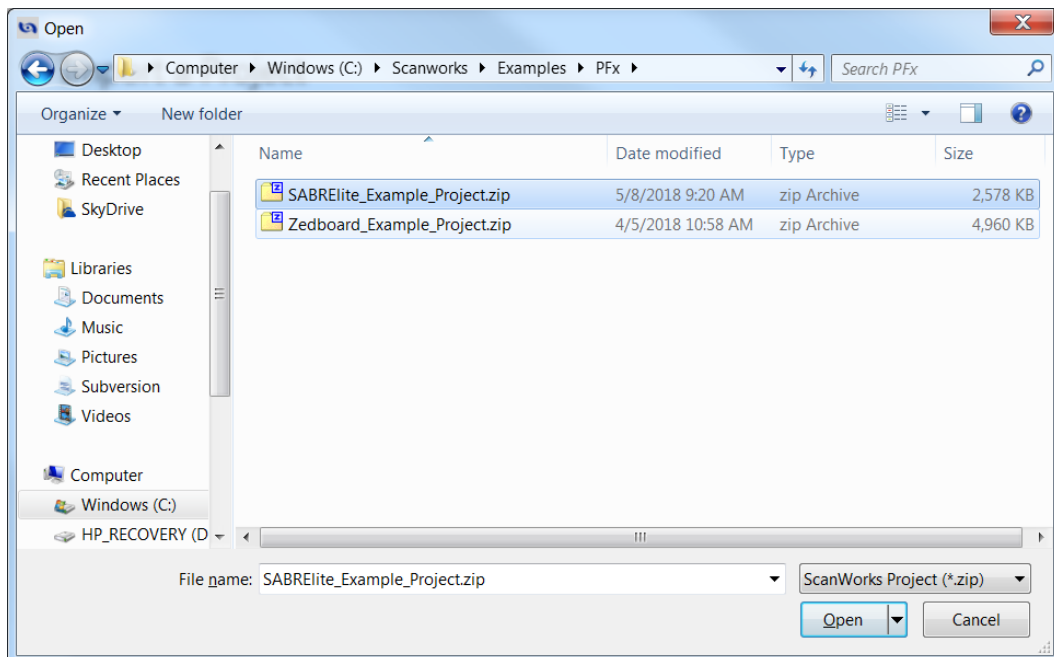
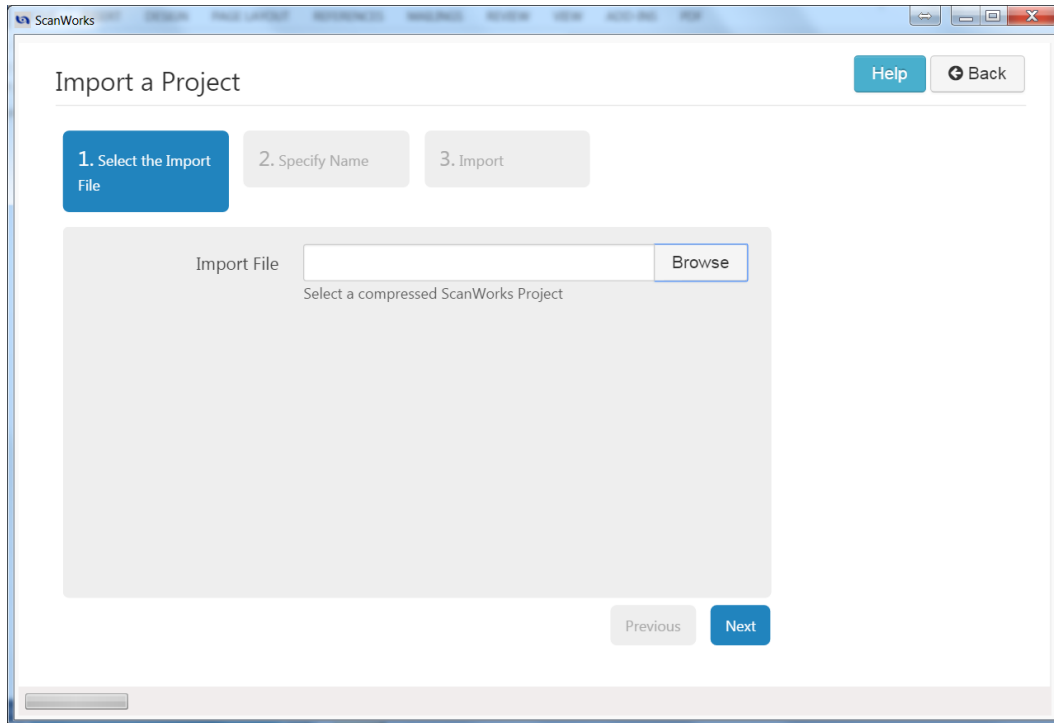
A computer is connected to a hub or switch via an Ethernet cable. A ScanWorks Remote Instrumentation Controller (RIC-1000) is connected to the hub or switch via an Ethernet cable. The Ethernet port on the SabreLite is connected to the hub or switch via an Ethernet cable. The RIC-1000 is connected to the SabreLite's JTAG port via a RIC-1000 UUT cable and an adapter for the i.MX6 JTAG port.

Examples in Development Mode

1. Start ScanWorks.
2. Click on the Import Button.



- Click on Browse and browse to the file to be imported –
C:\ScanWorks\Examples\PFx\SabreLite Example Project.zip and click on Open.



- Click on the Next Button.

ScanWorks

Import a Project

Help Back

1. Select the Import File

2. Specify Name

3. Import

Import As

Forbidden Characters: / ? \ * : | " > < .

Link Import to Source ☐ Notify when project source changes

Destination Directory Browse

Previous Next

- Click on either Import Button.

ScanWorks

Import a Project

Help Back

1. Select the Import File

2. Specify Name

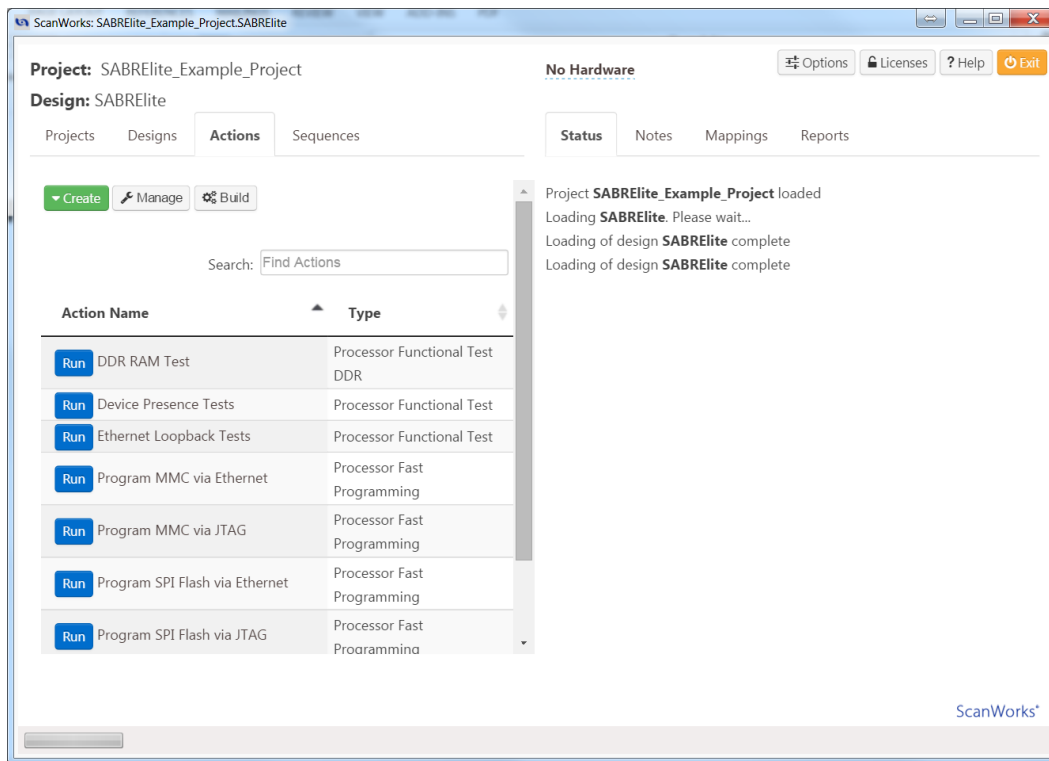
3. Import

Zip File Source	C:\Scanworks\Examples\PFx\SABRElite_Example_Project.zip
Project Name will be	SABRElite_Example_Project
Link to Source?	false
Import to	C:\ScanWorks\Projects

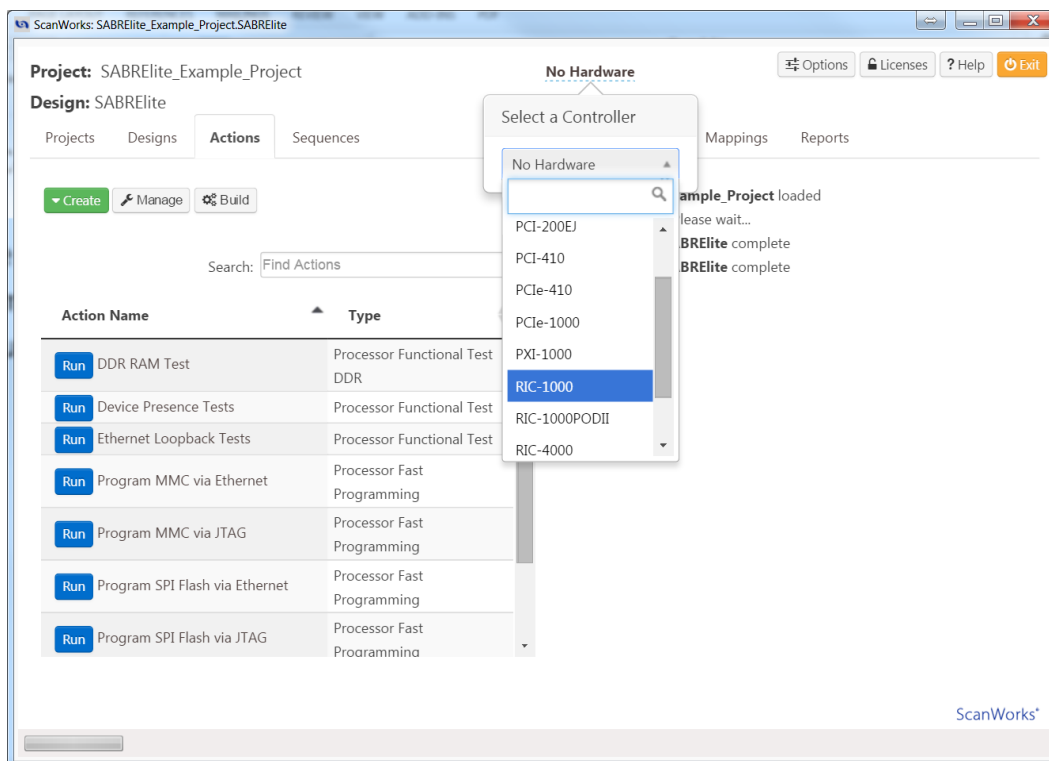
Ready to import

Previous Import

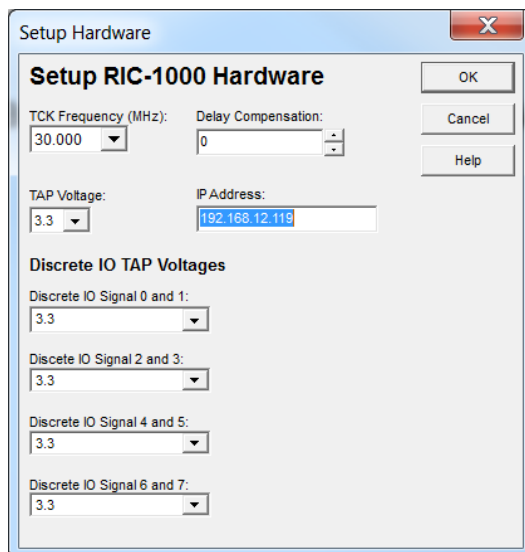
6. Click on **No Hardware** to select the hardware controller.



7. Select RIC-1000 as the controller.

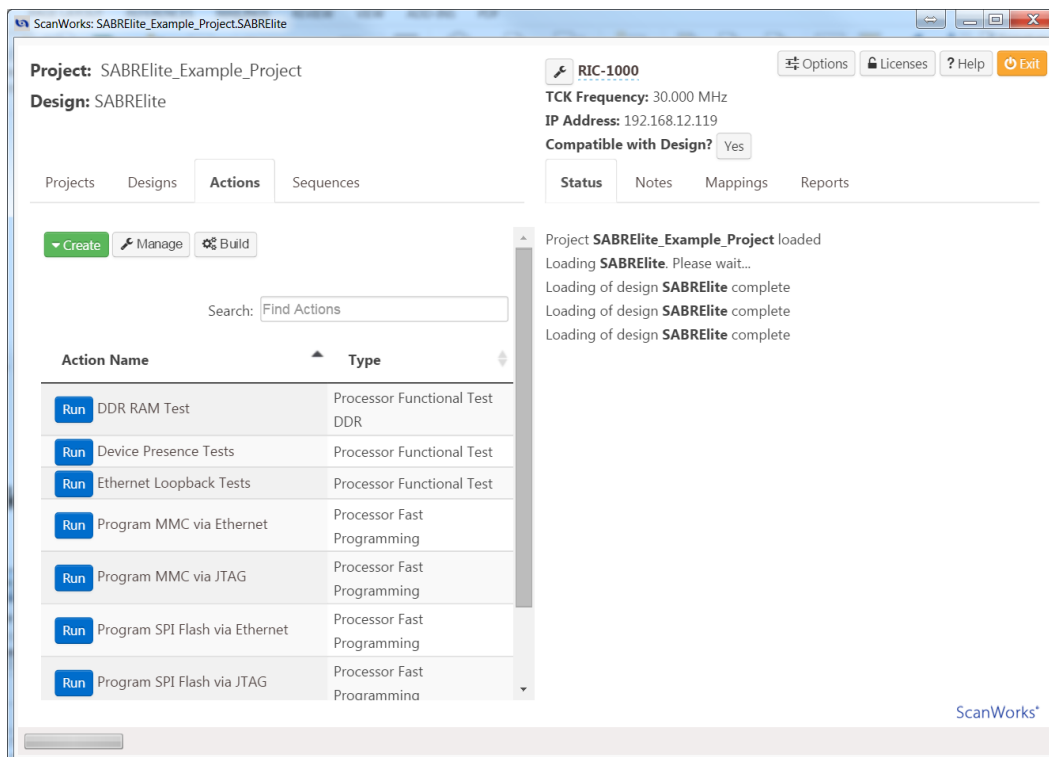


8. Configure the RIC-1000's ip address, and select a TCK Frequency of 30 MHz. Note that flash programming performance over JTAG is directly affected by the TCK frequency. The higher the TCK Frequency, the better the programming performance.

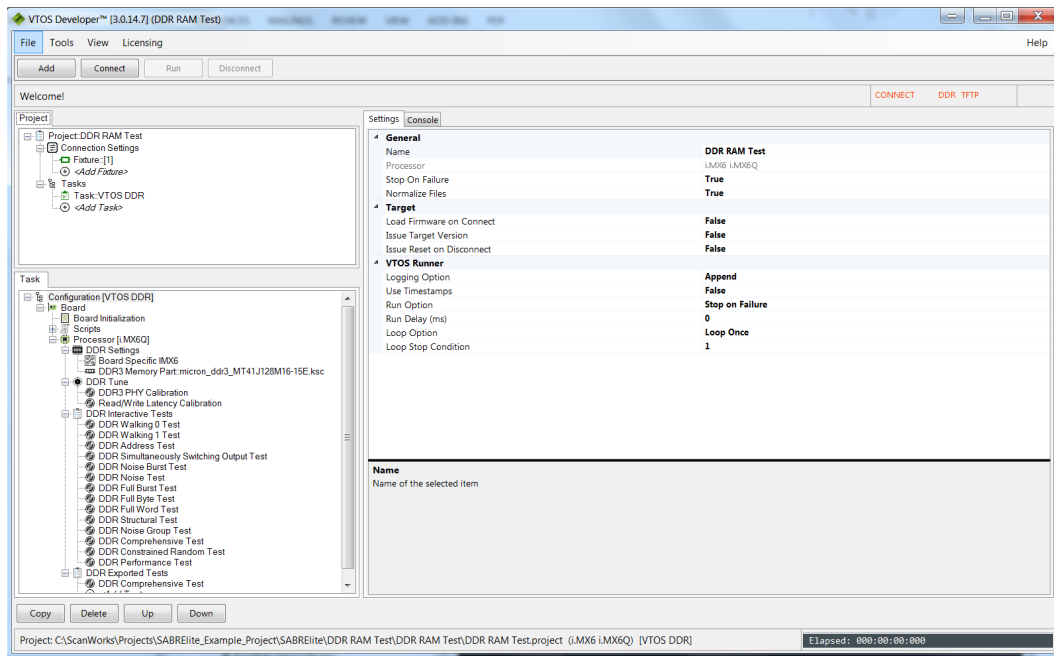


Click OK.

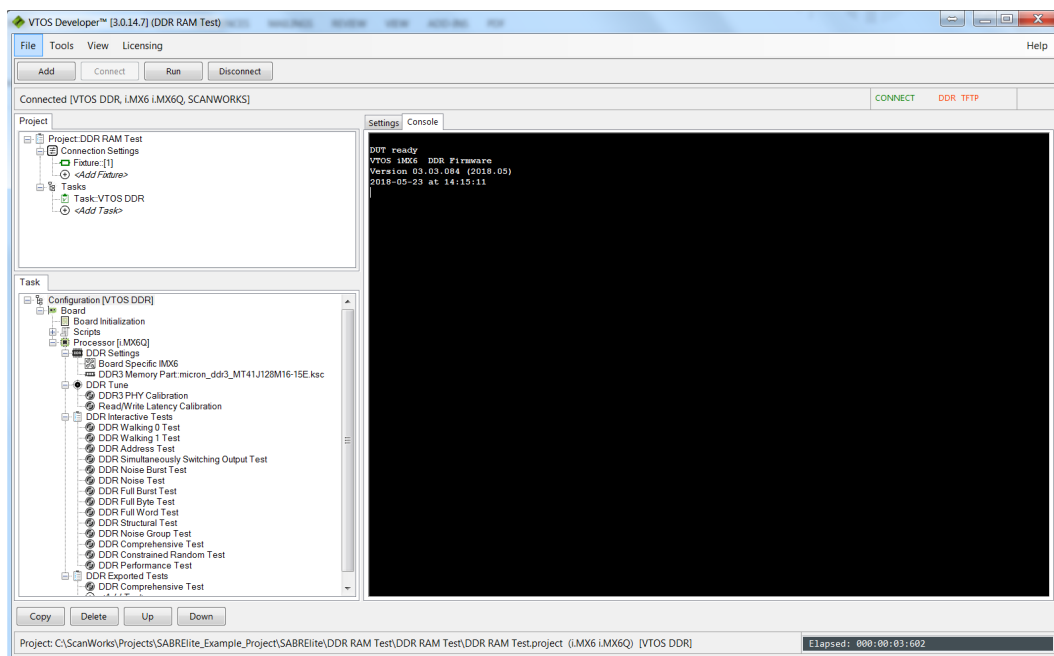
9. Now let's run the DDR RAM Test Action from within Edit mode.



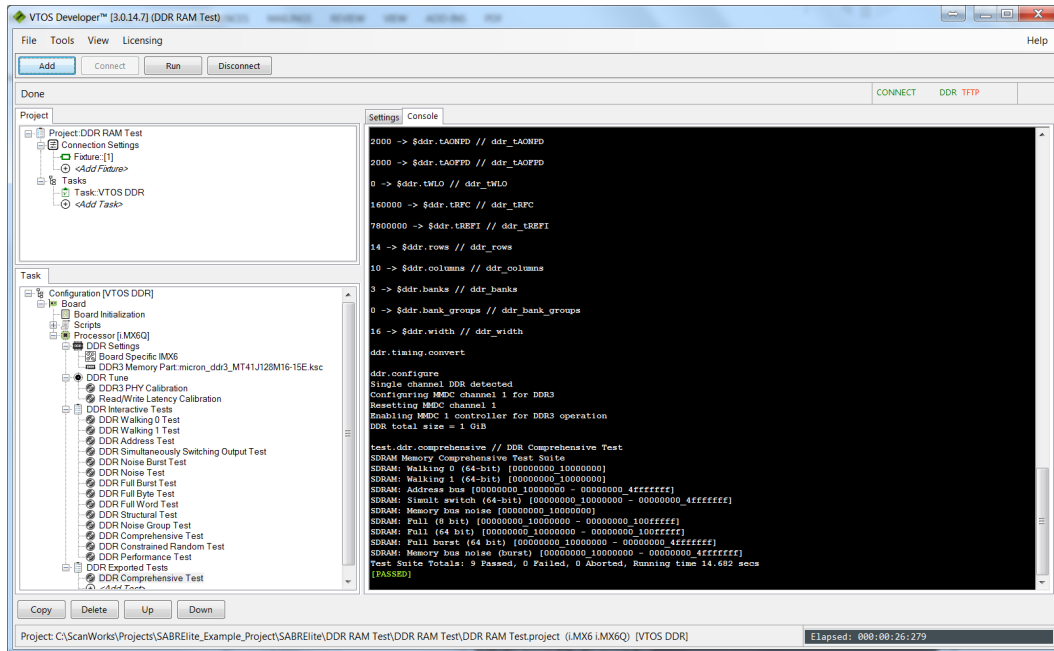
10. Right Click on DDR RAM Test. This will launch the Development interface.



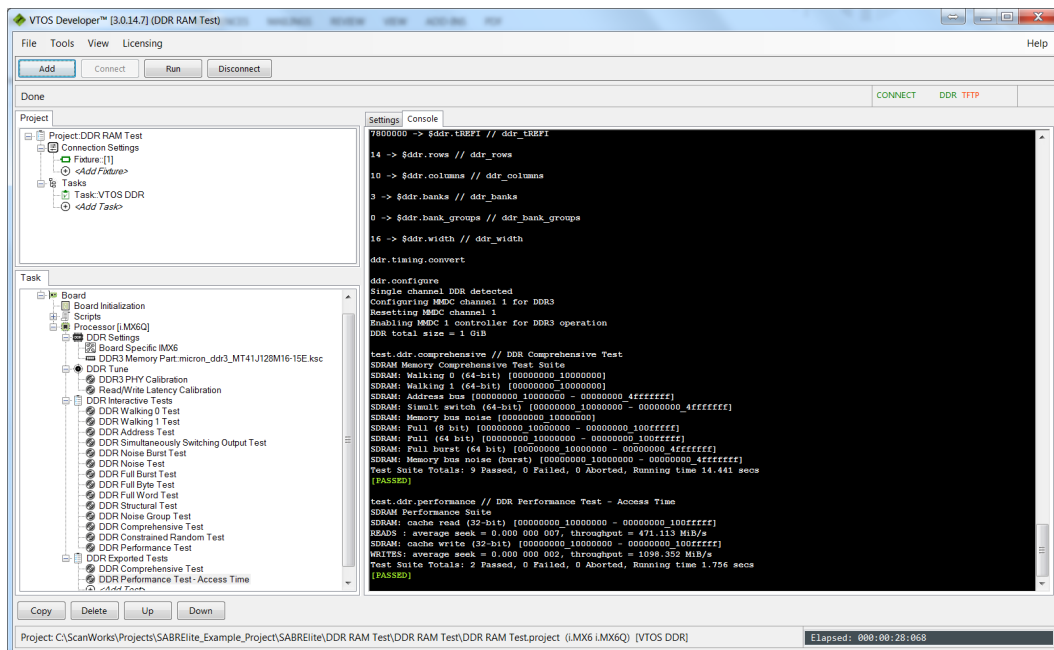
11. Click on the Connect Button. This will download a target agent to the SabreLite and begin communicating with the target agent.



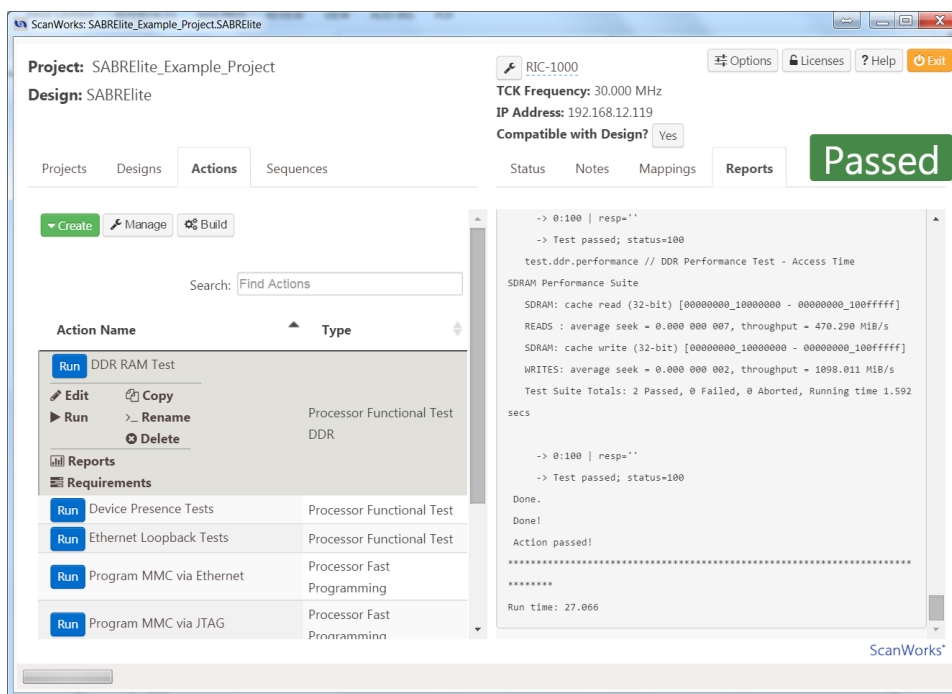
12. You can manually run any of the tests in the DDR Interactive Tests group or the DDR Tune Task by right clicking on it and selecting Run. Click on the Run Button near the top of the window to run the test(s) that are in the DDR Exported Tests group.



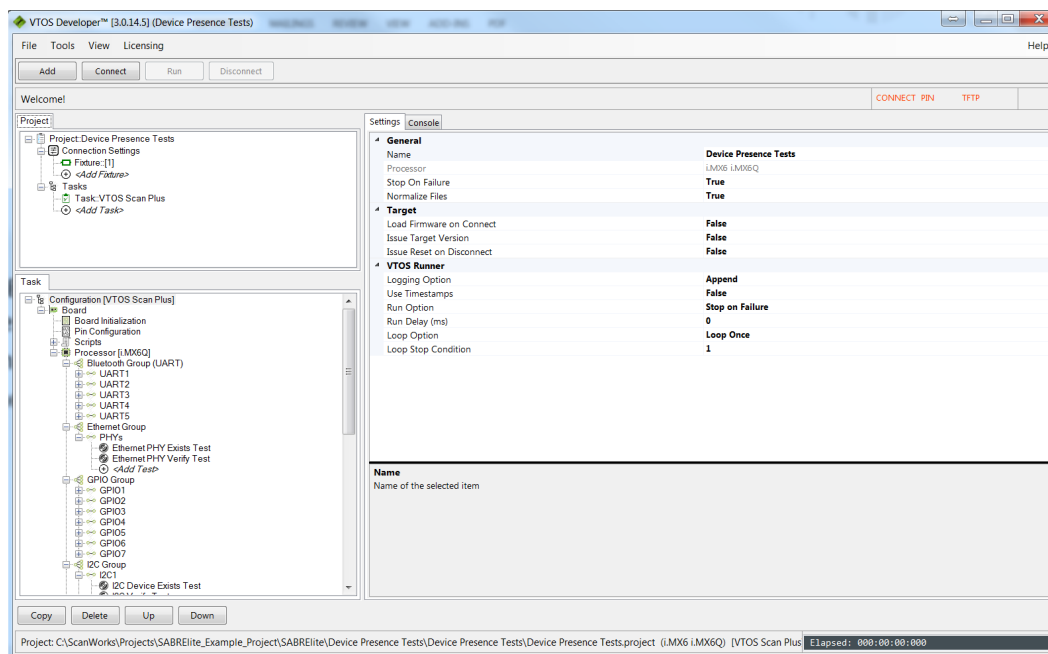
13. Add a test to the DDR Exported Tests group by right clicking on <Add Test> beneath DDR Comprehensive Test. Select DDR Performance Test from the list of tests. Then hit File->Save to save the updated project. Hit the Run button at the top of the interface.



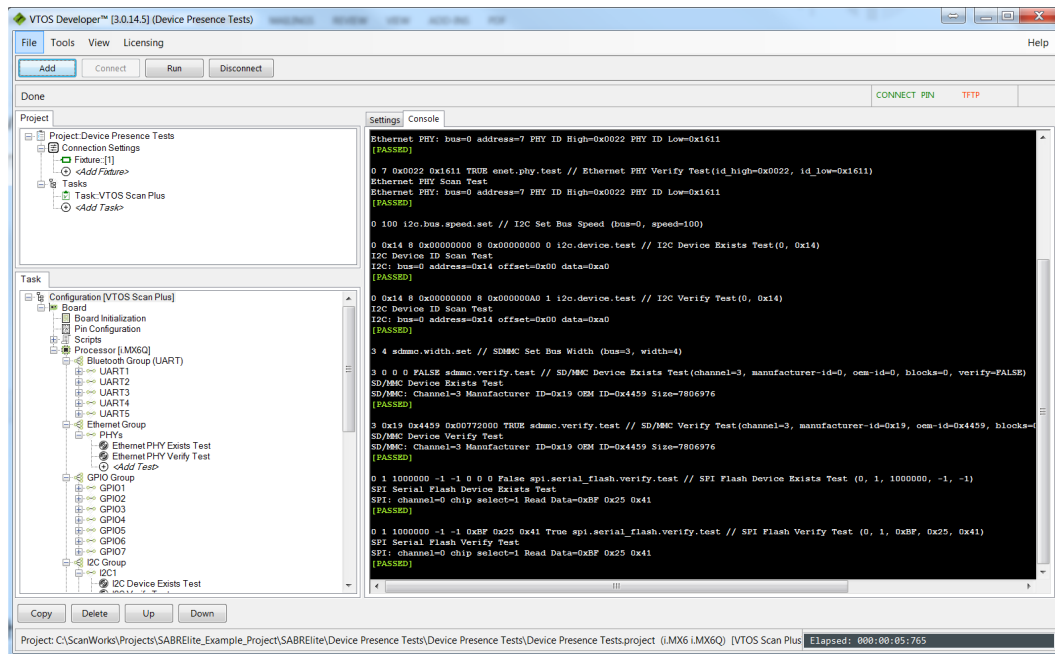
14. Close the Development window, and return to the ScanWorks Actions view. Click on the Run Button to the left of DDR RAM Test to run the DDR Exported Tests as a ScanWorks Action.



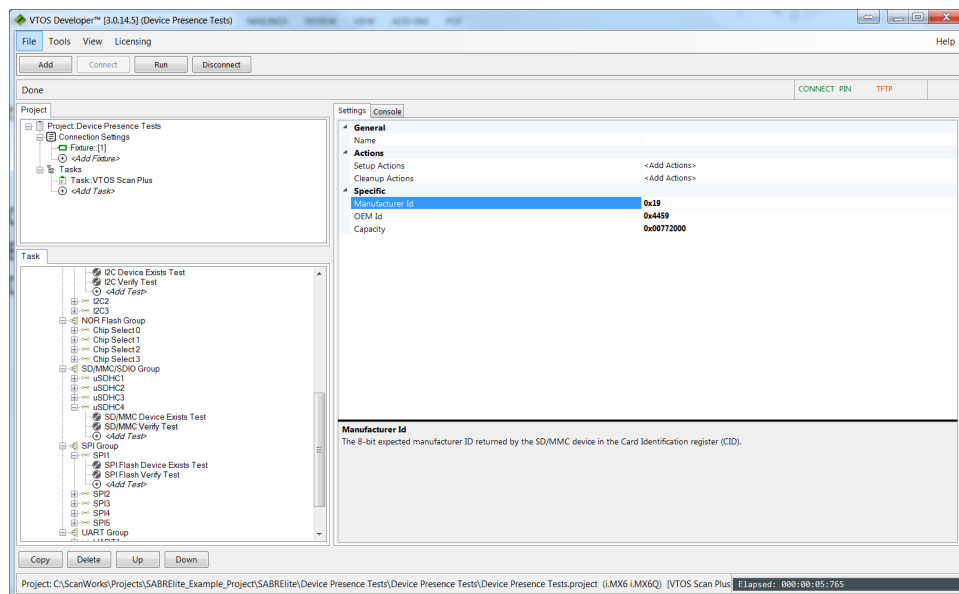
15. Right Click on Device Presence Tests to enter the Development interface for the Device Presence Tests.



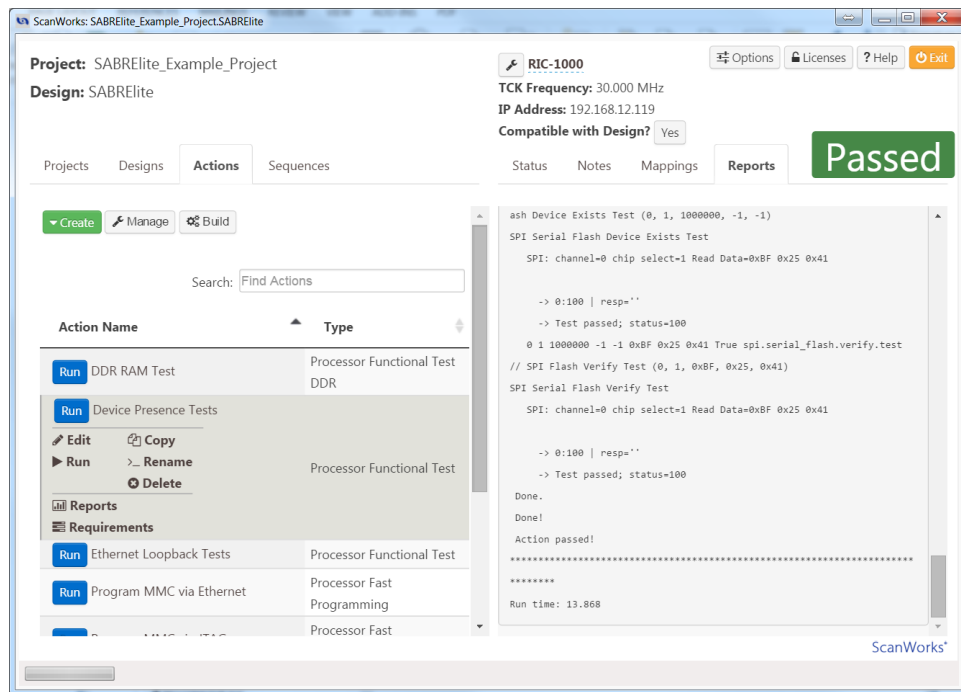
16. This action checks for the presence of the Ethernet Phy, the flash device on the SPI port, the device on the I2C bus, and the presence of the MMC device. Hit the Connect button, then the Run button.



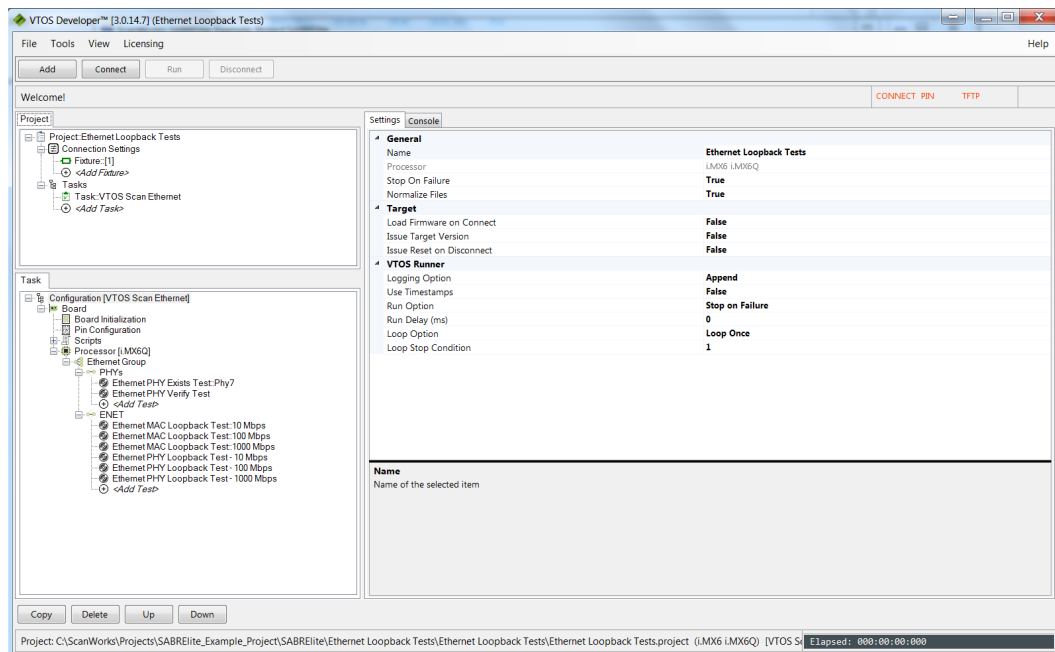
17. If the SD/MMC Verify test fails, the most likely cause is the SD/MMC card in your SabreLite is a different make/model than the one used when creating this guide. To update the settings for your SD Card, click on SD/MMC Verify test and then change the Manufacturer ID, OEM ID and size fields to match your SD card. Note that the size of the SD/MMC card is printed out in decimal in the test, but the input field is expecting a hexadecimal entry. Save the Project. Hit the Run button to verify the change in settings have corrected the problem.



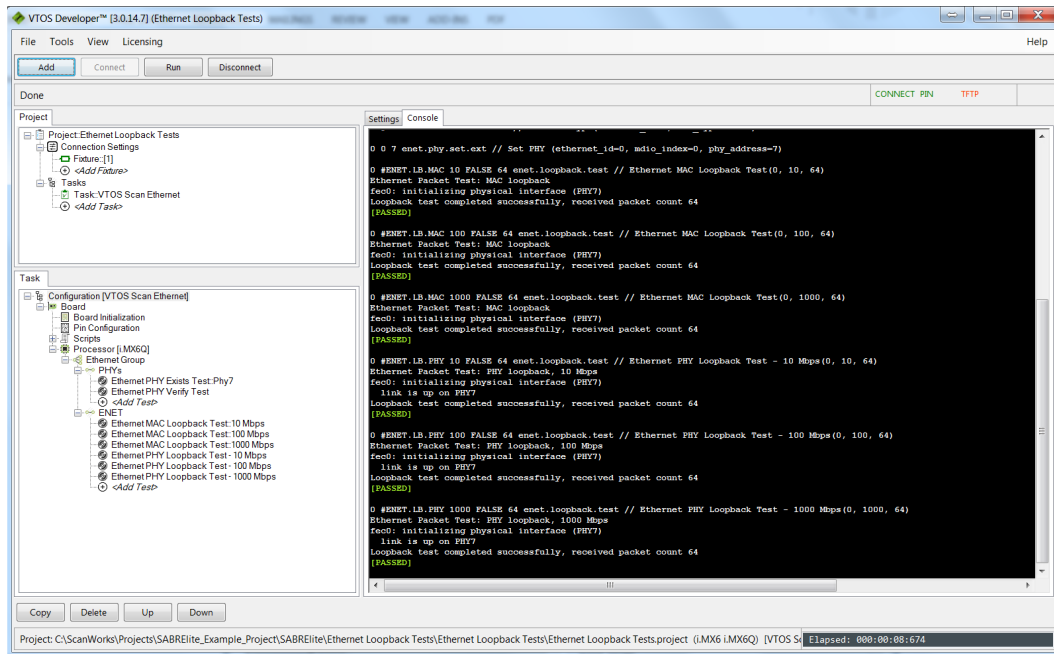
18. Close the Development window, and return to the ScanWorks Actions view. Click on the Run Button to the left of Device Presence Tests to run the Device Presence Tests as a ScanWorks Action.



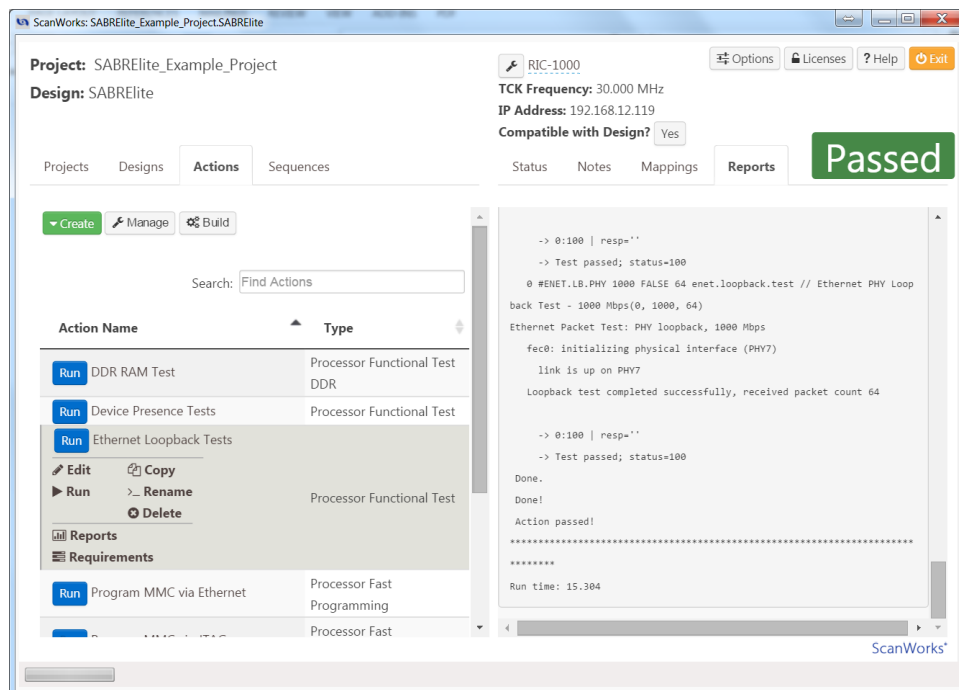
19. Right click on the Ethernet Loopback Tests action to open the Development interface for the Ethernet Loopback Tests.



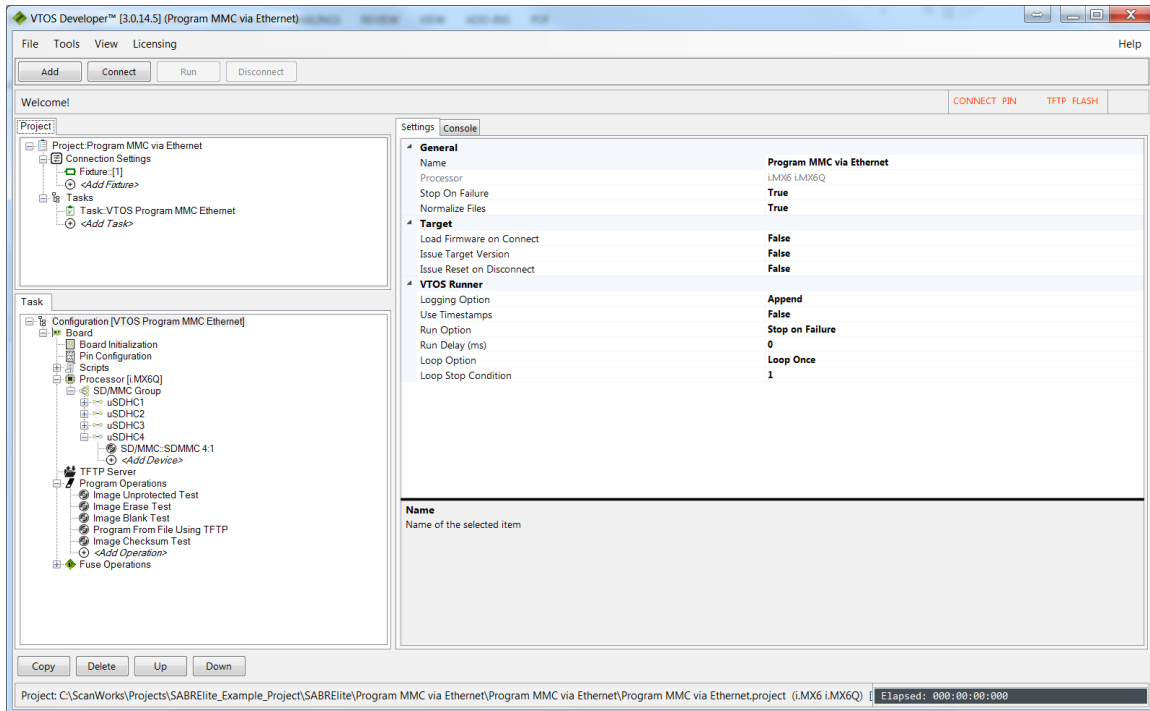
20. This action tests for the presence of the Ethernet Phy, does loopback tests on the ethernet MAC and loopback tests on the Ethernet Phy. Click on Connect and then on Run.



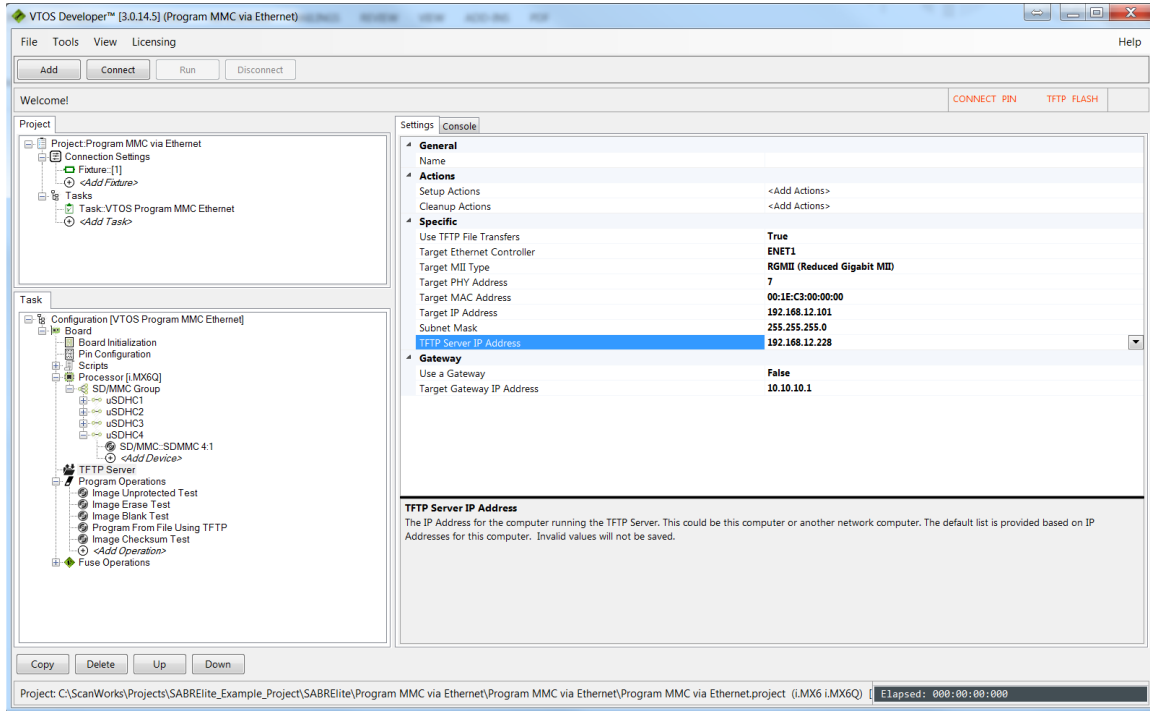
21. Close the Development window, and return to the ScanWorks Actions view. Click on the Run Button to the left of Ethernet Loopback Tests to run the Ethernet Loopback Tests as a ScanWorks Action.



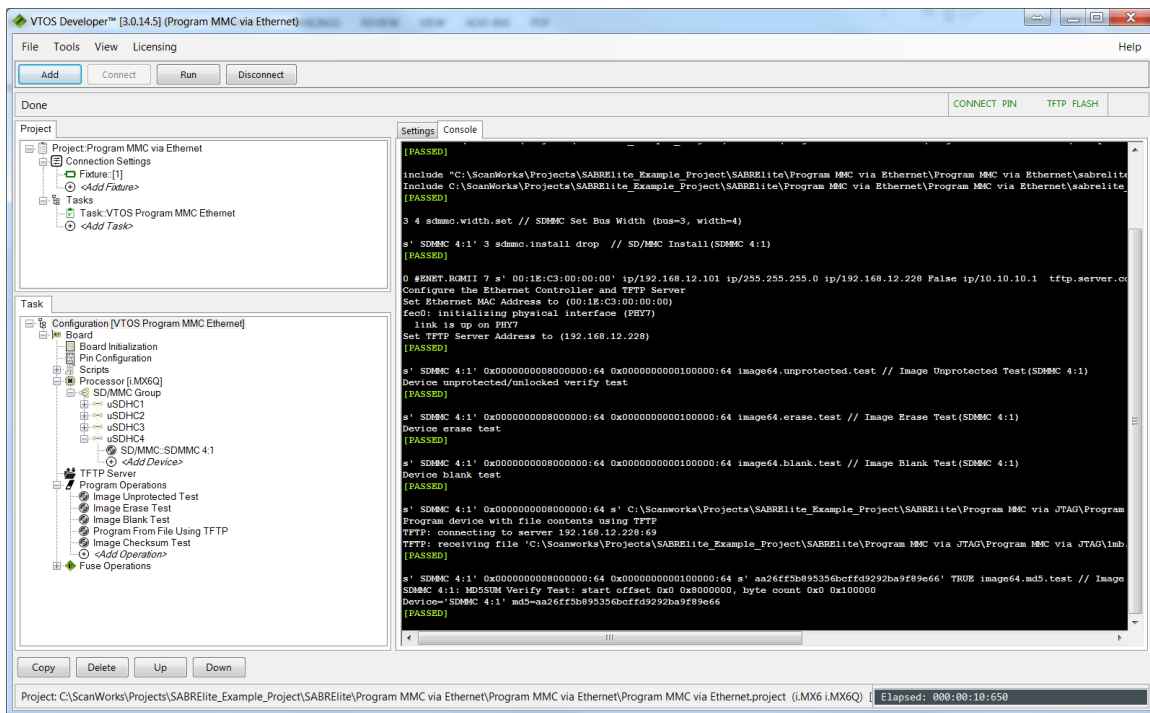
22. Right click on Program MMC via Ethernet to open Development interface for the Program MMC via Ethernet action. This action tests to see if the MMC is unprotected, erases the MMC, does a blank check on the MMC, programs the MMC with a test file over Ethernet, and then tests the checksum of the range of MMC memory that was programmed.



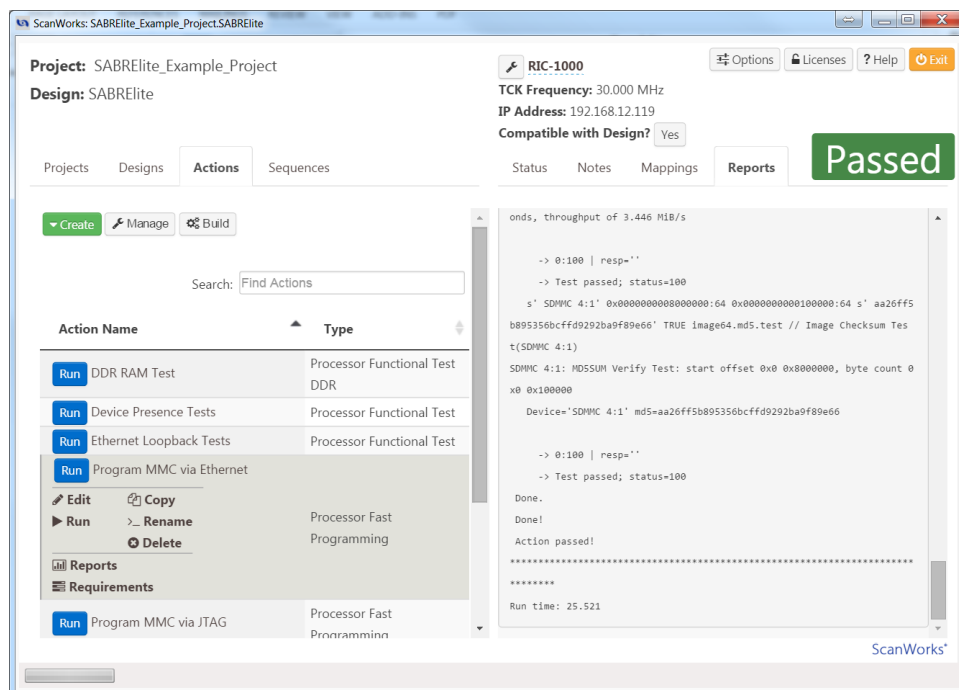
23. To use the ethernet port on the UUT as the data pipe, the ethernet on the UUT must be configured, and a TFTP client must be configured. Click on TFTP Server under the Task tab to configure the UUT's ipaddress and the TFTP client settings. Clicking on the pull down to the right side of TFTP Server Address will show a list of available addresses to use. Use the ipaddress of your computer as the ipaddress of the TFTP Server.

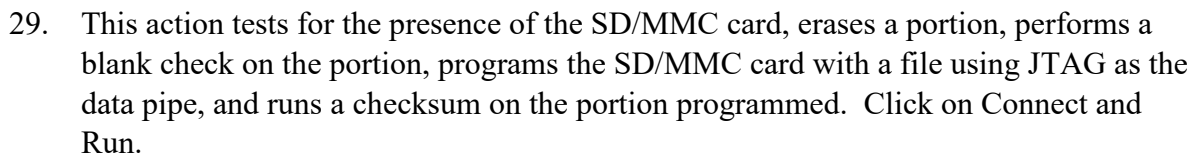


26. Click on Connect and then click on Run.

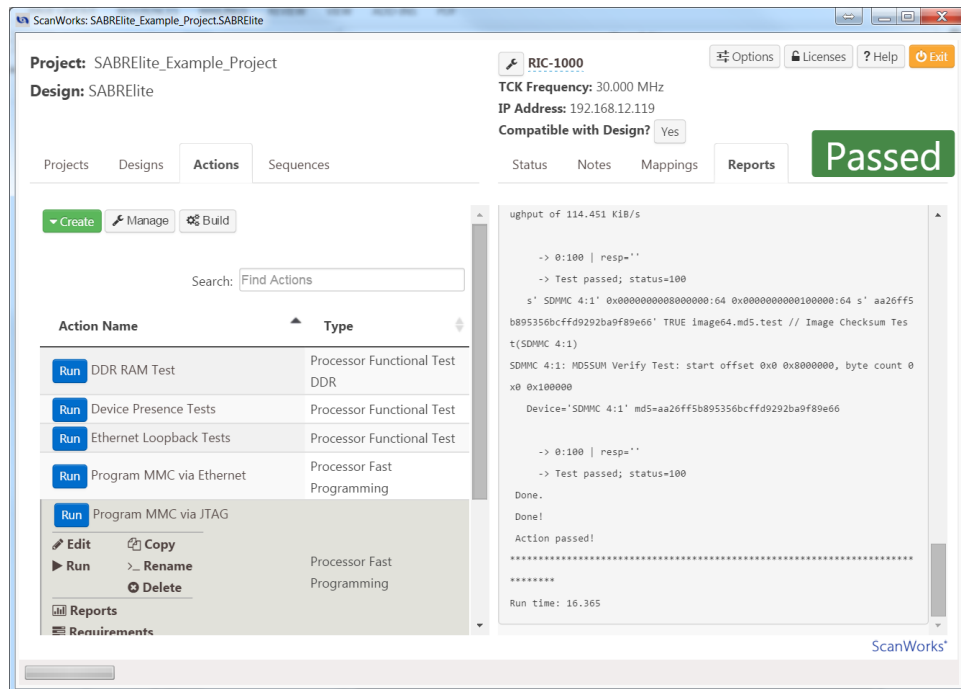


27. In the example above, the MMC was programmed at a rate of 7 MiB/second. Close the Development interface, and click on the Run button to the left of Program MMC via Ethernet to run the action from ScanWorks.

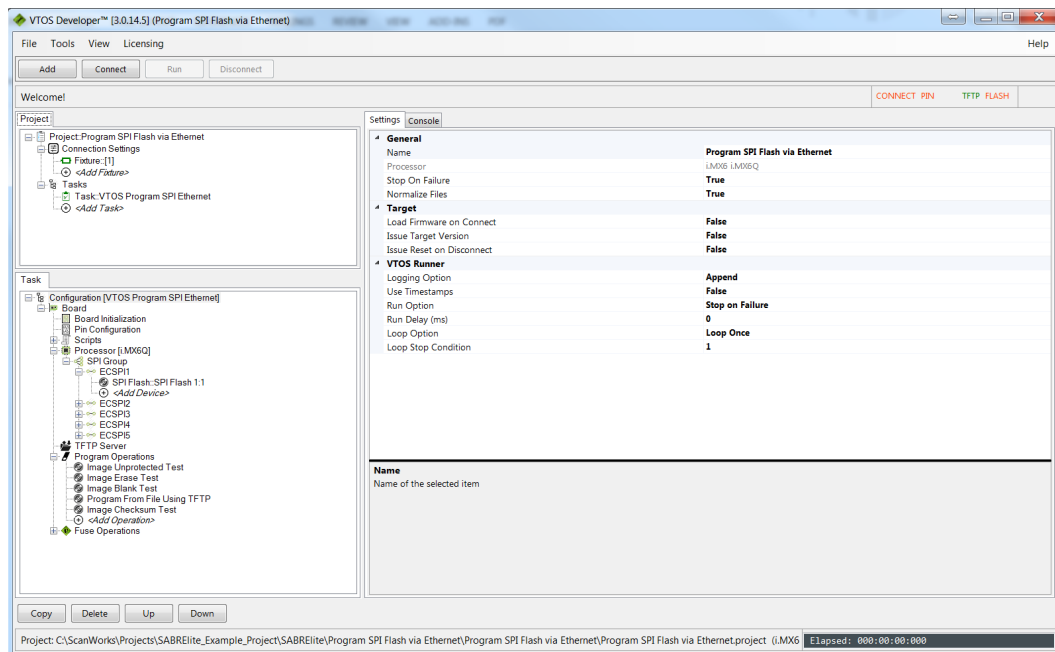




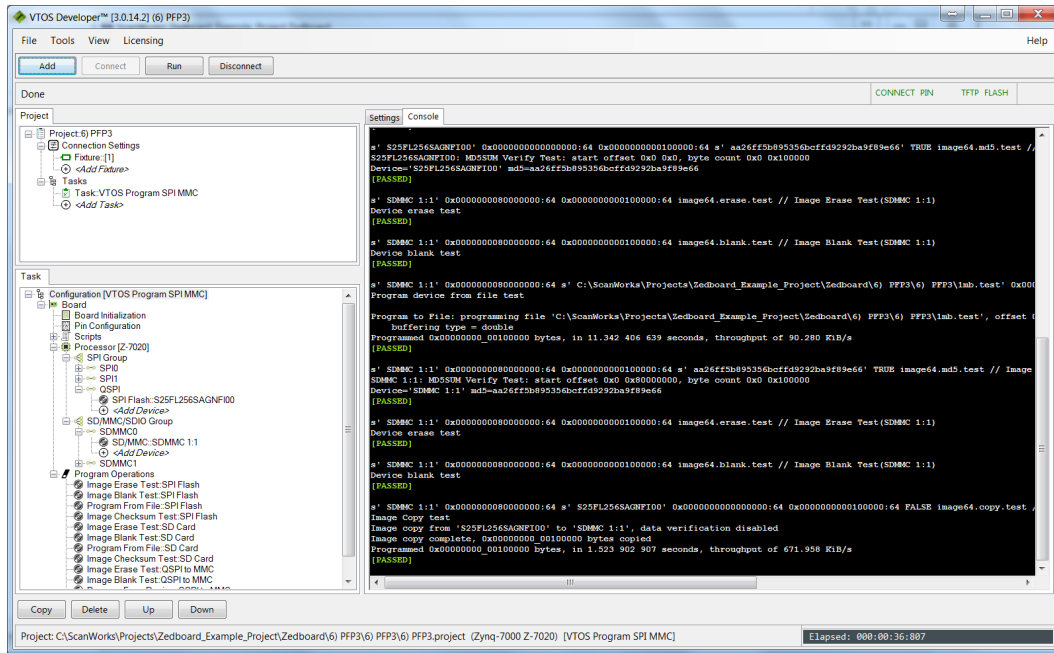
30. Note that in the example above, the SD/MMC card was programmed at a rate of 114 KiB/second. Close the Development interface, and click on the Run button to the left of Program MMC via JTAG.



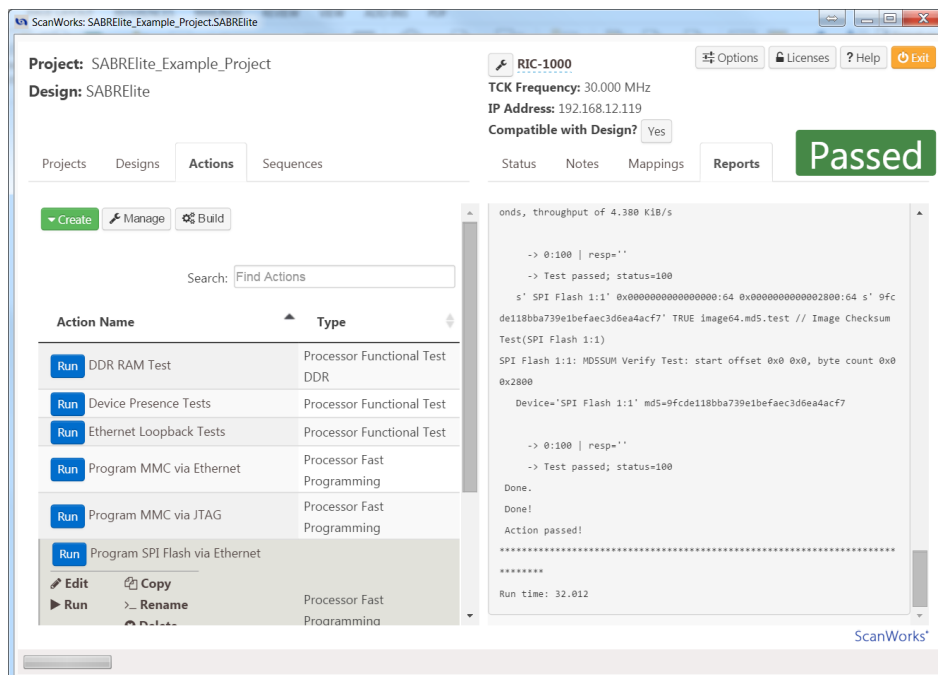
31. Right click on the Program SPI Flash via Ethernet to open the Development interface for the programming action.



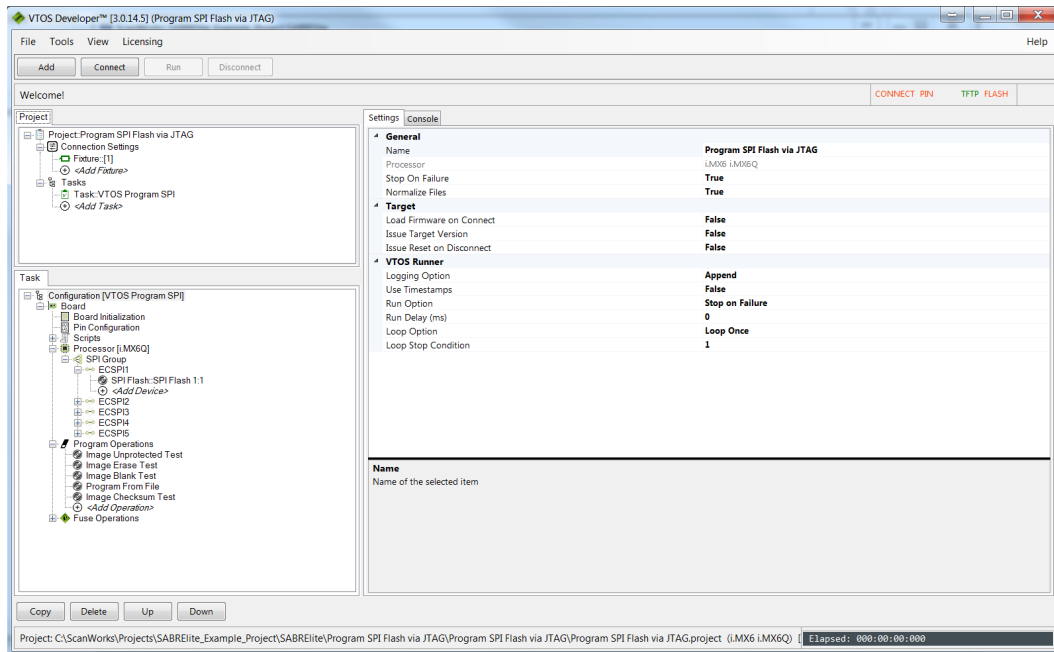
32. In this action, the SPI Flash is tested for presence, the Flash is tested to see if it is protected (locked), the Flash is erased, a blank check is run on the flash, the flash is programmed with data over the Ethernet port and the checksum test is run. Configure the TFTP Server setting the same as in Program MMC via Ethernet. Click on Connect and then Run.



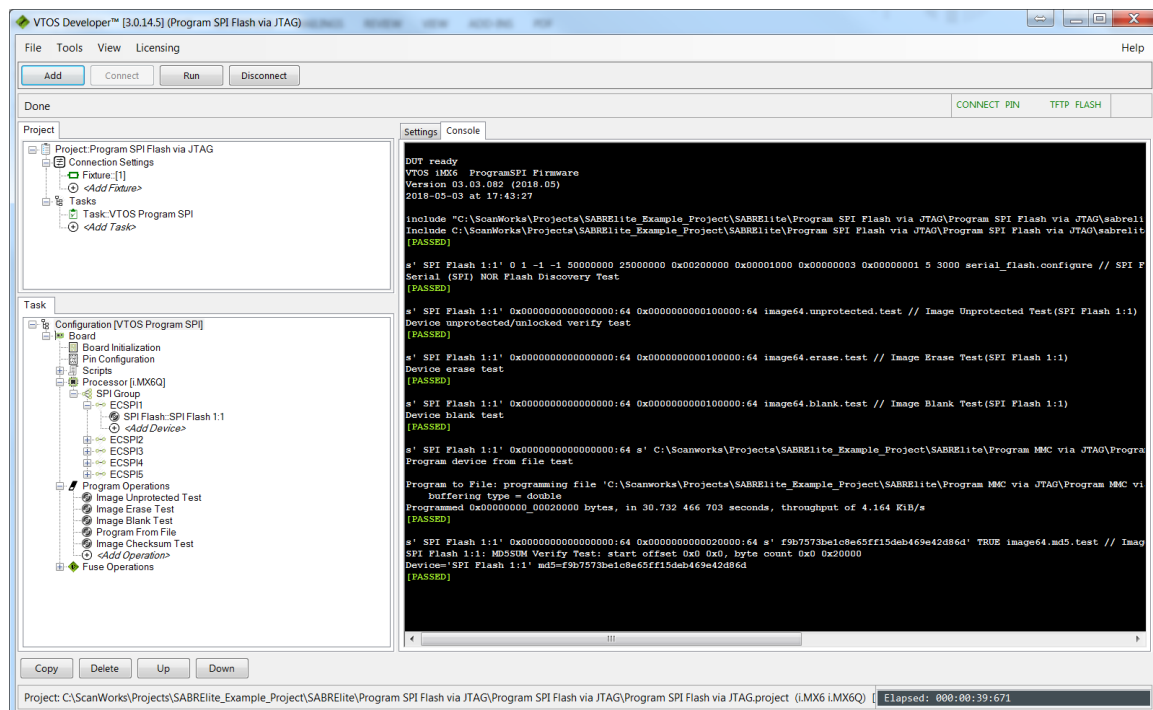
33. In the example above, the flash on the SPI is programmed over JTAG at a rate of 4.375 KiB/second. Close the Development interface. Click on the Run button to the left of Program SPI Flash via Ethernet to program the flash as a ScanWorks action.



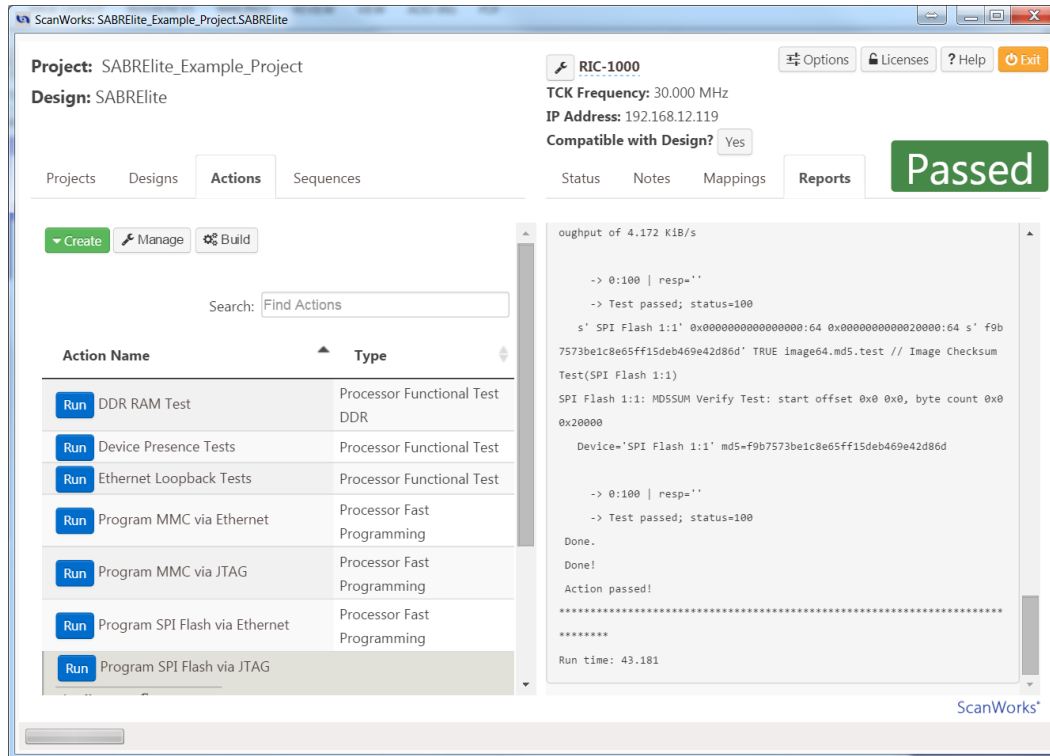
34. Right click on the Program SPI Flash via JTAG to open the Development interface for the programming action.



35. This action tests the SPI Flash for presence, checks to see if the flash is writable, erases the flash, blank checks the flash, programs a test file into the flash over JTAG, and tests the checksum. Click on Connect, and then Run.



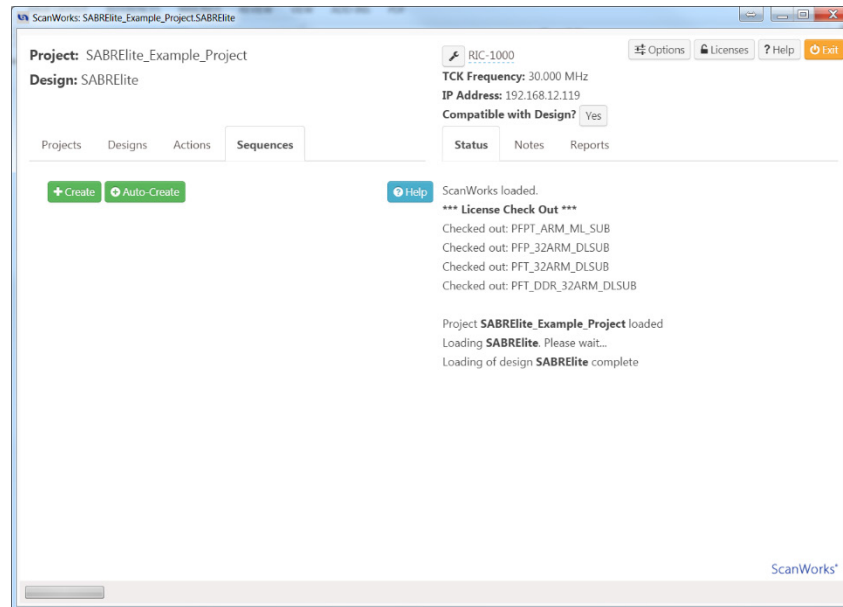
36. In the example above, the flash on the SPI is programmed over JTAG at a rate of 4.164 KiB/second. Close the Development interface. Click on the Run button to the left of Program SPI Flash via JTAG to program the flash as a ScanWorks action. This concludes the development portion of this guide.



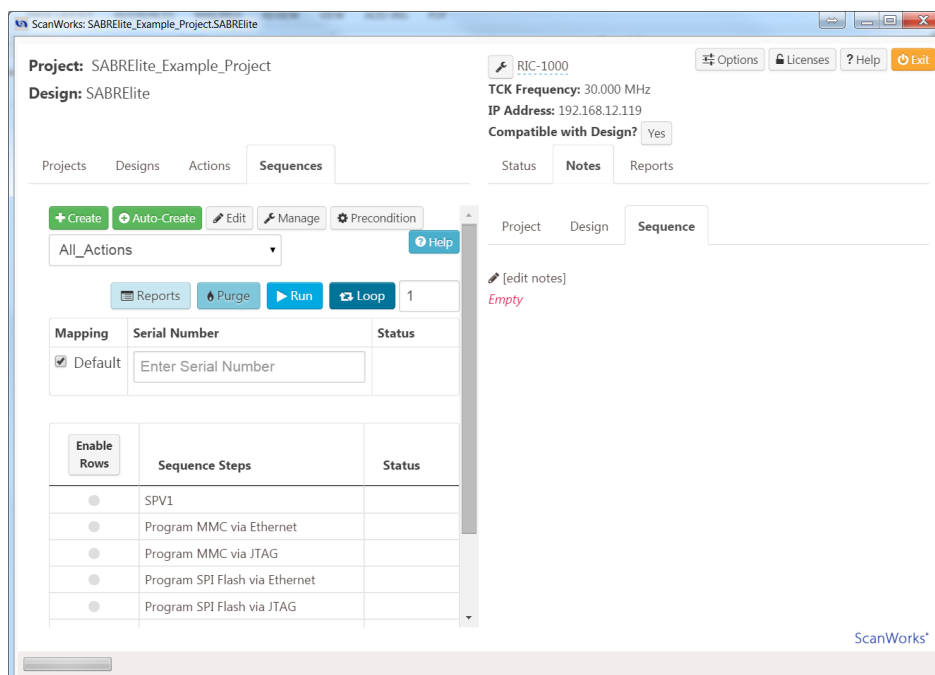
Putting it all together – Manufacturing Mode

When all the development is complete and it is time to use PFX on a manufacturing line, it is desired to run all the actions with a single click. The mechanism for doing this is Sequencing. To run all the actions as a sequence:

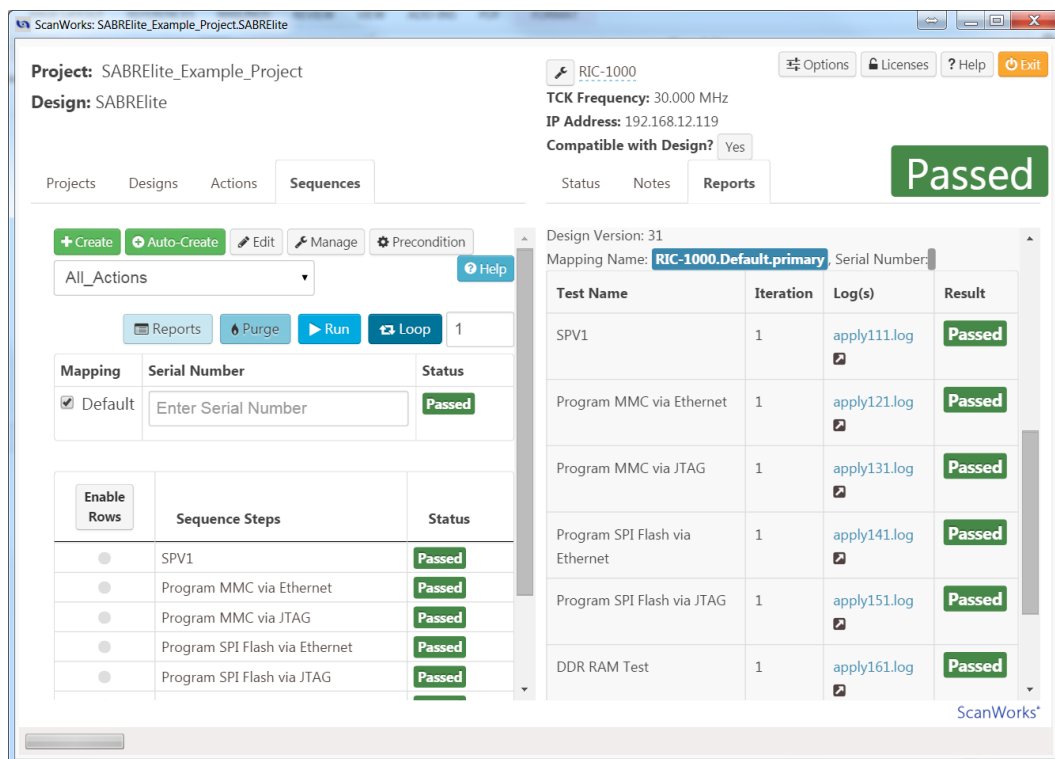
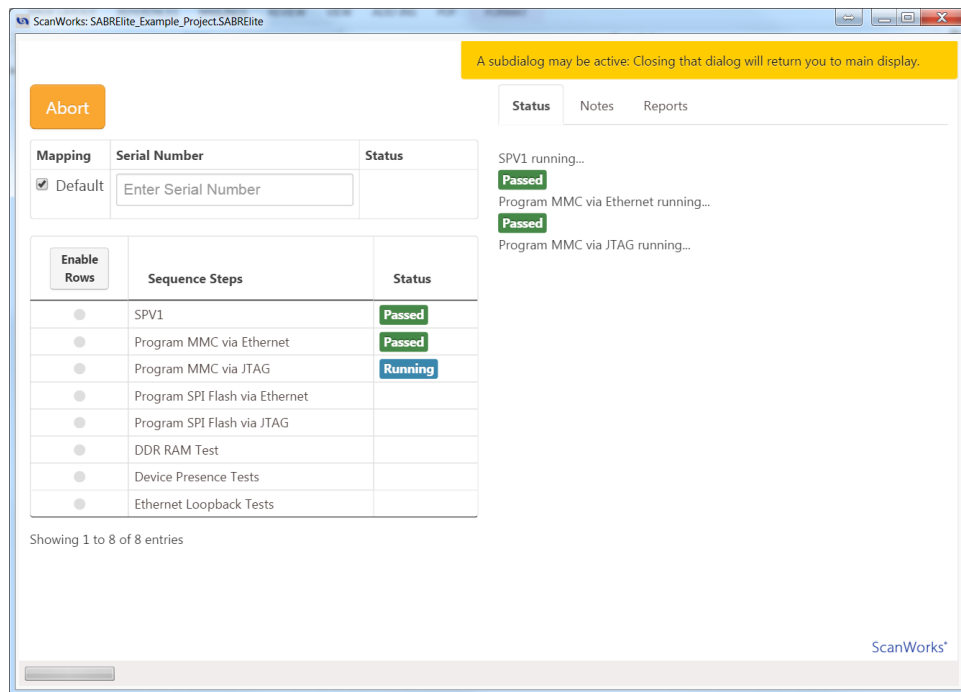
1. In ScanWorks, click on the Sequences tab.



2. Click on the Auto-Create button.



Hitting the Run button causes all the actions to be executed.



This concludes the Manufacturing portion of the guide.

Learn More

If you are interested in our products, please select one of the links below:

[*ScanWorks Processor-based Flash Programming \(PFP\) for ARM 32-bit Processors*](#)

[*ScanWorks Processor-based Functional Test \(PFT\) for ARM 32-bit Processors*](#)

[*ScanWorks Processor-based Functional Test DDR \(PDTDDR\) for ARM 32-bit Processors*](#)
