# Battery Management Solutions

The Final Steps to Production

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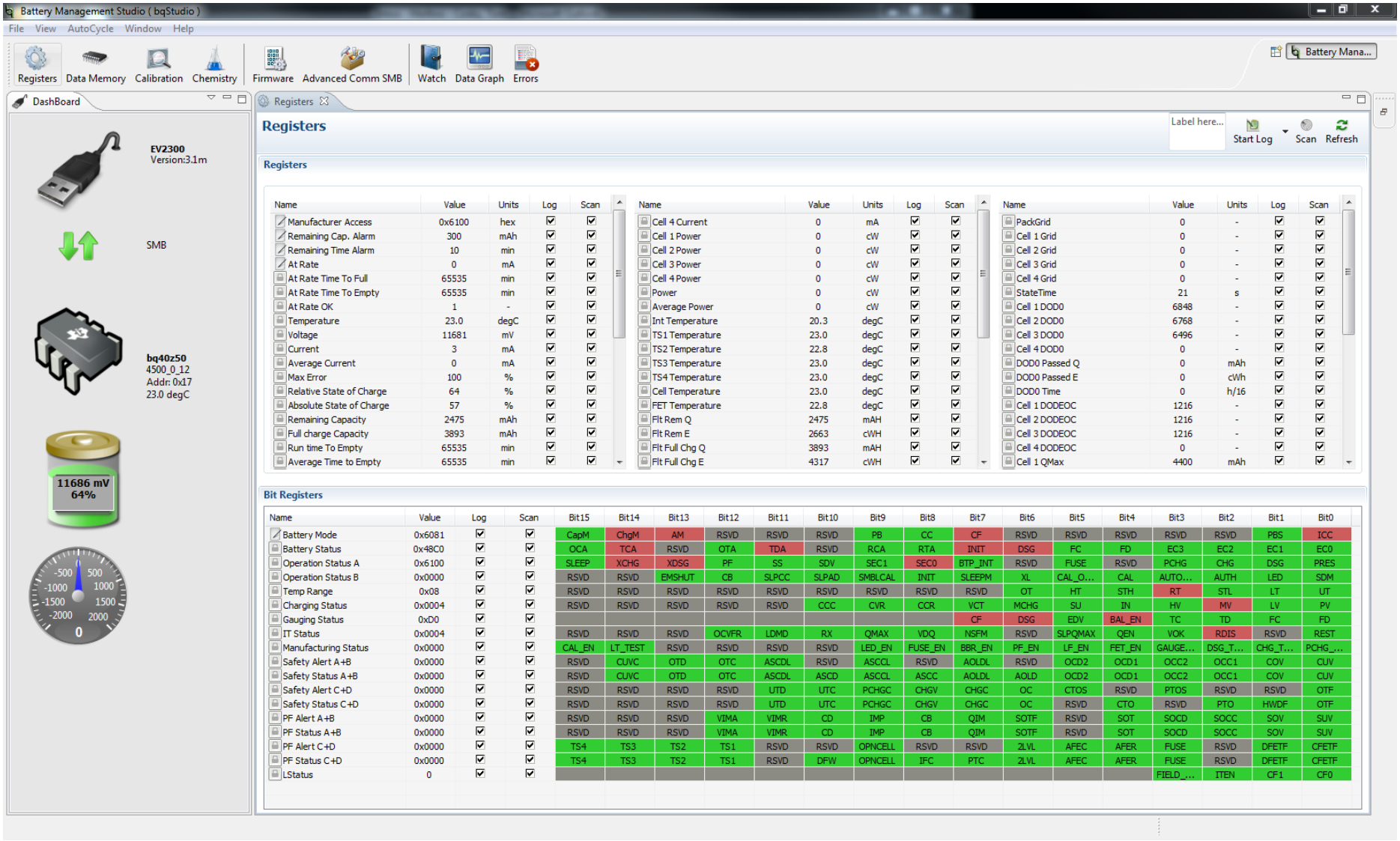
October 23, 2014

# The New Tools

| | | |
|---|---|---|
| **bqEvaluation** |  | **bqStudio** |
| **bqMTester** |  | **bqProduction** |

- **Consistent looks across device families.**
- **No longer required to run the full setup program for each device. Transfer a 50 kbyte file versus a 50 Mbyte setup program!!**
- **The tools use a standardized evaluation platform and it are customized for each device with a .bqz file.**
- **The chemistry files take much less disk space and are much faster to update.**

# bqStudio

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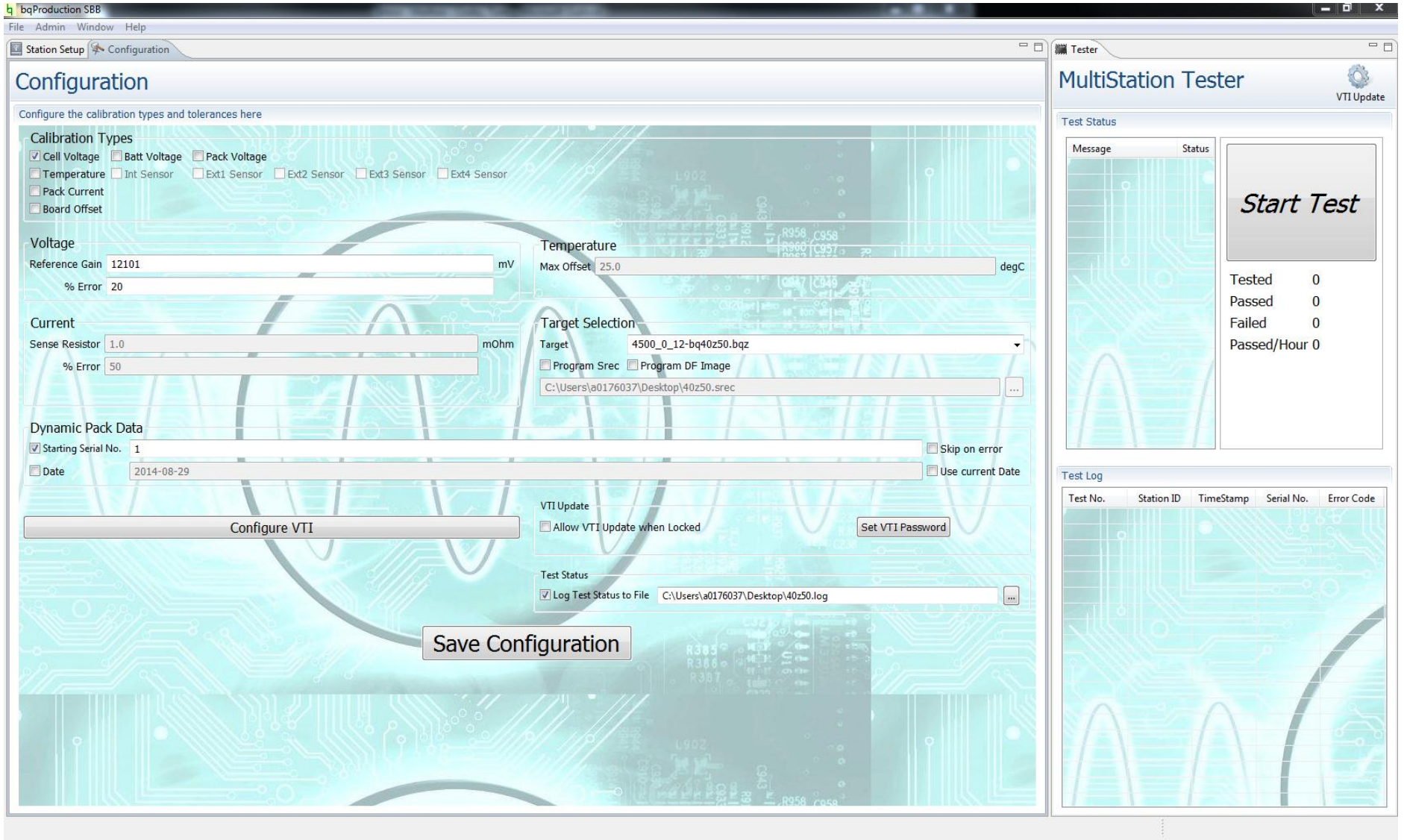
# bqProduction




TEXAS INSTRUMENTS

# Design Process

## Identify Product Requirements

- No. of series cells
- No. of parallel cells
- Protection required
- Special requirements
- Chemistry

## Select Gauging Solution

- Gauging Algorithm
- Protection
- Cell balancing
- Select ChemID

## Breadboard Concept

- TI EVMs
- ChemID Verification
- Preliminary Optimization Cycle
- Run test cycles
- Tweak parameters

## Develop System Platform

- Custom PCB
- Final Optimization Cycle
- Run test cycles
- Setup golden file

## Develop Production Tools

- bqProduction
- bqMTester
- Custom tools

## Production

# SREC File

## bqEvaluation Program

*file types:*

| | |
|---|---|
| .senc: | Contains the full flash memory. |
| .dfi: | Contains the full data flash memory. |
| .rom: | Contains the full data flash memory and header information. |
| .gg | Contains the data flash parameters that the user can change. |
| .chem | Contains the chemistry data. |

## bqStudio Program

*file types:*

| | |
|---|---|
| .srec: | Contains the full flash memory. Formatted in industry standard Motorola S-record format. |
| .gg.csv: | Contains the data flash parameters that the user can change. **Formatted in CSV, but edit with a text editor to import into the device.** |

chemdat2: Contains the chemistry data.

chemdat4:

chemdat6:

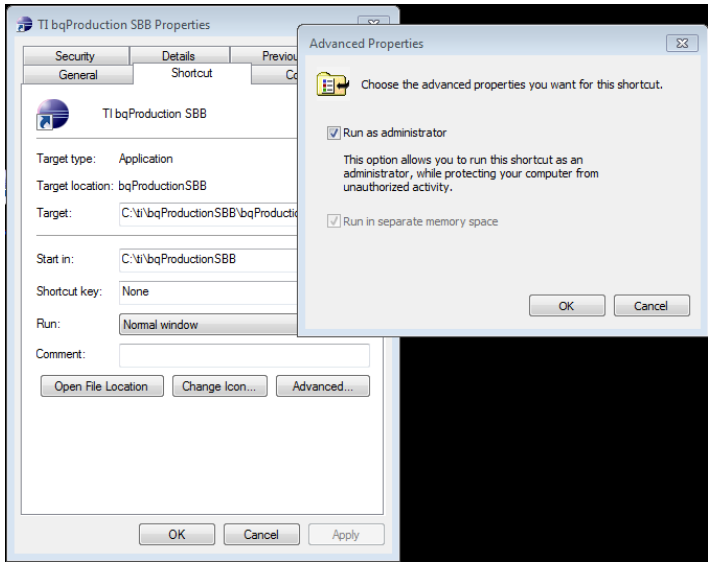
chemdat8:

# Golden File

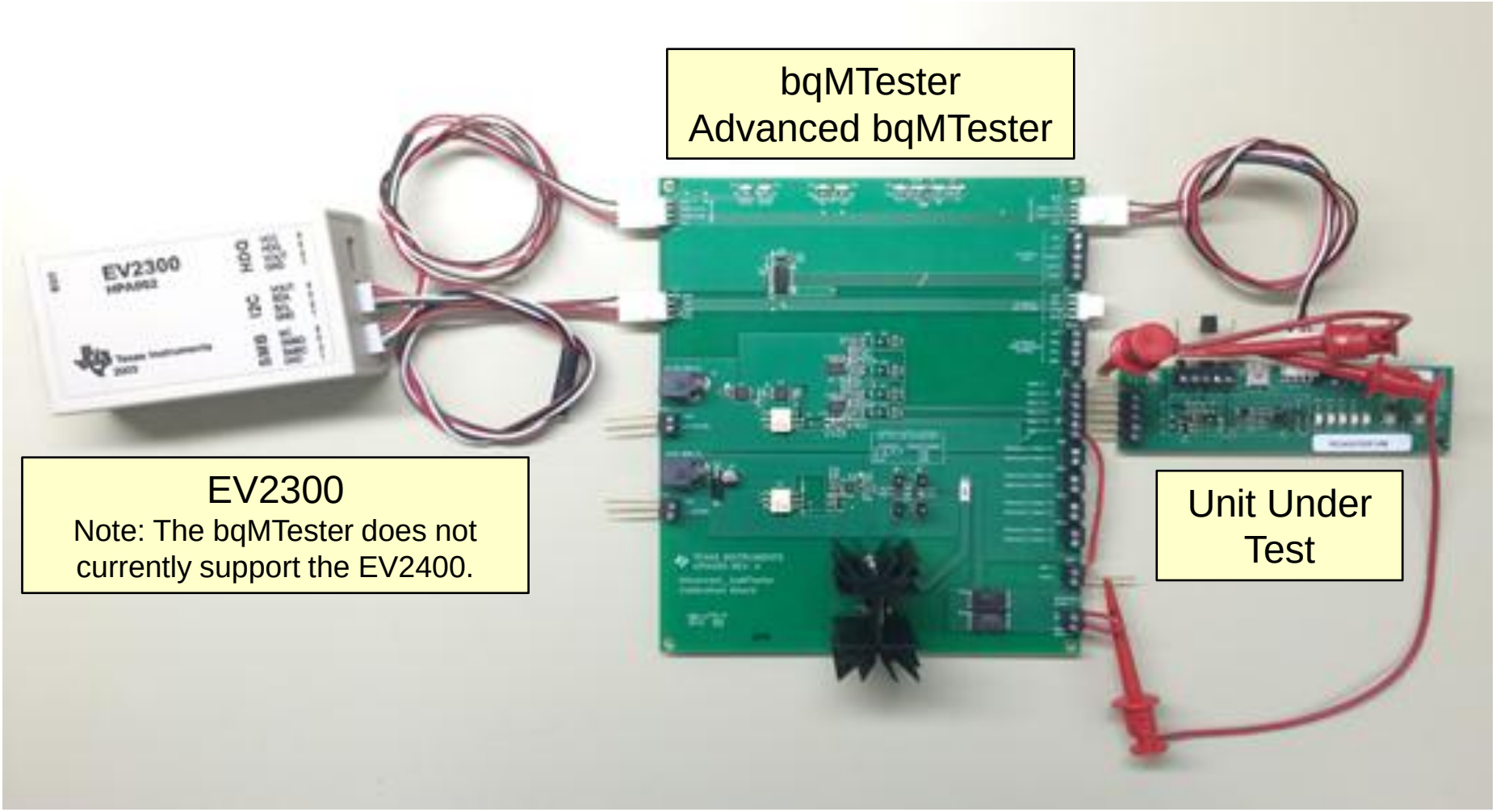
- Run the Optimization Cycle to update Qmax and the Ra-table.
- Go to the **Data Flash** window and press the **Read All** button.
- Export the gg.csv file
- Edit the gg.csv file using a text editor. e.g. Notepad. Do not use Excel.
- Set the Update Status to 02 and set the Cycle Count to 0.
- Load the default .srec file into the device.
- Load the ChemID into the device.
- Load your modified gg.csv file into the device and press the Write All button.
- Save the golden .srec file.

# bqProduction

- The bqProduction setup program can be downloaded from the TI website. Search for bqProduction.
- Download and run the setup program.
- The files will be stored at C:\ti\bqProductionSBB.
- The shortcut should get placed on your desktop.
- Right click the icon and select Properties.
- Select Advanced and check the “Run as Administrator” box.
- Select OK to exit the configuration tool.

# Items Needed



# bqProduction

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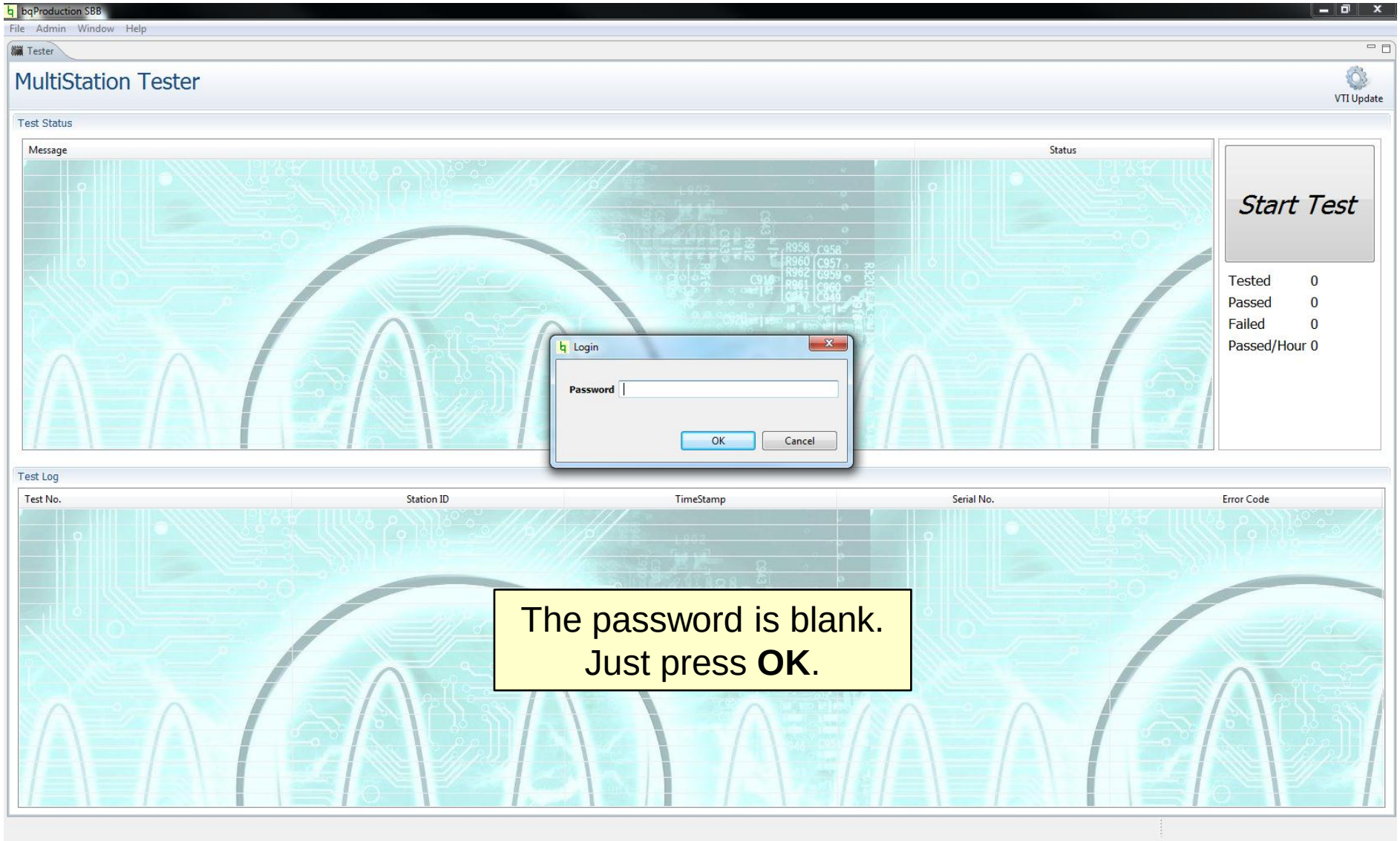

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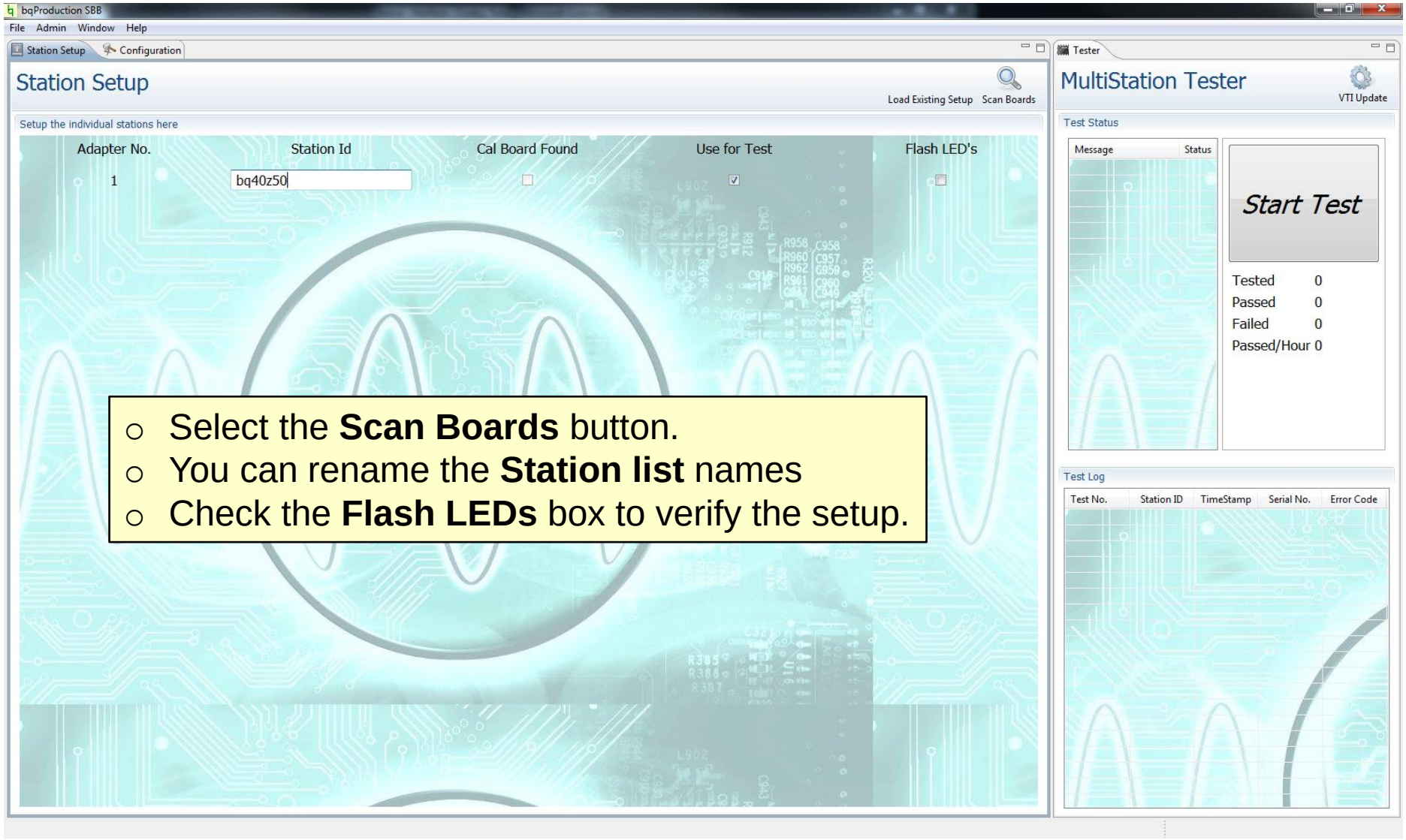


- Select the **Scan Boards** button.
- You can rename the **Station list** names
- Check the **Flash LEDs** box to verify the setup.

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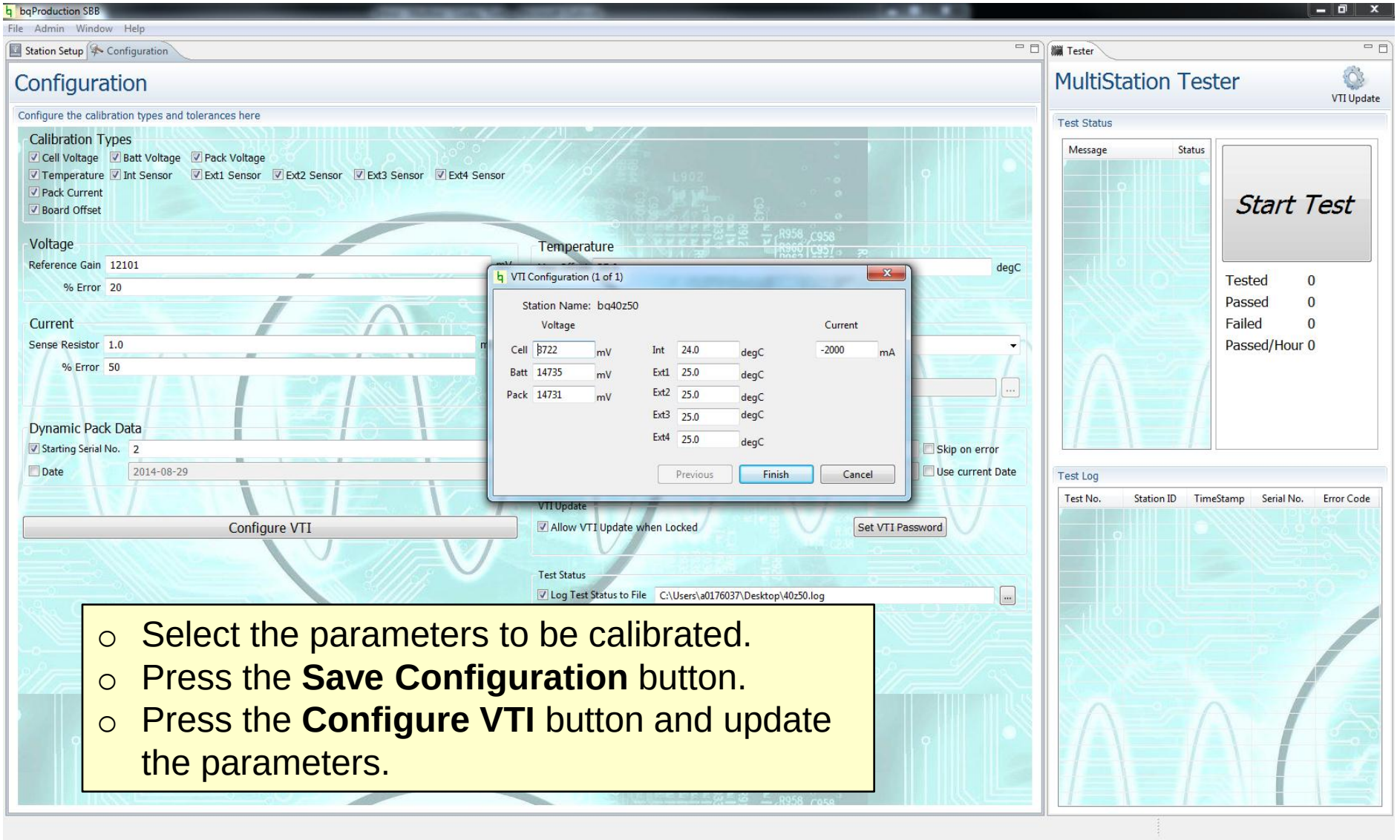
# bqProduction




- Select the parameters to be calibrated.
- Press the **Save Configuration** button.
- Press the **Configure VTI** button and update the parameters.

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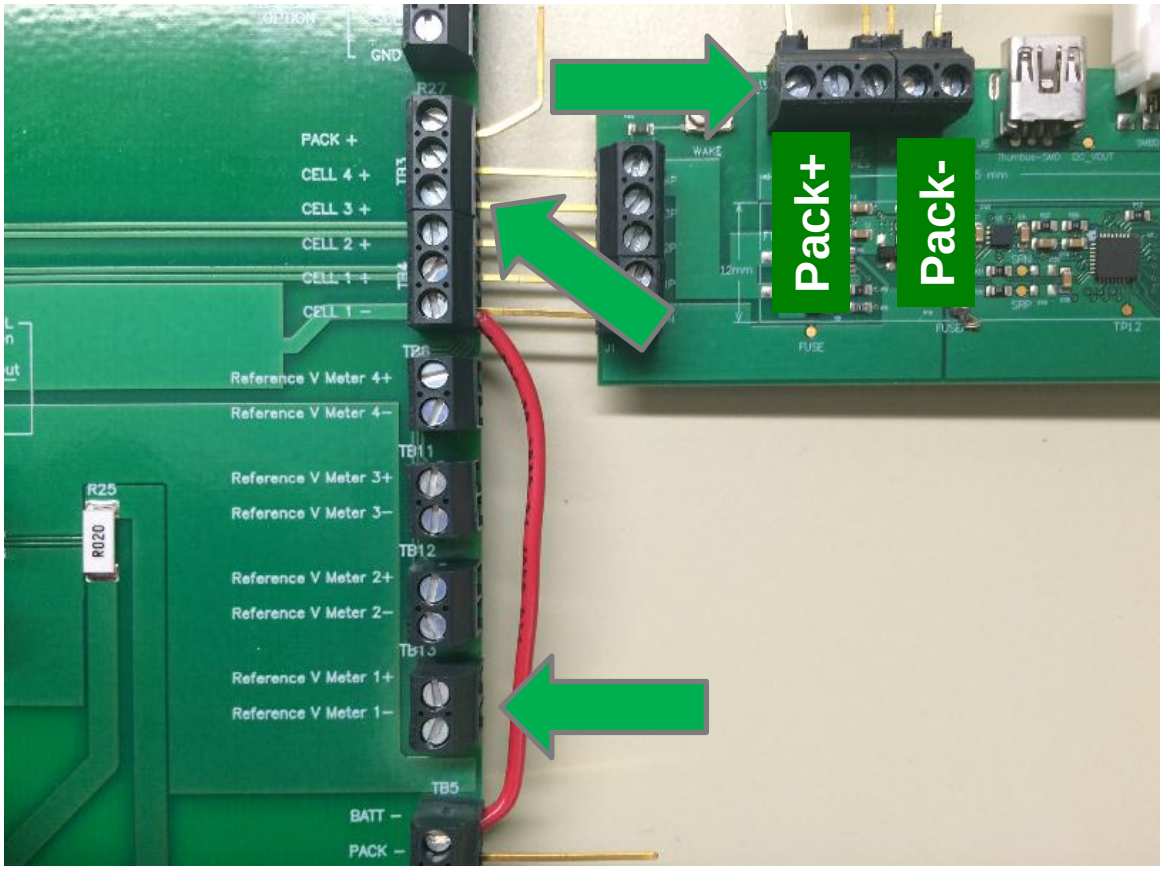
# bqProduction




**Voltage Calibration:**

Measure the Cell Voltage from CELL1+ to CELL1- or the Cell1 Reference V meter port.

Measure the Battery Voltage from CELL1- to PACK+.

Measure the Pack Voltage from Pack+ to Pack-.

Enter the data into the **Configure VTI** screen.

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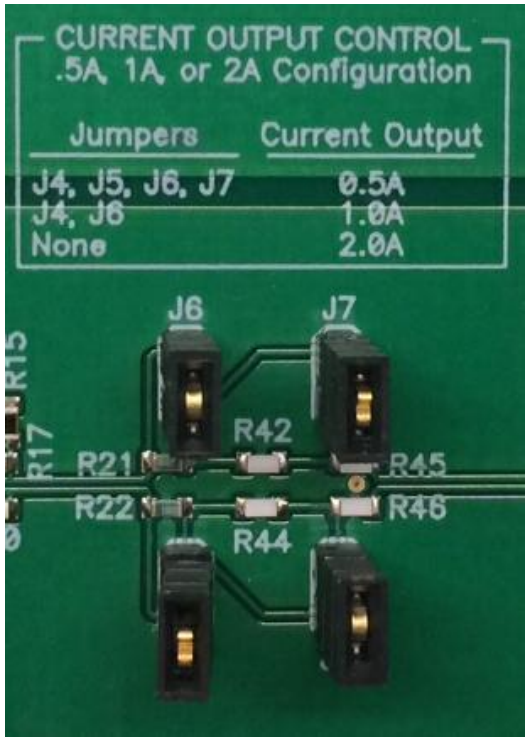
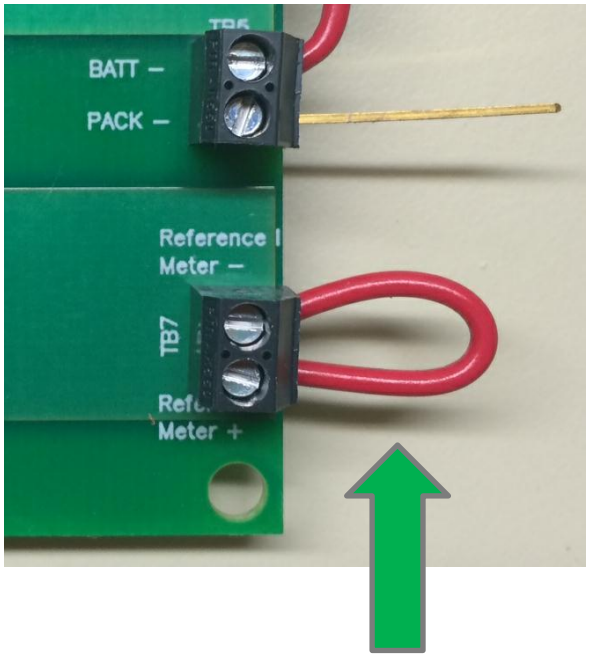



Replace shunt with current meter.

**Current Calibration:**

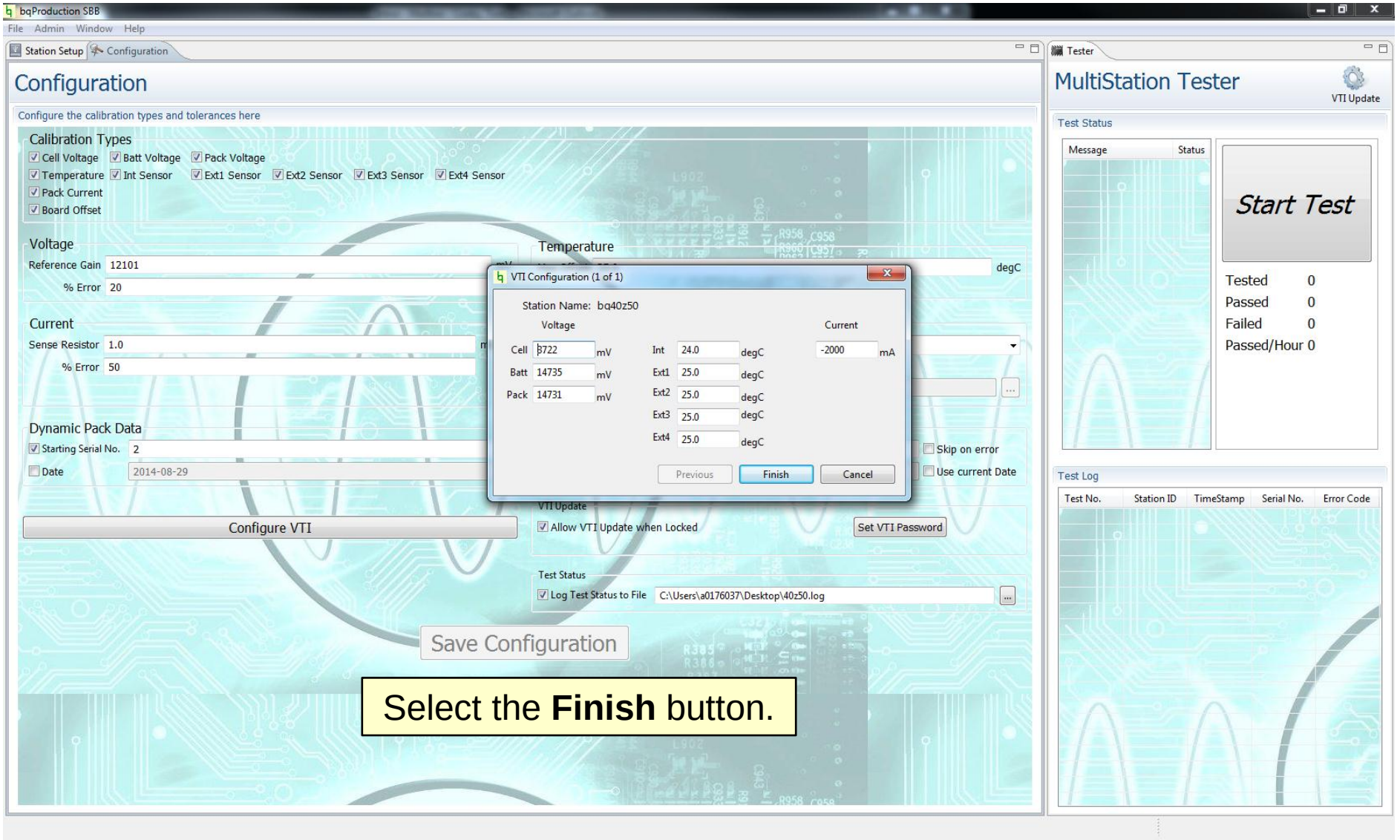
Set the CURRENT OUTPUT CONTROL jumpers to select the calibration current.

Replace the TB7 shunt with a current meter.

Measure the discharge current.

Enter the data into the **Configure VTI** screen.

# bqProduction




Select the **Finish** button.

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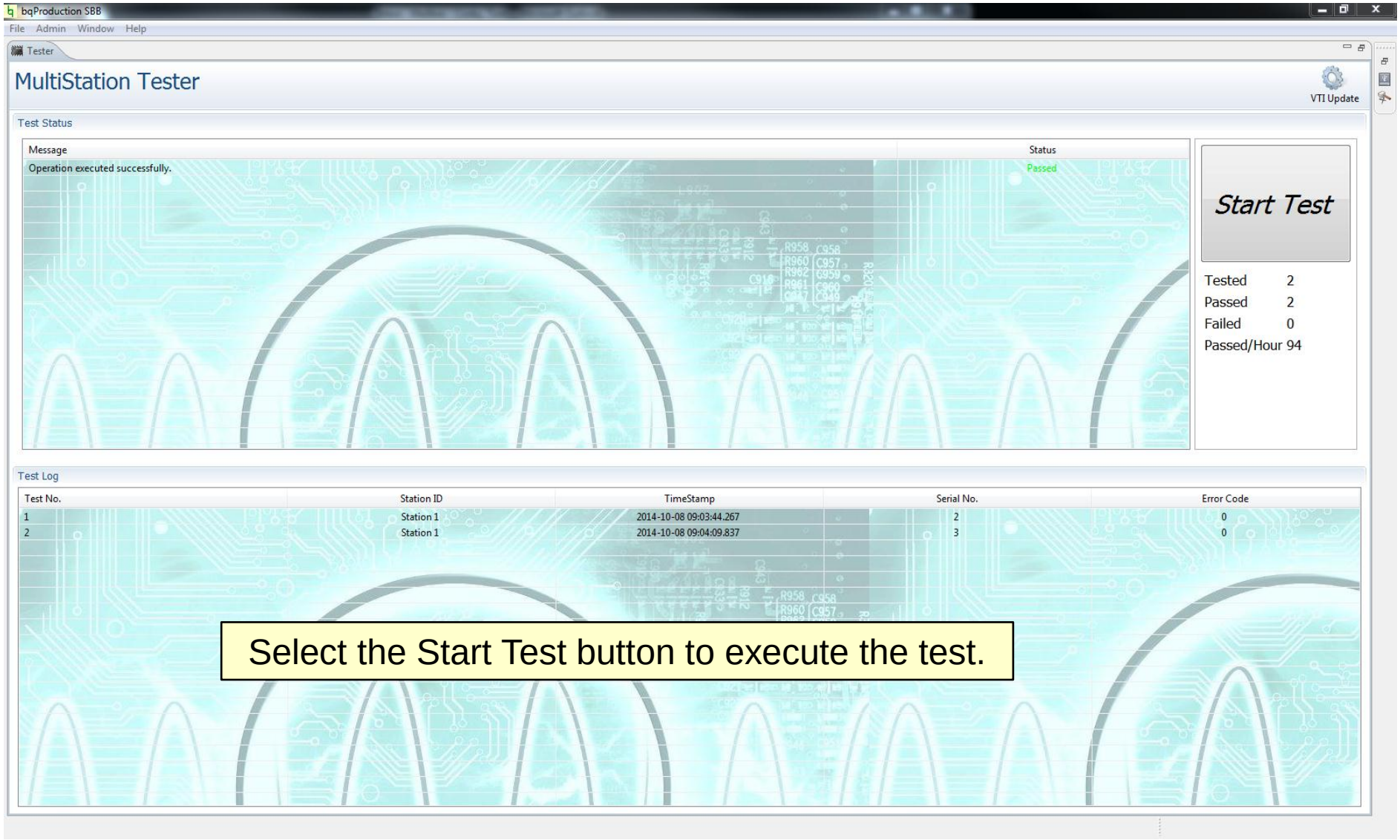


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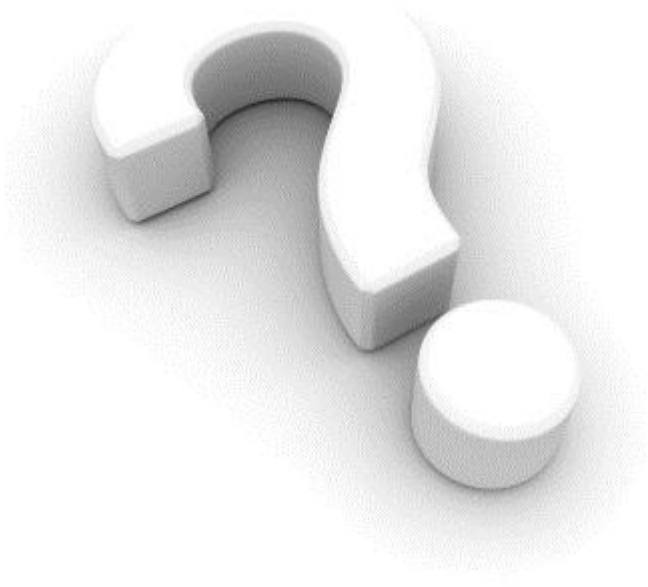
# Demonstration

bqProduction



# Questions