



VEBKO ONLINE HELP

Power Control and Its Relation to Heat

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1 Imported Content

To begin discussing Power Control in this device, it is necessary to first understand the design of its power supplies. Since this device is used not only for relay testing but also for testing instruments such as transformers, its power sources have a high burden capability. Depending on the design, if the equipment under test does not require a high burden, the device's power is dissipated in the existing MOSFETs and appears as heat. Therefore, the amplifier burden must be managed based on the connected load in order to prevent temperature rise.

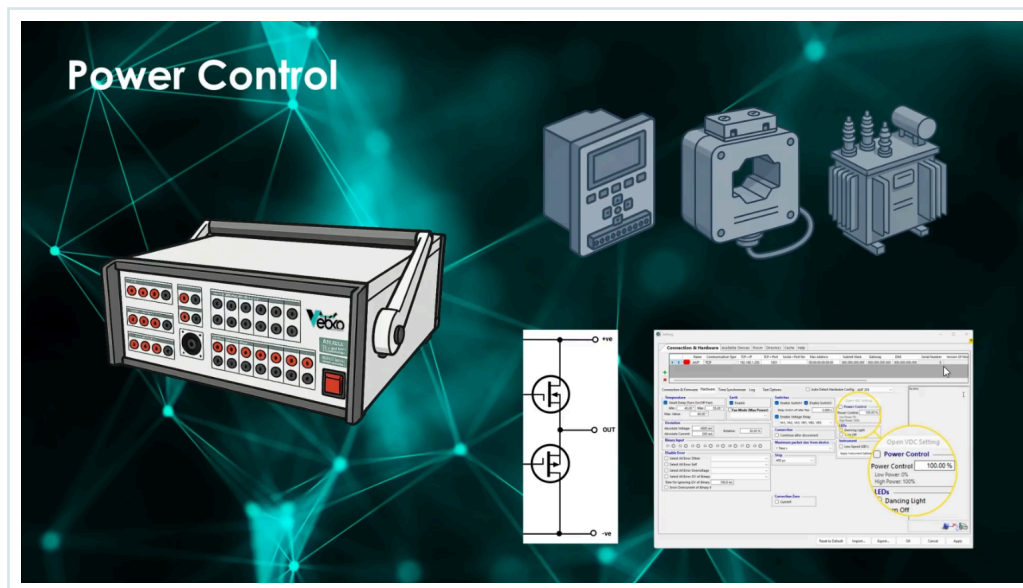


Figure 1

Note that when we talk about the device's *burden*, we are referring to the positive and negative voltage limits of the amplifier.

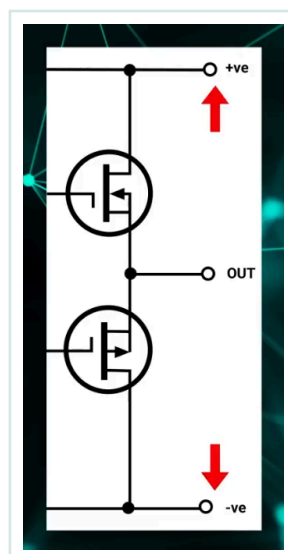
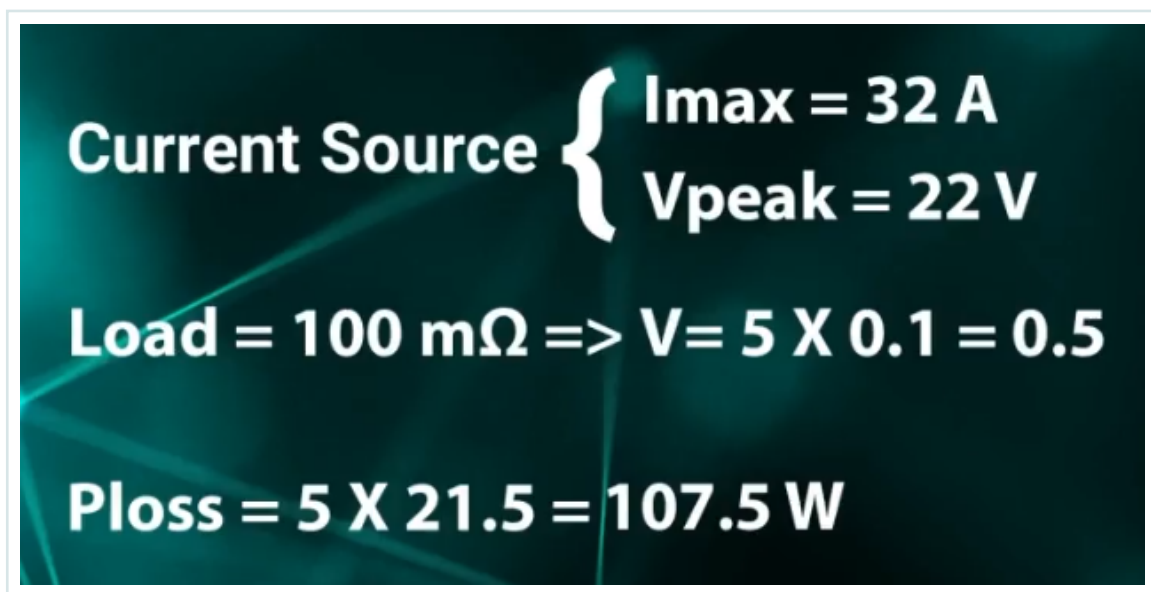


Figure 2

To better understand this, consider a current source capable of injecting 32 A of current and 22 V peak. If the connected load has an impedance of 100 milliohms, injecting 5 A requires only 0.5 V. Therefore, the remaining 21.5 V appears across the MOSFETs, and based on the power dissipation formula, we can say: $P = 21.5 \times 5 = 107.5$ watts. This amount of power is dissipated in the MOSFETs and results in increased temperature. Therefore, the lower the upper and lower voltage limits, the lower the power dissipated on the MOSFETs. On the other hand, if the voltage is too low, the current injection may not be performed correctly. Thus, there is an optimal point where the temperature remains low and the upper/lower voltage levels are just sufficient to deliver the requested current.



Current Source { $I_{max} = 32 \text{ A}$
 $V_{peak} = 22 \text{ V}$

Load = 100 mΩ => $V = 5 \times 0.1 = 0.5$

$P_{loss} = 5 \times 21.5 = 107.5 \text{ W}$

Figure 3

This adjustment can be done in two ways: automatic and manual. The automatic mode is available only on devices from model 8-205 and above.

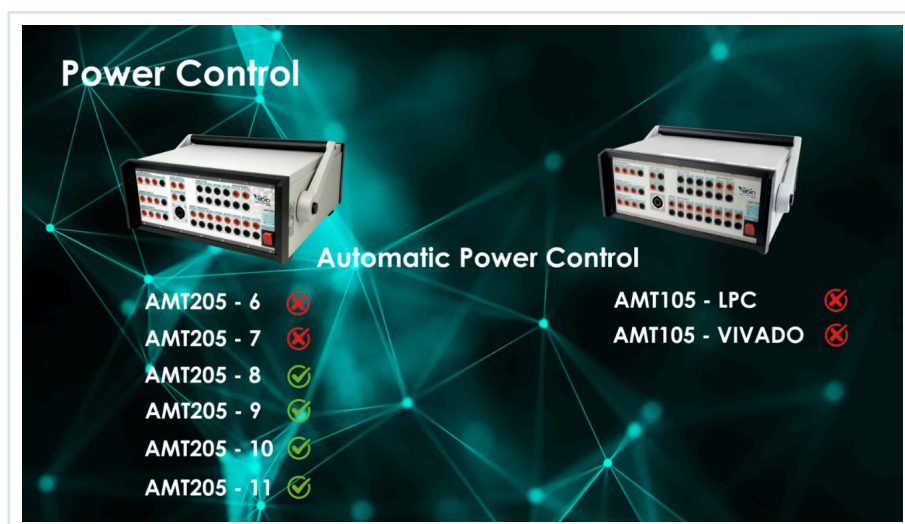


Figure 4

By enabling the *Power Control* option, the adjustment is performed automatically.

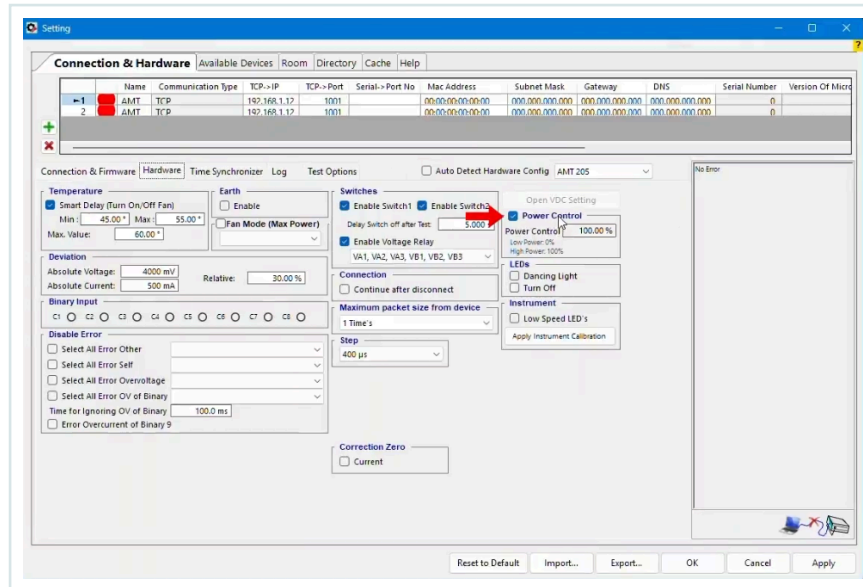


Figure 5

However, because the system must constantly monitor for current spikes at every moment,

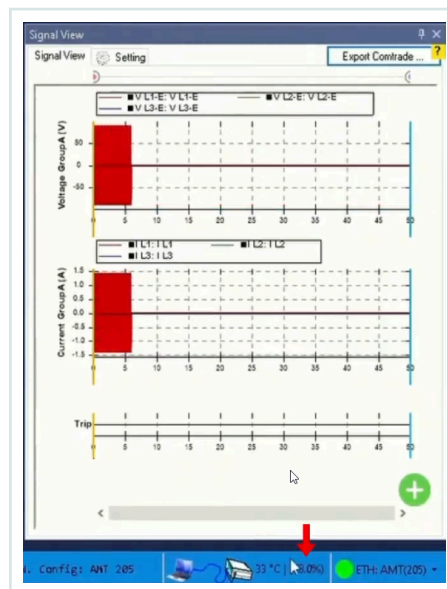


Figure 6

it carries out this process conservatively. After enabling this option and starting the test, you will see the **Power Control percentage** displayed.



Figure 7

The second method is the manual mode, which is available on all devices, including models 105 and 205. For this method,



Figure 8

after designing the test plan, the software automatically identifies the highest voltage and current values present in the test plan during the *Hardware Check* step, and uses them to optimize the Power Control. In the highlighted section, the percentage of the amplifier's voltage relative to its nominal value is reduced and adjusted as much as possible to minimize it.

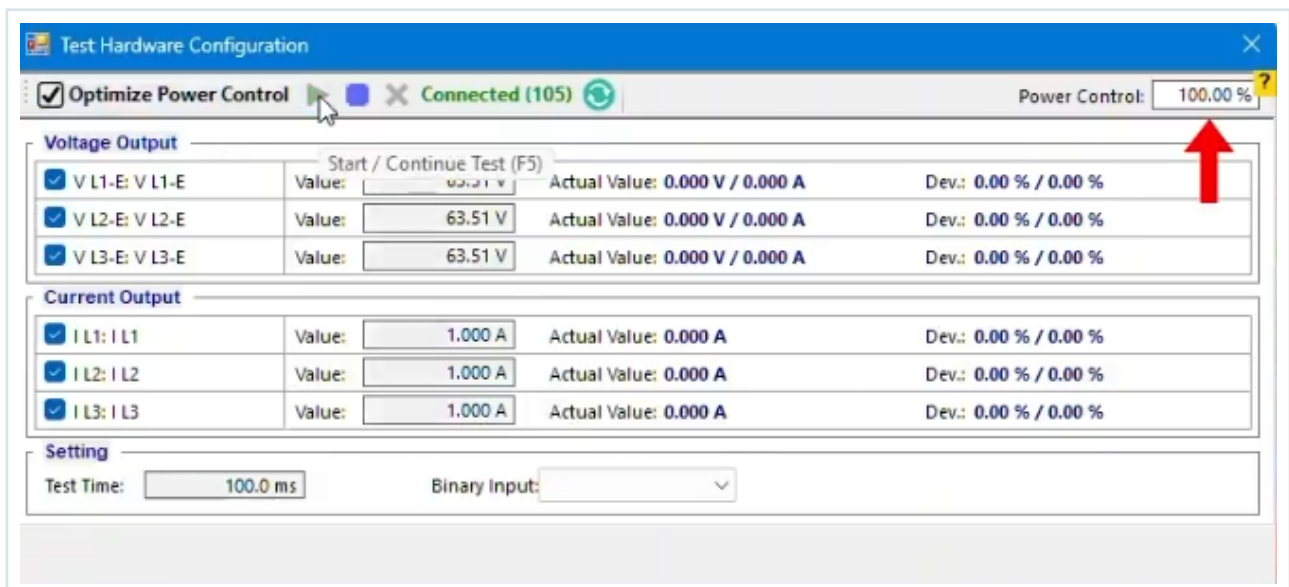


Figure 9

The user can also manually modify this value. Ultimately, an optimal value for Power Control is obtained and applied in the software.

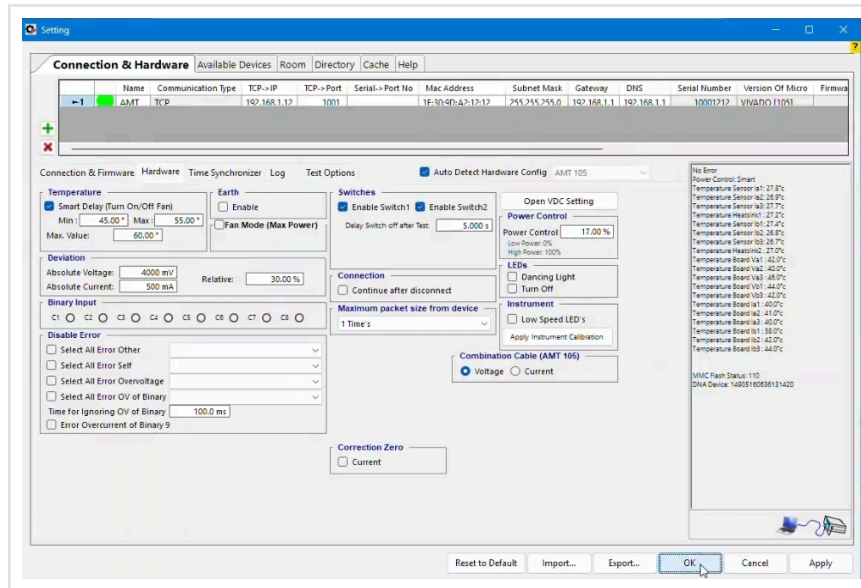


Figure 10

After running the test, you will see that the calculated value is used during the test for managing the device burden.

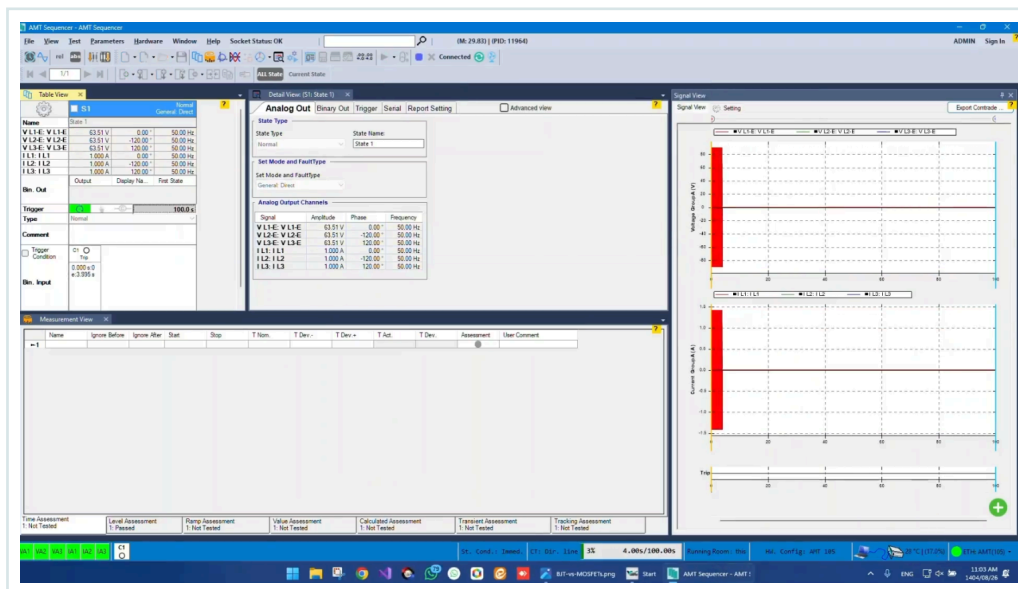


Figure 11

Power_Control