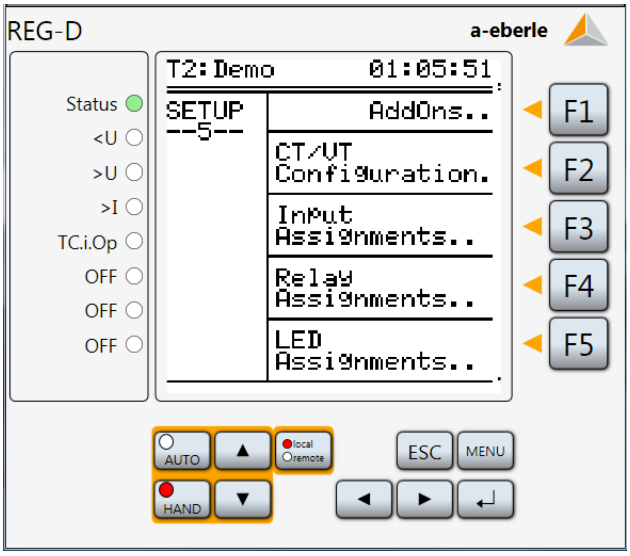
6 Steps to Basic Voltage Regulation

The following 6 settings are all that need to be made on the A.Eberle REG-D or REG-DA to enable basic voltage regulation. These settings can be made either by using the WinREG software provided with the REG-D/DA, or by using the front panel keys on the REG-D/DA device. This guide will describe using the keys on the REG-D/DA, therefore no other equipment is necessary. Although a REG-D is shown in the screenshots below, this procedure is exactly the same for a REG-DA:

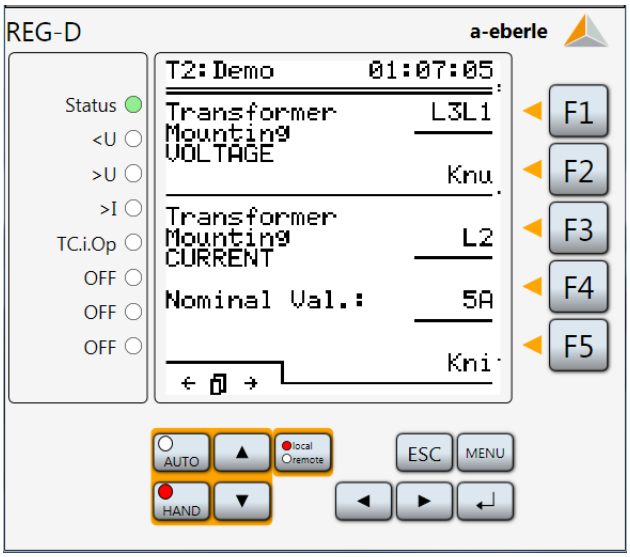
Setting 1: The VT ratio (Knu)

This is the ratio of the voltage transformer being used to measure the bus/feeder voltage on the LV side of the transformer. In this example a 100:1 VT is used to measure 11kV on the bus.

Press the Menu key, then the ◄ key twice, so that the following Setup-5 display is shown:



Next press the F2 key (CT/VT Configuration), so that the following display is shown:



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NZ: 09- 377 2001
AUS: 1-800-172-120
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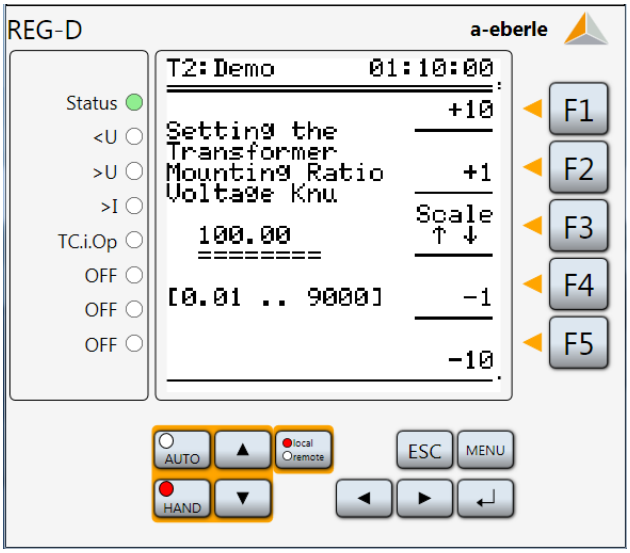
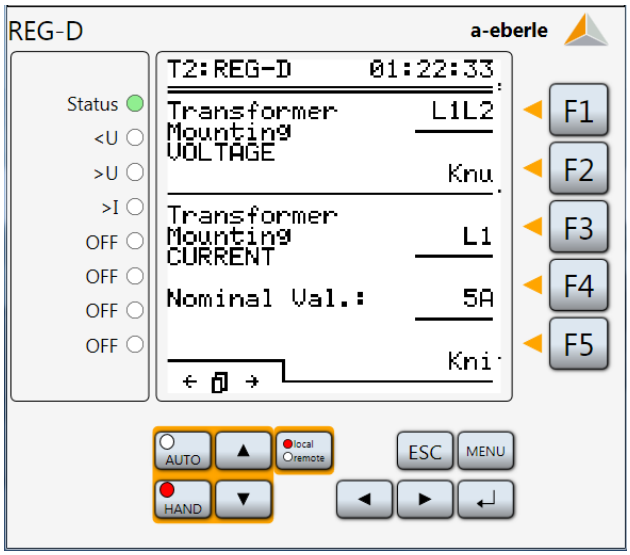
Finally, press the F2 key (Knu)

Using the F1..F5 keys, set the VT ratio (Knu) to the desired value (eg: 100), then press the ↵ key



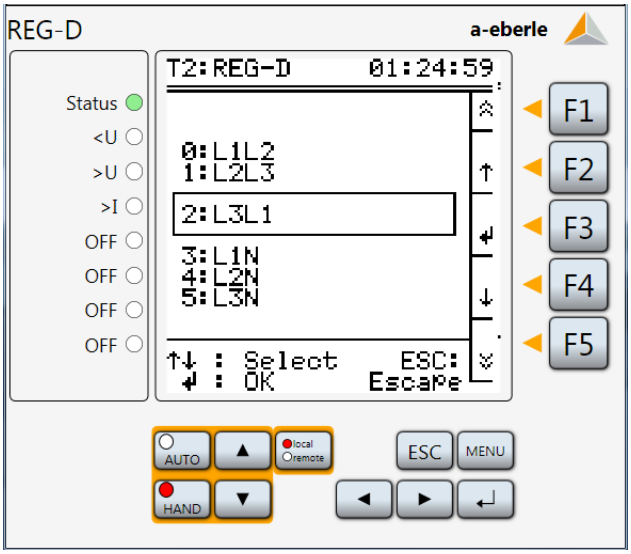


Setting 2: The VT Mounting

This setting tells the REG-D/DA which phase/s the VT is connected across for voltage measurement. If a CT input is also used, the VT Mounting setting allows the REG-D/DA to calculate the correct phase angle and power values. It is particularly important to make the correct setting here if transformers are to be run in parallel.

Press the F1 key (L1L2)

Use the F2 and F4 key to scroll up and down to make a selection from the list. In this example the VT is connected across L3 and L1 and measures the phase to phase voltage:



Once the correct setting is shown in the selection box, press the F3 or ↵ key

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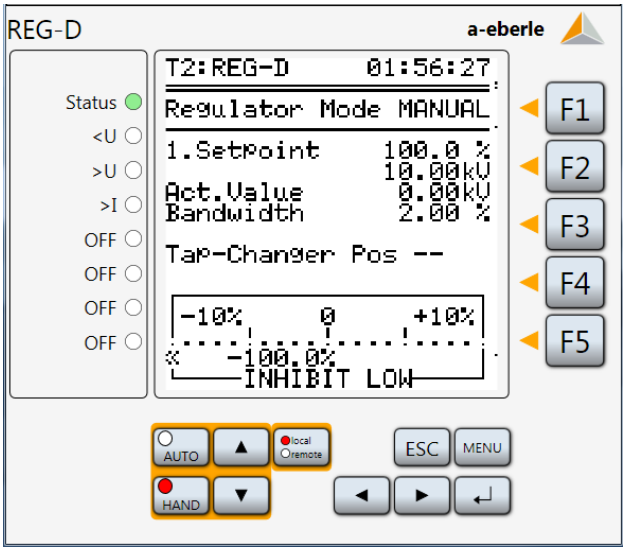
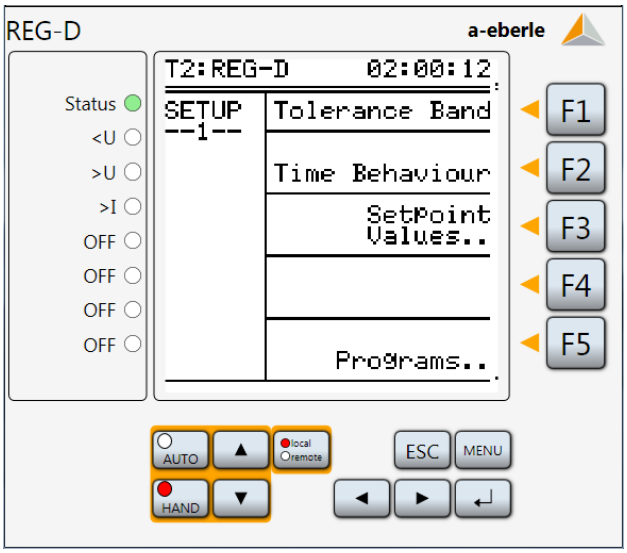
Setting 3: Setpoint Value

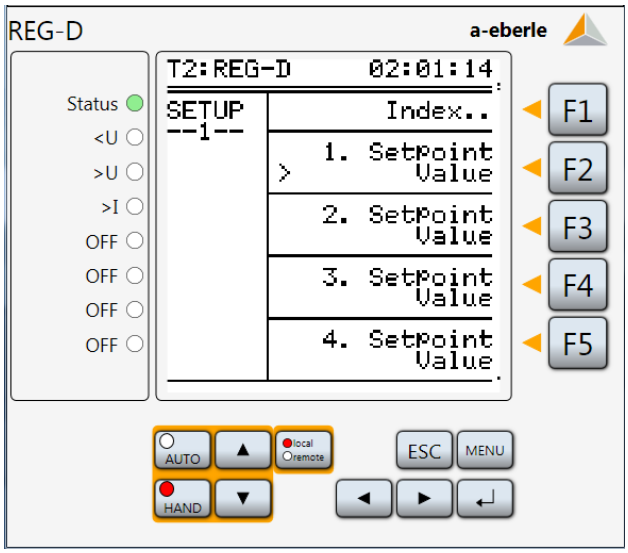
This is the desired value that the REG-D/DA will control the measured voltage to.

Press the ESC key to return to the main menu:



Press the Menu key 3 times, to access the Setup-1 menu, then press the F3 (Setpoint Values) key:





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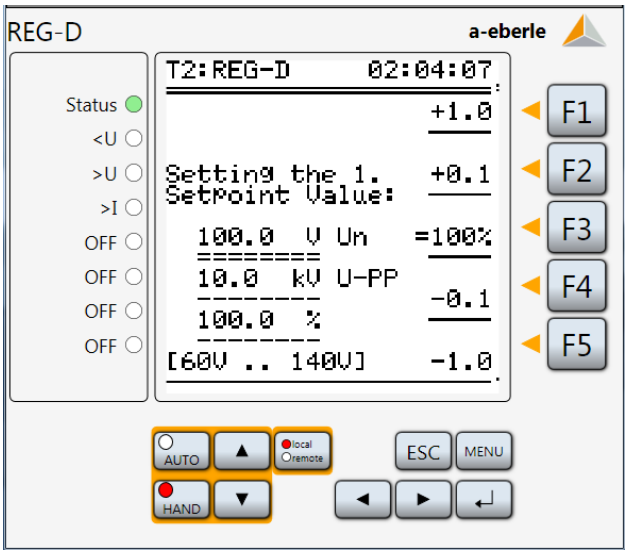
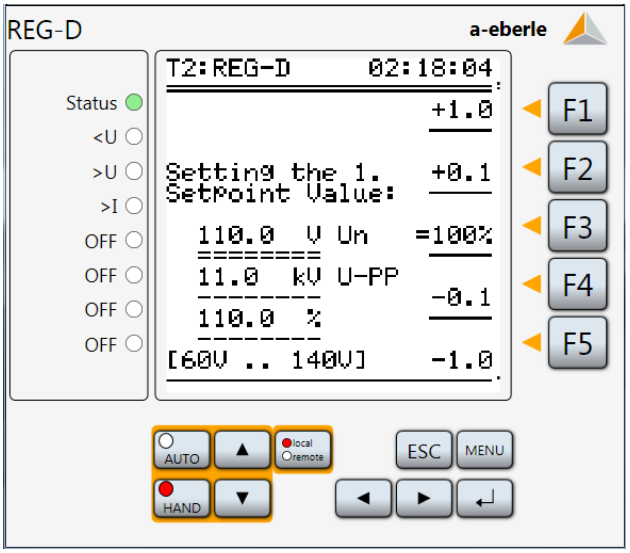
Next press the F2 key:



Use the F1, F2, F4 and F5 keys to set the setpoint to the required value. Note that the primary value is also shown below the secondary value to assist with this setting. In the example below, a setpoint of 11kV has been set:



Once the required value has been reached, the F3 key should be pressed to bring the new value back to 100%.

Then press the ↵ key *twice*.

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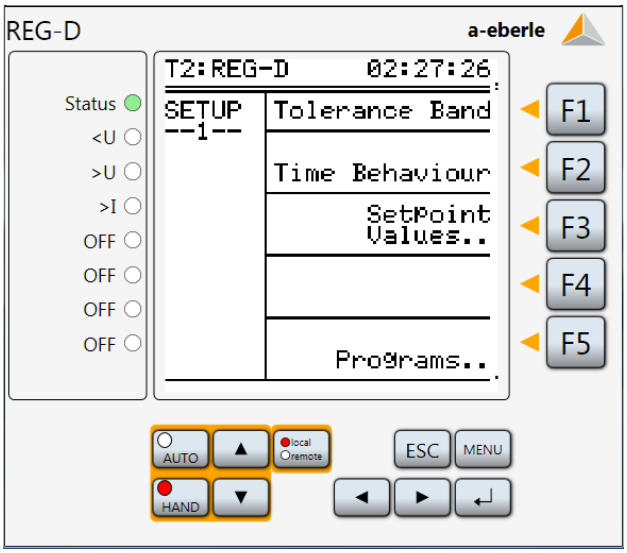
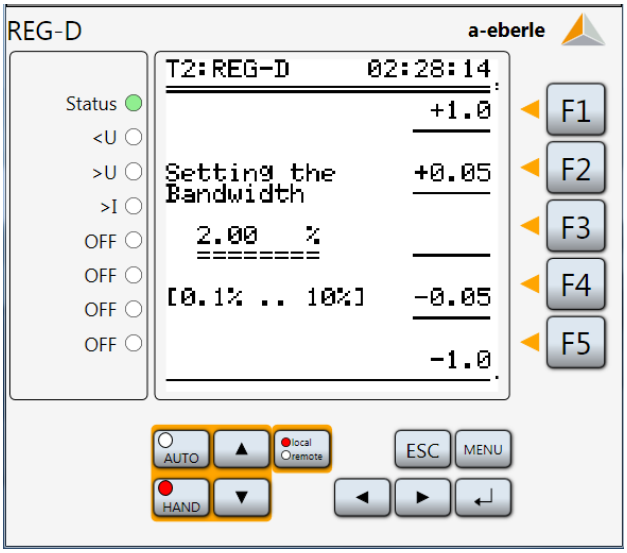
Setting 4: Tolerance Band

This is the permissible deviation from the setpoint that is allowed before an adjustment is needed. The value is from zero to one of the limits, not upper limit to lower limit. In this example, a Tolerance Band of 1.5% will be set.



Press the F1 key:



Use the F1, F2 F4 and F5 keys to set the required value.

Press the ↵ key.

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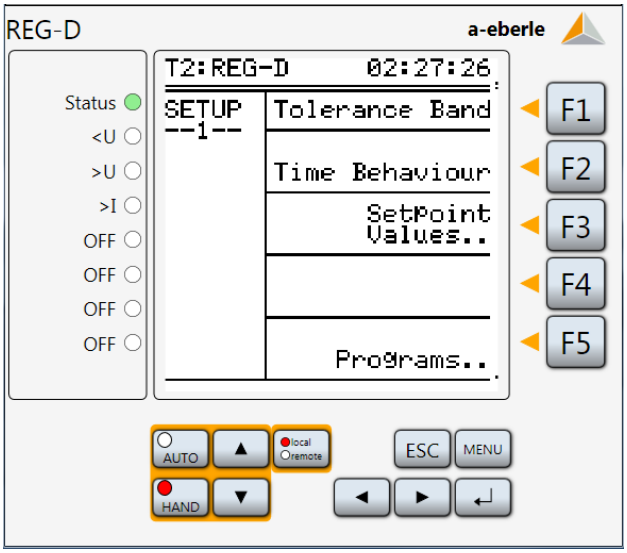
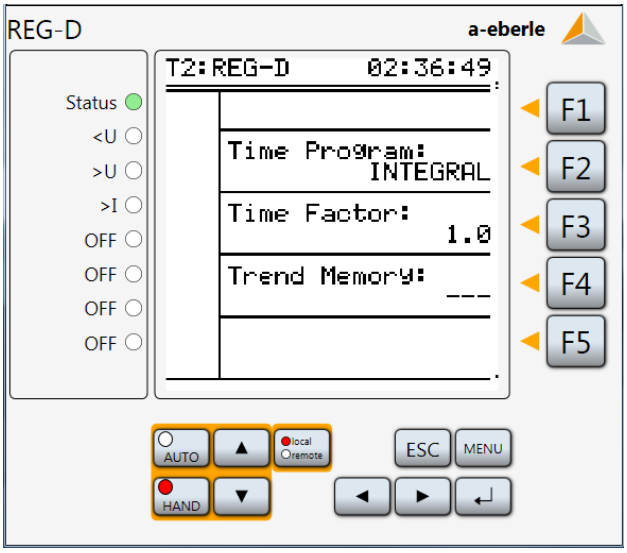
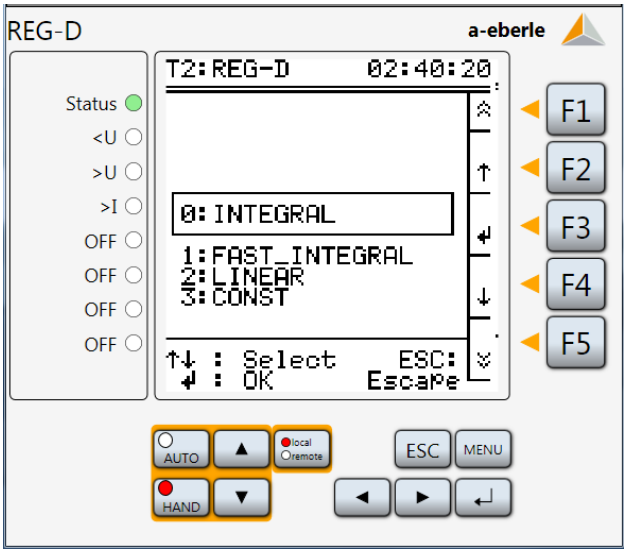
Setting 5: Time Behaviour

Various time curves are available to match the requirements of a particular site. These time curves can then be further configured using a time factor setting, which acts as a kind of multiplier. In this example, the Fast Integral time curve will be used, with a time factor of 2. A tool for predicting the response of the various time curves is available from HVPower on request.



Press the F2 key twice to access the Time Program menu:





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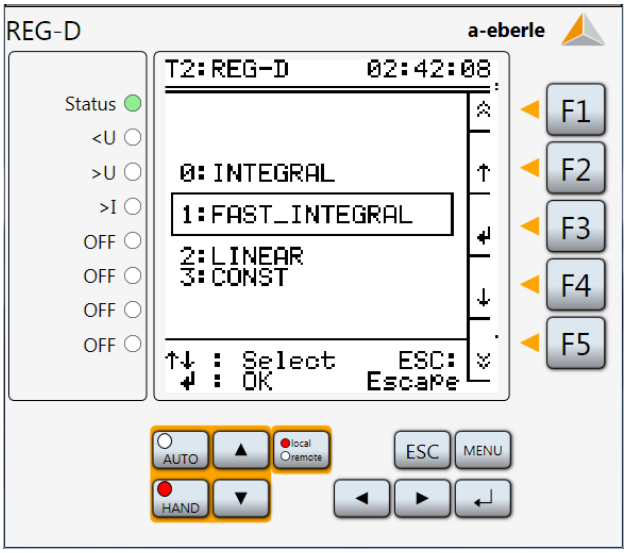
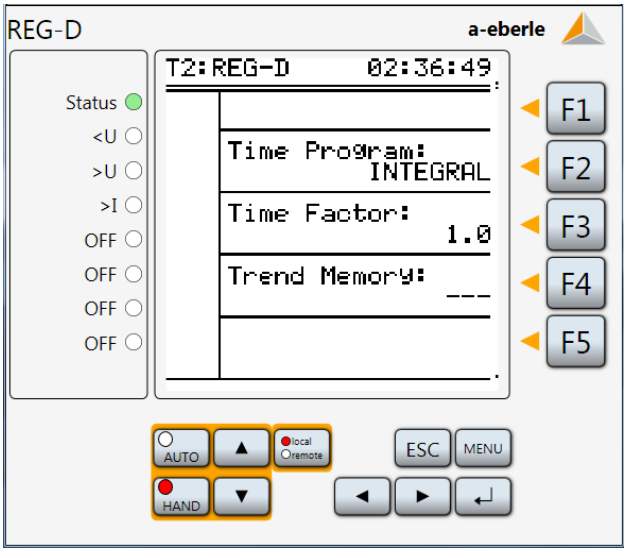
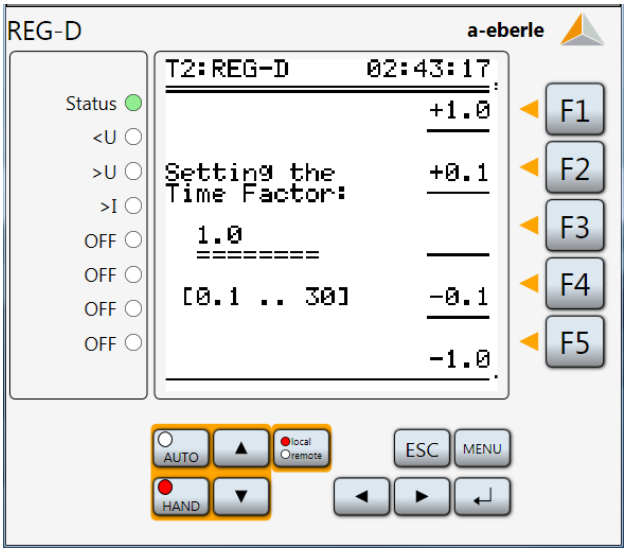
Use the F4 key to scroll down the available time curves, then press the ↵ key.





Next, press the F3 key:



Use the F1, F2 F4 and F5 keys to set the required value.

Press the ↵ key.

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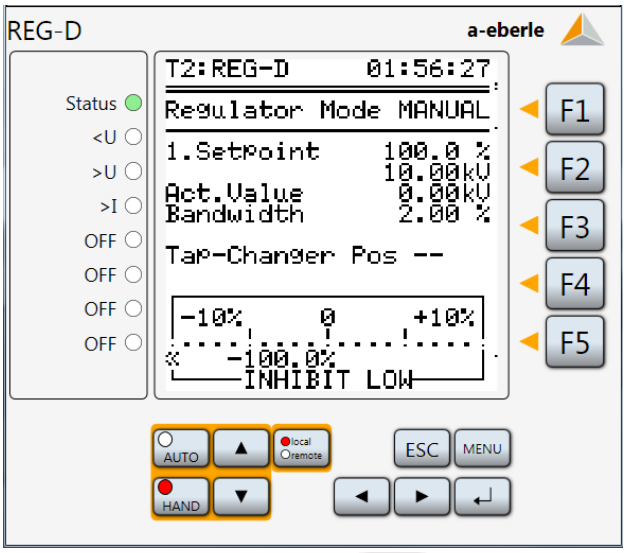
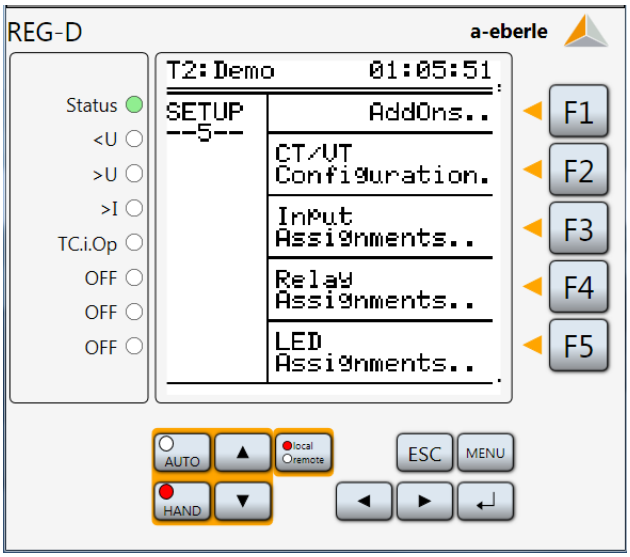
Setting 6: Maximum Time TC in Operation

This is the maximum time that the REG-D/DA should allow for one tap change command to complete before the next tap change command is issued. It is recommended that actual tap change times be measured as the tap changer is operated through the entire range. The Maximum Time TC in Operation setting should then be set at about 3s longer than the longest measured time. In our example the longest tap took 8s to complete.

Press the ESC key to return to the main menu:



Press the Menu key, then the ◄ key twice, so that the following Setup-5 display is shown:



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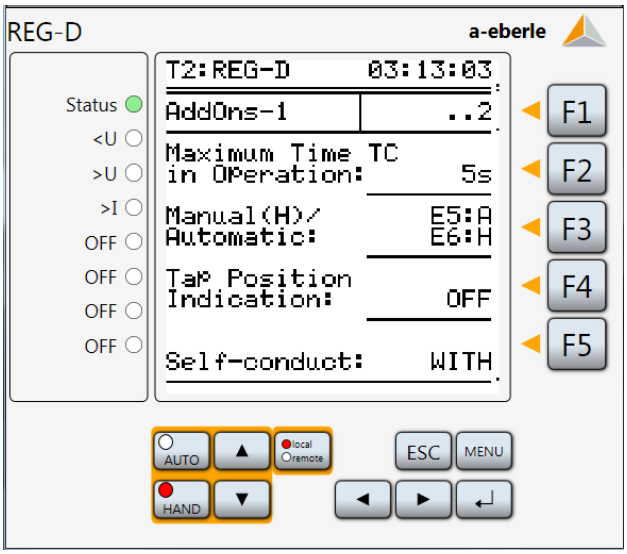
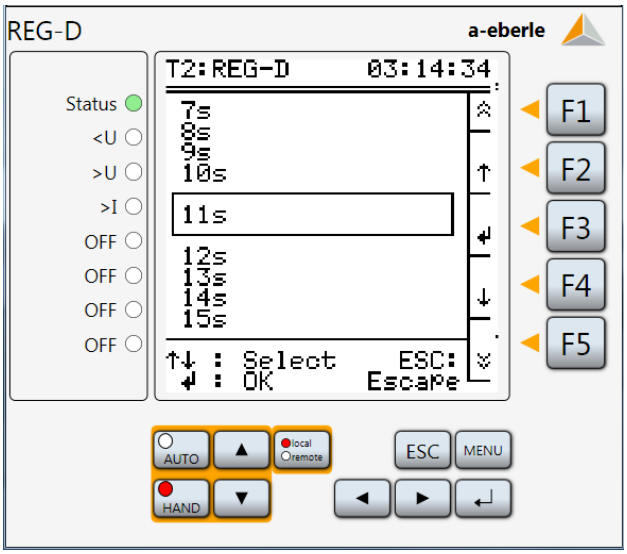
Press F1 to go to the Addons-1 menu:



Press the F2 key, then the F4 key to scroll down the list to 11s:



Once the correct setting is shown in the selection box, press the F3 or  key

Setup of basic voltage regulation is complete.

The A.Eberle REG-D/DA will now regulate from the measured single phase voltage (L3L1 phase to phase) to a setpoint of 11kV and within a tolerance of 1.5%. If the measured voltage leaves this tolerance band, the time behaviour settings ensure that the optimum balance between a stable measured voltage and number of tap changes is reached. Tap commands are issued via Relays 1 & 2, with a default pulse on time of 2s.

The REG-D/DA is highly configurable, so please ask the staff at HVPower if your application requires any further settings.

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