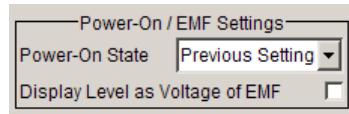


4.3.5.3 Power-On/EMF Settings



The power-on behavior of the R&S SMB and the level display in the display header are set in the "Power-On / EMF Settings" section of the "RF Level/EMF" dialog.

To open the "RF Level/EMF" dialog, select "RF > Configure > EMF" or use the [MENU] key under "RF".



Power-On State - RF Signal

Selects the state which the RF output is to assume after the instrument is switched on.

"RF Off" The output is deactivated when the instrument is switched on.

"Previous Setting" When the instrument is switched on, the output assumes the same state as it had when the instrument was switched off.

Remote command:

`:OUTPut<hw>[:STATE]:PON` on page 317

Display Level as Voltage of EMF - RF Level

Activates display of the signal level as voltage of the EMF (no-load voltage). If this setting is deactivated, the level is displayed as a voltage over a 50 Ohm load.

Note: This setting is not affected by an instrument preset ([Preset] key), *RST or the "Save/Recall" function. Only the [Chapter 4.2.3.16, "Factory Preset", on page 122](#) resets the setting.

Remote command:

`[:SOURce<hw>] :POWER:EMF:STATE` on page 384

4.3.5.4 Automatic Level Control - ALC

Your signal generator is equipped with an automatic level control unit to obtain best RF level accuracy.

Automatic Level Control (ALC) is an adaptive control system to stabilize the RF output level. It continuously monitors the current level and adjusts it to keep a steady state over temperature and time.



ALC is active in almost all applications by default. However, the **Pulse Modulation** mode excludes ALC, as the control loop would detect incorrect values and result in level deviations.

Also note that ALC may detect incorrect values in **multi-transmitter** test setups. If multiple generators are coupled, reverse power may affect the ALC readings. Based on incorrect values, ALC would have an impact on the signal to intermodulation ratio.

ALC States

The following description basically explains the ALC states and their principle of operation. In particular **ALC OFF (Sample & Hold)** gives an overview on the function in terms of the equipment of the generator.

The R&S SMB offers the ALC states:

- **AUTO**
automatically adjusts the output level to the operating conditions.
- **On**
enables ALC permanently, regardless of the currently selected mode.
- **Off**
deactivates ALC.
The instrument switches to **Sample & Hold (S&H)** state, which still allows to maintain a constant output level.

The following section explains the functionality of "Sample & Hold", to provide an overview and to indicate what is to be considered. "On" and "Auto" require no additional explanation. Furthermore, find the ALC state settings described in detail in [State - ALC](#).

ALC OFF (Sample & Hold)

In "S&H" mode, the signal generator switches for a short period of time into CW mode and activates ALC. ALC adjusts the level to the set value and the generator holds the value (freeze). Then, the generator switches ALC off again and back to the operating mode.

RF output behavior during Sample & Hold depends on the configuration of your instrument. Instruments equipped with...:

- **an electronic step attenuator**
The level is decreased by 30 dB.
- **a mechanical step attenuator**
By default, the mechanical step attenuator is not switched during S&H cycles to optimize the settling time. The instrument provides the output power for 3 ... 5 ms. However, you can affect the attenuation at the output by the setting "RF during Power Search" to "Minimum", see [RF During Power Search - ALC](#). Then the generator decreases the level by 30 dB with the mechanical attenuator. Note that this may take a certain period of time.
High frequency instruments, such as the R&S SMB with one of the high frequency options R&S SMB-B120 or R&S SMB-B140, are equipped with a **mechanical step attenuator**.
- **no step attenuator**
The signal generator outputs the set level for 3 to 5 ms after level or frequency setting during a Sample & hold measurement.
Instruments equipped with one of the options R&S SMB-B112L, R&S SMB-B120L or R&S SMB-B140L come without step attenuator.

The level control status is permanently displayed as a status message in the info line.

