

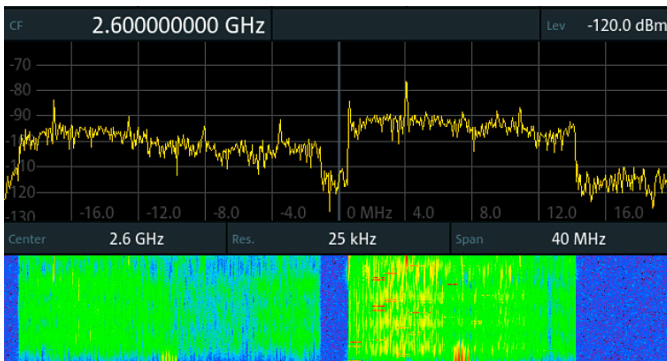
INTERFERENCE HUNTING IN TDD NETWORKS

Gated spectrum method with the R&S®PR200



Your task

In time division duplex (TDD) networks, the downlink (DL) and uplink (UL) use the same frequency band in different timeslots. When viewing such TDD signals on a conventional spectrum display, it is impossible to differentiate the two signals nor any other unwanted signals present in the same spectrum. This makes interference hunting extremely difficult.



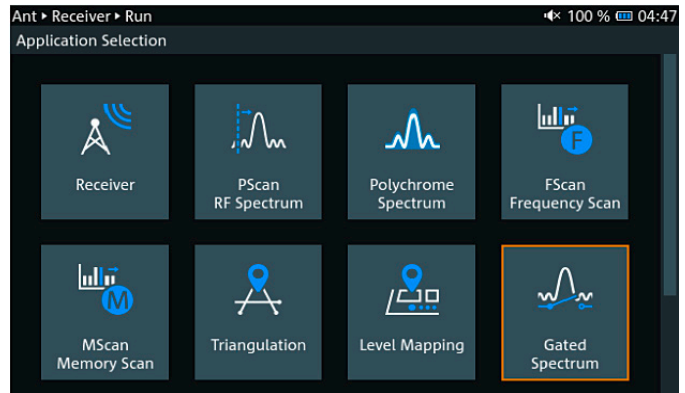
Example: 40 MHz real-time spectrum and waterfall display of two TDD-LTE signals with a persistent interferer at 2602 MHz that can hardly be seen on the display

Rohde & Schwarz solution

The R&S®PR200 portable monitoring receiver provides a gated spectrum function that enables users to effectively separate uplink and downlink of the TDD signals on the spectrum display. If the receiver is triggered to display spectrum only during the uplink timeslot, this will provide better visualization of interferers occupying the same frequency as the wanted signal.

Activating gated spectrum on the R&S®PR200

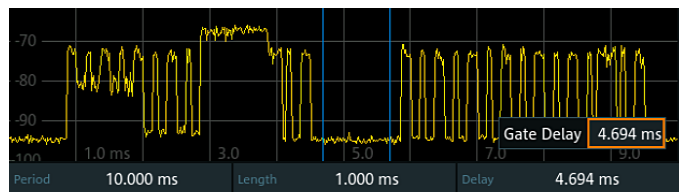
The gated spectrum function requires the R&S®CS-ZS time domain measurement option in the R&S®PR200.



Gated spectrum can be activated from the app menu

Viewing uplink (UL) spectrum in TDD-LTE

- ▶ Ensure the demodulation bandwidth is wide enough to receive the TDD-LTE signal
- ▶ Set the gate period to 10 ms (equivalent to one TDD frame duration in LTE)
- ▶ The gate length, which defines the trigger duration, is determined by the distance between the two parallel blue lines; set the gate length to approximately one subframe, i.e. 1 ms
- ▶ The position of the gate can be shifted by changing the gate delay and should be aligned with the uplink subframe



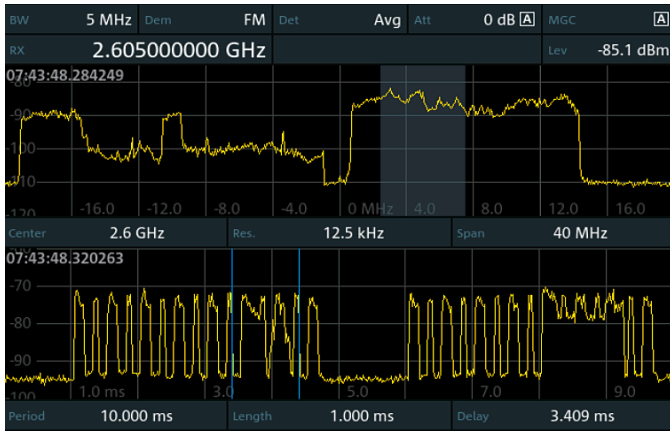
Gated trigger settings for viewing UL spectrum in TDD-LTE

Application Card | Version 01.00

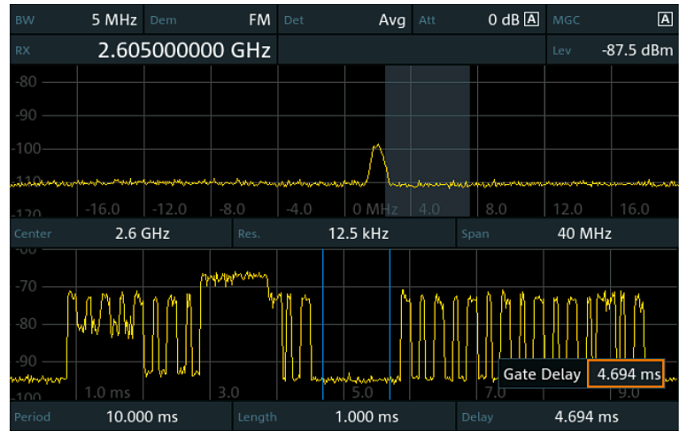
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Make ideas real





When the gate (two parallel blue lines) is positioned at the downlink slot, the downlink signal spectrum is observed in the top display



With the gate shifted to the uplink slot, the interferer at 2602 MHz can be observed clearly in the spectrum display (top)

Advantages of gated spectrum in the R&S®PR200

- ▶ Effective separation of TDD uplink and downlink signals on the spectrum display
- ▶ Dual displays on one screen showing both the signal spectrum and time domain display simultaneously. Users will have real-time view of the signal spectrum when the gate is shifted along the timeslots in the time domain display
- ▶ With dual displays, users are able to observe any misalignment of the gate position to the desired timeslot and then make adjustments accordingly. Users no longer need to toggle between the two displays, as is commonly the case with normal spectrum analyzer functionality



Typical configuration for interference hunting



Interference hunting with the R&S®HE400VHF VHF antenna module

Designation	Type	Order No.
Portable monitoring receiver, 8 kHz to 8 GHz	R&S®PR200	4500.5002.02
Time domain measurement (software option)	R&S®CS-ZS	4500.7111.02

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