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PSM1700, PSM1735 and SFRA45 - Additional technical data

RE: Measurement Selectivity

In many applications that require frequency response analysis, it is common for the frequency of interest (sometimes referred to as the injected frequency) to be immersed in noise. It is therefore important that the FRA instrument being used can reject frequencies other than that of the signal of interest. This feature is usually described as the **measurement selectivity** of the instrument and in most cases; selectivity is increased as the measurement speed is slowed down.

N4L frequency response analysers incorporate analogue circuits with high common mode rejection and unique 'real time' DFT (discrete fourier transform) analysis to provide exceptional wideband frequency response measurements even when the signal of interest is immersed in noise. As a result of this design technique, users are not required to concern themselves with the careful choice of selectivity criteria to achieve stable measurements.

In most applications, the signal of interest is generated by the FRA itself. When using this normal mode of operation, PSM units from N4L will automatically analyse the measurement signal with a DFT algorithm running at the same frequency as the injected signal. This process eliminates the problem of signal frequency detection.

Where an external signal source is used for signal injection, the PSM units will detect the injected frequency with a greater level of selectivity as the measurement speed is slowed down. The user need only select the measurement speed to achieve the optimum balance of speed and measurement stability.

While it is not required for the user to define the selectivity, nominal values used by the PSM units are defined in the following table:

speed	update rate	normal time constant	slow time constant	Measurement Selectivity
fast	1/20s	0.2s	0.8s	24Hz
medium	1/3s	1.5s	6s	3Hz
slow	2.5s	12s	48s	0.4Hz
very slow	10s	48s	192s	0.1Hz

NOTE:

Some FRA instrument manufacturers use the term 'IF Bandwidth'. While this term is usually used in general electronics to refer to the intermediate frequency of analogue RF circuits, in FRA applications the term relates to measurement selectivity.