



Laser Transmitter Optimization and Bench Marking

(Using the FOS 860A Instrument)

The alignment of laser transmitters with the correct Optical Modulation Index (OMI) automatically sets the transmitter for Maximum C/N and Minimum Distortions. The following is a brief description on how to use the FOS 860A instrument to align transmitters using OMI.

Required Information before testing begins:

- 1) The number of RF analog channels driving the laser (minimum 2).
- 2) The number of digital channels driving the laser. [For 6dB down digital channels, add 1 analog channel for each 4 digital channels and set the total (analog plus equivalent digital) on the instrument front panel selector].
- 3) The manufacturer total recommended input RF power level to the laser.
- 4) If available, the manufacturer recommended OMI per channel for that laser. (Manufacturer's have the OMI number for each laser type and will provide it if asked).
- 5) Make certain all RF channels driving the laser are flat and set to the approximate manufacturer specified RF power level.

Before connecting the laser output to the instrument, do the following:

- 1) Set the instrument to maximum optical attenuation.
- 2) Set the number of analog and digital equivalent channels on the front panel selector.

Now connect the output of the laser to the instrument:

- 1) Adjust the variable optical attenuator until the display reads approximately 0 dBm.
- 2) Read and record the OMI % per channel and the total OMI %.
- 3) If they are the same as the manufacturer's recommended OMI number, record the input RF level and you are done. The transmitter is now set optimally.
- 4) If they are not the same, adjust the RF input power level (up or down) to obtain the correct OMI % on the instrument. When the correct OMI number is obtained, record the RF input power level and the OMI readings and you are done. The unit is optimized.

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If you don't have the optimum OMI % per channel for this transmitter (from the manufacturer), you must do the following to obtain the OMI the first time you align the unit.

- 1) Optimize the C/N and the distortion performance the way you would normally do it with analyzers, power meters, etc.
- 2) Set the optical levels and number of channels on the front panel of the instrument as described above.
- 3) With the C/N and distortions optimized in your traditional way, measure and record the total RF input power, the OMI% per channel and total OMI % with the FOS 860A as described above.

Thereafter, whenever you have to align or check the performance of this unit, you simply need to use the FOS 860A instrument to adjust/measure the RF input to obtain the pre-recorded optimum OMI. Once you have the OMI number for that transmitter, you never have to calculate C/N or measure distortions again. Set the OMI and the unit is optimized.

Once you learn to use this instrument, you will find that you save a tremendous amount of time and best of all your system performance will be optimized. And if the manufacturer supplies you with the OMI % per channel for each of their transmitter products, you will never have to set up transmitters the old way again.

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