JJ&A Instruments

TMN-100

Transducer Matching Network

The TMN-100 automatically computes the proper impedance transformation between the power source and the transducer without any need for additional inductors and capacitors. As the transducer ages, its resonant frequency and impedance can change. The TMN-100 will correct for any drift. Setup is easy - simply connect the transducer to the TMN-100 with any length of coaxial cable. Includes USB interface for control.

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TMN-100 Features:

Ultrasonic HIFU transducers typically have a low impedance consisting of real and imaginary components. In order to use a transducer for experiments effectively, the user must build a matching network of inductors and capacitors to transform this complex low impedance up to the usual 50 ohms. The TMN-100 handles the task automatically, eliminating the need to build circuitry to match the tranducer. If the transducer's impedance changes over time, or due to hairline cracks in the metallization or partial delamination of the acoustic matching layer, the TMN-100 will automatically adjust itself to compensate. If proper impedance is not maintained, the transducer will eventually fail to perform adequately.

To use the TMN-100, simply issue one command via USB interface. The TMN-100 will begin analysis of the transducer and within 2 seconds it will have crafted an impedance match within an SWR (Standing Wave Ratio) of 1.5:1. Additional refinement of the SWR can also be done, as individual inductors and capacitors of the electrical matching network are controllable at will. The TMN-100 stores the optimum setting and issues the memory setting the next time it is used. It always remains totally programmable and has virtually unlimited memory space for custom settings.

The TMN-100 can be used by itself or in concert with other JJ&A HIFU products to provide a complete laboratory system.

Additonal JJ&A HIFU products for use with the TMN-100 include:

- **RFG-100 RF Generator:** A compact, 100 watt RF Power Generator with frequency ranges available from 700 KHz to 5 MHz. Includes USB interface, CW and Pulse modes, and emergency shutdown circuit. Multiple units can be combined for phased or annular arrays.
- **RFG-1000 RF Generator:** Same features as the RFG-100, except the maximum power output is 1000 watts.
- **PF-500 RF Power Fuse:** This module is a stand-alone RF power sentry used to protect transducers from accidental overpower damage. Placed in-line between the RF power generator and the transducer, it passes the signal unless the power level exceeds the desired limits.
- **PM-1000 Power Meter:** Pulse power and SWR monitoring module. Measures SWR (Standing Wave Ratio), forward power, and reflected power in either CW or Pulse modes. Very unique in that it will function properly with fast pulses. Information is sent back to the user via standard USB interface. This information can be used to halt the power generator if a high SWR condition suddenly exists.
- **DDL-1000 Digital Dummy Load:** Combination dummy load and power sensor with USB port. Useful for dry runs and diagnostics. Use to confirm that proper power levels are set.
- **RX-1 Receiver:** Used to present baseband I and Q (In phase and Quadrature) output signals for signal analysis. Receiver locks onto transmitting frequency and IQ outputs show phase information of received signal. Analog outputs, ready for any -5 to +5 volt digitizer.
- **CIRC-1000 Circulator:** Used to isolate transmitted and received signals, or can be used alone as a T/R switch.
- **FS-1 Foot Switch:** Accessory for use during experiments to control when the power generators are on.
- **HWS-1 HIFU Work Station:** Wet-lab work area with adjustable arms and clamps for holding transducers, test gels, cameras, etc. Includes a high intensity illuminator, 7 MP digital camera for still and video with USB interface, plus a stand-alone video screen on the workstation that is used to zoom in and adjust the experiment during setup. Work area is 18 x 24 inches (46 x 61 cm).

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