

ATLAS Mainframe Tester (MFT)

The ATLAS Mainframe Tester (MFT) is a hardware device that connects to the ATLAS mainframe unit in the same fashion as any ATLAS ultrasound probe adapter. The MFT device exercises various aspects of the ATLAS unit to verify proper operation of the ATLAS hardware. The device is a high-speed test instrument, intended to give ATLAS users a tool to evaluate the functionality and calibration of their ATLAS mainframe, and assist the user in determining whether hardware problems are due to their ATLAS mainframe or their probe adapter. A photo of the MFT is shown below:



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The following subsystems are tested as part of the MFT test suite, with overall test repeatability within 2%:

- Power Supplies - This tests the +12V, -12V, +5V, +HV Mux, -HV Mux, +LV Mux, and -LV Mux supplies (HV = High Voltage, LV = Low Voltage). Accuracy of these measurements is within 2%.
- Control Interface - This tests the digital control lines between internal printed circuit boards within the ATLAS unit.
- Cp Accuracy - This tests the measured accuracy of the reference capacitor component installed on Channel 1 of the MFT device. Accuracy of these measurements is within 1%.
- Channel Test - This tests for correct normal capacitance values on all 256 internal channels of the unit.
- Transmit (Tx) Pulse - Accuracy of these measurements is within 5% for pulse width and amplitude.
 - Tx Unipolar 90V - This tests the pulse width, fall time, and amplitude characteristics of a unipolar transmit pulse at a 90V setpoint.
 - Tx Unipolar 115V - This tests the pulse width, fall time, and amplitude characteristics of a unipolar transmit pulse at a 115V setpoint.
 - Tx Bipolar 60V - This tests the pulse width and amplitude characteristics of a bipolar transmit pulse at a 60V setpoint.
- Receive (Rx) Pulse - Accuracy of these measurements is within 5% for amplitude and 2% for frequency.
 - Rx Low Gain - This tests the amplitude and frequency characteristics of a synthesized receive pulse at a low gain setpoint.
 - Rx High Gain - This tests the amplitude and frequency characteristics of a synthesized receive pulse at a high gain setpoint.
- Drift Analysis - A drift analysis is maintained using the historical measured values of the power supplies. A trend is computed for these values and the resulting slope of this trend is available in the PDF report. The drift analysis requires 90 days of MFT data to be valid.

The MFT device requires annual calibration which can be performed only at Acertara facilities. The MFT device is not field-upgradeable and there are no components which can be repaired or replaced by the end user.