BondMaster® 600 Tester

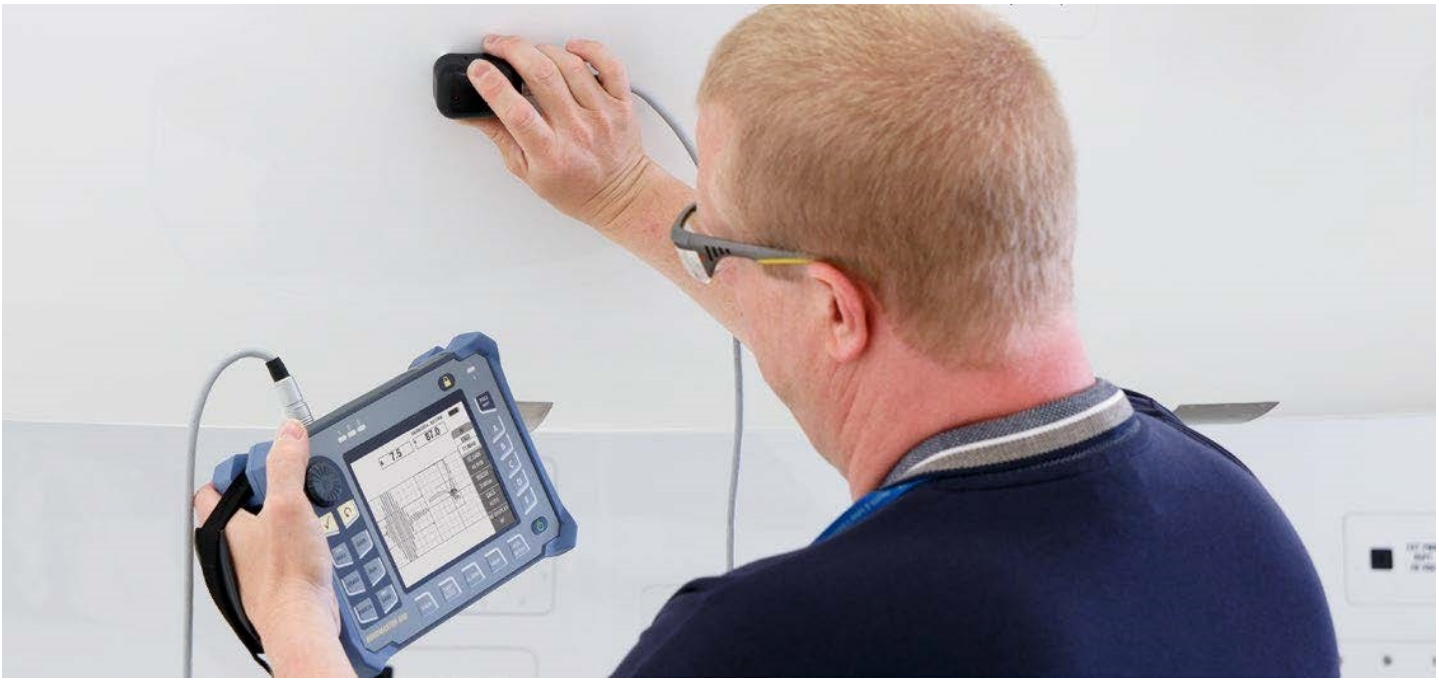
Intuitive Bond Testing

- High signal quality
- Multiple modes
- Application presets
- Full-screen display
- Complete archiving and reporting solution

BondMaster® 600 Multimode Bond Tester
High Performance Through Intuitive Operation

The BondMaster® 600 bond tester delivers a powerful combination of multiple mode bond testing software and highly advanced electronics, providing consistently crisp and high-quality signals. Whether you are inspecting honeycomb composite, metal-to-metal bonds, or laminate composite, the BondMaster 600 bond tester offers exceptional ease-of-use thanks to its direct-access keys and a streamlined interface that features convenient presets for common applications. The instrument's enhanced user interface and simplified workflow offer archiving and reporting that are accessible to any level of user.

The resolution and brightness of the 5.7-inch VGA screen become even more apparent when switched into full-screen mode. Activated simply by touching a key, the full-screen mode is always accessible regardless of the display mode or inspection method you are using. The BondMaster 600 bond tester is programmed for a range of standard inspection methods, including pitch-catch RF, pitch-catch impulse, pitch-catch swept, resonance, and an improved mechanical impedance analysis (MIA) method.



Portable, Lightweight, and Ergonomic

The instrument's ergonomic design is convenient for difficult-to-access inspection locations. For inspection in tight spaces, the factory-installed hand strap provides maximum comfort while maintaining access to the most critical functions.

Field Proven

The BondMaster 600 bond tester's case, based on a rugged, field-proven design, is built to withstand harsh, demanding inspection conditions. With a long battery life, airtight and water-resistant enclosure, high-friction bumpers, and dual-duty support stand/hook, this bond tester is a valuable tool for challenging inspection jobs.

Key Features

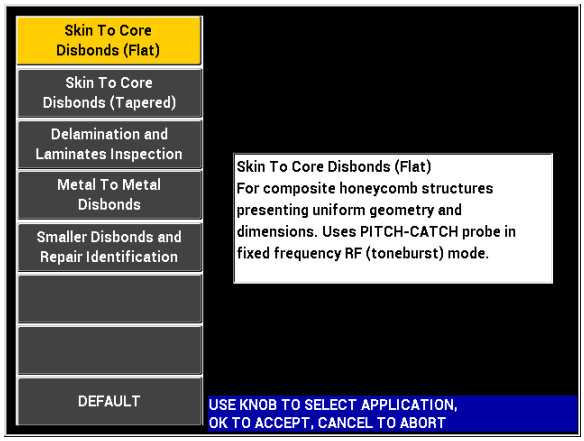
- Designed to meet the requirements of IP66.
- Long battery life (up to 9 hours).
- Compatible with existing BondMaster POWERLINK® probes and probes from other manufacturers.
- Bright, 5.7-inch color VGA display.
- Full-screen option in any display mode.
- Intuitive interface with application-specific presets.
- Instant display mode toggle using the RUN key.
- New SCAN view (profile).
- New SPECTRUM view and frequency tracking feature.
- Direct-access key gain adjustment.
- All settings configuration page screen.
- Up to two real-time readings.
- Storage capacity of up to 500 files (program and data).
- Onboard file preview.

Simplified Interface and Vibrant Display

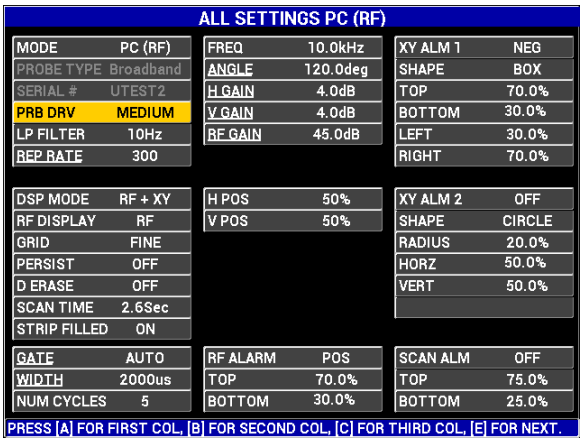
Instant Configuration and Direct Access to All Settings

One of the major assets of the BondMaster® 600 bond tester is its ease of use. Its streamlined and user-friendly interface was developed by incorporating innovative features from other Evident products and combining them with several new functions, including the application selection (presets) menu, the all settings direct modification screen, and the ability to calibrate signals while in freeze mode.

All the advantages offered by the BondMaster 600 interface are available in 15 languages.



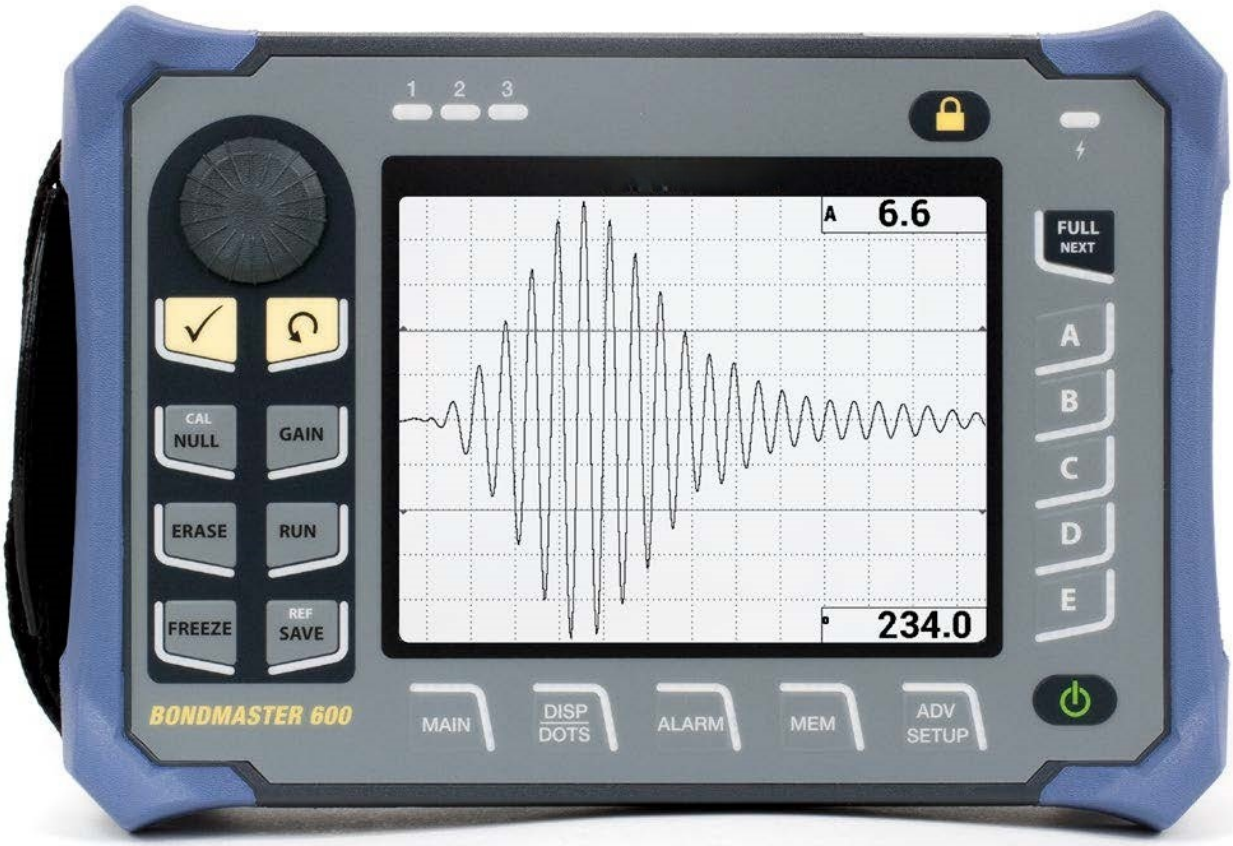
The application selection menu provides instant, ready setup to the user.



The all settings screen shows all parameters for rapid editing.

True Full-Screen Mode and Direct Access

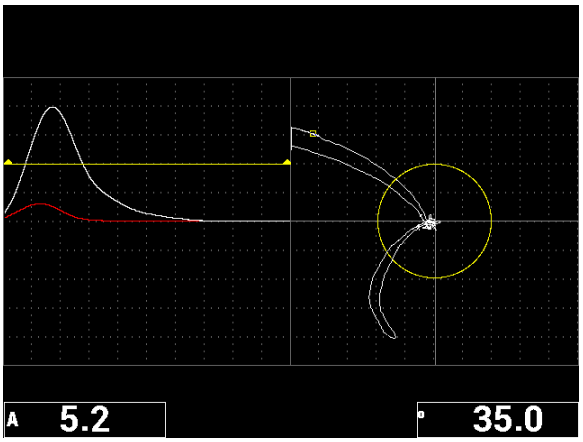
The BondMaster 600 bond tester features a comprehensive set of direct-access keys, enabling instant adjustment of commonly used parameters such as gain, full-screen mode, display mode (RUN), and more. Signals are displayed in eight vivid and identifiable color schemes, and the screen's enhanced visibility in indoor and outdoor conditions helps reduce operator eye fatigue.



Outstanding Signal Quality
Enhance Your Honeycomb Composite Inspection Capability

During bond testing inspections, the pitch-catch probe produces flexural plate waves and compression waves and compares changes in the signal amplitude between the probe's transmitter and receiver as it passes over the inspected part, detecting disbonds on both the near and far side. The BondMaster® 600 bond tester offers three pitch-catch mode options: RF (fixed frequency waveform), impulse (legacy view featuring an envelope filter), or swept (sweeping through a selected frequency range).

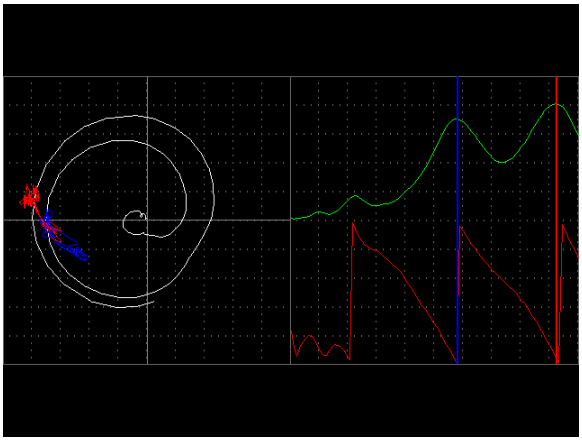
The instrument's pitch-catch menus have been optimized to provide fast access to the parameters that are adjusted most frequently during calibration and inspection. The real-time readings provide instantaneous information on the signal amplitude or phase, enabling you to interpret flaws more easily. The new auto gate mode automatically detects the best "gate" position based on the RF or impulse signal, reducing operator error and maximizing the results.



Pitch-catch in impulse display split screen. The X-Y view (right) shows a record of both near and far side disbonds (phase difference).

OEM Friendly: New Frequency Tracking Tool for Procedure Development

The BondMaster 600 pitch-catch swept mode not only features improved signal quality but also has a new "Spectrum" representation. This new view displays the live amplitude and phase of the signal compared to the frequency range. Two new frequency markers (called frequency tracking) enable you to observe the behavior of two specific frequencies so that you can choose the best detection parameters for a specific application. This new tool is ideal for developing procedures or new applications.



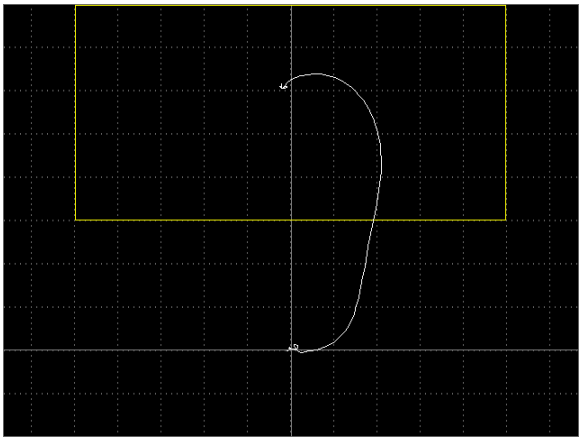
Spectrum view with frequency tracking.

Resonance Mode Presets to Meet Your Needs

Easy Inspection of Metal-to-Metal Bonds and Laminate Composites

Resonance mode measures the changes in phase and amplitude of the propagating/standing wave within the probe. Resonance probes are narrow bandwidth contact transducers, and the change in probe crystal impedance is represented in the X-Y instrument's display.

Resonance mode is a very simple and reliable way to detect delamination. Often, the depth of delamination can be estimated from signal phase rotation. Resonance mode on the BondMaster® 600 bond tester is remarkably easy to operate, due in large part to its factory presets for laminate composite and metal-to-metal disbond applications.

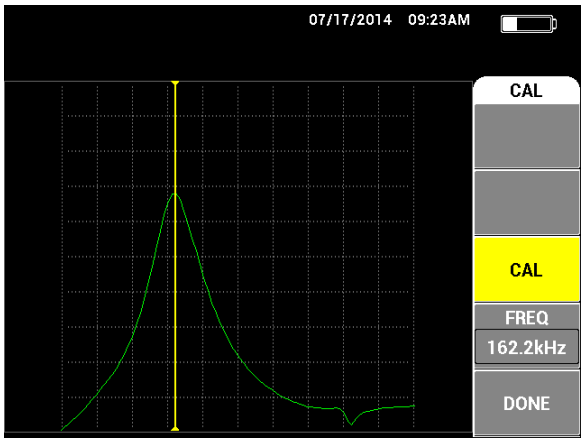


Resonance mode configured as “go/no-go”.

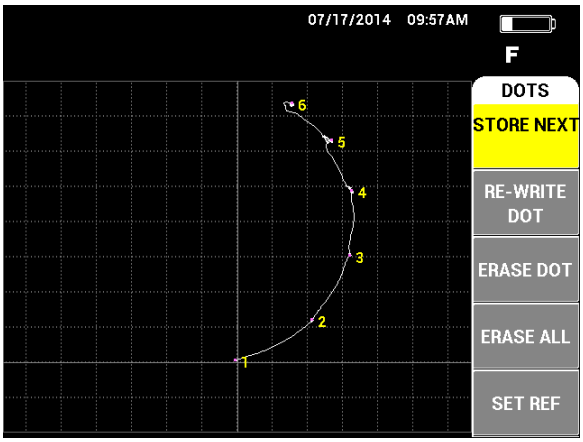
Simplified Calibration through an Optimized Interface

Calibrating the BondMaster 600 bond tester’s resonance mode has been simplified to a minimum number of steps. First, the optimum operating frequency for the probe is selected through the single-step calibration menu, and then the instrument’s streamlined interface and the ability to calibrate from frozen signals make the final calibration quick and simple.

Once calibrated, the improved signal reference and reference dot system enable you to easily track critical signals on the display during inspection. Moreover, its reference points system is so flexible that you can fine-tune the calibration without having to rerecord the points.



Calibration menu automatically selects the best working frequency.



Improved reference dot system of the BondMaster 600 bond tester.

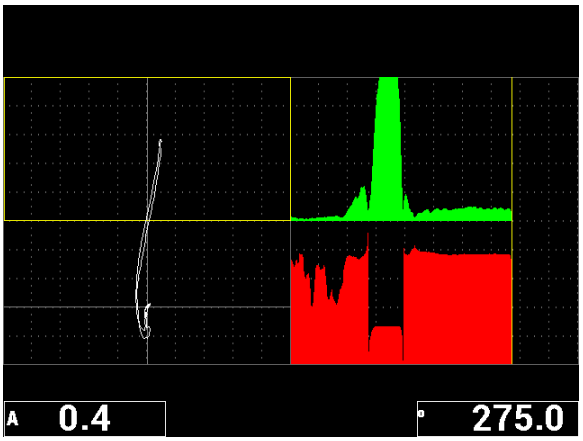
Witness the Power and Precision of MIA Mode

Detect Small Disbonds in Honeycomb Composite

The bond testing mechanical impedance analysis (MIA) method measures the mechanical impedance, or stiffness, of a material. MIA probes emit a fixed, audible frequency. Changes in material stiffness are indicated as signal amplitude and phase changes in the X-Y view of the BondMaster® 600 bond tester.

The small probe tip used with MIA, coupled with the high-performance electronics of the BondMaster 600 bond tester, make detecting very small disbonds in honeycomb composite much easier than with other methods. Moreover, the instrument's extended MIA frequency range (2 kHz to 50 kHz) obtains maximum results, even for far side disbonds.

A simple MIA calibration wizard guides you in selecting the best frequency for detecting smaller and otherwise hard-to-find defects in honeycomb composite.



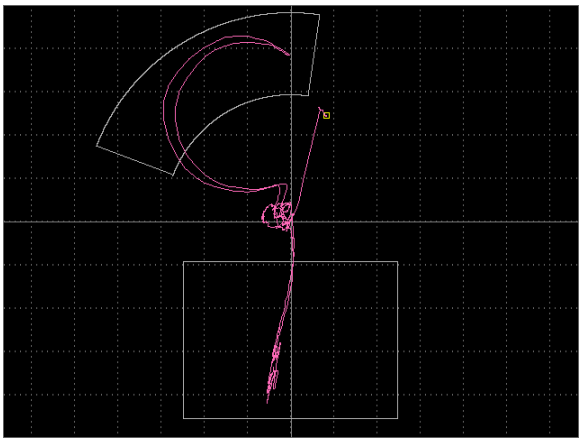
MIA mode with new "scan" view and real-time readings.

The BondMaster 600 bond tester also displays real-time readings showing signal amplitude or phase, and its new "scan" view enables you to monitor the probe amplitude and phase over time, aiding in the detection of small disbonds.

Indentifying Repaired Areas (Potting) in Honeycomb Composite

Identifying repaired areas on an aircraft's rudders or fuselage can be a challenge, especially when they are painted. With certain inspection methods, such as thermography, repairs can generate false indications. However, MIA mode can resolve this problem. Because the repaired area is generally stiffer, its mechanical impedance contrasts well with good areas as well as with disbonds.

The improved MIA method offered by the BondMaster 600 bond tester enables you to identify repaired areas with ease through a simple phase analysis of the MIA signal in the X-Y view.



MIA mode configured to identify a repaired area (bottom signal) as opposed to a disbonded condition (top signal).

Complete Inspection, Archiving, and Reporting Solution

Simplified Workflow for Any Level of User

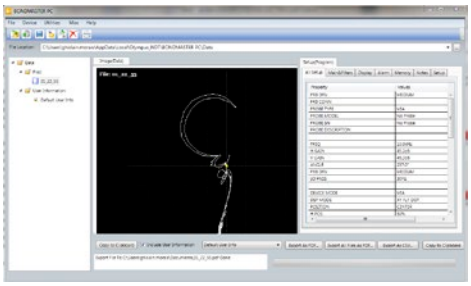
The BondMaster® 600 bond tester offers a streamlined and straightforward process for tracking your inspection results. Built-in features such as a large storage capacity (up to 500 data and program files) and an onboard file preview facilitate the inspection process, from start to finish.

A typical workflow consists of a few simple steps: save your results during the inspection process, download the saved files to the BondMaster PC viewing software, instantly generate a full inspection report using the “export all files as PDF” function, and archive the report if required.

1. Inspect

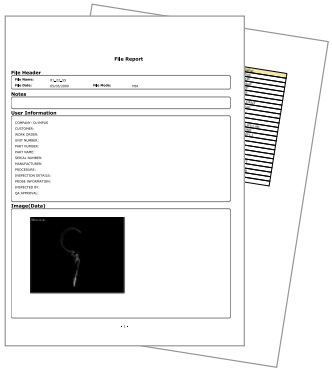
Press the SAVE key anytime during the inspection to record signals as viewed.

2. Download



Quickly download results to BondMaster PC through a USB connection.

3. Report



Produce a complete report with the touch of a single key and archive results as needed.

Two Models for Flexibility and Compatibility

The BondMaster 600 bond tester is offered in two models to accommodate the varying needs of composite bond testing. The basic model includes all pitch-catch capabilities while the B600M model features all bond testing inspection methods. The upgrade from basic to multimode can also be performed remotely.

Both bond tester models are compatible with existing Evident BondMaster probes, including those equipped with the POWERLINK® technology. Optional adaptor cables are available to enable compatibility with probes from other manufacturers.

Application	Recommended Method
General Honeycomb Composites Skin-to-Core Disbonds	Pitch-Catch (RF or IMPULSE)
Honeycomb Composites Skin-to-Core Disbonds in Tapered Structures or Nonconstant Geometries	Pitch-Catch (Swept)
Smaller Skin-to-Core Disbonds in Honeycomb Composite	MIA
Identification of Repaired Areas in Honeycomb Composite	MIA
General Detection of Delamination in Composite	Resonance
Inspection of Metal-to-Metal Bonds	Resonance

Feature	B600 (basic)	B600M (multimode)
Frozen-Signals Calibration	√	√
Real-Time Readings	√	√
Application Selection	√	√
PowerLink Probe Support	√	√
Pitch-Catch RF and Impulse Modes	√	√
Pitch-Catch Swept	√	√
Mechanical Impedance Analysis (MIA) Mode		√
Resonance Mode		√ (cable included)
Calibration Menu (Resonance and MIA Modes)		√

BondMaster® 600 Specifications*

For a complete specifications list, please download the full BondMaster® 600 user's manual at www.evidentscientific.com.

General	
Overall Dimensions (W × H × D)	236 mm × 167 mm × 70 mm (9.3 in. × 6.57 in. × 2.76 in.)
Weight	1.70 kg (3.75 lb), including lithium-ion battery
Standards or Directives	Mil Standard 810G, CE, WEEE, FCC (USA), IC (Canada), RoHS (China), RCM (Australia and New Zealand), KCC (South Korea) A version that conforms to the requirements of the ATEX directive is available.** For more information, visit us online at www.evidentscientific.com.
Power Requirements	AC Mains: 100 VAC to 120 VAC, 200 VAC to 240 VAC, 50 Hz to 60 Hz
Inputs and Outputs	One USB 2.0 peripheral port, one standard VGA analog output port, one 15-pin I/O port (male) with analog output, 3 alarm outputs.
Environmental Conditions	
Operating Temperature	–10 °C to 50 °C (14 °F to 122 °F)
Storage Temperature	–20 °C to 60 °C (–4 °F to 140 °F) [with batteries] and –20 °C to 70 °C (–4 °F to 158 °F) [without batteries]
IP Rating	Designed to meet requirements of IP66
Battery	
Battery Type	Single lithium-ion rechargeable battery or AA size alkaline batteries (in an 8-cell holder).
Battery Life	Between 8 and 9 hours
Display	
Size (W × H; Diagonally)	117.4 mm × 88.7 mm; 146.3 mm (4.62 in. × 3.49 in.; 5.76 in.)
Type	Full VGA (640 × 480 pixels) color, transflective LCD (liquid crystal display).
Modes	Normal or full screen, 8 color schemes. RUN key to toggle between screen modes.
Grids and Display Tools	Choice of 5 grids, crosshairs (X-Y views only)
Connectivity and Memory	
PC Software	BondMaster PC software included in base BondMaster 600 kit. BondMaster PC enables viewing saved files and printing reports.
Data Storage	500 files featuring user-selectable onboard preview.
Interface	
Languages	English, Spanish, French, German, Italian, Japanese, Chinese, Russian, Portuguese, Polish, Dutch, Czech, Hungarian, Swedish, and Norwegian.
Applications	Application selection menu for easy and rapid configuration in all modes.
Real-Time Readings	Choice of up to 2 real-time readings measuring signal characteristics (list depends on selected mode).

Probes Types Supported	
Probe Types	Pitch-catch, mechanical impedance analysis (MIA-B600M only), and resonance probes (B600M only). The instrument is fully compatible with BondMaster POWERLINK and non-POWERLINK probes, as well as those of other main probe and accessory suppliers.
Bond Testing Specifications (All BondMaster Models)	
Probe Connectors	11-pin Fischer
Gain*	0 dB to 100 dB in 0.1 or 1 dB increments
Rotation*	0° to 359.9° in 0.1° or 1° increments
Scan View*	Variable from 0.520 s to 40 s
Low Pass Filter*	6 Hz to 300 Hz
Probe Drive	LOW, MEDIUM, and HIGH user-adjustable settings
Variable Persistence*	0.1 s to 10 s
Variable Display Erase*	0.1 s to 60 s
Available Alarm Types*	3 simultaneous alarms. Choices include BOX (rectangle), POLAR (circle), SECTOR (pie), SCAN (time-based), and SPECTRUM (frequency response).
Reference Dots*	Up to 25 user-defined dot recordings
Pitch-Catch Specifications (All BondMaster Models)	
Supported pitch-catch modes	User-selectable mode. Choice of RF (toneburst), impulse (envelope), or swept (frequency sweep)
Frequency Range	1 kHz to 50 kHz (RF, impulse) or 1 kHz to 100 kHz (swept)
Gain	0 dB to 70 dB in 0.1 or 1 dB increments
Gate	10 µs to 7920 µs, adjustable in 10 µs steps. New auto gate mode automatically detects maximum amplitude.
Frequency Tracking*	Up to 2 user-adjustable markers to monitor 2 specific frequencies from the swept figure.
Mechanical Impedance Analysis (MIA) Specifications (B600M Only)	
Calibration Wizard	Calibration menu to determine the best frequency for the application based on simple "BAD PART" and "GOOD PART" measurements
Frequency Range	2 kHz to 50 kHz
Resonance Specifications (B600M Only)	
Calibration Wizard	Calibration menu to determine the best frequency based on the probe response
Frequency Range	1 kHz to 500 kHz

* Specific test modes have limitations within this range.

Standard Inclusions

The BondMaster 600 bond tester comes with the following standard inclusions:

Model: Basic and Multimode (M).

Power cord: Over 11 power cord models available (for the DC charger).

Keypad and instruction label: English, international (icons), Chinese, or Japanese.

Getting Started print manual: over 9 languages available.

Items included in all BondMaster 600 models†: BondMaster 600 instrument with factory-installed hand strap, getting started manual, calibration certificate, rigid transport case, DC charger with power cord, Li-ion battery, AA battery tray, USB communication cable, microSD™ memory card and adaptor, pitch-catch and MIA probe cable, and BondMaster PC software and product manuals disc.

Additional items included in BondMaster 600M model only: Resonance probe cable.

†Standard inclusions may vary depending on your location. Contact your local distributor.

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