



PowerStation Flaw Detector

FEATURES

- One to four channels of eddy current testing
- One to four channels of ultrasonic testing
- One or two channels of eddy current and/or ultrasonic testing simultaneously
- Front or rear facing module connectors
- Multiple analog, alarm, and digital outputs
- Large 10.4" (265 mm) color LCD
- USB and Ethernet communications
- PowerLink™ Technology - automatic transducer recognition and instrument set-up
- Durable/rugged case design
- VGA output
- Windows-based WorkMaster™ software



EDDY CURRENT AND ULTRASONIC FLAW DETECTOR

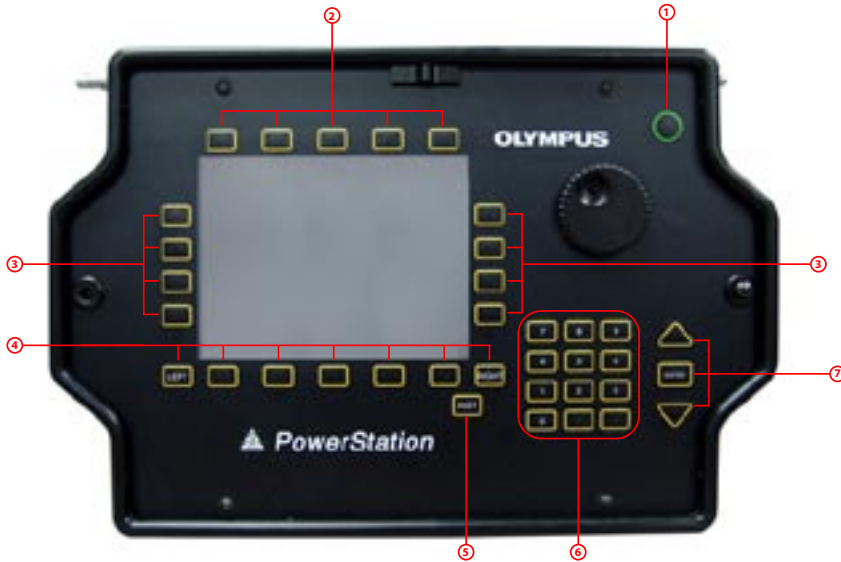
The PowerStation is a unique nondestructive testing instrument offering multiple testing methods through its innovative modular design concept. The PowerStation is capable of operating as a dedicated eddy current or ultrasonic flaw detector, or the user can choose to run both eddy current and ultrasonic tests simultaneously.

Reconfiguration of the PowerStation is achieved by simply turning the unit off, changing the module(s) and turning the instrument back on. In seconds, the instrument is ready for almost any type of inspection. And now, with PowerLink™ technology, inspections have never been so quick and efficient. PowerLink™ stores setup and identity information within the sensor so that the PowerStation can be rapidly configured for a specific application while documenting the exact sensor used.

The PowerStation base unit is configured with a large 10.4" (265 mm) color LCD display with a resolution of 640 by 480 pixels. This bright screen provides high resolution and remarkable contrast to ensure accurate inspections. In addition, it can be configured for use with a VGA compatible computer monitor or projector, making it an excellent choice for classroom training or remote monitoring applications.



POWERSTATION KEYPAD*



1. Power on/off
2. Softkeys
3. Immediate execution keys
4. Control keys. Left and right module
5. Instrument key
6. Numerical keypad
7. Up/Down and Enter key



The PowerStation's universal keypad features an easy-to-read Hi-Brite electroluminescent display, which is designed to adapt to either ultrasonic or eddy current testing. The keypad attaches securely while internally integrating the cable connector for complete enclosure. An optional extension cord that allows for remote operation up to 12 feet away is available for the instrument keypad.

POWERSTATION OUTPUTS*

The PowerStation comes equipped with a wide variety of standard analog and digital outputs. In addition, outputs can be customized through an expansion adapter. Most outputs are located on easy access BNC connectors. Non-standard and custom outputs are found on the standard 25-pin "D" connectors. Other outputs include: a printer port, RS-232, LAN/Modem, VGA, ACC, USB, 12 volt DC, 2 Trig In, and 2 Sync Out.

BNC Connector #	Eddy Current Signal	Ultrasonic Signal
1	Vertical Mix	Gate 1 Analog
2	Horizontal Mix	Gate 2 Analog
3	Vertical F2	Detected Video
4	Horizontal F2	RF
5	Sweep Alarm	Gate 1 Alarm
6	Alarm Box 2	Thickness Analog
7	Vertical F1	n/c
8	Horizontal F1	n/c
9	Alarm Box 3	Alarm 5
10	Polar Alarm	Gate 2 Alarm
11	Alarm Box 1	Thickness Alarm
12	Alarm 6	Alarm 6



NORTEC 200 MODULE



BASIC PERFORMANCE

Frequency Range: 50 Hz to 12 MHz

Gain: 0 to 90 dB in 0.1 steps. The horizontal and vertical gains may be adjusted together or separately.

Sensitivity: Adjustable to 200 volts per ohm (high probe drive).

Flaw Response: 0 to 2000 Hz nominal

Digitizing Rate: Up to 6000 samples/sec

Rotation: Variable from 0 to 359.9° in 1.0°, 0.5°, and 0.1° steps

Sweep: Variable from 0.005 to 4 seconds/division

Low Pass Filter: 10 - 50 Hz and wide band

High Pass Filter: Off, 2 to 500 Hz. 2 pole response

Probe Drive: 2, 6, or 12 volts peak-to-peak into 75 ohms

Null: 3 stage digital nulling system

DISPLAY

Variable Persistence: Screen persistence can be varied from 0.1 to 5 seconds. Timed erase cycles can be selected up to 1 minute in 1 second increments. Basic stored screen times are infinite with manual erase.

Screen Erase: Removes all signals from screen. Adjustable from 1 - 60 seconds

Continuous Null: Selectable among 0.1, 1.0, 5.0, and 10 Hz

Freeze: Freezes display on screen for storage or intervals.

Reference Memory: Allows the user to recall a stored image to compare against a live signal

On Screen Control: Pertinent instrument settings are displayed on-screen next to impedance display window.

Update Rate: 60 Hz

ALARMS

Alarms: All alarms can be set to trigger on positive (signal enters alarm area) or negative (signal leaves alarm area).

Box Alarm: 3 separate box alarms work independently of each other.

Polar Alarm: Circular gate with positioning and radius adjustments

Sweep Alarm: High/Low threshold adjustment for use with external or auto sweep modes

Alarm Dwell: Selectable, 0 - 10 seconds

Indicator: Visual and selectable audible

Alarm Volume: User adjustable

Alarm Outputs: TTL compatible 0 - 5 volts, outputs on rear panel. Independent per alarm type

FEATURES

Probe Types: Absolute and differential in either bridge or reflection mode. The instrument is fully compatible with Nortec PowerLink™ probes.

Analog Output: Rear panel BNC connectors for +/- 5 volts vertical and horizontal

NORTEC 210 MODULE



Includes all Nortec 200 Module specifications in addition to the following:

FEATURES

Scanner Compatibility: Will operate the following Nortec NDT scanners: Spitfire, RA 2000, PS-5AL, RA19, PS-4, PS-3, PS-2, MiniMite

Waterfall Display (PS-5AL only): Stores up to 64 sweeps per hole and includes an on-screen readout of the distance from the start of the scan to the defect

Digital Conductivity Specification:

Digital conductivity display from 0.9% to 100% IACS or 0.5 to 64 MS/m. Accuracy within +/- 0.5% IACS from 0.9% to 65% IACS and within +/- 1.0% of values over 62%. Meets or exceeds BAC 5651

Non-Conductive Coating Thickness: Can measure non-conductive coating thickness from 0" to 0.015" (0 to 0.38 mm). Accuracy of +/- 0.001" (0.025 mm) over 0.00 to 0.015" (0 to 0.38 mm) range

Conductivity Alarm: Independent High/Low limit alarms can be set for conductive values. Alarms can be triggered positively or negatively.

Liftoff Alarm: Independent High/Low limit alarms can be set for liftoff values. Alarms can be triggered positively or negatively.

NORTEC 215 MODULE



Includes all Nortec 210 Module specifications in addition to the following:

TEST MODES

- 1) Single frequency with one probe
- 2) Dual frequency with one probe

Display: Frequency 1 (F1) only, Frequency 2 (F2) only, sum of F1 and F2, difference between F1 and F2, split screen with selected combinations of F1 and F2 and mixed frequencies

Display Modes: Impedance Plane, Auto Sweep, External Sweep, Waterfall, Conductivity/Liftoff

Second Frequency: 50 Hz to 3 MHz, 2nd frequency is an exact division of the first frequency in ratios of: 1/2 (F1 < 6 MHz), 1/4, and even divisors to 1/32.

NORTEC 220 MODULE



Includes all Nortec 215 Module specifications in addition to the following:

TEST MODES

- 1) Single frequency with two separate probes (2 channel). The probes are operated independently at the same or related frequencies. Either probe can be absolute or differential, bridge or reflection.
- 2) Dual frequency with one probe
- 3) Scanner compatibility through channel 1

SONIC 200 MODULE



PULSER

Type: Square wave

Pulse Width: 15 to 1000 ns

Pulse Voltage: Selectable 50 - 300 volts, 50 volt steps

Damping: 20, 50, 100 or 200 ohms

Repetition Rate: 30 Hz to 100 Hz, 10 Hz steps. 100 Hz to 10 KHz in 50 Hz steps. Automatically limited with range, delay, pulse width and damping settings to prevent sweep wraparound and to limit pulser average power

Modes: Selectable single (pulse echo), dual, or through transmission

RECEIVER

Frequency Bandwidth: 0.3 to 25 MHz

Tuning: 0.5, 1, 2.25, 3.5, 5, 10, 15, 20 MHz,

High pass and Wide band

Gain Control: 0 to 110 dB, steps of 0.2, 1, 2, 6, and 12 dB

Accuracy: AWS D1.1-88, Section 6.22.2

+dB Switch: Selectable 6, 12, 18, 20, or 24 dB increments

Linear Reject: 0 to 80% full screen

Vertical Linearity: +/- 2% of FSH, 10% to 90% full screen per ASTM E317, Section 5.3.3

Modes: RF, halfwave+, halfwave-, fullwave, full wave filtered, halfwave filtered, and halfwave+ filtered

GATES

Functions: Dual IP/IF synchronized gates. Gate 1 time of flight, amplitude detection and flaw alarm. Gate 2 amplitude detection, flaw alarm and time of flight for echo-to-echo mode. IP (Initial Pulse) or IF (Interface Synchronization), operator selectable

Position: -1.28 to 400 inches (-32.512 mm to 10.16 m) of steel

Width: 0.001 to 400 inches (0.0254 mm to 10.16 m) of steel

Level Control: Variable in 0.5% increments, 5 to 100% of full screen

IF (Interface) Hold-Off: Variable to 100 inches (2.54 m)

Alarm Logic: Selectable, positive or negative occurrence. Gates are monitored off screen

Indicator: Visual or selectable audio

Alarm Dwell: Selectable, 0 - 5 seconds in 0.5 second increments

Alarm Filter: Selectable, 1 - 15 consecutive indications before valid alarm

Output: TTL 0 - 5 volt output at rear panel BNC and "D" connector. Updated at pulser repetition rate. Software selectable reset prior to next repetition or continuous

RF Gates: Dual differential for both gates 1 and 2

RF Gate Logic: Positive logic requires a signal cycle of either polarity cross a gate level. Negative logic requires that no signal crosses a gate level.

Peak Amplitude: Peak amplitude of

gated signal, displayed in % screen height

Peak Detector: Gate 1 and 2 analog output at rear panel BNC and "D" connector correspondence with 0 - 100% displayed signal during gated period, updated at pulser repetition rate. Scale control 100 mV to 10 V with offset control +/- 1500 mV. Reset mode selection resets the output 10 μ s prior to the next gated period.

TIME BASE

Range: 0.048" to 400" (1.219 mm to 10.16 m) of steel

Delay: -1.28" to 400" (-32.512 mm to 10.16 m) of steel

Velocity: 0.025 to 0.6000 in/ μ s

Horizontal Linearity: +/- 0.5% of full screen

Trigger Modes: IP (Initial Pulse) sweep, starts after selected delay. IF (Interface) sweep, starts after first selected interface signal. Delay control acts as hold-off control to select the desired interface signal. External, fires the pulser after receiving external trigger signal. External + IF, fires pulser after receiving external trigger signal. Sweep starts after selected interface signal.

THICKNESS

Range: 0.012 to 400 inches (0.3048 mm to 10.16 m) of steel

Resolution: To 0.0002" (0.00508 mm) at 1" (25.4 mm), 0.02% of full scale, all other ranges

Accuracy: +/- 0.001" (0.0254 mm) at 1" (25.4 mm), +/- 0.2% of full scale, all other ranges

Video: Thickness measurements can be performed on either detected video or RF.

Modes: IP-1st or Echo-Echo. Auto or manual calibration

Trigger Modes: Edge or peak

Display: Sound path, surface distance and depth from surface

Angle: 0 - 90° in 0.1° increments

Diameter: 0.25 to 100 inches (6.35 mm to 2.54 m), flat (off) manual calibration

Data Logger: Up to 5000 measurement readings can be stored in up to 100 user defined sequential or grid blocks with alphanumeric labels that can later be recalled for review on command. Stored readings can be sent to a printer or downloaded to a computer with appropriate software.

Distance Output: Analog thickness output at rear panel BNC and "D" connector correspondence with 0 - 100% of selected thickness range: 1, 5, 25, 100, 400 inches (25.4 mm, 127 mm, 635 mm, 2.54 m, 10.16 m) of steel. Scale control 100 mV to 10 V with offset control +/- 1500 mV. Updated at pulser repetition rate held continuous up to the next gated period. Reset mode selection resets the output 10 μ s prior to the next repetition.

Thickness Alarm: Adjustable high/low thickness alarms

Indicator: Visual or selectable audio

TTL: 0 - 5 V output at rear panel BNC and "D" connector. Updated at pulser repetition rate. Software selectable, reset prior to next repetition or continuous

DISPLAY

Signal: Hollow or filled

Screen Freeze: On command, freeze currently displayed signal

Waveform Recall: Select a stored waveform from memory

Peak Hold: Display peak amplitude waveform with active signals under peak waveform. Both images can be stored together.

Zoom: Zoom to area under Gate 1

View: Allows the operator to view an expanded display with the initial display indicated by screen markers. The View key enables the operator to view the pulses before and after the initial pulse, water path, or interface.

Update Rate: 60 Hz

SONIC 210 MODULE

Includes all Sonic 200 Module specifications in addition to the following:



FEATURES

Back Echo Attenuation: Up to 40 dB of attenuation applied to signals under Gate 2. Selectable in 0.2 dB steps

Reference Memory: Recalled waveform is displayed simultaneously with active signal. Recall waveform position is separate from active signal.

DAC

Type: Segmented with 25 operator selected points

Gain: 40 dB, total of gain and DAC limited to 110 dB max

Range: 400 μ s from initial pulse

Slew Rate : 6 dB/ μ s

Sync: IP (Initial Pulse) or IF (Interface Synchronization)

Display: Selection of multiple curves showing compensation. Single curve at signal level (0 dB), three curves at +6 dB, 0 and -6 dB levels, four curves at +6 dB, 0 dB, -6 dB, and -14 dB levels, DAC compensated echoes only, single curve with DAC compensated echoes

SONIC 230 MODULE

The Sonic 230 is a two channel ultrasonic module dedicated for the PowerStation. Each channel has the same specifications as a Sonic 210 Module.



All modules are customer-interchangeable.



NORTEC PS-4 CONTROLLER



NORTEC PS-4 CONTROLLER

Speed Range: Up to 1500 RPM

Probe Holder: 0.5 inch (12.7 mm) collet

Outputs: 16-pin LEMO Eddy Current signal interface. Index pulse BNC

Scanner Connector: 22-pin Burndy connector contains the power, signal, and interfaces.

Power Supply: 100 to 240 volts, 50 - 60 Hz, 2.2 amps max

Size: 9.25" W x 7.5" D x 3.4" H (235 mm x 190 mm x 86 mm)

Weight: 4.5 lbs. (2.04 kg)

Control: RPM is adjusted via the SmartKnob[™] located on the front panel of PS-4 Controller module.

Mounting: Controller mounts to the top of the WorkStation via 4-pin latches.

POWERSTATION SPECIFICATIONS*

GENERAL

Dimensions:

16.5" W x 9.75" H x 12.25" D
(419 mm x 248 mm x 311 mm)

Display: Color liquid crystal display

Display Size: 10.4 inch (265 mm) diagonal (640 x 480 resolution)

Display Update: 60 Hz

Operating Temperature:
32° to 131° F (0° to 55° C)

Storage Temperature:
5° to 158° F (-15° to 70° C)

POWER

AC: 90 to 264 VAC, 47 to 63 Hz

Humidity: 95% per MIL-PRF-28800F

Altitude: Maximum operating and non-operating - 15,000 ft. (4600 m)

Hazardous Area Operation: Safe operation as defined by Class I, Division 2, Group D, as found in the National Fire Association Code (NFPA 70), Section 500, and tested using MIL-STD-810F, Method 511.4, Procedure 1

ADDITIONAL FEATURES

PowerLink™: Automatic sensor recognition and application setups. Sensor identification on printouts. Optional Level III programming by user.

Program and Screen Storage: Provides ability to store up to 200 screen captures in nonvolatile memory. Supports naming of setups

Report Fields: 18 fields with 38 user-defined characters per field

Clock, Calendar: Time and date information stored and printed with each waveform

Languages: Selectable - English, Spanish, French, German, and Italian

Software: Windows-based WorkMaster™

OUTPUTS

RS-232C: DB-9 connector for serial data

LAN or Twisted Pair Ethernet: 10 BaseT

VGA Output

USB: Universal Serial Bus

Printer: Connection for parallel printers

Analog output BNC Connectors: Module specific. See module data for details.

12 V DC: For 12 V accessories

25-Pin I/O Connectors: Analog, Alarms, Null, and Erase

Alarm BNC Connectors

Trig-In/Sync Out Connectors

OLYMPUS

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