



ES601 Plus

International Automated Electrical Safety Analyzer



ES601 Plus - a new generation of system connectivity.

Unprecedented Ease of Use - the large, graphical touch screen display provides excellent visibility with a full QWERTY keyboard and numeric keypad for data input.

Large Internal Memory - with over 1 MB of non-volatile memory, ES601Plus has loads of room for test results and equipment lists.

Equipment Lists - ES601Plus provides an interface path to PC based equipment management systems and will maintain over 2975 control numbers on line for fast identification. Equipment information may also contain test procedure protocols for quick and easy test selection.

Autosequences - 24 editable safety test sequences, 6 editable ECG test sequences and 11 other autosequence modules for interfacing ES601 Plus to other test devices such as defibrillator testers, infusion pump analyzers and pulse oximeter testers... Even the "other" guys' instruments.

Test Procedures - Link PM test procedures to a control number or run independently.

Most Complete Testing - ES601Plus provides the most complete implementation of international electrical safety standards testing available, with implementation of signal I/O isolation tests and specific tests for battery-powered devices.

Improved Connectivity - in addition to the industry standard input/output connections, RS-232 and Centronix, ES601Plus has added both USB and Ethernet connectivity for ease of control and rapid data transfer to both stand alone and networked PC systems.

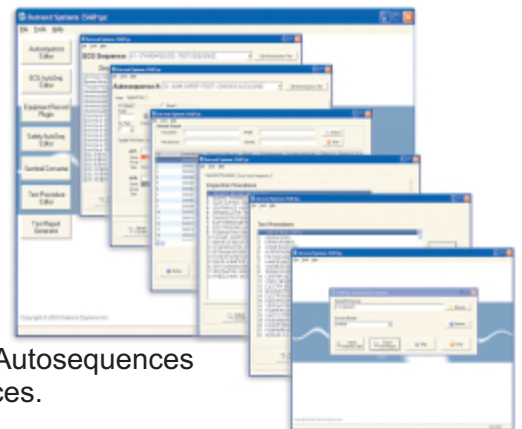
ES601 Plus also provides connections for RS-232 barcode scanner and PS/2 keyboard or PS/2 barcode scanner.

ES601pc Companion Software -

Unleash the full potential of your ES601Plus with our ES601pc Companion Software.

Simply install ES601pc and you're ready to customize your ES601Plus to handle all your automated testing.

Included as a Standard Accessory with your Safety Analyzer, ES601pc allows you to view and print Test Reports and to customize Safety Autosequences and ECG / Performance waveform Autosequences.



ES601 Plus

Electrical Safety Testing Standards

IEC60601
AAMI-ES1
VDE-0751
TR62353 (IEC62353)
EC601-BAT (IEC60601 for battery-powered medical device)
AAMI-BAT (AAMI-ES1 for battery-powered medical device)
VDE-BAT (VDE-0751 for battery-powered medical device)
TR353-BAT (IEC62353 for battery-powered medical device)
IEC61010

Automated Testing

By Safety AutoSequence
By ECG AutoSequence
By General Inspection
By Tester AutoSequences
By Test Procedure
By Device ID (Control Number) Search

Manual Mode Safety Tests

Line Voltage
Load Current
Insulation Resistance
Protective Earth
Leakage Current

Voltage Measurement

Range: 0.0 to 300.0 VAC
Accuracy: DC to 100Hz $\pm 1\%$ of reading ± 1 LSD

Load Current

Range: 0 - 20.00 amps AC
Accuracy: $\pm 2\%$ of reading ± 1 LSD

Insulation Resistance

Range: 0.5 to 999.9 megohms
Accuracy: $\pm 2\%$ of reading ± 1 LSD

Protective Earth Resistance

Range: 0.001 to 0.200 ohms at 25A AC $\pm 10\%$
0.001 to 3.000 ohms at ± 1 A bipolar DC
Accuracy: $\pm 1\%$ of reading ± 1 LSD

Leakage Current

Standards: IEC60601-1, AAMI-ES1:1996, VDE-0751, IEC62353, IEC61010
Range: 0 to 6,500 uA RMS / 0 to 20,000 uA DC
Method: True RMS reading
Accuracy: DC & 25Hz-200kHz - $\pm 1\%$ of reading ± 2 LSD
200kHz-1MHz - $\pm 4\%$ of reading ± 3 LSD

Mains on Applied Parts voltage is 110% of AC supply for IEC60601 tests, or 100% of AC supply for other safety standards.

ECG Simulator

Performance Waveforms

DC Pulse: 4 seconds
Square Wave: 2 Hz
Triangle Wave: 2 Hz
Havertriangle Pulse: 10, 25, 40, 100 and 200 msec, @ 60 BPM
Sine Wave: 0.5, 10, 20, 40, 50, 60, 70 and 100 Hz
Normal Sinus Rhythm: 30, 60, 90, 120, 150, 180, 240 and 300 BPM

Arrhythmia Waveforms

Second Degree A-V Block (BLK II)
Premature Atrial Contraction (PAC)
Right Bundle Branch Block (RBBB)
Premature Ventricular Contraction (PVC)
R-on-T PVC
Run of 5 PVC
Multifocal PVC
Bigeminy

Defibrillator/AED Test Waveforms

Atrial Fibrillation (AFIB)
Asystole
Supraventricular Tachycardia (SVT)
Polymorphic VTach @ 140 BPM (PVT140)
Monomorphic VTach @ 160 BPM (PVT160)
Ventricular Fibrillation (VFIB)
Missed beat @ 80, 120 BPM

Output Amplitude

Selectable: 1mV, 2mV, or 0.5 mV on Lead II
Accuracy: - Rate: $\pm 0.2\%$
- Amplitude: $\pm 2\%$

8001-120 120V, N. America
8001-121 120V, N. America w/ PETM
8001-220 230V, Europe
8001-221 230V, Europe w/ PETM
8001-240 230V, UK
8001-241 230V, UK w/ PETM
8001-222 230V, Australia
8001-223 230V, Australia w/ PETM

User Interface

Display

Graphic LCD 4.53" x 3.40" (11.5 cm x 86 cm)
Monochrome backlit
320 x 240 pixel graphics
53 character x 30 lines text

Keypad - Touch screen

Audio Indicator - Single-frequency piezoelectric

Non-Volatile Memory - 1 Megabyte flash memory

Data Capacity

341 Test Records (test data)
6142 PM Test Data Items
2976 Equipment Records
500 PM Test Procedures
24 Safety Test AutoSequences
6 ECG Test AutoSequences
18 General Inspections
12 Pulse Oximeter Tester AutoSequences
12 IV Pump Tester AutoSequences
12 Defibrillator Tester AutoSequences
12 NIBP Tester AutoSequences
12 ESU Tester AutoSequences
12 Pacemaker Tester AutoSequences
60 AutoSequences for user-defined Testers
Printer Port Data Output - DB25F, Centronix standard
RS-232 Port Data Output - DB9F, 9600 baud, N, 8, 1

USB Data Transfer/Capture

Hardware Interface - USB Device
Protocol - USB 2.0 compliant, 1 Mbit/sec

Ethernet Data Transfer/Capture

Hardware Interface - RJ-45
Protocol - 10baseT, 10 Mbits/sec, maximum

Keyboard and Barcode Scanner Ports

RS-232 barcode scanner
PS/2 keyboard or PS/2 barcode scanner

Equipment Technical Specifications

Electrical-Region Specific: 115VAC ($\pm 10\%$), 60 Hz, 16A
230VAC ($\pm 10\%$), 50 Hz, 13A

Environment for Use

15 to 40 °C, 10% to 90% RH, Altitude: 2000m max., Indoor use only, Category II

Dimensions

9" (23 cm) W x 9" (23 cm) D x 10" (25 cm) H

Weight

12 lbs (5.4 kg) Standard / 17 lbs (7.7 kg) with PETM option

Standard Accessories

Kelvin Cable (P/N 3140-425)
USB Cable (P/N 3140-403)
ES601PC Software on CDROM (P/N 6950-003)
Operator's Manual on CDROM
Power Cord (region specific)
North America 15A (P/N 3000-009)
Continental Europe (P/N 3000-011)
United Kingdom (P/N 3000-012)
Australia (P/N 3000-018)
Accessory Bag 7006-052

Optional Accessories

Barcode CCD Scanner, RS-232 (P/N 7600-051)
Barcode CCD Scanner, PS/2 (P/N 7600-052)
PC Interface Cable: DB9F-DB9M (P/N 3140-010)
RJ-12M to RJ-12M Tester Port Cable (P/N 3140-429) used with:
- RJ-12F to DB9F Adapter (P/N 3140-426)
- RJ-12F to DB9M Adapter (P/N 3140-427)
- RJ-12F to DB25M Adapter (P/N 3140-428)
ECG/Banana Adapter (set of 10) (P/N 7500-425)
Power Cord: North America 20A (P/N 3000-010)

