

ITECH TEST SOLUTION Medical Equipment

YOUR POWER
TESTING
SOLUTION



Global Medical Electronics Market Insights

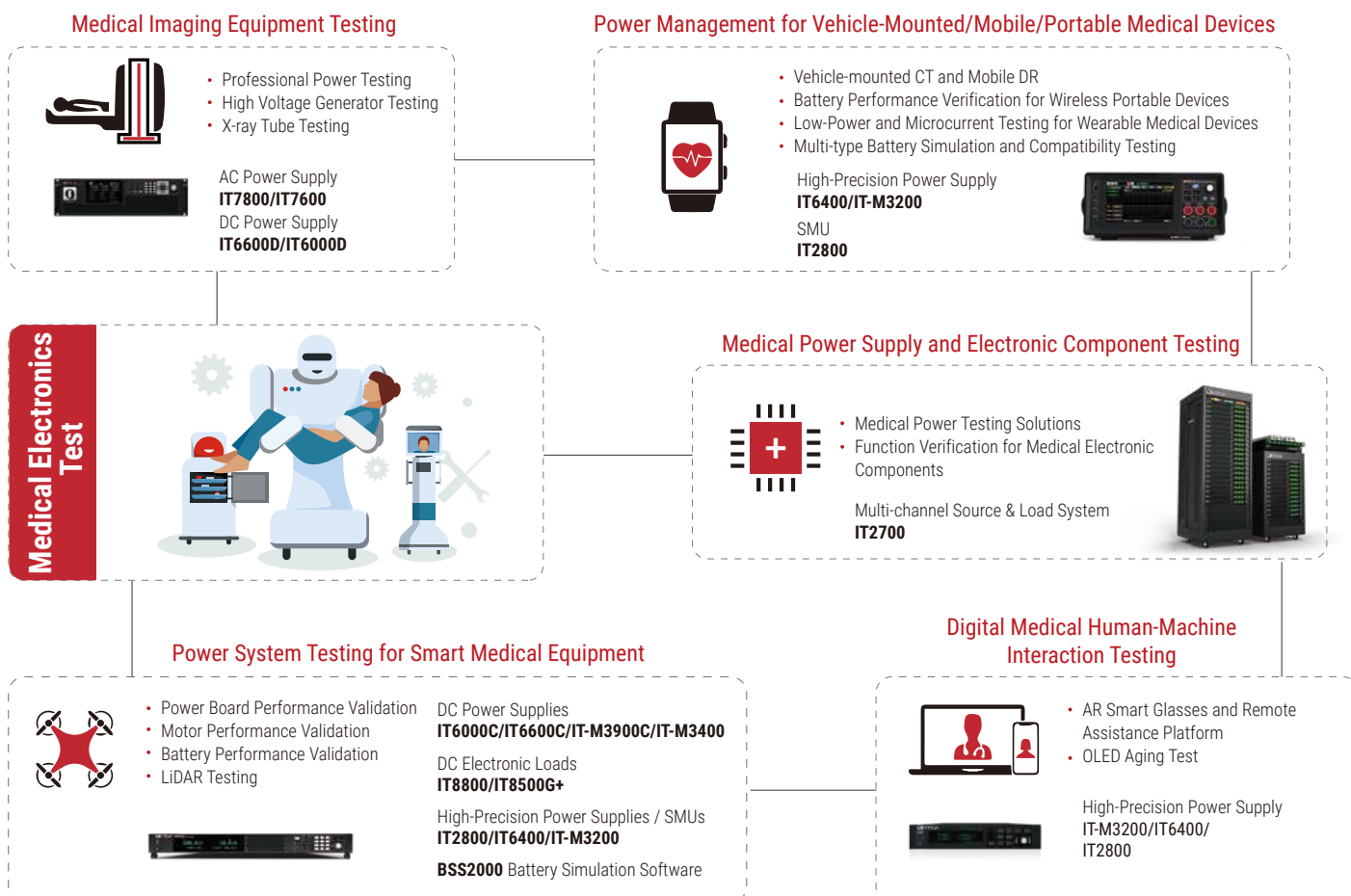
- Aging and Chronic Disease Management: The global population aged 65+ has reached 17% (WHO 2023), driving surging demand for remote monitoring and wearable devices.
- Post-pandemic Technological Advancement: The intelligence level of CT and MRI equipment rose by 42% (Frost & Sullivan 2024), and AI-based image diagnostics has exceeded 35% penetration.
- Green Medical Revolution: The EU MDR mandates a 30% improvement in medical device energy efficiency, while China's 14th Five-Year Plan requires $\geq 92\%$ power conversion efficiency for medical power supplies.

ITECH's Technical Response

ITECH continuously monitors the latest developments in the medical electronics industry and provides highly customized and precise testing solutions to meet the stringent requirements of various medical electronic devices. The company offers a portfolio of professional testing products characterized by high accuracy, fast dynamic response, and high power density:

☑ Battery Simulators ☑ AC/DC Power Supplies ☑ AC/DC Electronic Loads ☑ Power Analyzers ☑ Battery Test Systems

Core application scenarios



Medical Imaging Equipment Testing

—Ensuring Reliable Power and Imaging System Verification for Accurate Diagnostics

With the continuous advancement of CT, DR, and MRI systems, higher requirements are placed on the stability and responsiveness of power supplies, imaging components, and high-voltage drivers. ITECH provides comprehensive power and component testing solutions for medical imaging systems, covering key elements such as main power supplies, high-voltage generators, and X-ray tubes, enabling high-resolution, fast imaging, and continuous operation.

Dedicated Power Testing for Medical Imaging Systems (Main Power & Auxiliary Modules)

Medical imaging hosts and their auxiliary modules must possess high stability and strong anti-interference capabilities. ITECH provides precise power testing solutions to ensure reliable device operation under conditions such as mains voltage fluctuations.

Technical Challenges

- Medical imaging equipment requires highly stable supply voltage; mains fluctuations (+6% to -5%) can easily cause operational errors.
- Shared hospital power lines with frequent startups of high-power equipment like air conditioners introduce voltage disturbances that affect imaging system stability.
- Imaging systems are sensitive to power quality; voltage fluctuations may trigger faults and reduce overall system reliability.

Test Solutions

- The standby power reaches 5kVA, and during exposure, it can handle over 10 times that power.
- High-power AC sources simulate frequency and voltage fluctuations during final testing.
- The equipment demands high accuracy, low ripple, and strong transient load handling capability.

Recommended Products

IT7800 Series High Power Programmable AC/DC Power Supply

- Up to 6kVA in 1U/2U, 15kVA in 3U
- Voltage ratings: 350/700/1050 VL-N ^{*1}
- Multi-channel capability; a single unit can test 1–3 DUTs simultaneously
- Output frequency: 16–2400Hz, with adjustable voltage and frequency slew rates
- List mode replicates mains conditions and simulates instantaneous power interruption

^{*1} Refer to the IT7800 high-voltage series; for higher power requirements, choose the IT7800E series.



IT7800 Series High Power Programmable AC/DC Power Supply

IT7600 Series High Performance Programmable AC Power Supply

- Output frequency: 10–5000Hz, with adjustable voltage/frequency slew rate
- 750VA~4500VA
- Resolution: 10mV / 10mA
- Accuracy: $\pm 5\% + (0.8\% + 0.3\% \cdot K \cdot \text{freq}) \cdot \text{FS}$
- Total Harmonic Distortion (THD): < 0.5% (10–500Hz)
- Voltage ripple: 300mVp-p



IT7600 Series High Performance Programmable AC Power Supply

High Voltage Generator Performance Testing and Fluctuation Control

The high-voltage system used to generate X-rays operates by converting low-frequency, low-voltage AC into high-frequency, high-voltage power. It is highly sensitive to voltage fluctuations and requires stable output, fast rise time, and consistent response.

Technical Challenges

- Radiation simulators and CT scanners require extremely stable high-voltage power; voltage fluctuations must be controlled within 1%.
- High-voltage generator testing requires a stable, high-precision DC high-voltage power supply (450V–550V, around 50kW).
- Insufficient voltage accuracy or power output can cause imaging systems to malfunction, seriously affecting image quality and system reliability.

Recommended Products

IT6600D Series High Power Programmable DC Power Supply

- Up to 42kW in 3U, scalable to 10MW via parallel connection
- Voltage range: 600V~2250V
- Dual-channel design in 3U; channels can be connected in series or parallel
- Accuracy: $\leq 0.02\% + 0.01\%FS$
- Ripple: $\leq 0.1\%FS$



IT6600D Series High Power Programmable DC Power Supply

IT6000D Series High Power Programmable DC Power Supply

- Voltage: 80V ~ 2250V
- Up to 18kW in 3U, scalable to 2MW via parallel connection
- Power conversion efficiency up to 92%
- Comprehensive protection features (OVP, OCP, OPP, OTP, power-off and input undervoltage protection)



IT6000D Series High Power Programmable DC Power Supply

X-ray Tube Filament Preheating Characteristics Analysis

The X-ray tube is the core of the imaging system and contains a filament that requires preheating. The heating power supply requires 12V DC and power below 200W, making it suitable for use with low-power supplies.

Recommended Products

IT6900A Series Wide-range Programmable DC Power Supply

- Voltage: 60~150V
- Power: 100W~600W
- Resolution: 1mV/0.1mA
- Accuracy: $\leq 0.03\% + 5mV / \leq 0.1\% + 5mA$
- Interfaces: RS232/USB/RS485/Analog Interface

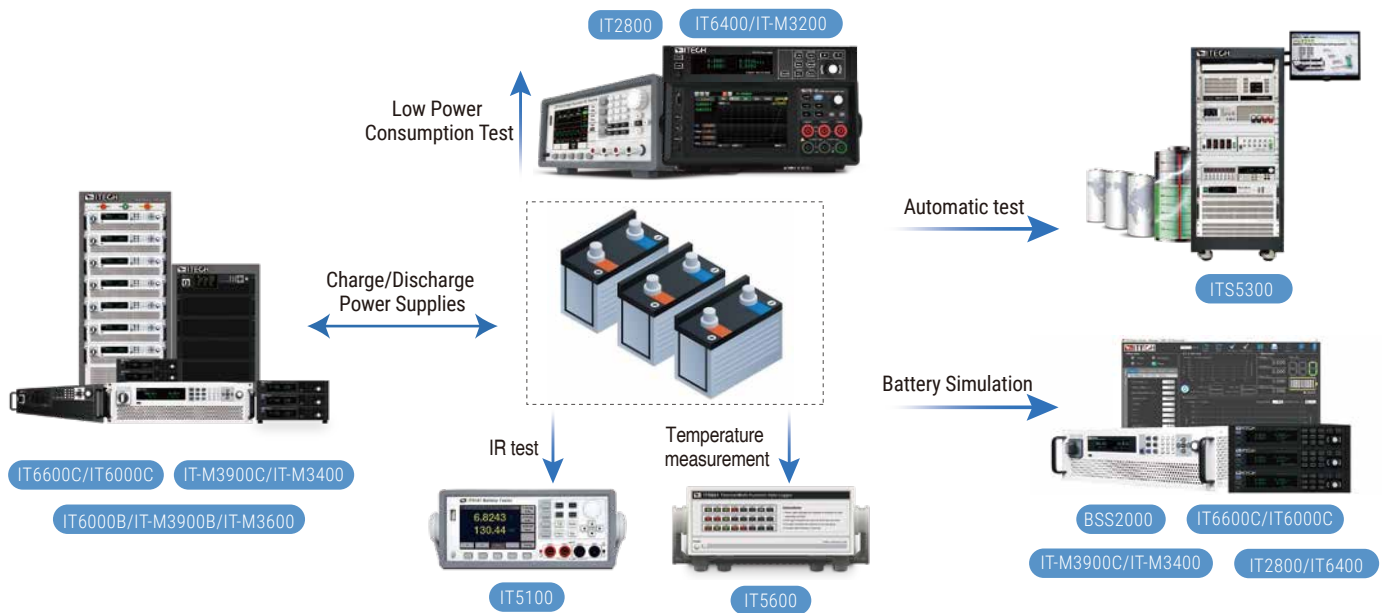
IT6800A/B Series Dual-range Programmable DC Power Supply

- Voltage: 8V~150V
- Power: 72W~180W
- Resolution: 1mV/0.1mA
- Accuracy: $\leq 0.04\% + 8mV / \leq 0.1\% + 5mA$
- Interfaces: USB/RS232/GPIB

Energy Management Solutions for In-Vehicle/Mobile/-Portable Medical Equipment

—Supporting High-Endurance and Low-Power Testing Solutions for Mobile Medical Equipment

With the growing demand for telemedicine, emergency care, and home healthcare, the market for vehicle-mounted CT scanners, mobile digital radiography (DR), and wearable medical devices is rapidly expanding. These devices depend on high-energy-density storage systems and ultra-low-power designs. ITECH provides comprehensive battery charge-discharge testing solutions covering capacity, lifespan, and safety, ensuring low power consumption, high endurance, and reliability of medical equipment.



Energy Storage System Testing for Vehicle-Mounted CT and Mobile DR

To meet the growing demand for mobility and portability in medical services, an increasing number of medical device manufacturers are launching portable medical products such as vehicle-mounted CT scanners and mobile digital radiography (DR) systems. These devices typically utilize batteries or supercapacitors as energy storage systems, ensuring long endurance and reliable operation.

Testing Advantages

- Built-in battery charge-discharge test interface
- Validation of battery capacity compliance
- Convenient evaluation of battery cycle life
- Automated charge-discharge testing
- Testing compliance of battery rate discharge
- Measurement of battery charge-discharge times
- Simulated testing based on customers' actual operational current waveforms
- Powerful statistical analysis capabilities
- Comprehensive safety configurations

Recommended Products

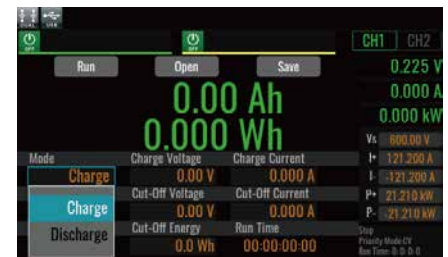
IT6600C Series Bidirectional Programmable DC Power Supply (42kW/3U, scalable up to 10MW+)

IT6000C Series Bidirectional Programmable DC Power Supply (18kW/3U, scalable up to 2MW)

IT6000B Series Regenerative Source-Load System (18kW/3U, scalable up to 2MW, integrated source-load)

IT-M3900C Series Bidirectional Programmable DC Power Supply (6kW/1U, 12kW/2U, voltage range 10V~1500V)

IT-M3900B Series Regenerative Source-Load System (6kW/1U, 12kW/2U, integrated source-load)



Battery Performance Validation for Wireless Portable Devices

Portable medical devices rely on advanced electronics to provide convenient and efficient health monitoring and treatment. Wearable medical devices powered by batteries, due to direct human contact and prolonged usage, impose stringent requirements on battery performance, endurance, and safety. Thus, medical device manufacturers typically perform specialized battery performance validation and testing.

Testing Solution

- **Devices Under Test:** Portable pacemakers, portable ultrasound devices and monitors, rehabilitation robots, wearable blood pressure monitors, wearable pulse oximeters, etc.
- **Testing Requirements:** Quick validation of battery performance, directly yielding intuitive results: PASS or FAIL.
- **Testing Items:** ☒ DC Internal Resistance ☒ Instantaneous Discharge ☒ Life Cycle Degradation

Recommended Products

ITS5300 Charge/Discharge Test System

- Customized test items and reports based on customer requirements
- Charging modes: Constant Current (CC)/ Constant Voltage (CV)/ Pulse Charging
- Discharging modes: Constant Current (CC)/ Constant Resistance (CR)/ Constant Power (CP)/ Pulse Discharging
- Real-time online monitoring of internal resistance, voltage, and temperature for each module
- Comprehensive alarm and protection settings to effectively prevent battery over-discharge, overcharge, and other unexpected faults
- Independent multi-channel control



Low Power Consumption and Microcurrent Testing for Wearable Medical Devices

Wearable medical devices must ensure stable long-term operation, which requires not only high-energy-density batteries but also intrinsic low-power designs. Consequently, precise power consumption testing has become one of the core challenges manufacturers face during product validation. ITECH provides nA-level microcurrent sampling and dynamic power switching testing, suitable for high-precision devices such as glucometers and heart-rate monitors.

Testing Solution

- **Testing requirements:** Measure standby and operational power consumption of wearable devices, including screen on/off states, with minimal operational currents potentially at nA-level.

Recommended Products



IT6400 Series Bipolar Power Supply/
Battery Simulator



IT2800 High-Precision Source
Measurement Unit (SMU)



IT-M3200 High Precision Programmable
DC Power Supply

IT6400 Series Bipolar Power Supply/Battery Simulator

Provides high-precision power supply and testing for low-voltage devices within the operational voltage range.

- Voltage setting and measurement accuracy: 0.02% of reading +3mV
- Four-wire (Sense) mode ensures accurate voltage delivery to the load, maintaining precise preset values even during rapid or large-scale load variations.

Ensures stable voltage output during fast and wide-ranging loading

- Load transient recovery time < 20 μ s

High-precision current measurement capability

- Current display resolution down to 1nA, enabling precise power consumption analysis even when the device is in minimal-power sleep mode or consuming microamp-level current.
- Minimal interference with the device under test
- Output ripple and noise < 2 μ Arms

High-resolution LCD and softkey/icon-based user interface simplify power supply operation

Multi-Type Battery Simulation and Compatibility Testing

Healthcare professionals increasingly rely on smartphones for continuous remote monitoring and tracking of patients' physiological data. ITECH products support built-in battery models and CSV file import, enabling realistic simulation of various battery types and their impact on device operation.

Testing Solution

- **Test Requirement:** When Bluetooth mode is activated on portable medical devices, measure current consumption under different function on/off states.

Recommended Products

- IT6400 Bipolar Power Supply / Battery Simulator
- IT2800 High-Precision Source Measurement Unit (SMU)
- IT2700 Multi-channel Source Load Modular System

Testing Advantages

- Simulates real battery output, supporting up to 10A sourcing and 10A sinking current
- Simulates battery State of Charge (SOC) and Equivalent Series Resistance (Res)
- Simulates battery output based on models with customizable initial states to accelerate test cycles
- Direct GUI-based monitoring of key battery parameters
- Logs voltage, current, and capacity over time via upper-computer software

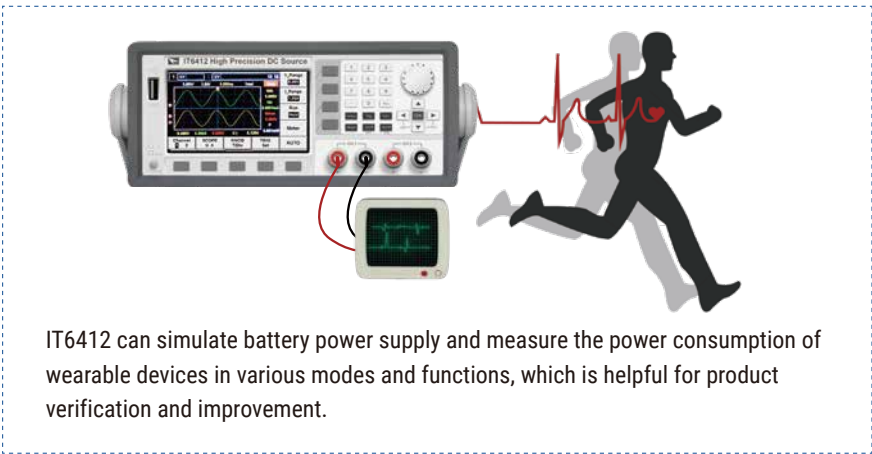
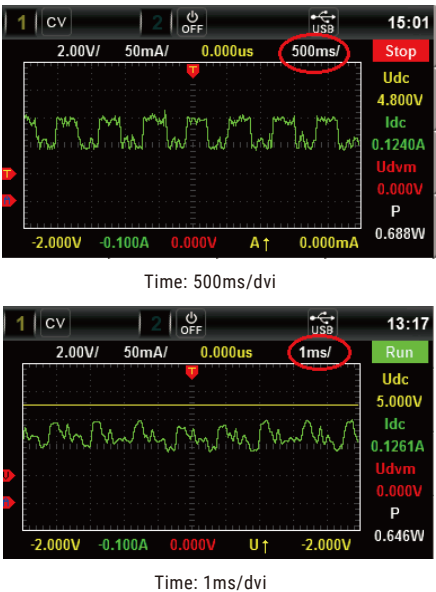
IT2800 High-Precision Source Measurement Unit (SMU)

Includes a built-in battery simulator that generates battery curves via customizable SOC-VOC-R settings or standard parameters, allowing instant initial SOC configuration and eliminating the wait time of real charging/discharging.



IT6400 Series Battery Simulator

Easily builds any type of battery model to simulate current draw and power consumption under various operating modes, assisting engineers in fast validation and design optimization.



Medical Power and Electronic Component Testing

—Ensuring Stable Operation of Key Components in Medical Systems

Medical devices require high reliability from their power systems and electronic components. In critical applications such as vital sign monitoring, surgical assistance, and diagnostic terminals, even momentary anomalies may compromise treatment safety. ITECH provides high-precision source/load systems and automated test platforms to support comprehensive functional and protection testing of power modules, drivers, and sensors.

Medical Power Testing Solutions

In many cases, medical equipment is in direct contact with a patient's body. Power quality directly affects system stability and reliability, so power testing standards in the medical field are significantly stricter than those for standard power modules.

Devices Under Test

Medical power modules (AC-DC / DC-DC) , Medical power adapters

Test Standards

- CE certification for medical devices: EN6060-1
- IEC60601-1 general standard for medical electrical equipment
- General safety requirements for medical electrical equipment: GB9706
- EMC (Electromagnetic Interference) compliance standard: IEC61000-4-11

Test Items

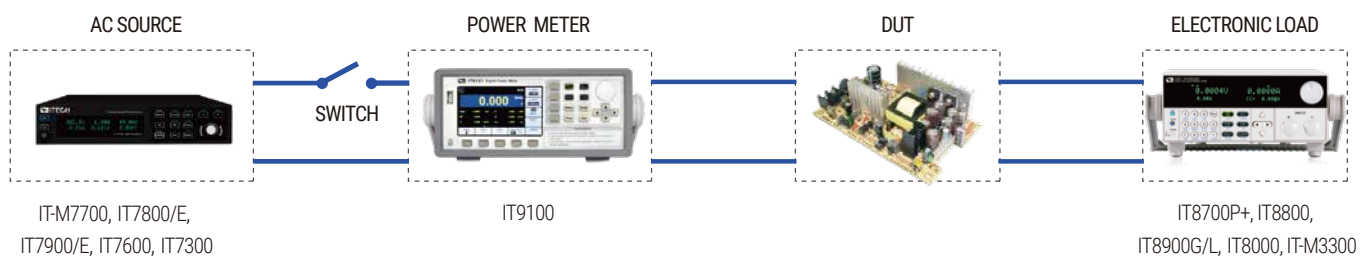
- Load effect / Load regulation
- Line regulation
- Dynamic response time
- Overload testing
- Immunity testing

Recommended Products

- **AC Power Supplies**: IT-M7700, IT7800/E, IT7900/E, IT7600, IT7300
- **Power Analyzer**: IT9100
- **DC Power Supplies / Loads**: Select as needed from ITECH product line
- **Automated Test System**: ITS9500 Power Test System

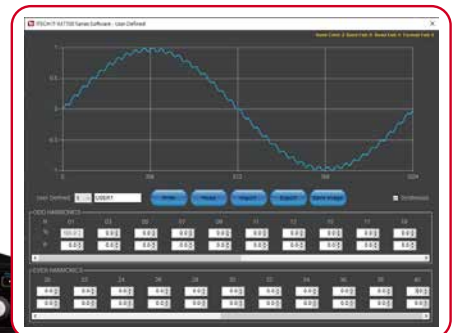


Test line connection (AC-DC power module)



IT-M7700 Series High-Performance Programmable AC Power Supply

- Compact 1/2 1U design improves space utilization
- Supports AC, DC, and AC+DC output modes; AC+DC mode enables DC offset simulation
- Built-in AC power meter
- Configurable output waveform start/stop phase angles
- Customizable 30 harmonic waveform settings



Functional Validation of Medical Electronic Components

With increasing intelligence, medical electronic products are integrating more functions—such as diagnostics, monitoring, imaging, and communication—into compact and user-friendly systems like multi-functional monitors. Semiconductors have become core components in many medical devices, supporting features like control, data processing and storage, wireless connectivity, and power management.

Test Items	Recommended Products	
Sensor and chip aging tests	Multichannel test source load: IT2700, IT-M3400, IT-M3600, IT-M3100, IT-M3300, IT-M3100D	
Biomedical sensor testing	High precision DC source: IT-M3200, IT6400	High precision SMU: IT2800
Discrete component testing	DC source: IT-M3400, IT-M3600, IT6400, IT-M3100	DC load: IT-M3300, IT8800

IT2700 Multi-channel Modular Power System

Max. 240 Channels In a Single Cabinet



240 Channels

- Multi-channel control via PC or front panel, single cabinet can output up to 240 channels
- Meet the needs for high efficiency, cost reduction and diverse independent testing of production lines
- Master-slave parallelization of modules in each unit, synchronization error <5μs

Coupling/Group - Channel Grouping Function

Controlled by LAN, no limit of channels

Group function supports grouping across frames.

System				Status			
Channel Name	Channel	Model	Status	Voltage	Current	Power	Pr
Group 1							
PS_1.CH1	1	IT27300	OFF	0.0028V	0.0023A	0.00W	Cur
PS_2.CH1	1	IT27300	OFF	0.0004V	0.0042A	0.00W	Cur
Group 3							
PS_1.CH2	2	IT27100	OFF	0.0039V	0.0053A	0.00W	Cur
PS_2.CH2	2	IT27100	OFF	0.0041V	0.0033A	0.00W	Cur
Group 2							
PS_1.CH3	3	IT27500	OFF	0.0055V	0.0053A	0.00W	Cur
PS_1.CH4	4	IT27700	OFF	0.0009V	0.0047A	0.00W	Cur

Control includes setting voltage and current
|ON by group|Start a function
|Trigger

The coupling function within the frame allows separate settings for output coupling, protection coupling and Inhibit coupling.

Power System Testing for Smart Medical Equipment

—Empowering Power and Control System Testing for Intelligent Medical Terminals

During the pandemic, drones have played essential roles from broadcasting messages and public awareness to disinfectant spraying and surveillance. In medical rescue scenarios, such as earthquake relief, drones have proven to be invaluable tools.

Medical robots refer to robots used in healthcare settings, including surgical robots, rehabilitation robots, and AI-powered temperature screening robots.

Core Components

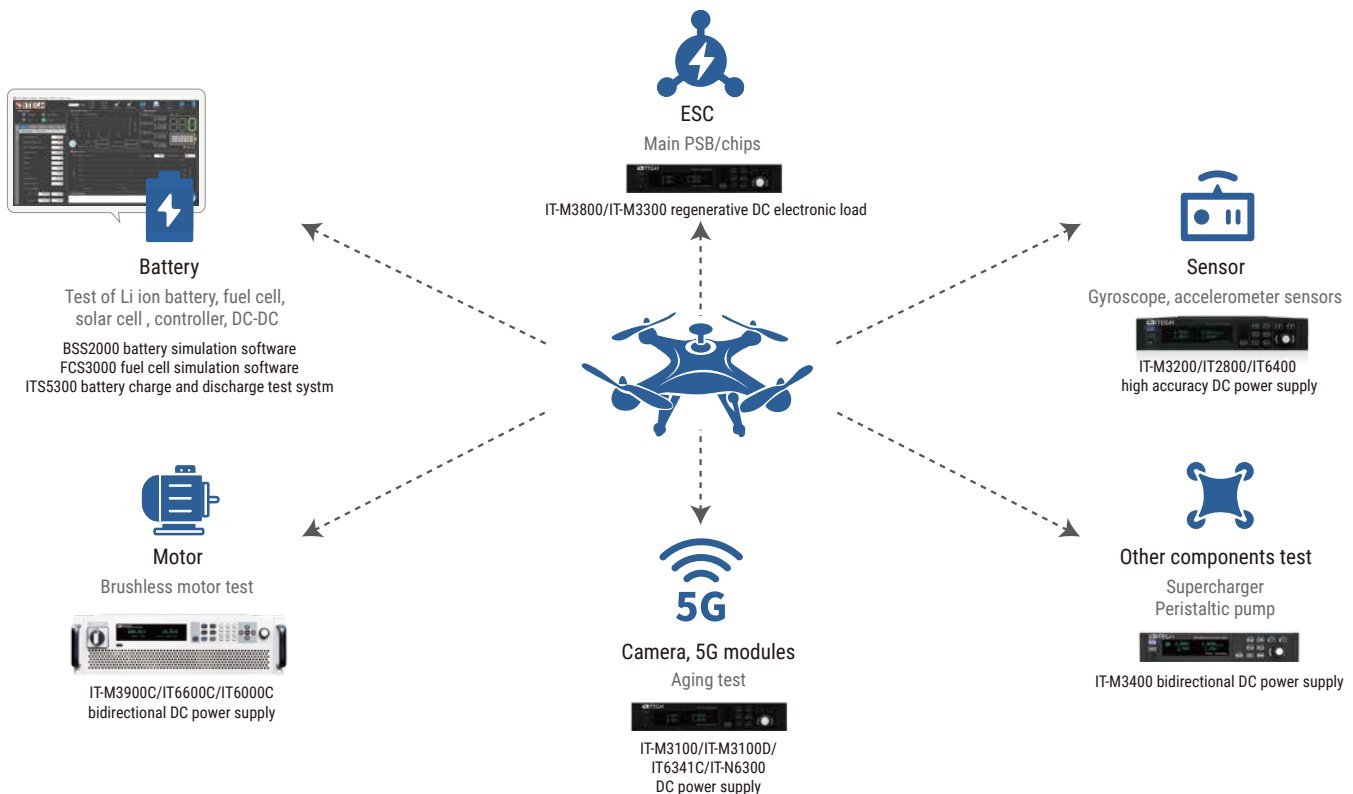
Power regulation circuits, Motor drive circuits, Infrared obstacle avoidance circuits, Cameras, Robotic arms, Display panels, Batteries

Testing Requirements

- Power board performance validation
- Battery performance validation: simulation, charge/discharge testing, cycle life testing
- Motor performance validation: locked-rotor testing, aging testing
- Lidar testing

Recommended Products

- IT-M3900C / IT-M3400 Series Bidirectional Regenerative DC Power Supply
- IT-M3900B / IT-M3600 Series Regenerative Source-Load System
- IT6000C / IT6600C Series Bidirectional Programmable DC Power Supply
- IT-M3100 / IT-M3100D / IT6341C Series DC Power Supply
- IT8800 / IT8500G+ Series Programmable DC Electronic Load
- BSS2000 Battery Simulation Software
- IT2800 / IT6400 / IT-M3200 High-Precision Power Supply / Source Measure Unit



Testing of Digital Medical Human-Machine Interface Technologies

—Supporting Display and Interaction Device Testing for Next-Generation Telemedicine

As telemedicine continues to evolve, AR glasses and VR visualization systems have become essential tools for remote consultation, surgical collaboration, and health guidance. These devices typically feature high-resolution OLED displays, low-latency sensors, and wireless communication modules, requiring stringent testing of power supplies, control chips, and display components. ITECH offers one-stop testing solutions, including OLED aging evaluation and power stability verification.

AR Smart Glasses and Remote Assistance Platforms

Test Applications

Epidemic guidance from remote medical experts; Emergency remote conferencing; Community-level epidemic control (facial/license plate recognition); 5G smart hospital infrastructure

Test Items

IoT-related testing, WiFi and network module testing

Recommended Products

IT-M3200 High-Precision Programmable DC Power Supply, IT6400 Bipolar Power Supply / Battery Simulator, IT2800 High-Precision Source Measurement Unit (SMU)

Testing Advantages

- Seamless current range switching allows complete testing of the DUT (Device Under Test)
- High-precision current measurement down to 1nA enables analysis of ultra-low-power devices
- Current waveform analysis from 1nA to 10A with up to 30kHz bandwidth, reducing undetected power losses

OLED Module Aging Test

Applications

Immersive VR/AR experiences require advanced components such as video processors, displays, sensors, and microprojectors.

Test Items—OLED Displays

- Power consumption of OLED displays
- Static current measurement from screen-off to various brightness levels
- Testing of OLED driver circuits
- Long-term OLED aging test

Recommended Products

IT2700, IT-M3100, IT-M3100D, IT6400, IT-M3200, IT-M3300



This information is subject to change without notice. For more information, please contact ITECH.

ITECH ELECTRONIC CO.,LTD.

Taipei

Add: No.918, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

Web: www.itechate.com

TEL: +886-3-6684333

E-mail: info@itechate.com

Factory I

Add: No.108, XiShanqiao Nanlu, Nanjing city, 210039, China

TEL: +86-25-52415098

Web: www.itechate.com

Factory II

Add: No.150, Yaonanlu, Meishan Cun, Nanjing city, 210039, China

TEL: +86-25-52415099

Web: www.itechate.com



THURLBY THANDAR
instrument distribution

Thurlby Thandar Instrument Distribution
Glebe Road, Huntingdon, PE29 7DR, UK
+44 (0)1480 412 451

sales@ttid.co.uk

www.ttid.co.uk



ITECH Web



ITECH Facebook



ITECH LinkedIn