



How to Test an Bidirectional DC-DC Module remotely by IT-M3900 Web Control Function

Work from home

Working from home has become a normal working status to which many engineers and scientific researchers need to adapt across the globe. Universities and laboratories also need to consider the way for flexible distribution of work to different employees, students' synchronous viewing of the operation by teachers and other students, and re-deployment of resources and devices. The remote software simulation function is possible only with computers but the high-performance test bench is difficult to move. Then, is there any way to expand the link between engineers and devices when it is necessary to perform hardware verification and tests and to remotely operate test instrument for seamless connection of online and offline work?

In this case, the Web control function has become a common choice when engineers use ITECH test instruments. Through the built-in Web server, you can directly monitor the instrument from your PC's Web browser and even from your mobile phone or tablet. Compared with the ITECH's free host computer software IT9000 series, the Web control function can support simultaneous access to several computers in the LAN and synchronous display of real-time

status of instrument, which is more flexible and adaptive to teaching or team coordination scenarios.

Case study

A power supply user needs to test the electrical performance and protection function of its bidirectional DC-DC module in the hope to realize remote initialization, power supply test load setting, as well as test data reading and to reduce online wiring.

1). Testing method

Connect two units of IT-M3906B-80-120 to the 50V high-voltage end and 20V low-voltage end of the bidirectional DC-DC module of the DUT to realize bidirectional tests without changing the wiring through the characteristics of the all-in-one machine in the bidirectional source load system.

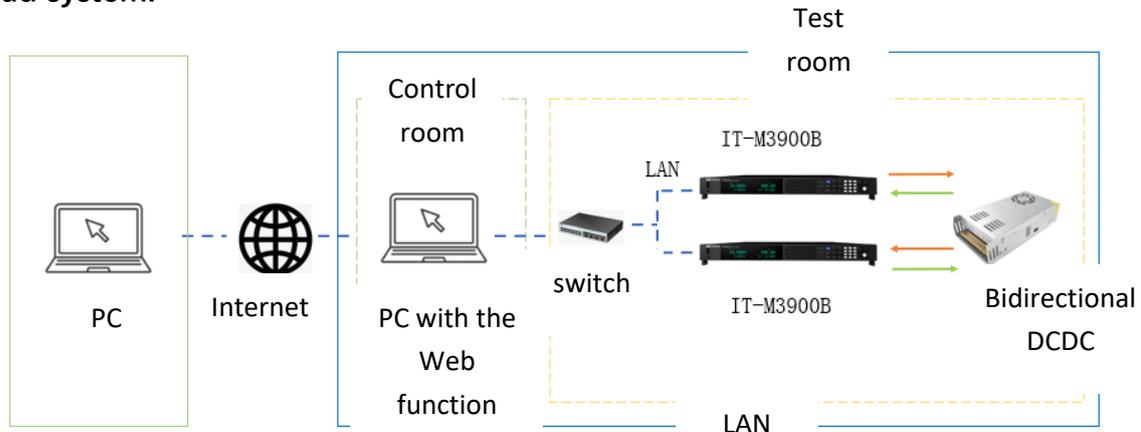


Fig. 1 Web control function wiring structure

2). Testing process

I. Communication settings

Change the setting of the two sets of the IT-M3906B to the network interface communication mode and set the network interface parameters to the same network segment with the on-

duty computer, then input the device's IP address in the browser to enter the control interface (as shown in Fig. 2).

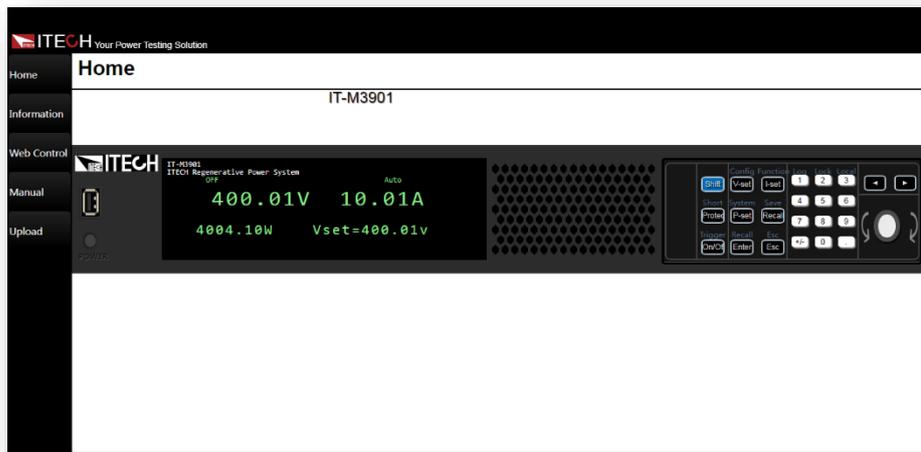


Fig.2 Web control interface

II. Test parameter settings

After the device enters the Web control mode, thanks to the one-click switching of source load function in IT-M3900B, the user can set the IT-M3906B at the high-voltage end to source mode and set the output voltage to 50V and current limit to 30A. Test the DUT's input performance at the high-voltage end and the output performance at the low-voltage end.

A). Static test: Set the IT-M3906B at the low-voltage end to load mode and the load pulling current to 10A in CC load pulling mode.

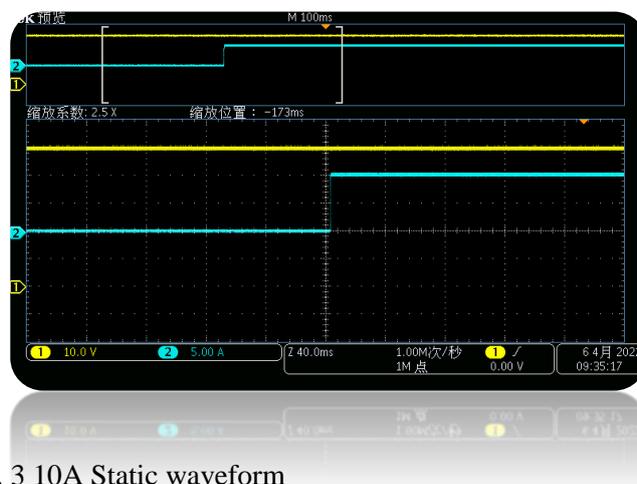


Fig. 3 10A Static waveform

B). Dynamic test: Use the LIST function of the IT-M3906B at the low-voltage end to edit 0-10A, and set frequency to 500HZ and duty circle to 50% dynamic.

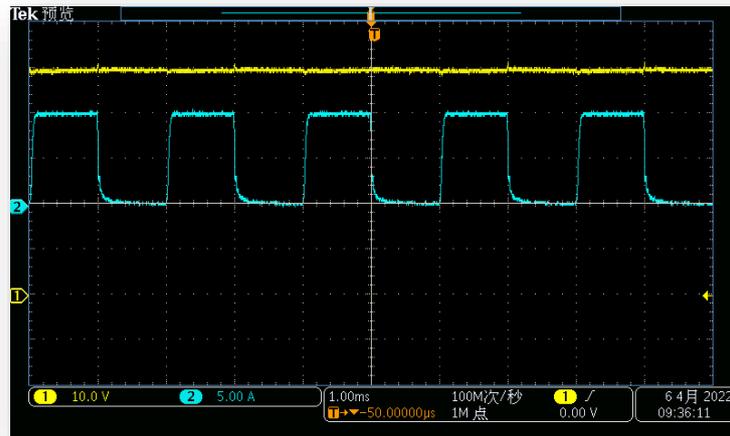


Fig. 4 10A Dynamic waveform

You can see that two sets of IT-M3900B have well completed the bidirectional power tests.

Summary:

Through the Web function, the IT-M3906B series can control all communication test devices in the LAN with one computer and the interface is simply and clear. The IT-M3900 has four series including DC power supply, bidirectional power supply, 2 in 1 source load system, and regenerative DC load. All of them are small with the high power density design. Within 1U height, the max. power is up to 6kW and the current and voltage can reach 510A and 1500V respectively, which can effectively reduce the device occupation space and installation time on cabinet. The IT3900B series 2 in 1 source and load power system has seamless switching function of bidirectional power supply in the source mode. In load mode, there are pure load interfaces and performance in 8 working modes. Its abundant models can meet different testing requirements. In combination of multiple functions, high energy saving, high-safety, and high-stability, users will have the confidence to face various complex tests and quickly improve product's competitiveness.

In addition to IT-M3900 series, other ITECH products with the Web function include IT6000B/C/D high power regenerative power system, the IT8000 high power regenerative electronic load, IT-M3100/3200/3300/3400/3600 series, IT6500C/D DC power supply series, IT6300C triple channels power supply.

IT-M3900B

- ◆ 2 in 1 unit - a bidirectional power supply and a regenerative load
 - ◆ One button switch between source and load on front panel
 - ◆ Compact design, 1U@6kW, 2U@12kW
 - ◆ Voltage range: 10~1500V
 - ◆ Current range: -720A~1020A
 - ◆ Power range: ±12kW
 - ◆ Bidirectional energy flow between the DUT and the grid, current seamless switching
 - ◆ Master/slave parallel connection with parallel technology - keep good performance while power extension*1
 - ◆ Efficient power regeneration - reduce cost of electricity and cooling
 - ◆ CC/CV priority
 - ◆ Adjustable output impedance
 - ◆ Battery charge and discharge test
 - ◆ Battery simulation
 - ◆ Partial pre-compliant with LV123, LV148, DIN40839,ISO-16750-2, SAEJ1113-11,LV124 and ISO21848 automotive testing standards
 - ◆ Support solar panel I-V curves simulation*2
 - ◆ Slope of voltage, current and power is settable
 - ◆ Simulation of dynamic driving conditions, up to 10 million points
 - ◆ 8 operation modes under Source mode: CC/CV/CW/CR/CC+CV/CV+CR/CR+CC/CC+CV+CW+CR
- Multiple protection:
- ◆ OVP / ±OCP / ±OPP / OTP /voltage transient drop protection/anti-islanding/power grid detection/pre-charge
 - ◆ Built-in USB/CAN/LAN/digital IO interfaces, Optional GPIB/Analog&RS232

*1. If parallel connection >6 units, pls. contact ITECH for details

*2. Not available for 10V models



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