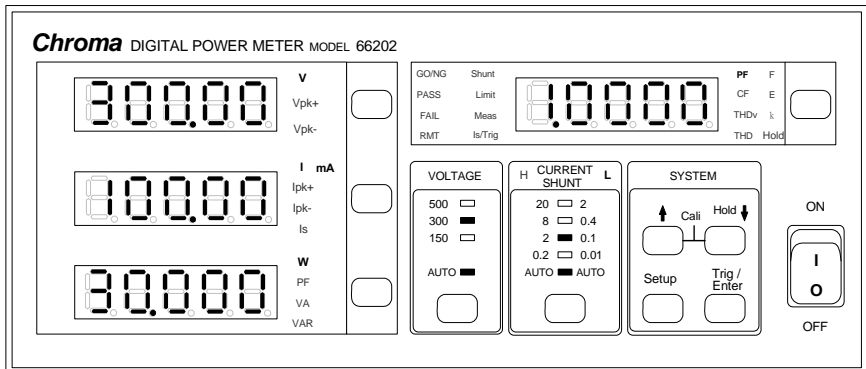


Digital Power Meter

66201/66202

Quick Start Guide

Digital Power Meter 66201/66202 Quick Start Guide



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	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr ⁶⁺	PBB	PBDE
PCBA	×	○	○	○	○	○
CHASSIS	×	○	○	○	○	○
ACCESSORY	×	○	○	○	○	○
PACKAGE	○	○	○	○	○	○

“○” indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

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2. The environment-friendly usage period of the product is assumed under the operating environment specified in each product's specification.

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Digital Power Meter

(Product Name/ Trade Name)

66201,66202

(Model Designation)

Chroma ATE Inc.

(Manufacturer Name)

66 Hwa-Ya 1st Rd., Hwa-Ya Technical Park, Kuei-Shan Hsiang, Taoyuan Hsien, Taiwan.

(Manufacturer Address)

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EN 61010-1:2001

EN 61326:1997/A1:1998/A2:2001/A3:2003

EN 55011 :1998/A1:2000/A2:2003 CIASS A, EN 61000-3-2:2000/A1:2001,

EN 61000-3-3:1995/A1:2001

IEC 61000-4-2:1995/A2:2000; IEC 61000-4-3:2002; IEC 61000-4-4:1995/A2:2001;

IEC 61000-4-5:1995/A1:2000; IEC 61000-4-6:1996/A1:2000; IEC 61000-4-11:1994/A1:2000

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(Company Address)

Person responsible for this declaration:

Mr. Terry Cheng

(Name, Surname)

T & M BU President

(Position/Title)

Taiwan

2007.05.10

(Place)

(Date)

(Legal Signature)

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1. Overview

1.1 Product Introduction

This 66201/66202 Digital Power Meter manual covers the product model of 66201 and 66202. 66201/66202 is a digital power meter with voltage and current auto ranging function that can identify PASS / FAIL of UUT based on the inputted specification. Its front panel has 4 sets of 7-segment LCDs that can display AC voltage, current and the measurements of active power / power factor / apparent power / reactive power concurrently. The valid measurement ranges are 0 ~ 500 Vrms for AC voltage, 0 ~ 20Arms for AC current, 0 ~ 10KW for active power, 0 ~ 1.000 for power factor, 0 ~ 10KVA for apparent power and 0 ~ 10KVAR for reactive power.

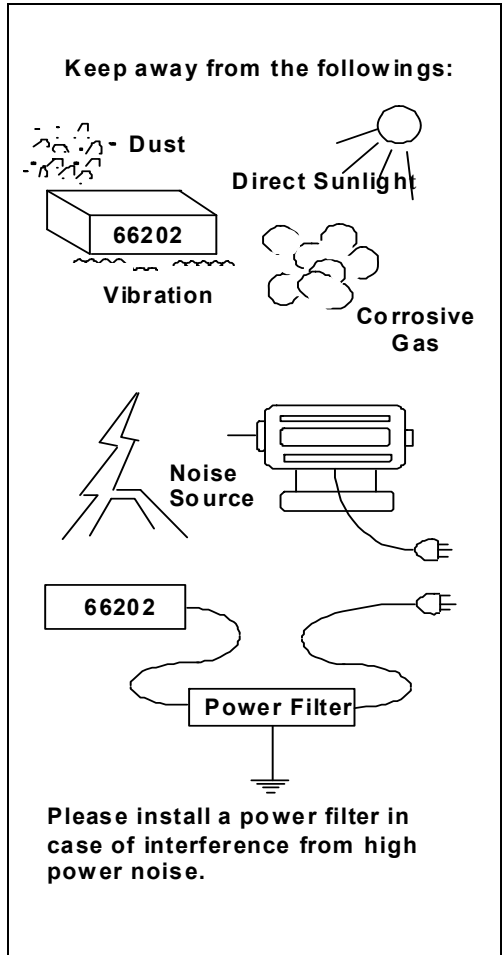
66201/66202 Digital Power Meters can also connect to PC via GPIB (IEEE standard 488-1978) and USB interfaces to perform measurements automatically when on line.

1.2 Inspection

Before shipment, this instrument was inspected and found to be free of mechanical and electrical defects. As soon as the instrument is unpacked, inspect for any damage that may have occurred in transit. Save all packing materials in case the instrument has to be returned. If damage is found, please file claim with carrier immediately. Do not return the instrument to Chroma without prior approval.

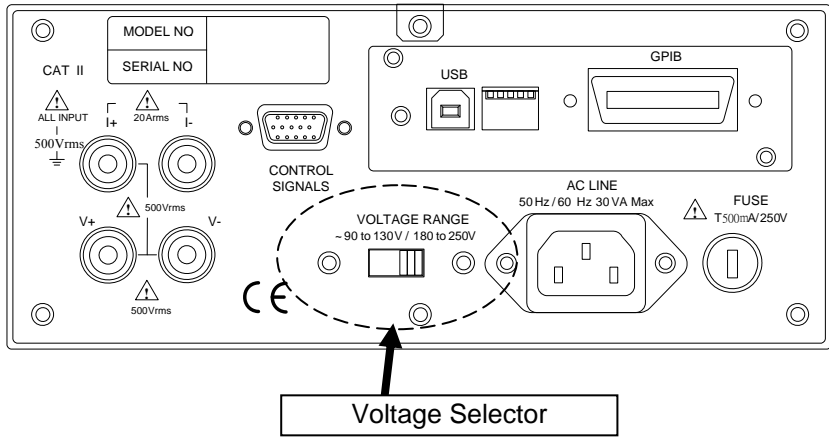
1.3 Ambient Environment

- (1) Do not use the meter in a dusty or vibrating location. Do not expose it to sunlight or corrosive gas. Be sure that the ambient temperature is $0^{\circ}\text{C} \sim +40^{\circ}\text{C}$ and the relative humidity is 20% ~ 80%.
- (2) The meter has been carefully designed to reduce the noise from the AC power source. However, it should be used in a noise-free or as low as possible environment. If noise is inevitable, please install a power filter.
- (3) The meter should be stored within the temperature range $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$. If the unit is not to be in use for a long time, please store it in the original or similar package and keep it from direct sunlight and humidity to ensure its accuracy when using again.



1.4 Power Line Connection

Before plugging in the power cord, make sure the power switch is off and the voltage selector on the rear panel meets the required voltage. Please use the power supply frequency of 50Hz or 60Hz.



1.5 Fuse

There is one fuse installed in the rear panel, please be aware of the following when replacing it:

- (1) First turn off the power and unplug the power cord before changing the fuse.
- (2) Since visual check cannot ensure the fuse to be used is appropriate, it is necessary to test its resistance to see if it is below 15Ω which is normal when checking.
- (3) When replacing the fuse, use a finger or a flat screwdriver to press the cover of fuse holder gently and turn it counter clockwise for 60 degree, the cover will be unlocked from the holder for 3mm.
- (4) Remove the over and replace the fuse with a new one (must be same as the original fuse.)
- (5) Press the cover down into the holder by a finger or a flat screwdriver and turn it clockwise for 60 degree to secure it.

Table 1-1 Specification of Fuse

	Specification	Note
Power Fuse	Slow blow 0.5A	Applicable for AC 190V ~ 250V

⚠ WARNING

To prevent fire from occurring it is required to use the fuse of same type and same specification when replacing it.

1.6 Time for Warm-Up

All functions of this meter are active when it is powered on; however, to meet the accuracy listed in the specification it is suggested to warm-up for at least 60 minutes.

1.7 Cleaning

Ensure all cables and power cords are removed before cleaning the hardware. Use a dry cloth to clean the chassis. As the rear panel of power meter connects to the internal circuit board, to avoid damaging the hardware due to short circuit internally it is not allowed to wipe it with damp cloth.

2. Panel Description

2.1 Front Panel

Figure 2-1 and Figure 2-2 show the front panel of 66201 and 66202 digital power meters with parts described from item (1) to (12) as listed below. For detail operation procedures, please see the User's Manual in the CD attached to the shipment.

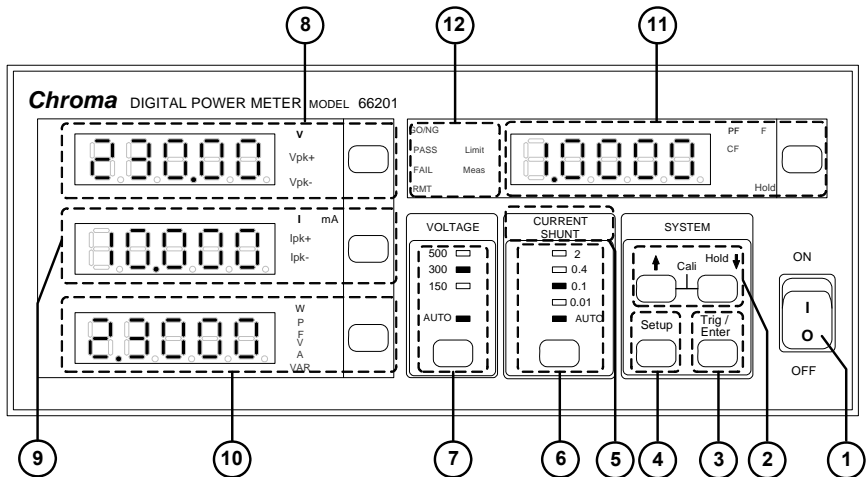


Figure 2-1 Front Panel of 66201 Digital Power Meter

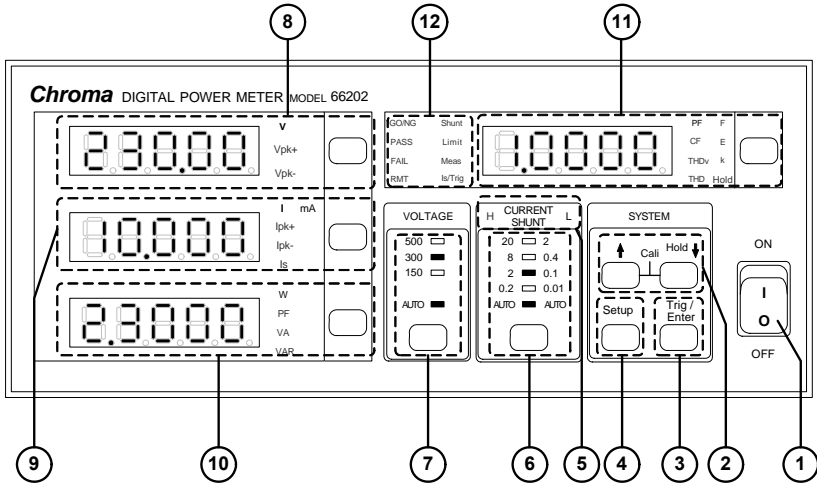


Figure 2-2 Front Panel of 66202 Digital Power Meter

- (1) **Power Switch** : It is the power switch to turn the meter ON or OFF.
- (2) **↑↓ Arrow Keys** : The up and down arrow keys can be used to select the parameters when in Setup. Press these two keys concurrently will go to automatic calibration function.
- (3) **Trig/Enter Function Key** : It is the confirmation key for various parameters when in Setup.
- (4) **Setup Key** : It is the function setup key that can select various functions for setting and the indicator above will show the selected item.
- (5) **Current Shunt Indicator** : It shows the state of Shunt module in use for current detection. (**Note 1**)
- (6) **Current Range Selection Key** : It is the selection key for AUTO and specified current range. The indicator above shows the selected range. (**Note 2**)
- (7) **Voltage Range Selection Key** : It is the selection key for AUTO and specified voltage range. The indicator above shows the selected range.
- (8) **Voltage Measurement Display** : It is the voltage readout indicator that can switch to display V, Vpk+ and Vpk-. The mapping indicator will be on when selected.
- (9) **Current Measurement** : It is the current readout indicator that can switch to display I, Ipk+, Ipk- and Is (Inrush

- Display** current). The mapping indicator will be on when selected. For instance, when the mA indicator is on it means the unit is mA. (**Note 3**)
- (10) **Power Measurement Display** : It is the power readout indicator that can switch to display W, PF, VA and VAR. The mapping indicator will be on when selected.
- (11) **Special Measurement Display** : It can switch to display PF, CF and F. The mapping indicator will be on when selected. (**Note 4**)
- (12) **Function Setting Indicator** : It shows the setting mode when in Setup or shows PASS/FAIL when executing GO/NG. When the RMT LED is on, it indicates the system is under remote control. (**Note 5**)

- Note**
1. 66201 Digital Power Meter is applicable for small current range measurement only, so there is no Current Shunt indicator.
 2. 66201 Digital Power Meter is applicable for small current range measurement only, so there is no high current range indicator.
 3. 66201 Digital Power Meter provides the measurements of I (current RMS), I_{pk+} (positive peak current) and I_{pk-} (negative peak current) only.
 4. 66201 Digital Power Meter provides the parameters of PF (Power Factor), CF_i (Crest Factor of Current) and F (Frequency).
 5. 66201 Digital Power Meter has Limit and Meas function for setting.

2.2 Rear Panel

Figure 2-3 shows the rear panel of 66201/66202 digital power meter with parts described from item (1) to (9) as listed below.

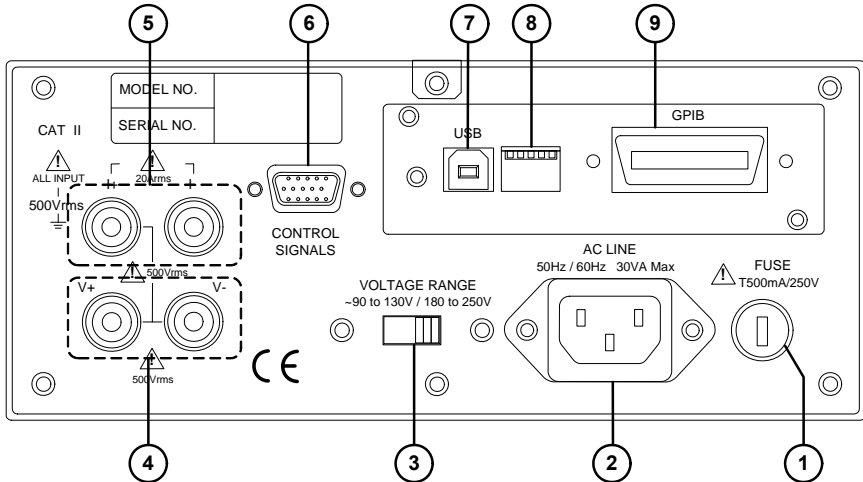


Figure 2-3 Rear Panel of 66201/66202 Digital Power Meter

- (1) **Fuse Holder** : It is the fuse holder for power supply.
- (2) **AC LINE Inlet** : It is the power supply connection socket that is connected by power cord.
- (3) **VOLTAGE Range Switch** : AC input voltage selector that can switch to 110V or 220V.
- (4) **Voltage Measurement Input Terminal** : It is the positive/negative terminal input for voltage test point.
- (5) **Current Measurement Input Terminal** : It is the positive/negative terminal input for current test point.
- (6) **Control Signal Input/Output Terminal**
- (7) **USB Interface Port**
- (8) **ADDRESS DIP Switch** : It is the DIP switch for setting GPIB interface address.
- (9) **GPIB Interface Port**

2.3 Examining Firmware Version

1. Power on the 66201/66202 Digital Power Meter.
2. When the panel is in normal state, press **Setup** and **Enter** simultaneously. The screen shows:

The Model No. is 66202, F/W version is 1.20 and FPGA program version is 1.00.

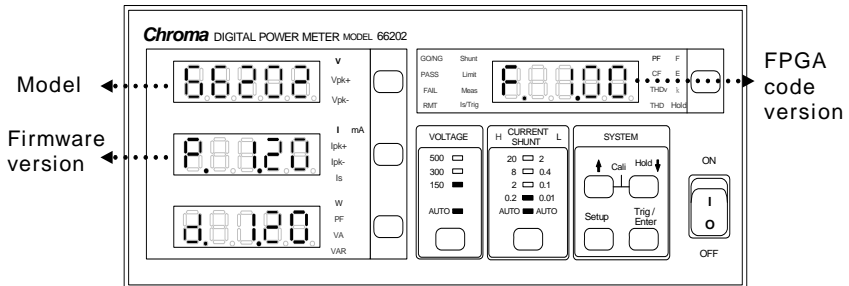


Figure 2-4 66202 Digital Power Meter Firmware Version Check

3. Press **Setup** to return to measurement screen when version is confirmed.



For more detail information, please see the User's Manual in the CD attached to the shipment.

3. Operation

3.1 Preparation before Test

- (1) Before plugging in the power cord, make sure the power switch is off and the voltage selector on the rear panel meets the required voltage.
- (2) If there is a need to change the voltage, ensure the fuse used matches the voltage selected. See section 1.5 *Fuse* for the specification.

⚠WARNING It is required to remove the power cord when replacing the fuse or changing the input voltage to avoid the hazard of electric shock.

3.2 Connecting Test Device

3.2.1 Standard Connection

66201/66202 Power Meter has two types of connection. Its measurement theory is shown in Figure 3-1 (a) and (b).

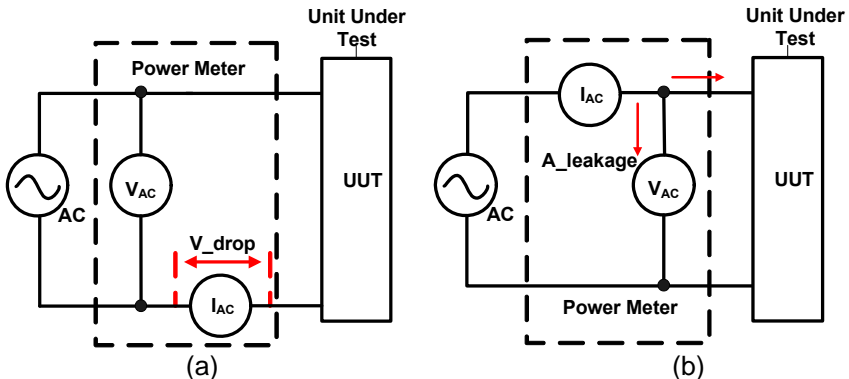


Figure 3-1 Measurement Theory for Power Meter Connection

The connection of Figure 3-1(a) is more accurate for current measurement; however, the voltage measurement may have small errors due to the voltage difference of current meter. It is applicable for the UUT with medium or small power. Its connection with 66201/66202 Power Meter is shown in Figure 3-2.

The connection of Figure 3-1(b) is more accurate for voltage measurement, but the current measurement will add the leakage current from voltage meter. It is applicable for the UUT with medium or larger power. Its connection with 66201/66202 Power Meter is shown in Figure 3-3.

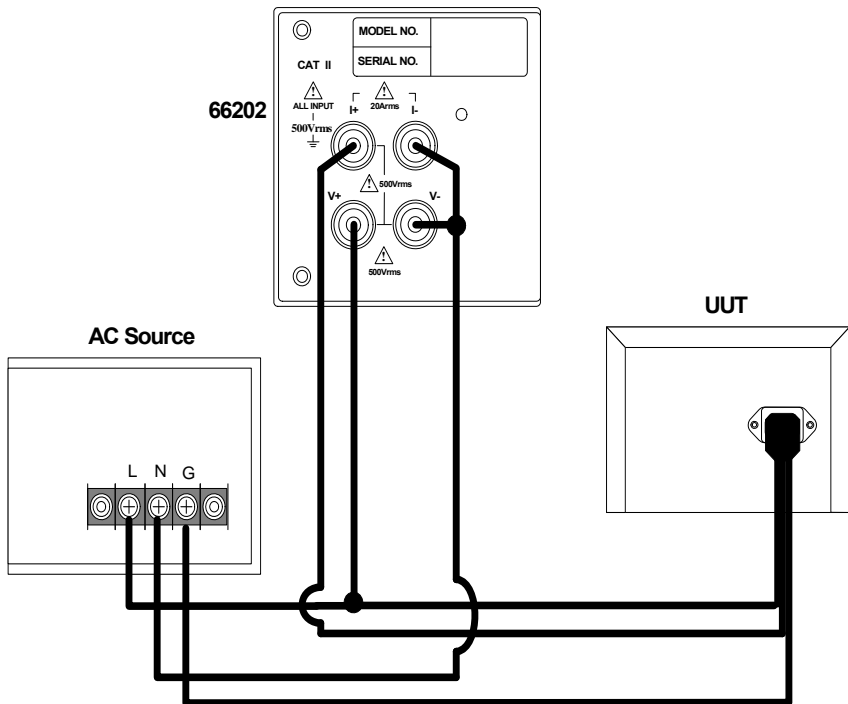


Figure 3-2 66201/66202 Power Connecting Diagram (for Figure 3-1(a))

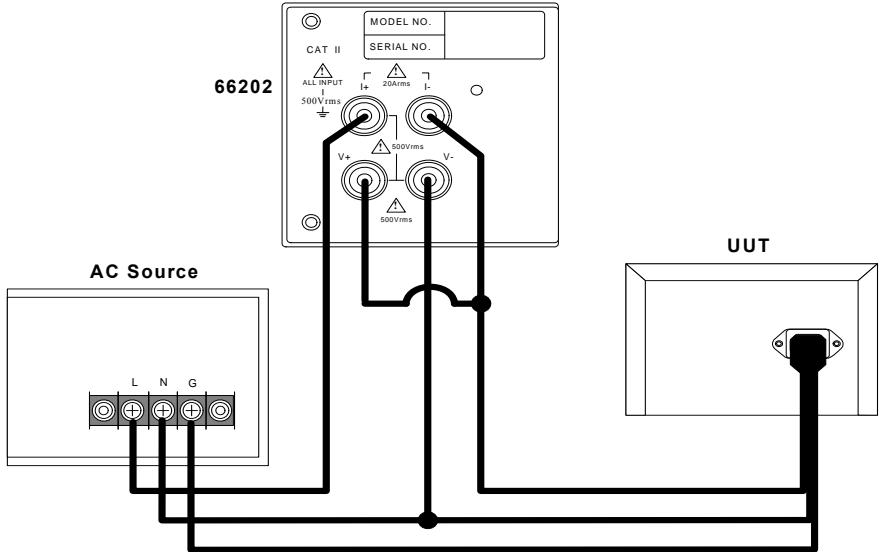


Figure 3-3 66201/66202 Power Meter Connecting Diagram (for Figure 3-1(b))

3.2.2 Connecting with A662003 Fixture

Figure 3-4 shows the connection of 66201/66202 Digital Power Meter and A662003 fixture. The connection of Figure 3-1(a) is applied by A662003 internally.

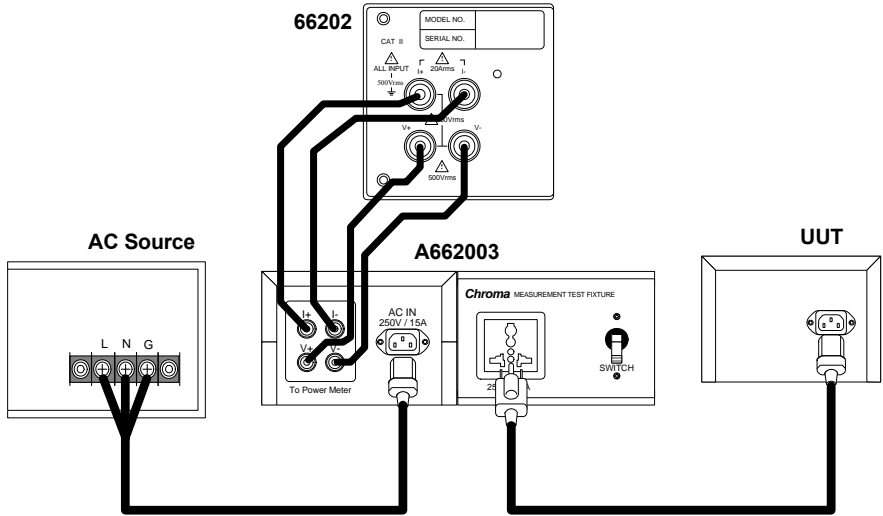


Figure 3-4 Connection of 66201/66202 Digital Power Meter & A662003 Fixture

WARNING

Be sure the connecting cable of voltage and current are in correct position as it may cause the internal circuit to burnout if connected mistakenly.

3.3 Test Function & Operation

When the Power Meter is powered on all LEDs on the front panel will be on for 3 seconds at the same time and users can check if they are acting normally. The Power Meter will set the panel display to its initial settings automatically where the voltage and current range are set to AUTO after 3 seconds.

Before powering off the 66201/66202 Power Meter, it will automatically save all parameter settings to internal flash (not including the voltage/current range selection), so that all settings will be resumed when power-on next time.

4. Using Remote Control

4.1 Overview

66201/66202 provides GPIB and USB two kinds of remote control interfaces and all functions of panel keys can be controlled by these two interfaces. The USB interface supports 2.0/USB 1.1, while the GPIB interface is complied with IEEE-488 standard.

4.2 USB Interface

Supported Hardware: USB 2.0 and USB 1.1
Supported Software: USBTMC class and USB488 subclass
Supported OS: Windows 98/2000/XP

Installing Driver Program:

The USB Interface of 66201/66202 supports USBTMC; therefore, if the PC's OS supports USBTMC (the PC has installed NI-VISA runtime 3.00 or above) there is no need to install other drivers in particular. The OS will search the standard USBTMC for installation automatically.

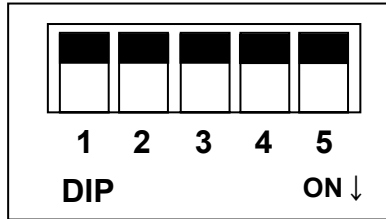
If the PC's OS does not support USBTMC, it is suggested to install NI-VISA runtime 3.00 or above first. The USBTMC driver will be in the OS once the NI-VISA runtime is installed. Power on the Digital Power Meter after connected it with the PC via USB cable and the PC can use the 66201/66202 SCPI commands through **NI-VISA** to communicate with the Digital Power Meter.

Related Documents:

- USB Test and Measurement Class (USBTMC) specification, Revision 1.0, <http://www.usb.org>
- USB Test and Measurement Class USB488 subclass specification, Revision 1.0, <http://www.usb.org>

4.3 Definition of GPIB Address

The DIP switch on the rear panel of 66201/66202 defines the GPIB address. The definition is binary (Bit0~Bit4) with Address 1 ~ Address 30 for setting as shown below.



DIP Switch	1	2	3	4	5
Address 1	1	0	0	0	0
Address 2	0	1	0	0	0
Address 3	1	1	0	0	0
Address 4	0	0	1	0	0
Address 5	1	0	1	0	0
Address 6	0	1	1	0	0
Address 7	1	1	1	0	0
Address 8	0	0	0	1	0
Address 9	1	0	0	1	0
Address 10	0	1	0	1	0
Address 11	1	1	0	1	0
Address 12	0	0	1	1	0
Address 13	1	0	1	1	0
Address 14	0	1	1	1	0
Address 15	1	1	1	1	0
Address 16	0	0	0	0	1
Address 17	1	0	0	0	1
Address 18	0	1	0	0	1
Address 19	1	1	0	0	1
Address 20	0	0	1	0	1
Address 21	1	0	1	0	1
Address 22	0	1	1	0	1
Address 23	1	1	1	0	1
Address 24	0	0	0	1	1
Address 25	1	0	0	1	1
Address 26	0	1	0	1	1
Address 27	1	1	0	1	1
Address 28	0	0	1	1	1
Address 29	1	0	1	1	1
Address 30	0	1	1	1	1



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