

- (1)POWER SWITCH/ POWER INDICATOR
- (2)VARIABLE POSITIVE POWER
- (3)VARIABLE NEGATIVE POWER
- (4)POTENTIOMETERS (VR1=1k $\Omega$ , VR2=100k $\Omega$ )
- (5)FREQUENCY VARIABLE
- (6)WAVEFORM AMPLITUDE VARIABLE
- (7)WAVEFORM SELECTORS
- (8)FREQUENCY RANGE
- (9)16 BITS DATA SWITCHES
- (10)16 BITS LED DISPLAYS
- (11)DIGITAL DISPLAYS
- (12)REMOVABLE BREADBOARD
- (13)ADAPTER
- (14)TWO PULSE SWITCHES
- (15)SPEAKER
- (16)UNIVERSAL CONNECTOR FIXED HOLDERS

### 3. CAUTION

- 3.1 When operating is finished, put it in a dry place of good ventilation, and keep it clean. If it is not in use for a long period, pull off the power supply plug for storage.
- 3.2 For maintenance, input voltage must be cut off.

### 4. ACCESSORIES

- |     |                    |                            |
|-----|--------------------|----------------------------|
| 4.1 | Instruction manual | 1 copy                     |
| 4.2 | Power cord         | 1 pc                       |
| 4.3 | Breadboard         | 1 pc                       |
| 4.4 | Connector cord     | 20cm 20 pcs<br>10cm 10 pcs |
| 4.5 | Fuse               | 1 pc                       |



SHANGHAI MCP CORP.

M21-7000 is one of high level, high quality, digital-analog trainer, which combines all essential function of digital experiment and analog experiment. It is equipped with removable breadboard, DC power supply, function generator, two digits of 7 segment LED displays, 16 bits LED displays, two pulse switches, 2 1/4 inch 8 ohm 0.25W speaker. Additionally, it is with the unique design of universal connector, which reserves fixed holders on the panel in order to be connected with various connectors for the convenience of developing interface circuit. As far as cost-effectiveness is concerned, its versatile function makes users unnecessary to supplement other experiment equipments. In a word, it is ideal for the students of high schools, colleges, vocational training schools, universities and research departments.

## 1. SPECIFICATIONS

### 1.1 SOLDERLESS BREADBOARD:

Interconnected with 2820 tie points nickel plated contact, fitted all DIP sizes and all components with lead and solid wire AWG # 22-30 (0.3-0.8mm). It can be changed and replaced for different purpose and can be connected with demonstration panel. Therefore, it is very convenient for both teachers and students.

### 1.2 DC POWER SUPPLY:

- A. Fixed DC output: +5V, 1A
- B. Fixed DC output: -5V, 1A.
- C. Variable DC output: 0V to +15V, 1A.
- D. Variable DC output: 0V to -15V, 1A.

### 1.3 POTENTIOMETERS:

- A. Variable resistor VR1 = 1k $\Omega$
- B. Variable resistor VR2 = 100k $\Omega$

### 1.4 FUNCTION GENERATOR:

- (A) Frequency range: 1Hz—10Hz  
 10Hz—100Hz  
 100Hz—1kHz  
 1kHz—10kHz  
 10kHz—100kHz

### (B) Amplitude

- Sine wave output: 0—10 Vpp variable
- Triangle wave output: 0—10 Vpp variable
- Square wave output: 0—10 Vpp variable
- TTL mode output: 5 Vpp

### 1.5 SIXTEEN BITS DATA SWITCHES:

16 pcs toggle switches and corresponding output point. When switch is set at “down” position, the output is LO level; contrarily, it is to be HI level while setting at “up” position.

### 1.6 TWO PULSE SWITCH

(WITH 2 SET OF OUTPUT: (A, A, B, B) 2 pcs push buttons contain switches debouncer for eliminating the bounce caused by switch from “open” to “close” or from “close” to “open” position.

### 1.7 SPEAKER:

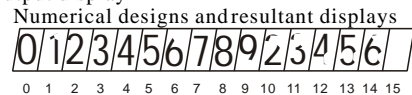
2-1/2 inch diameter, 8 ohm/0.25W to be used for load.

### 1.8 FOUR CHANNEL ADAPTOR:

Both of the two banana sockets' and two BNC jacks' point tips are changeable. It is suitable for M21-7000 to be connected with peripherals.

### 1.9 TWO DIGITS OF SEGMENT LED DISPLAY

#### (A) Output display



segment identification



## (B) Function tables

Decimal Or Function	Inputs				Outputs								
	D	C	B	A	a	b	c	d	e	f	g		
0	L	L	L	L	H	H	H	H	H	L	L		
1	L	L	L	H	L	H	H	L	L	L	L		
2	L	L	H	L	H	H	L	H	H	L	H		
3	L	L	H	H	H	H	H	L	L	L	H		
4	L	H	L	L	L	H	H	L	L	H	H		
5	L	H	L	H	H	L	H	H	L	H	H		
6	L	H	H	L	L	L	H	H	H	H	H		
7	L	H	H	H	H	H	H	L	L	L	L		
8	H	L	L	L	H	H	H	H	H	H	H		
9	H	L	L	H	H	H	H	L	L	H	H		
10	H	L	H	L	L	L	L	H	H	L	H		
11	H	L	H	H	L	L	H	H	L	L	H		
12	H	H	L	L	L	H	L	L	L	H	H		
13	H	H	L	H	H	L	L	H	L	H	H		
14	H	H	H	L	L	L	L	H	H	H	H		
15	H	H	H	H	L	L	L	L	L	L	L		

### 1.10 SIXTEEN BITS LED DISPLAY:

16 red LED's separate input terminals. The LED will be lighted up when input is at “HI level”, and it will be turned off when it is at no input or at “LO level”.

### 1.11 UNIVERSAL CONNECTOR FIXED HOLDER:

It reserves universal connector fixed holder on the panel in order to be connected with various universal connectors, which are available as below, all these accessories are optional:

- (1). Straight header connector 60 pin
- (2). D sub, connector 25 pin male & female
- (3). Card edge connector 3.96mm 56 pin
- (4). Card edge connector 2.54mm 62 pin
- (5). Dip sockets connector 28 pin & 40 pin

### 1.12 DIMENSIONS: 258×95×334mm (W×H×D)

### 1.13 WEIGHT: 4.5kg

## 2. CONTROLS AND DESCRIPTION OF FRONT PANEL

