

TL21-5000 CE

Feature

- High level, high quality digital trainer
- Combines all essential function of digital experiment
- With removable breadboard, DC power supply, pulse generator, two pulse switches, digital probe, TTL/CMOS selector and etc.

Specification

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.

2. DC POWER SUPPLY :

- Fixed DC output : +5V, 1A
- Fixed DC output : -5V, 1A
- Variable DC output : +3V to +15V, 1A
- Variable DC output : -3V to -15V, 1A

3. MODE SELECTOR SWITCH:

When the switch is put on "TTL" or "CMOS" position, the input or output of pulse generator, pulser switches, 8 bits data switches digital probe, 8 bit LED display will meet the HI or LO level of "TTL" or "CMOS".

4. TWO DIGITS OF 7 SEGMENT LED DISPLAY

5. PULSE GENERATOR

- Duty cycle: 50%
- Frequency range: 1Hz ~ 10Hz
10Hz ~ 100Hz
100Hz ~ 1kHz
1kHz ~ 10kHz
10kHz ~ 100kHz
100kHz ~ 1MHz
- Amplitude: 0 ~ 10Vpp
- TTL/CMOS mode output
TTL: +4V
CMOS: +VDC (depend on the +VDC output)

6. SIXTEEN BITS LED DISPLAY

Set mode selector switch to "TTL" position

Logic Level	Input level Display light up
LO	$<0.8 \pm 0.2V$ Green
HI	$>2.3 \pm 0.2V$ Red
Open	0.8 ~ 2.3 No display

Set mode selector switch to "CMOS" position

Logic Level	Input level Display light up
LO	$<30\%+VDC \pm 10\%$ Green
HI	$>70\%+VDC \pm 10\%$ Red
Open	30% ~ 70% +VDC No display

7. TWO PULSE SWITCH:

- A/A,B/B output
Output level:
TTL: HI=4V LO=0.1V
CMOS: HI=+VDC LO=0.1V

8. SIXTEEN DATA SWITCHES:

- TTL: HI=4V LO=0V
CMOS: HI=+VDC LO=0V

9. DIGITAL PROBES:

Set mode selector switch to "TTL" position

Logic Level	Input level Display light up
LO	$<0.8 \pm 0.2V$ L
HI	$>2.3 \pm 0.2V$ H
Open	0.8 ~ 2.3 O
Transit	LO-- >HI P



TL21-5000

Optional accessories



Set mode selector switch to "CMOS" position

Logic Level	Input level Display light up
LO	$<30\%+VDC \pm 10\%$ L
HI	$>70\%+VDC \pm 10\%$ H
Open	30% ~ 70% +VDC O
Transit	LO-- >HI P

Memory: the two points of LED beside 7 segment LED display will keep lighting when they are in "level transition" (LO-- >HI or HI-- >LO)

10. 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 :

- optional accessories :
- Straight header 60 pin
 - Card edge connector 2.54mm 62pin
 - D sub25 pin connector, male & female
 - Card edge connector 3.96mm 56pin
 - Dip sockets connector 28 pin & 40 pin

11. OTHER STANDARD ACCESSORIES :

- Power cord
- Pin : 10cm 20pcs/20cm 20pcs
- User manual

12. DIMENSIONS(W H× ×D): 258 ×95 ×334mm

13. WEIGHT : 4.5kg

TL21-7000

Feature

- High level, high quality digital-analog trainer
- Combines all essential function of analog and digital experiment
- With removable breadboard, DC power supply, function generator, two pulse switches, 2 1/4 inch 8 ohm 0.25W speaker and etc.

Specification

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.

2. DC POWER SUPPLY :

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

3. POTENTIOMETERS:

- Variable resistor VR1 = 1k Ω
- Variable resistor VR2 = 100k Ω

4. FUNCTION GENERATOR :

- 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 : 4 Vpp

5. SIXTEEN BITS DATA SWITCHES :

16pcs 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.

6. TWO PULSE SWITCH

(WITH 2 SET OF OUTPUT : ($\bar{A}$, A, $\bar{B}$, B))
2pcs pushbuttons contain switches debouncer for eliminating the bounce caused by switch from open to "close" or from "close" to "open" position.

7. SPEAKER :

2-1/2 inch diameter, 8 ohm/0.5W to be used for load.

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.

9. TWO DIGITS OF 7 SEGMENT LED DISPLAY

- Output display
- Numerical designs and resultant displays



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

segment identification



Optional accessories



TL21-7000



(B) Function tables

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

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".

11. UNIVERSAL CONNECTOR FIXED HOLDER :

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optional accessories :

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