

INSTRUCTION MANUAL OF DIGITAL TRAINER KIT MODEL NO: DTK 209

“SYNCHRO ELECTRONICS” made Digital Trainer Kit to verify the following experiments:

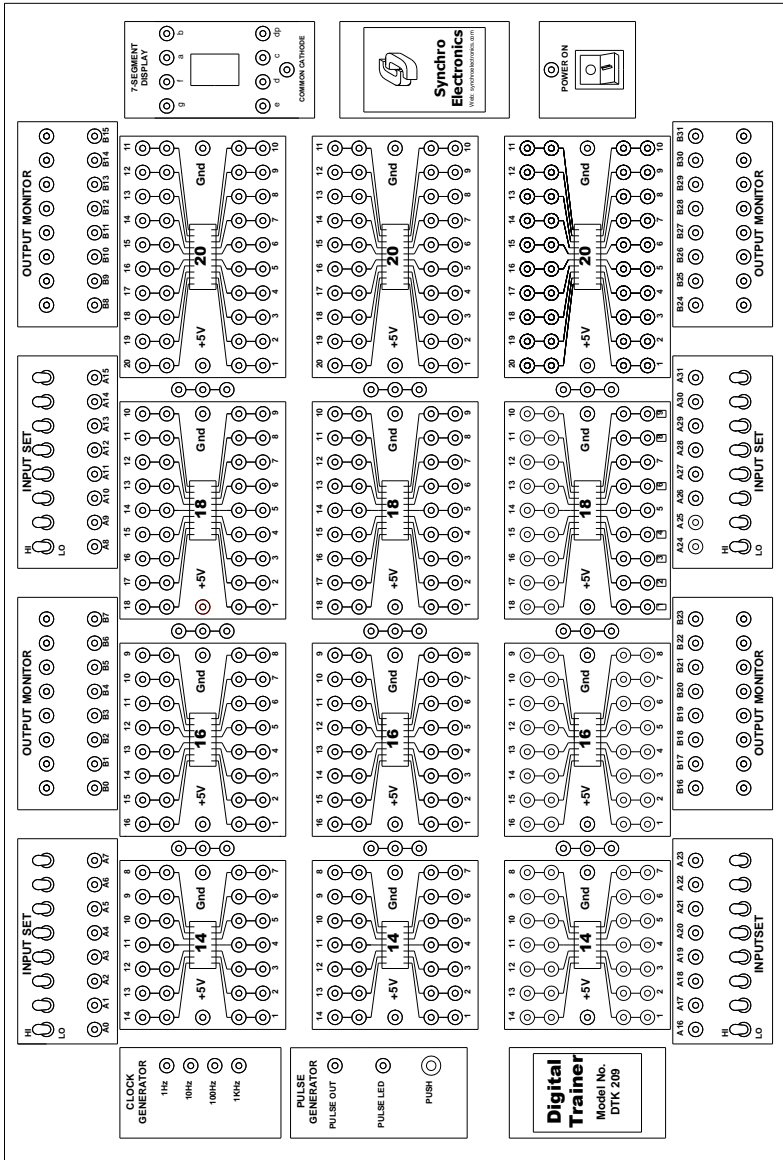
- A. IC Basic Logic Gates.
- B. Verification of Basic Logic Gates.
- C. Verification of Boolean algebra.
- D. Verification of De Morgan’s Theorem.
- E. Multiplexer & Demultiplexer.
- F. 4-Bit Counter (Synchronous & Asynchronous).
- G. Study of Flip-Flop.
- H. 4/8 Bit Analog to Digital Converter.
- I. Digital to Analog Converter.
- J. Encoder & Decoder Circuit
- K. Study of Parity generator/checker.
- L. Study of Adder & Subtractor.
- M. Study of Shift registers.

This Trainer Kit also performed many other Digital experiments other than above experiments.

The Instrument comprises of the following built in parts: -

- Fixed output DC Regulated power supply of 5V & ground point in each blocks.
- 32 logic input ‘LO’ & ‘HI’ selectable through SPDT switches with output on sockets are provided on the top & bottom of the front panel.
- 3 nos. of 14 pins, 16 pins, 18 pins, 20 pins IC base are provided on the front panel & 2 nos. of output sockets in each pin.
- One Clock Generator with frequency range of 1Hz, 10Hz, 100Hz & 1KHz provided.
- One 7-segment Display with common Cathode is in front panel.
- 32 nos. red output indicators with 2mm. sockets are provided of important test points.
- Single Pulse Generator of 10 μ s with indicator in front panel.

Functional Description:



TOP VIEW OF DTK 209

Specification:**INPUT SET:**

- Can be set as 'High' or 'Low' input by toggle switches
- Set 'High' is $5V \pm 4\%$ through fixed impedance of $200\Omega \pm 1\%$
- Set 'Low' is $0V$ through fixed impedance of $200\Omega \pm 1\%$
- Can be set any binary combination up to 32 bit
- Output is short circuit protected against GND and +5V for infinite time

OUTPUT MONITOR:

- Can be monitored logic levels at any test point
- Logic 'High' is indicated by corresponding LED glow
- Logic 'High' is discriminated when the voltage is more than 2.2V
- Logic 'Low' is discriminated when the voltage is below 1.8V
- The corresponding LED will not glow when high impedance state is connected
- Input impedance $> 20K\Omega$
- Can be monitored up to 32 bit

SEVEN SEGMENT DISPLAY:

- Can be monitored logic levels at any test point
- Logic 'High' is indicated by corresponding LED glow
- Logic 'High' is discriminated when the voltage is more than 2.2V
- Logic 'Low' is discriminated when the voltage is below 1.8V
- The corresponding LED will not glow when high impedance state is connected
- Input impedance $> 20K\Omega$
- Can be displayed from common cathode standard 7-segment driver

CLOCK GENERATOR:

- 1KHz, 100Hz, 10Hz and 1Hz output
- Frequency accuracy: $\pm 0.1\%$
- Duty cycle: $50 \pm 0.1\%$
- Output impedance $< 220\Omega$
- Output is short circuit protected against GND and +5V for infinite time

PULSE GENERATOR:

- Single Pulse is generated when TRIGGER push switch is pressed
- Pulse width $10\mu\text{s} \pm 10\%$
- Rise time $< 200\text{ns}$
- Fall Time $< 100\text{ns}$
- Output is short circuit protected against GND and +5V for infinite time

Others:

Power Input: AC 230V $\pm 10\%$, 50Hz,

Operating Temperature: 0°C to 40°C

Dimension: 485mm X 335mm X 180mm

Weight: 5.9 Kg

Standard Accessories: Mains Cord – 01No. Patch Cord – 28Nos. Instruction Manual – 1No.

Do's

- Please cover the system when not in use
- Please connect to the rated input power only (AC 230V $\pm 10\%$, 50Hz)
- Please switch off the Instrument, when not in use.

Don'ts

- Please do not put voltage more beyond -0.5V to 5.5V at the 'OUTPUT MONITOR' pins
- Please do not use fuses more than the specified current rating mentioned,
- Please do not use any patch cord which is not fitted easily to this kit,

Primary Trouble shooting:

- Mains LED (Green) not glowing: - Checked the Input Voltage and Mains Fuse (500mA).
- Output Monitor LED (Red) not glowing: - Checked the DC Drive Fuse (500mA).