**FEATURES**

- Computer-based training in the areas of electrical engineering and electronics.
- Huge selection of courses
- Encourages practical experiments using the PC-based measuring instrument
- Built-in, removable connectors for easier and more cost-effective connectivity
- Provides the inputs, outputs, relays and measuring equipment necessary for experiments.
- Transferring measured data to the computer and adjustment data to the interface.
- Intuitive graphic interface for easy use
- Learning and experiment software
- Integrated measuring instruments and power supply
- Multimedia courses
- High-tech measurement and control interface

**DESCRIPTION**

An understanding of Electricity and Electronics is a primary requirement in all branches of engineering and science education. A challenging and interesting medium is required to hold the attention of students in such a multi-discipline area of study.

GOTT-PCBASE-EE is a multimedia e-learning system with integrated, mobile electronics lab for general education and advanced training in electrical engineering and electronics. Students can learn to log the real time data through DAQ card and outputs can be observed on the PC by connecting trainer to a PC through DAQ CARD.

**SYSTEM REQUIREMENTS**

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>1.5 gigahertz (GHz) or faster</td>
</tr>
<tr>
<td>Random Access Memory</td>
<td>256 MB or higher</td>
</tr>
<tr>
<td>Free Hard Disk Space</td>
<td>1 gigabytes (GB) or higher</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>CD drive or DVD drive</td>
</tr>
<tr>
<td>Sound Card</td>
<td>16-bit sound card or higher</td>
</tr>
<tr>
<td>Sound Output Device</td>
<td>Speakers or headset</td>
</tr>
<tr>
<td>Monitor</td>
<td>Super VGA (800 x 600) resolution or higher</td>
</tr>
</tbody>
</table>

**EXPERIMENT TOPICS**

**DC CIRCUIT GROUP**

- Electric Circuit
- Ohm's Law
- Series Connection
- Parallel Connection
- Series & Parallel 1
- Series & Parallel 2
- Series & Parallel 3
- Series & Parallel 4
- Power Series Connection
- Power Parallel Connection
- Multiplier
- Switch Contact
- Relay Contact

**AC CIRCUIT GROUP**

- Y Network
- Network
- Kirchhoffs Current Law
- Kirchhoffs Voltage Law
- Kirchhoffs Law
- Wheatstone Bridge
- Principle of Superposition
- Thevenin's theorem
- Millmans's theorem
- Reciprocity theorem
- Reciprocity theorem
- Impedance matching

**SEMICONDUCTOR CIRCUIT GROUP**

- R.L.C. Circuit
- R.L.C. Series Circuit
- R.L.C. Parallel Circuit
- Band Pass Filter
- Low Pass Filter
- High Pass Filter
- Inductance Measure
- L Series Circuit
- L Parallel Circuit
- Parallel Resonance Circuit
- Capacitance Measure

- C Series Circuit
- C Parallel Circuit
- Series Resonance Circuit
- Wye Connection of Voltage and Current
- Delta Connection Voltage and Current
- Wye & Delta Connection of Current

- Diode Characteristic
- Zener Diode Characteristic
- Diode Limiter
- Bridge Diode
- Diode Clamper
- Zener Diode Limiter
- Light Emitting Diode
- Infrared LED & Photo TR
- Photo Diode

- JFET Characteristic
- MOSFET Characteristic
- UJT Characteristic
- SCR Characteristic
- NPN Transistor
- PNP Transistor
- Diac Characteristic
- PUT Characteristic
- Triac Characteristic
- IGBT Characteristic
**EXPERIMENT TOPICS**

**DIGITAL CIRCUIT GROUP**
- AND / NAND
- OR / NOR
- NOT
- XOR / XNOR
- De Morgan XOR
- De Morgan XNOR
- Open Collector
- De Morgan’s Law 1
- De Morgan’s Law 2
- Boolean Algebra 1
- Boolean Algebra 2
- RS Flip Flop
- JK Flip Flop
- Half Adder & Full Adder
- Half & Full Subtractor
- D Flip Flop
- Johnson Counter
- Up/Down Counter
- Synchronous
- Decade Counter
- 2 to 4 Decoder & 4 to 2 Encoder
- 2 to 4 Line Decoder
- 8 to 3 Line Priority Encoder
- BCD to Seven Segment Decoder
- 4 to 1 Multiplexer
- 4 Bit Decade Counter
- 8 Bit Shift Register
- Decade Counter
- SRAM 6264
- EEPROM 28 C64

**TRANSISTOR AMPLIFIER CIRCUIT GROUP**
- Base Bias
- Emitter Bias
- Voltage Division Bias
- Collector Feedback Bias
- DC Load Line Bias
- Frequency Response Bias
- Common Base
- Common Emitter
- Common Collector
- Heat Stability 1
- Heat Stability 2
- Darlington Pair
- Common Source Amp JFET
- Common Drain Amp JFET
- Common Gate Amp JFET
- Common Source MOSFET
- Multistage FET Amplifier
- B Class Push-Pull Amp
- Synchronous C Class Amp
- Differential Amp
- Multistage Amplifier
- Complementary Amp

**POWER SUPPLY GROUP**
- Half / Full Rectifier
- Bridge Rectifier 1
- Bridge Rectifier 2
- Voltage Booster
- IC Voltage Regulator 1
- IC Voltage Regulator 2
- Constant Voltage Circuit
- Series Voltage
- Constant Current Limit
- TR Voltage Regulator
- Parallel Voltage Regulator
- Fold-Back Current Limit
- 5V Output Shunt Regulator
- Current Boost (PNP TR)

**EXPERIMENTAL TOPICS**

**OP-Amp CIRCUIT GROUP**
- Input offset
- 741 Slew rate
- 356 Slew rate
- 741 CMRR Characteristic
- Gain Band Width Product
- OP-AMP Power Coupling
- Zero Crossing Detector
- Hysteresis Comparator
- Output Limit
- Inverting Amplifier
- Non-Inverting Amplifier
- Voltage Follower
- Inverting Summer Amplifier
- Non-Inverting Summer Amplifier
- Comparator
- Window Comparator
- Difference Amplifier 1
- Difference Amplifier 2
- Differentiator
- Integrator
- Voltage to Current
- Current to Voltage
- Half Rectified
- Wave Convert
- Low Pass Filter
- Band Pass Filter
- High Pass Filter
- Phase Shifter
- Adder Amp 1
- Adder Amp 2
- Adder Amp 3
- OP- Amp Rectifier
- Peak Detector

**OSCILLATION CIRCUIT GROUP**
- Tank Circuit
- Lamp Generator
- Astable Multivibrator
- Monostable Multivibrator
- Bistable Multivibrator
- Two Phase Oscillator
- Oscillator
- Phase Shift Oscillator
- Wien Bridge Oscillator
- Colpitts Oscillator
- Hartley Oscillator
- Crystal Oscillator
- Triangular Oscillator
- Voltage Controlled Oscillator
- Rectangular Wave Oscillator

**PHOTO ELECTRONICS (DEVICE) CIRCUIT GROUP**
- Photo Transistor TLP521-1
- Photo IC TLP520
- AC Power Coupler TLP60

**MAGNETIC CIRCUIT GROUP**
- Electricity and Magnetism
- Coil of Polarity
- Reverse Electromotive Force
- DC & AC Relay
- Electromagnetic Induction
- Motor & Generator
- Rotary Magnetic Field
- Magnetic Mutual Induction
- Transformation Ratio
- Transformer Polarity
- Transformer Load

**DC SERVO GROUP**
- Summing Amp
- Proportion Amp
- F/V Converter
- Motor Driver & Encoder
### EXPERIMENTAL TOPICS

#### AD & DA CONVERTER GROUP
- 4 Bit Weight
- Resistance Type D/A
- Current Add Type D/A
- Voltage Add Type D/A
- 4 Bit Resistance
- Voltage Division Type D/A
- DAC 0800D/A Converter
- Parallel Comparison A/D
- VR Continuance
- Comparison Type A/D
- Feedback Type
- Sample & Hold
- Basic Voltage Circuit
- ADC0804 A/D Converter

#### SENSOR CIRCUIT GROUP
- Thermocouple
- Resistance Temperature
- Detector (RTD)
- Thermistor NTC
- Thermistor PTC
- Infrared Sensor
- Cadmium Sulphide
- Cell (CDS)
- Gas Sensor
- Humidity Sensor
- Pressure Sensor
- Load Cell
- Photo Sensor
- Solar Cell
- Temperature
- Controller
- Current Sensor
- Voice Control
- Sensor
- Supersonic Sensor
- Inductance Meter
- Capacitance Meter
- Distance Measurement
- Meter

#### POWER ELECTRONICS CIRCUIT GROUP
- SCR DC Gate
- Diode Half Rectifier
- Diode Full Rectifier
- Single Phase Inverter
- Half Phase Control
- Full Phase Control
- AC Phase Control
- Buck Chopper
- Boost Chopper
- DC Power Controller
- SCR AC Control
- SCR Gate Trigger
- Single Phase Cycle
- Converter
- Three Phase Diode
- Full Rectifier
- Three Phase
- Voltage Type
- Inverter
- Three Phase
- Controller
- Three Phase Half-
- Wave Control Rectifier
- Three phase AC
- Control
- Three Phase Full-
- Wave Control Rectifier

### SOFTWARES

#### MAIN INSTALLATION SCREEN
- Double-click the
- “GOTT-10-05 (CBT
- Main)” icon from
- the desktop to access
- the CBT system.
- CBT system can also
- be started from
- Windows Start Menu.
- Follow this sequence
- “Start → All Programs →
- GOTT CBT →
- GOTT-10-05 (CBT
- Main)”

#### CBT MAIN MENU
- CBT Main Menu will prompt
- on the screen

#### GROUP DESCRIPTION 1
- Among the menu
- that can be select is
- by the boxes that
- provide in the Group
- Description 1: -
- DC Circuit Group
- AC Circuit Group
- Semiconductor Circuit
- Group
- Digital Circuit Group
- Transistor Amplifier
- Circuit Group
- Power Supply Group

#### GROUP DESCRIPTION 2
- Among the menu
- that can be select is by
- the boxes that provide
- in the Group Description
- 2: -
- OP-Amp Circuit Group
- Oscillation Circuit
- Group

### GROUP MODULE MENU

- By default,
- the first module
- and the first sub
- module will be
- selected. Example,
- this figure showing
- that module
- number “06-01. Digital
- Circuit 1 S-
- 50-M12 (GOTT-10-
- M12)” and sub
- module number
- “06-01-01.”
- AND / NAND” were
- selected. The
- experiments available
- are total three (3)
- experiments.
- Different module will
- have different number
- of experiments.

### EXPERIMENTAL MENU

- The experimental
- menu will prompt
- out as shown in
- above figure.
- By default, the
- experiment
- objectives will be
- shown first. Simply
- point the mouse
- cursor to any other
- tab, the colour of
- the tab will be
- highlighted.
- Next, click on the
- tab button. It will then
- change to purple
- colour. The
- document shown will
- be changed
- Example, figure 2.3.3
- showing that the
document had been
changed from
“Objectives” to
“Components and
Equipment”.

---

**E-57**

---
**ANSWERING RELATED QUESTION / INFO**

- Answering related question/info in experimental procedures

**SUMMARY TAB**

- When finished the experimental procedures, browse through the “Summary” tab.

**EXERCISES**

- When finished, browse to “Exercises” tab and try answering all those questions.

**INSTRUMENTS (1)**

- The “16 bit LEDs” will display on the second screen as shown in figure as above.

**INSTRUMENT (2)**

- As shown in next to figure, click the “START” button, then the LEDs will be turned on or off. A graphical LED status will be shown in time domain where the sampling time is 0.5 seconds.

The optional hardware modules incorporated in this GOTT-PSBASE-EE are:-

**PRODUCT MODULES**

<table>
<thead>
<tr>
<th>AC/DC POWER SUPPLY</th>
<th>CODE 102-977</th>
<th>IC SOCKET 1</th>
<th>CODE 102-989</th>
<th>FUSE</th>
<th>CODE 102-979</th>
<th>SPEAKER</th>
<th>CODE 102-980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage : 240VAC</td>
<td></td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td></td>
<td>Input Voltage : 240VAC</td>
<td></td>
<td>Input Voltage : 5VDC or 12VDC</td>
<td></td>
</tr>
<tr>
<td>Output Voltage : ± 18VDC and 5VDC</td>
<td></td>
<td>IC Socket Type : 14 pin x 2 units and 16 pin x 2 units</td>
<td></td>
<td>AC Fuse : 3A x 2 units</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IC SOCKET 2 CODE 102-990 | INVERTER CODE 102-993 | ADAPTER CODE 102-981 | TOGGLE SWITCH CODE 102-982 |

| Input Voltage : 5VDC and 12VDC | Input Voltage : 240VAC | Input Voltage : 5VDC or 12VDC | Input Voltage : 5VDC or 12VDC |
| IC Socket Type : 20 pin and 40 pin | Output : U,V,W | Panel Socket : 4mm,2mm and BNC sockets | Switch Type : SPDT and DPDT |

**MAIN SUPPLY UNIT CODE 102-978 | SENSOR CIRCUIT 2 CODE 102-986 | VARIABLE AC CODE 102-983 | POTENTIOMETER CODE 102-984 |

| Input Voltage : 240VAC | Input Voltage : 5VDC and 12VDC | Input Voltage : 240VAC | Input Voltage : 5VDC or 12VDC |
| Three Phase: 12VAC and 24VAC |              |              | Range : 1kΩ, 100kΩ, 500kΩ and 1MΩ |
**PC BASED ELECTRICITY AND ELECTRONICS TRAINER**

Model Number : GOTT-PCBASE-EE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CODE 102-976</th>
<th>CODE 102-988</th>
<th>CODE 102-987</th>
<th>CODE 102-992</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINGLE PHASE AND THREE PHASE POWER SUPPLY</strong></td>
<td>Built-in with MCB, ELCB, Emergency Stop Button and protection fuse.</td>
<td>Sensor Type : Pressure Sensor and Distance Measure Meter</td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Brand : LODESTAR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CODE 102-991</th>
<th>CODE 102-995</th>
<th>CODE 102-994</th>
<th>CODE 102-996</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPUTER BASED MULTIFUNCTION DATA ACQUISITION CARD</strong></td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
</tr>
<tr>
<td></td>
<td>Digital input and output : 16 each</td>
<td>NPN Type : 2N3904, 2N3772, BD137, BC40, BC550 and TIP162</td>
<td>Inductor Range : 10mH/20mH/30mH/33mH/100mH/2.2µH/100µH/140µH/150µH</td>
<td>Trigger Pulse input Voltage : 21VAC</td>
</tr>
<tr>
<td></td>
<td>Analog input : 16</td>
<td>PNP Type : 2N3906, TIP2955, BC160</td>
<td>Diode Range : 1N4007, 1N914, 1N5821 and 1N5822</td>
<td>SCR Type : 2N4441, 2N443,BTW58</td>
</tr>
<tr>
<td></td>
<td>Analog Output : 2</td>
<td>FET Type : 2N5457 and 2N5458</td>
<td>Zener Diode : 6.2V,8.2V,9.1V</td>
<td>TRIAC Type : BT137</td>
</tr>
<tr>
<td></td>
<td>Built-in with Counter Signal, Gate Input Timer, PCI Output Voltage and External Input AD Trigger Signal and Clock Signal.</td>
<td>Photo diode : TIL80</td>
<td></td>
<td>MOSFET Type : 2SK31100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photo Transistor : TIL100</td>
<td></td>
<td>DIAC Type : DB3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CODE 102-985</th>
<th>CODE 159-019</th>
<th>CODE 297-000</th>
<th>CODE 102-997</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRANSISTOR</strong></td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
<td>Input Voltage : 5VDC and 12VDC</td>
</tr>
<tr>
<td></td>
<td>Sensor Type : Thermocouple, Photo Sensor, PTC &amp; NTC Thermistor</td>
<td>NPN Type : 2N3904, 2N3772, BD137, BC40, BC550 and TIP162</td>
<td>Inductor Range : 10mH/20mH/30mH/33mH/100mH/2.2µH/100µH/140µH/150µH</td>
<td>Trigger Pulse input Voltage : 21VAC</td>
</tr>
<tr>
<td></td>
<td>Cadmium Sulphide Cell (CDS) and Resistance Temperature Detector (RTD)</td>
<td>PNP Type : 2N3906, TIP2955, BC160</td>
<td>Diode Range : 1N4007, 1N914, 1N5821 and 1N5822</td>
<td>SCR Type : 2N4441, 2N443,BTW58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FET Type : 2N5457 and 2N5458</td>
<td>Zener Diode : 6.2V,8.2V,9.1V</td>
<td>TRIAC Type : BT137</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photo diode : TIL80</td>
<td></td>
<td>MOSFET Type : 2SK31100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photo Transistor : TIL100</td>
<td></td>
<td>DIAC Type : DB3</td>
</tr>
</tbody>
</table>

**SAFETY CONNECTING LEAD**

4mm connecting leads

**U-LINK**

For connecting junction point

**VERTICAL FRAME**

High level : DIN standard A4 with two shelves
Material: Aluminium
Side Frame: T shape
Size: 3-Layer 1450mm Length

**SAFETY CONNECTING LEAD**

4mm connecting leads

**GENERAL TERMS:**

1. Accessories will be provided where applicable.
2. Manual & Training will be provided where applicable.
3. Design & specifications are subject to change without notice.
4. We reserve the right to discontinue the manufacturing of any product.

**ORDERING INFORMATION:**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL NUMBER</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC BASED ELECTRICITY AND ELECTRONICS TRAINER</td>
<td>GOTT-PCBASE-EE</td>
<td>102-975</td>
</tr>
</tbody>
</table>

*Proposed design only, subject to changes without any notice.*