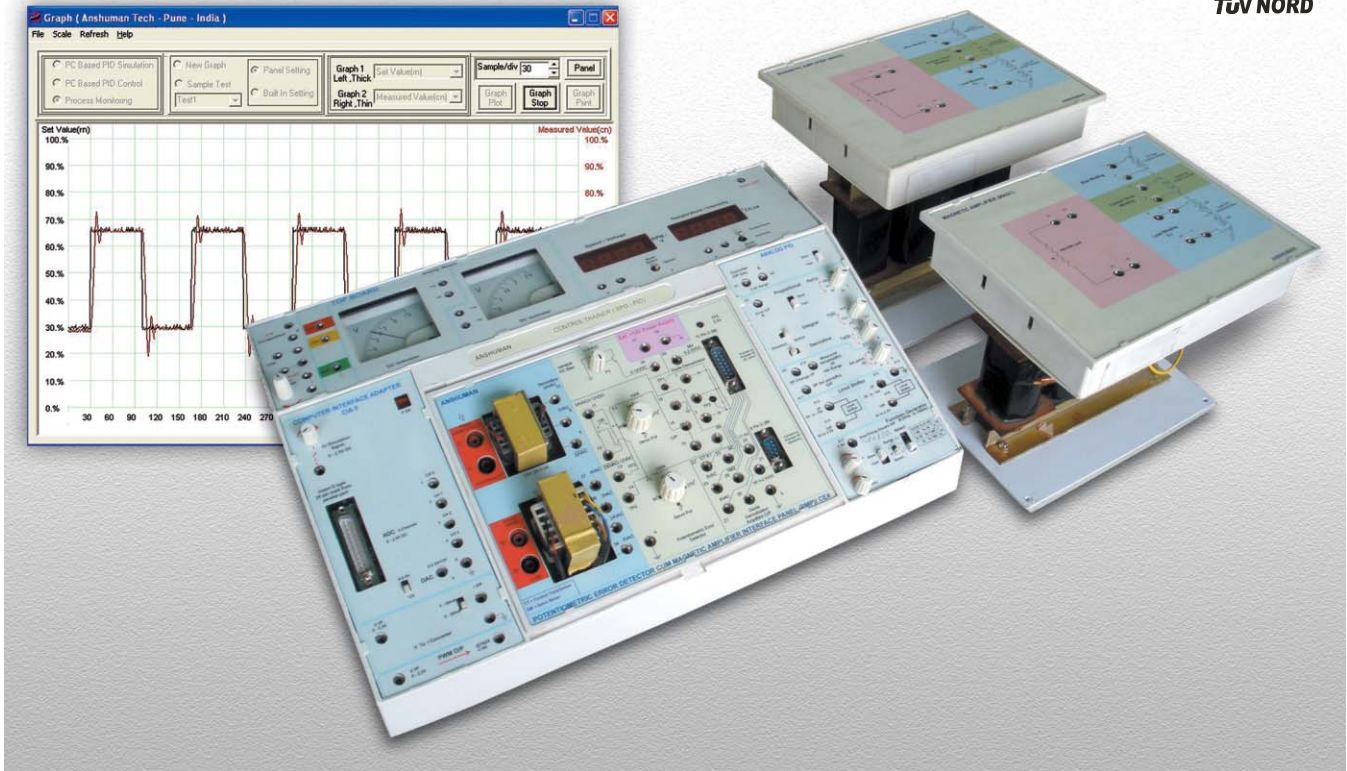


# ELECTRICAL CONTROL TRAINER (Model : XPO-ECT)



## SALIENT FEATURES

- ◆ Learn how NAVY control systems work.
- ◆ Facility to monitor behavior of the output & process variable either on PC screen or on CRO.
- ◆ Can learn about different optional building blocks and real life processes using replaceable experiment panel & table top units : e.g. Magnetic amplifier, AC servo motor, Synchros, servo pot etc.
- ◆ Graph printing facility for laboratory journal entries.
- ◆ Aesthetically designed injection moulded electronic desk (master unit) carrying useful experiment resources like Power supplies, meters, Computer Interface, with central slot to hold various replaceable experiment panels.
- ◆ Connection through sturdy 4mm Banana sockets & Patch cords, security sockets for high voltage.
- ◆ Students workbook & Instructor's Guide provided with each unit

## SPECIFICATIONS OF MASTER UNIT

- ◆ **Basic Resources on Top board**
- **Built in power supply**
  - DC supply
  - ±12V,500mA.
  - Variable DC power supply: 7 to 14Vdc/3Amp.
- **Display**
  - A) Analog Meter 2Nos.
  - a) Centre zero for display of process error (+9V)
  - b) For MV/SP (0-2.5V)
- **Operating voltage**
  - Switch selectable 220-240Vac ±10% 50Hz.
- **Computer Interface Adaptor / CIA**
  - Optoisolated Adaptor to prevent damage to PC

parallel port (25 pin LPT) due to wrong connections. Interfaces through 25 pin M to F cable 1mtr Length.

4 ADC channels : 0 to 2.5V full scale.

1 DAC channel : O/P 0 to 2.5 V FS.

V to I Function block : Input : 0-2.5Vdc  
Output : 0-20 or 4-20mA,  
(Max.100 ohm load).

### ● Software

P4 / XP / Parallel port based, data acquisition cum monitoring interface adaptor to study closed loop dynamics (PC not in scope of supply).

### ● Mechanical Dimensions

a) Master Unit : 400mm(W) X 25mm(H)  
X 270mm(D)

Net weight : 8Kg.  
 Gross weight : 10Kg.  
 b) Panel : 215mm(W) X 165mm(H) X  
 X 40mm(D)  
 Net weight : 700gm approx.

### MODULAR EXPT. PANELS OFFERED

(Must select atleast one of following panels to work)

#### ◆ Potentiometric error detection cum magnetic amplifier interface panel (PMP)/CE4.

Onboard Transformer - 2Nos.

I) P: 0-230Vac S1 : 0 - 24Vac / 50mA,  
 S2 : 0 - 6Vac / 500mA  
 II) P: 0-230Vac S1 : 24 - 0 - 24 / 50mA

- **Potentiometric error detector (Can be Supplied as standalone panel)**
  - 360° servo pots / 10K - 2Nos.
  - Facility to study error under AC supply (24-0-24) as well as DC supply ( $\pm 12$ ) application.
- Diode Demodulator to convert AC error signal from process VI into DC error to control magnetic amplifier.
- 15 pin D (F) connector to interface with AC servo motor (process VI) & 9 pin D (F) connector to interface with synchro command station (Process VII).
- Variable control voltage 0 - 12VDC / 500mA for plotting Magnetic amplifier characteristics.

### Optional Process Set up

Process	VI AC servo position Control	VII Synchro Transmitter Receiver process	VIII Magnetic Amplifier
<b>Electrical</b>	<ul style="list-style-type: none"> <li>● AC geared (50:1) servo motor. Main winding : 230VAC, Control winding : 6VAC/1A, O/P shaft RPM 25 (D), RPM 2500(ND).  <b>Loading</b> : Using PMDC generator. 12V/1.5A max., Servo amplifier with builtin Power Supply.</li> <li>● 15 pin D (M) connector to interface with PMP</li> </ul>	<ul style="list-style-type: none"> <li>● Operated from 230Vac <math>\pm 10\%</math> 50Hz.</li> <li>● <b>Synchro transmitter / Receiver pair</b> <ul style="list-style-type: none"> <li>- Rotor 1phase 115Vac/ 120mA</li> <li>- Stator 3 phase 90Vac</li> <li>- 9 pin D (M)connector (optional) to interface with PMP panel</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Mag. Amplifiers 2Nos table top units with bias &amp; error winding (12V / 500 mA each) and load winding (6Vac/500mA).</li> </ul>
<b>Panel</b>	PMP	PMP (Optional)	PMP
<b>Sensor</b>	<ul style="list-style-type: none"> <li>● 1No. of Servo pot as position feedback of synchro control transformer coupled to motor shaft for PC/CRO interface. (0-2.5Vdc)</li> <li>● <b>Synchro control transformer</b> to generate position feed back for mag. amplifier based Electrical control system(Naval application)</li> </ul>	<ul style="list-style-type: none"> <li>● 1 No. servo pot (optional) for position feedback (0-2.5V) of command synchro for PC interface.</li> </ul>	<ul style="list-style-type: none"> <li>● Loading resistor 10 ohm/5W.</li> </ul>
<b>Mechanical</b>	Weight : 8 Kg 365 (L) x 220 (W) x 95 (H)	Wt. 1.5kg 220 (L) x 150 (W) x 95 (H)	Wt. 5 kg 210 (L) x 165 (W) x 150 (H) mm
<b>Additional</b>		<ul style="list-style-type: none"> <li>● Acts as electrical command station (SP)for process VI if interfaced with PMP.</li> </ul>	Can draw characteristics curve, series parallel mode of connection.

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