



EDUCATIONAL MODULAR SYSTEM FOR THE STUDY OF THE SENSORS, TRANSDUCERS AND THE RELATED CONTROL CIRCUITS

The **TP-4000 "MODULAR-GAUGE"** unit is a modular training system for the study of the industrial transducers and of the relevant electronic circuits of signal managing and conversion.

By means of its modular composition, it is possible to choose the optimal configuration according to any specific educational requirements and available budget. The possibility of further integrations or updating in the future is obviously ensured.

The **TP-4000** system consists of the following items:

- Desk-top base unit (**TP-4000/BS**) arranged to house the "**UBE**" and "**UMS**" series panels and experimental modules.
- Different D.C. power supplies, digital instruments, A/D, D/A, I/V and V/I converters, drives and controls are provided to carry out all the exercises foreseen in the courseware manuals included.
- "**UBE**" series experimental panels with electronic circuits for the conditioning of signals coming from any ic or digital transducer.
- "**UMS**" series experimental modules for the study of different types of transducers.
- Series of special conductors and different accessories required for the system use (included in the basic configuration).
- Theoretical-practical volumes with developed exercises available in English or French languages.
- Hardware and management software device for PC data acquisition Mod. **USM/HSW**
- Storage enclosure Mod. **UN/CNT** for **UBE-UMS** series modules.

Each **TP-4000** training system configuration chosen by the Customer is supplied completely autonomous. The experimental modules with different built-in transducers are already equipped with the electrical or mechanical devices for the transducer excitation without additional external devices. The Mod. **TP-4000/BS** desk-top base unit and the "**UBE**" series of electronic panels are designed to receive and manage signals of the most transducers nowadays on the market, so making the **TP-4000** system even more flexible. The connection to external devices, as for example PLC or PC, allows to simulate dynamically open or closed loop in industrial processes.

TECHNICAL FEATURES

Mod. TP-4000/BS DESK-TOP BASE UNIT

a) Mechanical features:

- Sturdy structure in folded sheet-steel
- Key locked back door
- Synoptic panel in anodized and silk-screened aluminium
- Adjustable feet
- Antiscratch oven painting
- Dimensions: cm 41x72x44h
- Weight: about 21 kg.

b) Electrical features:

- 220 V / 50 Hz single-phase mains power supply (others on request)
- Fuses and mains filter
- Execution according to CE safety rules

c) Functional features:

On board of the Mod. **TP-4000/BS** desk-top base unit are included:

- Stabilized 0÷30 Vdc power supply
- Stabilized +5 ±12 ±15 + 24 Vdc power supply
- Temperature adjustable oven for thermocouples and thermo-resistances
- Two digital multimeters
- Analog-to-digital converter (8 bit)
- Digital-to-analog converter (8 bit)
- Signal converter 0÷10 V/0÷20 mA
- Signal converter 0÷20mA/0÷10V
- 4 digit BCD display
- 12 led string for binary reading
- 1 high reliability bread board
- Banana plug-BNC adapters (different diameters)



"UBE" SERIES EXPERIMENTAL PANELS WITH ELECTRONIC CIRCUITS

a) Mechanical features:

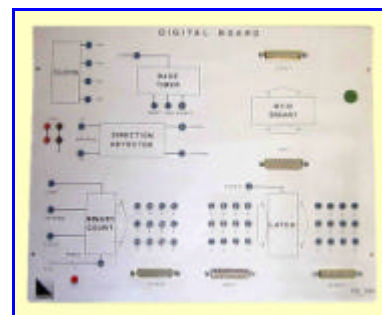
- Panel in anodized and silk-screened aluminium reproducing different internal electronic circuits
- Electronic circuits lower plastic protection
- High reliability 2mm bushes
- Rubber feet
- Dimensions: cm 30x37

b) Functional features of the Mod. UBE-01/A analog signals conditioning electronic panel:

- Reference current generator
- Reference voltage generator
- 2 Comparator amplifiers
- Four inputs summing amplifier
- Adjustable gain output stage

c) Functional features of the Mod. UBE-02/D digital signals conditioning electronic panel:

- 12 bit latch
- Up-down binary counter
- Direction detector
- 12 bit binary to BCD converter
- Clock generator
- Base time generator



d) Functional features of the Mod. UBE-03/T electronic panel for conditioning of analog signals coming from temperature transducers:

- Linearization circuit for thermoresistances
 - Cold junction compensator for thermocouples
- The panel is supplied with a J type industrial thermocouple and a PT100 industrial thermoresistance with shielded and compensated cables.

"UMS" SERIES EXPERIMENTAL MODULES WITH ANALOG / DIGITAL TRANSDUCERS

a) Mechanical features:

As for "UBE" series panels but with dimensions: cm 16x37

b) Functional features:

- Analog and digital transducers of industrial type
- Built-in transducer electrical or mechanical excitation system

Detailed technical specification of each transducer are available on request.

NOTE: The analog transducers need the Mod. **UBE-01/A** experimental panel, while the digital ones the Mod. **UBE-02/D** panel.

TP-4000 "MODULAR GAUGE" SYSTEM COMPOSITION

1. TP-4000/BS

Desk-top base unit for "UBE", "UMS" series panels and experimental modules.

2. UBE-01/A

Universal electronic panel for managing and conversion of signals coming from analog transducers.

3. UBE-02/D

Universal electronic panel for managing and conversion of signals coming from digital transducers.

4. UBE-03/T

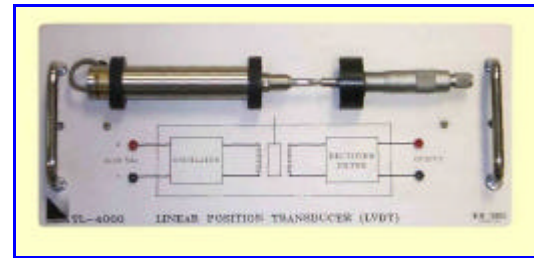
Universal electronic panel for signals managing coming from temperature transducers. It is supplied equipped with J type thermocouple and PT100 thermoresistance with shielded and compensated cables. The sensors may be inserted into the variable temperature oven of the **TP-4000/BS** base unit.

5. UMS-01/PZ

Module for the study of potentiometric resistive transducers (linear and angular position) with displacement micrometric device.

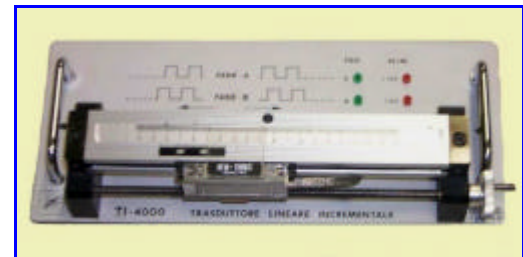
6. UMS-02/LVDT

Module for the study of linear position transducers (LDVT differential transformer) complete of displacement micrometer.



7. UMS-03/RO

Module for the study of incremental linear position transducers with displacement micrometric device.



8. UMS-04/SG

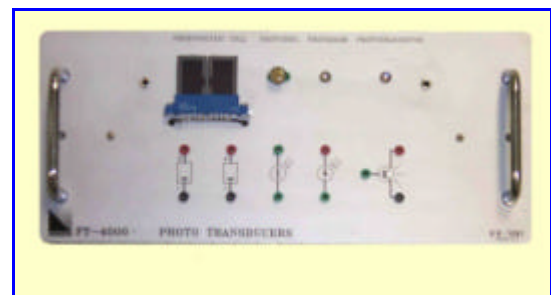
Module for the study of strength, weight and pressure (Strain-gage) transducers complete of calibrated weights.

9. UMS-05/PS

Module for the study of inductive, analog inductive and capacitive proximity sensors complete of displacement micrometric device.

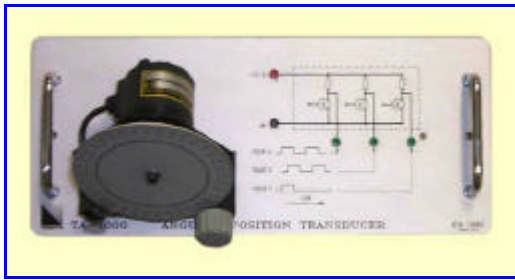
10. UMS-06/FT

Module for the study of the main phototransducers (photo-diode, phototransistor, photoresistance and photovoltaic cell) complete of variable intensity light source.



11. UMS-07/EN

Module for the study of angular encoders (angular position transducers) with graduated angular scale.



12. UMS-08/TV

Module for the study of speed transducers (encoder and tachometric generator) with variable speed motor-driven dragging.

13. UMS-09/FC

Module for the study of photocell sensors (2 types) with trigger device.

14. UMS-10/PS

Module for the study of pressure transducers with pneumatic device and reading manometer.

15. UMS-11/US

Module for the study of ultrasonic sensors.

16. UMS-12/EA

Module for the study of absolute encoders with decoder and manual displacement device.

17. UMS-13/UM

Module for the study of moisture transducers.

18. UMS-15/HL

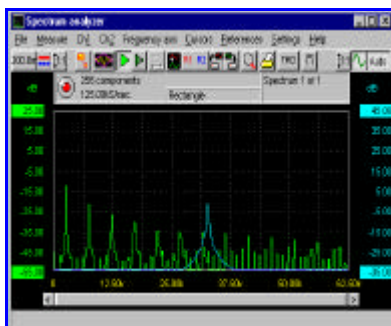
Module for the study of magnetic "HALL" effect proximity sensors with excitation device.

19. UMS-16/PL

Module for the study of flow and level sensors complete with hydraulic devices.

20. USM/HSW

Multifunctional PC measuring instrument for data acquisition from analog and digital transducers



21. UNC/CNT

Special metal storage enclosure suited to house the "UBE" and "UMS" series modules.



NOTE: "UBE" and "UMS" series experimental modules range is constantly on the increase: ask for the last realizations.

On Customer's request it is possible to get a special version of the TP-4000 which is carried out on a vertical table-top frame. This special feature makes it possible the vertical use of the TP-4000 along with the different modules.

The technical features of the system remains unchanged and the modules for the vertical use are clearly identify by the "/T added extension.

