

TRAINING KIT

for process control
simulation

TRAIN-KIT

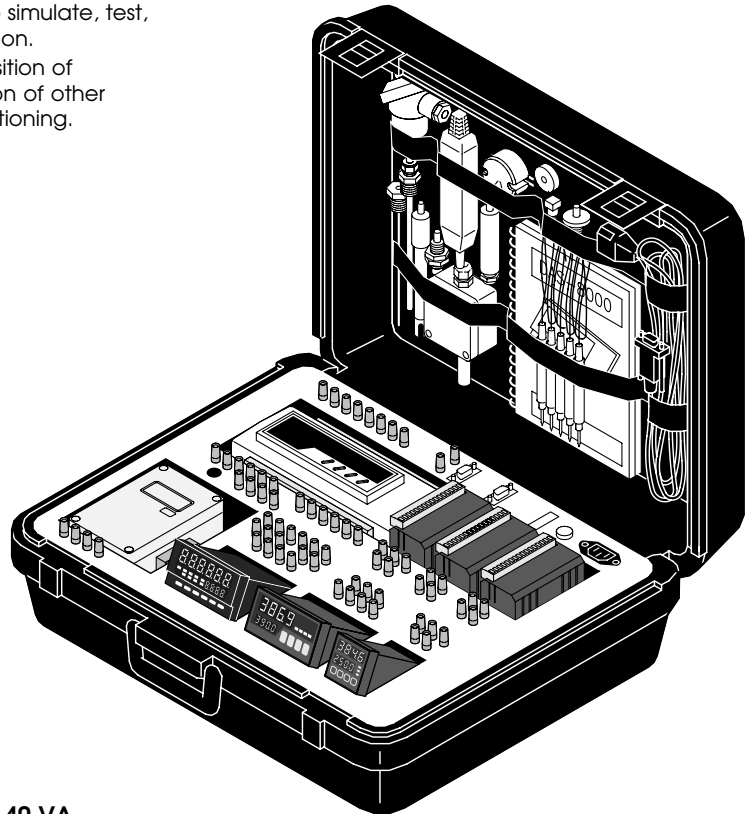
Desin
Instruments

DESCRIPTION

The **TRAIN-KIT** is prepared for users who require to simulate, test, analyse variables in any process control application.

This kit allows measuring, control and data acquisition of Temperature, RH, pH, Flow, Pressure and simulation of other variables, as well as, PID control and signal conditioning.

- **PORTABLE**
- **OFF-LINE/ON-LINE PROCESS SIMULATION**
- **TEST IN LABORATORIES**
- **MAINTENANCE TESTING**
- **PROCESS SUPERVISION**
- **TRAINING**
- **MEASURING CONTROL AND DATA ACQUISITION PHYSICAL VARIABLES**
- **REAL (PRACTICAL) DEMONSTRATION**
- **INPUTS: 4/20 mA, Pt-100, mV, THERMOCOUPLE, pH, 24 VDC DIGITAL SIGNALS**
- **OUTPUTS:**
 - Relay: 3 A/ 220 Vac
 - Logic: 24 Vdc
 - Analog: 4/20 mA
 - SSR: 4 A/ 220 Vac
 - Transmitter power supply: 24 Vdc
- **COMMUNICATION: RS-232 AND RS-485**
- **POWER SUPPLY: 220 VAC. CONSUMPTION: 40 VA**

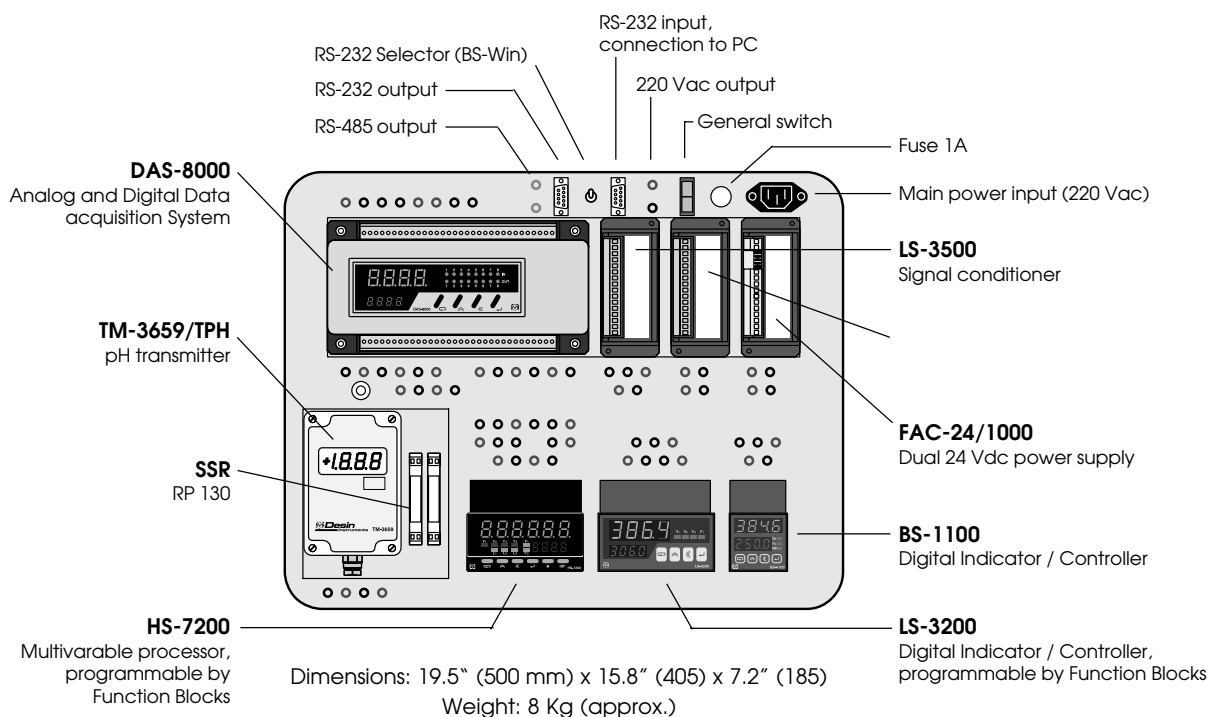


CONTENT

- 1 **HS-7200** Programmable multi-loop indicator
- 1 **LS-3500** Programmable signal conditioner
- 1 **LS-3200** Programmable indicator
- 1 **AC-1000** RS-232/ RS-485 communication adapter
- 1 **DAS-8000** Data Acquisition Module
- 1 **BS-1100** Configurable single-loop controller
- 1 **FAC-24/1000-D** Power supply dual 24 Vdc outputs
- 1 **TM-3649/TPH** pH transmitter, 4/20 mA output
- 1 **Kit BS-Win BS-1000** Series configuration interface
- 2 **RP130** SSR 4 A/ 220 Vac
- 1 **THR-340/C** 2-Wire RH transmitter
- 1 **IRT-1000/1** Infrared temperature transmitter
- 1 **CR-BNNs** Pt-100 temperature sensor
- 1 **EPH-SOTA** pH electrode
- 1 **STA-150** Ambient temperature sensor, Pt-100 3-Wire connection
- 1 **OPTICAL LEVEL DETECTOR**
- 1 **PROXIMITY DETECTOR** (inductive)
- 1 **TEMPERATURE SENSOR THERMOCOUPLE** type "J"
- 2 **PT-100 TEMPERATURE SENSORS**
- 1 **CM-40** Temperature transmitter 4/20mA output, 2-Wire transmission
- 1 **RED COLOR LED**
- 1 **POWER SUPPLY CABLE**
- 1 **COMMUNICATION CABLE** to RS-232 9/9 pins
- 12 **RED AND BLACK CABLES FOR INPUT / OUTPUT CONNECTIONS**
- 1 **PACK SYSTEM CD-ROM** including software and manuals
- 1 **MKT CD-ROM** including power point presentations
- **INSTRUCTION SHEET** for each product
- 1 **TRAINING MANUAL** including exercises

LAYOUT

0145 HI30.07-0



FUNCTIONS OF THE KIT

The **TRAINING-KIT** was designed to cover the Educational area requirements for instrumentation and control of industrial process applications. The analysis and simulation of industrial applications using analog and digital signals is easily realized.

Measuring, control and data acquisition exercises of physical and chemical variables such as Temperature, Pressure, Flow, RH, Level, pH, Redox and logic variables such as proximity detectors, distance sensors, level switches events and position sensors can be done easily through the connectors and cables provided in the kit.

Among other functions we can highlight the following:

- Explanation of the different types of sensors, detectors and instruments usually used in the industrial process applications.
- Analog measurement (Pt-100, TC, 0...4/20 mA, 0/10 Vdc etc).
- Logic signal detection (5 to 40 Vdc inputs).

- Explanation of the operation of the different types of alarms and activation of Relays and SSR devices.
- Analog signals conditioning (conversion).
- Analog signals (Pt-100, TC, Pressure, RH) conversion and transmission through 4/20 mA signals.
- PID control with different types of control output (Continuous, Time Proportional, Step-by-Step w / without feedback potentiometer).
- Programming, Configuration and Parameterization of the indicators and controllers using Loop-Win and BS-Win software.
- Study of Digital Communication through RS-232 to RS-485 using Modbus Protocol.
- Analog and digital data acquisition through Proasis-DCS or LAN-Win software.
- ON-Line and OFF-Line operation capabilities.
- Possibilities to extend the RS-485 network using external devices.

EXERCISES

1. Measurement and monitoring of Temperature (3 different methods) and Humidity using the available analog inputs.
2. Logic Input / Output activation.
3. Operating the analog outputs of the **LS-3200** and **HS-7200** applying these signals to the other devices (**BS** or **DAS**).
4. Operation of different types of alarms in the indicators and **DAS-8000**.
5. Special curves linearization using the **LS-3200** and **DAS-8000** linearization capabilities.
6. Practical exercise of PID, Auto-tuning and Fuzzy Logic operation (Time Proportional control).
7. Practical exercise of PID, Auto-tuning and Fuzzy Logic operation (continuous control).
8. RS-485 digital communications between the different devices.
9. Data exchange in the field using the **AC-1000** LINKER function.
10. Arithmetic operation using the **HS-7200** capabilities.
11. pH measurement through pH transmitter with temperature compensation using Pt-100 sensor.