italtec
Technical Training Systems

Company with Quality Management System
Certified by DNV = ISO 9001/2008 =

TRAINING MODULE FOR INDUSTRIAL ELECTRIC MOTORS FOR MAIN DRIVE AND CONTROL CIRCUITS

URM-00

- **URM-01/PP**
Stepper motor control

- **URM-02/CC**
DC motor (2-quadrant) control

- **URM-03/CA**
AC three-phase motor control

- **URM-04/BL**
Brushless motor control

- **URM-05/4Q**
DC motor (4-quadrant) control

- **URM-06/PS**
Speed and position DC motor control

- **URM-SMC**
Multifunzional measuring system

- **URM- PCS**
PC motors control

CE

EDUCATIONAL KIT TO STUDY MOTORS CONTROL AND PROTECTION

It is composed of 35 modules with standard electrical control components, vertical frame and accessories to perform a wide range of experiments .
Teaching and experimental series modules have been especially designed to provide a comprehensive, hands-on and complete instruction in the principles and operations of control circuits of the main types of electrical motors (open and closed loop) most widely used in industry today, such as:

- **STEPPER MOTORS**
- **DC MOTORS**
- **AC MOTORS**
- **BRUSHLESS MOTORS**

All the modules are completely self-sufficient and do not require any external devices or special equipment other than a common DC power supply and the standard laboratory measuring instruments in order to work. The system modularity allows to programme investments through the complete or partial purchasing of seven modules currently available.

A special computerized device known as “URM-SMC” enables automatic measurements, data acquisition and graphic monitoring of the signals using any PC. Full technical bibliography complete of the theory of the control circuits and many hands-on experiments are provided with each module ensuring a fast and effective learning of the subject. Each module can be used as easily either resting on a flat surface or fitted to a special vertical anodized aluminium frame.

italtec Technical Training Systems S.R.L.
20129 – MILANO – ITALIA – Viale Regina Giovanna, 35
Tel. +39 02 90 721 606 – Fax. +39 02 90 720 227
e-mail: italtec@italtec.it www.italtec.it

TRAINING MODULE FOR INDUSTRIAL ELECTRIC MOTORS FOR MAIN DRIVE AND CONTROL CIRCUITS

URM-00

URM-01/PP
Stepper motor control

URM-02/CC
DC motor (2-quadrant) control

URM-03/CA
AC three-phase motor control

CE

URM-01/PP STEPPER MOTORS AND RELATED ELECTRONIC DRIVE CIRCUITS

- 20 KHz PWM control
- Step angle degree: 1,8°
- 1/1,1/2,1/4 and 1/8 step angle selectable
- Power supply: 24 Vdc
- Peak output current: 2.5 A
- Mean output current: 1.5 A
- Motor power: 5W
- Max revs.:1500
- Max torque: 24.5 mNm
- Step accuracy: 0.08mm
- Max output current: 5 A

URM-02/CC - FOR STUDY DC MOTOR DRIVES

- Connection to external DC motors
- Protected thyristor bridge
- Dual speed and current loop
- Speed feedback selectable from D.T. or I x R mode
- 24V/4W DC motor fitted with tachometer dynamo
- Adjustable electromechanical load wit DC dynamo
- Stall torque: 31 mNm
- Efficiency: 81%

URM-03/AC - FOR STUDY THREE PHASE AC MOTOR DRIVES (INVERTER)

- Power supply: 220/240 Vac single-phase
- Acceleration/deceleration to/from 0 to rated speed in 5 seconds (adjustable)
- Output voltage: 220V three-phase on safety bushes
- Max power: 0.187KW
- Sinusoidal wave form
- Mosfet power stage
- Frequency generated from 2.5Hz to 100 Hz
- Frequency stability better than 1.5%
- Electronic short-circuit protection
- 220V/170W asynchronous three-phase motor on base
- Power supply safety insulator transformer

italtec Technical Training Systems S.R.L.
20129 – MILANO – ITALIA – Viale Regina Giovanna, 35
Tel. +39 02 90 721 606 – Fax. +39 02 90 720 227
e-mail: italtec@italtec.it www.italtec.it

TRAINING MODULE FOR INDUSTRIAL ELECTRIC MOTORS FOR MAIN DRIVE AND CONTROL CIRCUITS

URM-00

URM-04/BL
Brushless motor control

URM-05/4Q
DC motor (4-quadrant) control

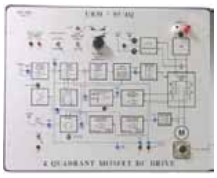
URM-06/PS
Speed and position DC motor control

CE

URM-04/BL - FOR BRUSHLESS MOTOR DRIVES

- Power supply: 24Vdc
- Max current: 3A
- Digital speed and analog current feedback
- Electronic braking
- PWM frequency: 10KHz
- Digital rotation sense detector
- Brushless 4-phase Dc motor on panel
- Built-in polyphase encoder
- Torque rate: 8 Ncm
- Max speed: 3000 rpm

URM-05/4Q - FOR STUDY DC 4 QUADRANT MOTOR DRIVES



- Power supply: 42 -48 Vac
- Output voltage: 48V on safety bushes (4 mm)
- Max current: 6,8A
- Power of DC motor : 250W (0,8 N/m)
- Adjustable acceleration and deceleration ramps
- Automatic sense of rotation reversing
- Dual thyristor bridge fully controlled
- Dual feed back (speed and current)
- Permanent-magnet DC motor with T.D (fitted on metal base)

URM-06/PS - DC MOTOR SPEED AND POSITION CONTROL

- Microprocessor position control
- Settings and regulations either via PC or manually
- 5 coded switches (contraves) for manual settings
- RS-232 interface
- PC managing software Windows environment
- Independent PID loops separately adjustable
- Tracking error indicator and automatic zero point
- 4Q drive with DC. Motor, encoder and load
- 60 cm. linear axis with mechanical indicator
- External PC control

italtec Technical Training Systems S.R.L.
20129 – MILANO – ITALIA – Viale Regina Giovanna, 35
Tel. +39 02 90 721 606 – Fax. +39 02 90 720 227
e-mail: italtec@italtec.it www.italtec.it

italtec
Technical Training Systems

Company with Quality Management System
Certified by DNV = ISO 9001/2008 =

TRAINING MODULE FOR INDUSTRIAL ELECTRIC MOTORS FOR MAIN DRIVE AND CONTROL CIRCUITS

URM-00

URM-07/IV
Vectorial AC motor control

URM-08/PLC
PLC motor control module

URM-09/2Q
2-Quadrant DC motor drive and control

URM-10/ID
AC digital motor control

URM-11/PID
PID/ON-OFF control module

CE

URM-07/IV - VECTORIAL AC MOTOR CONTROL

AC three-phase VECTORIAL motor control module
- Silk screened anodized aluminium panel
- AC three-phase programmable vectorial motor drive (inverter) and related electrical AC motor
- Internal or external controls (PLC and PC interface)
- Dedicated digital Keyboard and LCD panel

URM-08/PLC - PLC MOTOR CONTROL MODULE

The PLC motor control module allows the automatic management of all the "URM-00" series.
- 16 ON/OFF inputs and no.12 ON/OFF outputs
- 4 analog inputs and no. 4 analog outputs (0-10V/12 bit resolution)
- Five language programming

URM-09/2Q -2 - QUADRANTS DC MOTOR CONTROL

The 2-Q DC motor drive and control experimental module has been especially designed to provide a complete instruction in the principles and operations of DC motor control circuits most widely used in industry. Equipped with DC motor (200V/300W) and tachometer dynamo. No external devices required to operate.

URM-10/ID - AC DIGITAL MOTOR CONTROL

- Silk screened anodized aluminium panel
- Digital Variable Frequency drive and related asynchronous three-phase motor on base
- Multifuncion operator panel with LCD display
- External speed regulation, via PC or PLC (0-10Vdc)

URM-11/PID - PID/ON-OFF UNIVERSAL CONTROL MODULE

The PID/ON-OFF control module is an universal control that can be employed in any process application. It has been especially designed to provide a suitable PID or ON/OFF control for many applications.
- Microcontroller management
- RS-232 PC connection
- PID parameters freely configurable
- ON/OFF control with hysteresis
- Industrial standard signals compatibility
- Four different feedback input signals
- Differential Output signal (± 10Vdc)
- Complete of management software

italtec Technical Training Systems S.R.L.
20129 – MILANO – ITALIA – Viale Regina Giovanna, 35
Tel. +39 02 90 721 606 – Fax. +39 02 90 720 227
e-mail: italtec@italtec.it www.italtec.it

TRAINING MODULE FOR INDUSTRIAL ELECTRIC MOTORS FOR MAIN DRIVE AND CONTROL CIRCUITS

URM-00

ELECTRONIC & FUNCTIONAL

- Industrial electronic drives (low power) with built-in latest technology
- Main test points and controls available on panel
- LEDs to indicate operating modes
- Short circuit electrical and electronic protection
- Test points on safety bushes
- Supplied complete of motor and speed detectors (see individual module)
- External speed regulation via PC
- Supplied complete with teaching manual containing theory and practical experiences

MECHANICAL

- Anodized aluminium and silk screened panel reproducing the various internal electronic circuits
- Easy mechanical mounting/removal system from the vertical frame
- Shaft lexan protection for any motor
- Plastic protection under the electronic circuits
- Highly reliable bushes for safe connections
- Side ventilation
- Rubber feet
- Dimensions: mm 375 x 303 x 110h

CE

URM-SMC - COMPUTERIZED MEASURING SYSTEM FOR DATA ACQUISITION & GRAPHIC MONITORING

Multifunctional measuring system for data acquisition and graphic monitoring. It performs a wide range of measures: as oscilloscope, storage oscilloscope, true RMS voltmeter, spectrum analyzer and transient recorder.

- PC printer port connection
- Resolution: 12 bits 0.025%, Linearity: 10 bits
- Sampling frequency: 100KHz
- Software running in Windows XP environment
- Conversion time: 10 µS
- Input impedance : 1Mohm/20pF
- Two separate input channels complete with 1:1 and 10:1 probes
- Accuracy: 0.25% ± 1 LSB
- Measuring Instruments: oscilloscope, storage oscilloscope, true RMS voltmeter, spectrum analyzer and transient recorder

URM-PCS - PC MOTORS CONTROL

- It allows to drive URM series modules using a PC.
- PC serial port connections (RS-232)
- Resolution: 16 bits with oversampling
- Microcontroller (16 bit) control
- Conversion accuracy: 16 bit
- Signals outputs: 0 ÷ 10VDC or 0 ÷ ± 10VDC
- Software for (Win 98/2000/XP)

italtec Technical Training Systems S.R.L.
20129 – MILANO – ITALIA – Viale Regina Giovanna, 35
Tel. +39 02 90 721 606 – Fax. +39 02 90 720 227
e-mail: italtec@italtec.it www.italtec.it