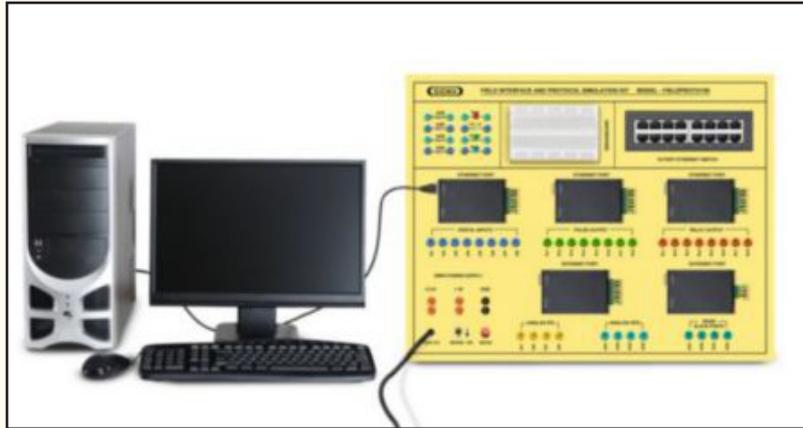# SIGMA

FIELD INTERFACE AND PROTOCOL SIMULATION KIT MODEL-FIELDPROTO100

This trainer has been designed with a view to provide practical and experimental knowledge Field Interface and Protocols Simulation.

SPECIFICATIONS

(1) Hardware

Following Hardware is assembled on Single PCB of size - 18 Inch x 15 Inch

1. A console including with Branded Desktop
2. Computer with Windows Operating System
3. Ethernet Devices with Isolated Supply and port
4. 4 AIi (0.1% FSR), 4 AO (0-10VDC), Ethernet Port
5. 8 Relay Outputs, Ethernet Port
6. 8 Pulse Outputs, Ethernet Port
7. 8 Digital Inputs, Ethernet Port
8. 4 RS485 Slave ports, 1 Ethernet Port – Qty 4
9. 16 Port Ethernet Switch for networking of field Ethernet devices
10. SMPS to power up multiple Ethernet based field simulation devices
11. Required Connectors, Switches and LED indicators for Field Interface circuits such as Digital Inputs, Relay Outputs, Analog Inputs, Analog Outputs, Pulse Signals

(2)   Software

1.   Communication with simulation device on Ethernet MODBUS TCP Protocol
2.   Field Interface simulation using HMI replica of Console for easy understanding of students
3.   Port Simulation – Serial Port Terminal, TCP/IP, UDP, HTTP
4.   Protocol Simulation – MODBUS RTU Master/Slave, MODBUS TCP Master/Slave, DLMS Client
5.   IoT Protocol   Simulations – MQTT   topic publish subscribe simulation

(3)   Accessories

1.   Ethernet Cable   : 2 No
2.   Jumper wires   : 30 Nos.
3.   Software and Driver CD   : 1 No.
4.   Practical Manual - Printed + Soft Copy   : 1 No.
5.   E-Books for Subject   : 10 Nos. in PDF Format
6.   Mp4 Video Class for Subject   : 40 Nos

(4)   Cabinet and PCB

The complete circuit diagram is screen printed on component side of the PCB with circuit and Parts at the same place. The PCB with components on front side is fitted in elegant wooden box having lock and key arrangement. The acrylic cover is fitted on PCB to safeguard parts. It works on 230 V AC Supply.

EXPERIMENTS

A.   Theory Experiments

1.   To study theory of Field Interface and Protocol Simulations
2.   To study theory of Ethernet Devices with Isolated Supply and port
3.   To study theory of 4 Analog Inputs and 4 Analog Output Ethernet Port
4.   To study theory of 8 Relay Outputs Ethernet Port
5.   To study theory of 8 Pulse Outputs Ethernet Port
6.   To study theory of 8 Digital Inputs Ethernet Port
7.   To study theory of 4 RS485 Slave ports to Ethernet Port converter
8.   To study theory of 16 Port Ethernet Switch for networking of field Ethernet devices
9.   To study theory of SMPS to power up multiple Ethernet based field simulation devices

B.   Hardware Experiments

10.   To implement different Field Interface and Protocol Simulations
11.   To use Ethernet Devices with Isolated Supply and port
12.   To use and implement 4 Analog Inputs and 4 Analog Output Ethernet Port
13.   To use and implement 8 Relay Outputs Ethernet Port
14.   To use and implement 8 Pulse Outputs Ethernet Port
15.   To use and implement 8 Digital Inputs Ethernet Port
16.   To use and implement 4 RS485 Slave ports to Ethernet Port converter
17.   To use and implement 16 Port Ethernet Switch for networking of field Ethernet devices
18.   To study theory of SMPS to power up multiple Ethernet based field simulation devices

C.   Software Experiments

19.   To implement communication with simulation device on Ethernet MODBUS TCP Protocol
20.   To implement Field Interface simulation using HMI replica of Console
21.   To implement Field Interface Simulation using HMI
22.   To implement TCP/IP, UDP, HTTP Port Simulation
23.   To implement MODBUS RTU Master/Slave, MODBUS TCP Master/Slave, DLMS Client Protocol Simulation
24.   To implement IoT Protocol Simulations - MQTT topic publish & subscribe Simulation