HMI Theory Syllabus
- Overview
- HMI function
- Data handling with HMI
- Terminology
- History
- Command Line Interface
- Interface Design
- Interface Types
- Introduction to PID
- PID Control
- PID Control types
- 4-20mA current loop Basics
- Terminology
- Self powered Sensors
- 2-wired sensors
- 3-wired sensors
- Configuration and interfacing with PLC and PC
- Communication standards, Ethernet, profibus, RS484

HMI Practical Syllabus
Basic experiments
1) I/O instructions: NO,NC O/P coil, Inverter I/P, inverterO/P, logic gates
2) Data Transfer: MOV word: moving data to register or on data visible on the screen MOV dword Table initialize Table block transfer Data exchange berween to register or two displayed data Mux/Demux Arithmatic: Addition, subtraction, multiplication, division,float addition, increment,decrement,log,antilog,square root,max/min : using above instruction implementation of basic level maths function,calculator,pulse generator
3) Comparison: grater than/less than, equal to,not equal to : decision making algorithms. store the specific data dicision basis
4) logic: gates using direct instructions shift register,absolute values,2's complement,flip flops

Advanced experiments:
5) Timer : on/Off timer
6) Counter: single pulse counter , Up/down counter, counter using rising edge and falling edge to avoid noise
7) subroutine: call and ret instructions
8) program control: examples for jump, for loop, master set/reset, sequential initialization, sequential input/output.
9) interrupt enable/disable
10) ADC:Analogmeter using ADC and current gain 4:20 mA

Touch screen specific experiments:
1) Drawing tools: to draw shapes and animate it as per need, insert image, insert background images
2) quick buttons : go to screen, next screen, previous screen,open popup screen, reset, write value, add value, toggle bit
3) show data: numerical, bit and message data, edit data
4) advanced optios: buttons, bit buttons, word buttons, lamp, bar graph, pie graph, meter graph,multiple bar graph, trend, alarm, keypad, ascii keypad.
5) clock object: time , date

Practicals on: Renu Electronics: Prizm (FP5043T-E) includes following tasks:

Basic:

- Go to Screen, Go to Next Screen,
- Go to Previous Screen Write value to a Tag Screens
- Add Constant to Tag, Subtract a Constant from Tag,
- Turn Bit On Turn Bit Off memory.
- Toggle Bit Copy Tag B to Tag A objects,
- Print Data Set RTC
- Copy Tag to STR
- Wait
- Copy RTC to PLC Block
- Copy Recipes Block to PLC Block
- Copy PLC Block to Recipes Block

Application Task List Alarms
Application task list includes tasks which are executed at power-on and global tasks which are executed irrespective of the active screen.

Screen Task List
The screen task list includes tasks, which are executed only when that particular screen is active. Different set of tasks can be executed "before" the screen is shown; "while" the screen is being shown and "after" the screen is closed.

Touch Screen Task
A list of tasks can be created which are executed upon touching an area (button) on the Prizm screen. Different set of tasks can be executed when the button is "pressed"; while the button is "held down" and "when" the button is "released". Special tasks allow creating buttons such as numeric inputs, alarm management, data logger management etc.

Dual Port Support
Prizm series has two communication ports. One port is used for connecting to a PLC. The other port is used for programming of Prizm unit, printing screens, connecting to third party serial devices (barcode readers, printers etc.) or to connect to another PLC or drive.

Bitmaps / Wizards
Bitmaps can be imported into the application and displayed on the Prizm screens. In addition, several wizards are supported to create commonly used objects such as Analog meters, Lamps, Buttons and Bar graphs.
The Number of screens, which can be defined, is constrained only by the unit memory. Various types of objects can be defined on the screen such as plain text objects, Data display (coil status, register value, value dependent text), Data entry objects, Alarm objects, Bitmaps, Wizards, Date / Time etc.

Data Entry
Data entry objects can be placed on screens. Each data entry object can have high / low limits and math function associated with it. Various types of data formats are supported including floating point data.

Alarms
Up to 256 real time alarms can be defined in Prizm. Alarms can be displayed on the screen in formatted (user defined) columns. Alarms could also be logged and historical alarms can also be displayed. Buttons can be created to acknowledge alarm, print alarm, view next / previous alarm etc

Multilanguage / Unicode Support
All the languages are supported in the Prizm unit. The user can now display messages, alarms in any regional language. All Windows® fonts can also be used in an application