

7. HUMAN MACHINE INTERFACES (HMI)

<TODO - Find an implementation platform and write text>

Topics:

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Objectives:

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7.1 INTRODUCTION

- These allow control systems to be much more interactive than before.
- The basic purpose of an HMI is to allow easy graphical interface with a process.
- These devices have been known by a number of names,
 - touch screens
 - displays
 - Man Machine Interface (MMI)
 - Human Machine Interface (HMI)
- These allow an operator to use simple displays to determine machine condition and make simple settings.
- The most common uses are,
 - display machine faults
 - display machine status
 - allow the operator to start and stop cycles
 - monitor part counts
- These devices allow certain advantages such as,
 - color coding allows for easy identification (eg. red for trouble)
 - pictures/icons allow fast recognition
 - use of pictures eases problems of illiteracy

- screen can be changed to allow different levels of information and access

- The general implementation steps are,

1. Layout screens on PC based software.
2. Download the screens to the HMI unit.
3. Connect the unit to a PLC.
4. Read and write to the HMI using PLC memory locations to get input and update screens.

- To control the HMI from a PLC the user inputs set bits in the PLC memory, and other bits in the PLC memory can be set to turn on/off items on the HMI screen.

7.2 HMI/MMI DESIGN

- The common trend is to adopt a user interface which often have,

- Icons
- A pointer device (such as a mouse)
- Full color
- Support for multiple windows, which run programs simultaneously
- Popup menus
- Windows can be moved, scaled, moved forward/back, etc.

- The current demands on user interfaces are,

- on-line help
- adaptive dialog/response
- feedback to the user
- ability to interrupt processes
- consistent modules
- a logical display layout
- deal with many processes simultaneously

- To design an HMI interface, the first step is to identify,

1. Who needs what information?
2. How do they expect to see it presented?
3. When does information need to be presented?
4. Do the operators have any special needs?
5. Is sound important?
6. What choices should the operator have?

7.3 DESIGN CASES

- Design an HMI for a press controller. The two will be connected by a Devicenet network.



Figure 76 A PLC With Connected HMI

7.4 SUMMARY

7.5 PRACTICE PROBLEMS

7.6 ASSIGNMENT PROBLEMS

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