L10 - Develop Safety Applications Using Guardmaster® 440C-CR30 Configurable Safety Relay
Guardmaster® 440C-CR30
Software Configurable Safety Relay

- CR30 Software Configurable Safety for machine safety applications
- PLe and SIL 3
- 22 Safety I/O
  - 12 inputs
  - 4 outputs
  - 6 configurable as input, output, or test pulse
- Supports expanded standard I/O via plug-in
- Configured using free Connected Components Workbench™ software, or Add-on Profile v3.01 for Studio 5000 Logix Designer® software
- Intuitive software simplifies configuration
Guardmaster® 440C-CR30 Safety Relay

Key Features

- **Easy to Use:**
  - Innovative rapid configuration editor

- **Single Wire Safety support:**
  - A single wire to expand safety I/O

- **2080 Plug-in support:**
  - Expansion of standard I/O

- **Comms for Diagnostics**
  - EtherNet/IP to Logix
  - Serial to Micro800® or PanelView™ 800

Keeps safety simple, separate and flexible
Guardmaster® 440C-CR30 Safety Relay
Easy to Use

Configure Device
- Configured in CCW or by using the Add-on Profile (AOP) in Studio 5000 Logix Designer®

Configure Safety Function
- Logic configured with Simple Drag and Drop Function Block Editor

Validate and Verify
- Checklist to walk through validation and verification process

DONE!

Assigned safety function via Drag ’n’ Drop
Ease of configuration – No previous programming skills required
Guardmaster® 440C-CR30 Safety Relay

Easy to Use

- **Online Monitoring**
  - Color-coded online monitoring helps troubleshoot code
  - Diagnostic tooltips provide natural language fault descriptions

**Diagnostic tooltips for application troubleshooting**
Guardmaster® 440C-CR30 Safety Relay

2080 Plug-in Support

2080-IQ4OB4 plug-in for expansion I/O:

Standard Input Expansion:
- Use standard inputs for standard signals such as circuit resets, feedback monitoring or muting sensors

Standard Diagnostics:
- Land auxiliary contacts of series wired safety devices and share over EtherNet/IP or serial comms
- Use standard outputs to drive status indicators or send gate unlock commands

Expansion I/O with no impact to panel footprint
Supports Single Wire Safety for easy integration of GSR relays:

- Add Safety Relay Outputs
  - Add multiple dry contact outputs by utilizing GSR EM (Expansion module) while only consuming a single safety output configured for Single Wire Safety

- Connect Upstream GSR Relays
  - Expand inputs and functionality using GSR relays by connection through Single Wire Safety
Guardmaster® 440C-CR30 Safety Relay
Optional Ethernet Plug-in for Logix Communication

Share diagnostics with a Logix controller via EtherNet/IP

- Add-on Profile for Studio 5000®
  - Requires v20 or later
- Predefined Input tags:
  - I/O Terminal status
  - Verification ID
  - Faults
  - Logic function status
Guardmaster® 440C-CR30 Safety Relay
Add-on Profile v3.01 with Integrated Editor

Integration with Logix:

- Add-on Profile v3.01 for Studio 5000 Logix Designer® contains fully functional Logic editor for the Guardmaster® 440C-CR30.
- Single software/project for configuring and monitoring Logix controller and Guardmaster® 440C-CR30.
Guardmaster® 440C-CR30 Safety Relay

Working with 440C-CR30 Add-on Profile

1. Download Project From Workstation to Controller.
2. Open device profile.
3. Select Logic Configuration tab.

Configuration stored in project ACD and downloaded to Controller
For the purposes of this lab, we are using a SoftLogix™ controller, but the process is the same for any other Logix controller.
In this lab, you will develop the following:

- E-Stop Application
- Gate Switch and E-Stop Application
- Manual Reset of E-Stop with Automatic Reset of Gate Switch
- Guard Locking Application
- Zone Control Application
- Input Signal via Ethernet
- Maintenance Mode
Safety Functions to mitigate risk

- Safety Function PLr = PLd
  - Sensor
    - SensaGuard Switch
  - Logic Device
    - GuardMaster 440C-CR30 Relay
  - Actuator
    - 700-HPS Relays
Safety Function Application Technique

- SAFETY-AT133
- Input: SensaGuard
- Logic: Guardmaster 440C-CR30 Configurable Safety Relay
- Actuator: 100S-C Safety Contactors

Safety Function: Door-Monitoring Interlock Switch with a Configurable Safety Relay

Products: SensaGuard Switch, Guardmaster 440C-CR30 Configurable Safety Relay, 100S-C Safety Contactors

Safety Rating: CAT. 4, PLe to ISO 13849-1: 2008
Safety Function Application Technique

- Functional description (for use in SRD)
- BOM
- Wiring diagram
- Program / Configuration
- SISTEMA Calculation
- Verification & Validation checklists
SISTEMA Calculation for Safety Function

- Safety Function
  - Sensor
    - SensaGuard switch
  - Logic Device
    - Guardmaster 440C-CR30
  - Actuator
    - 100S Contactors
Thank You!