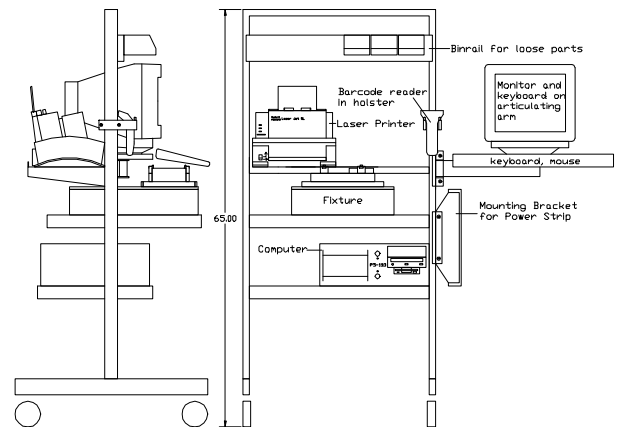


The Problem:

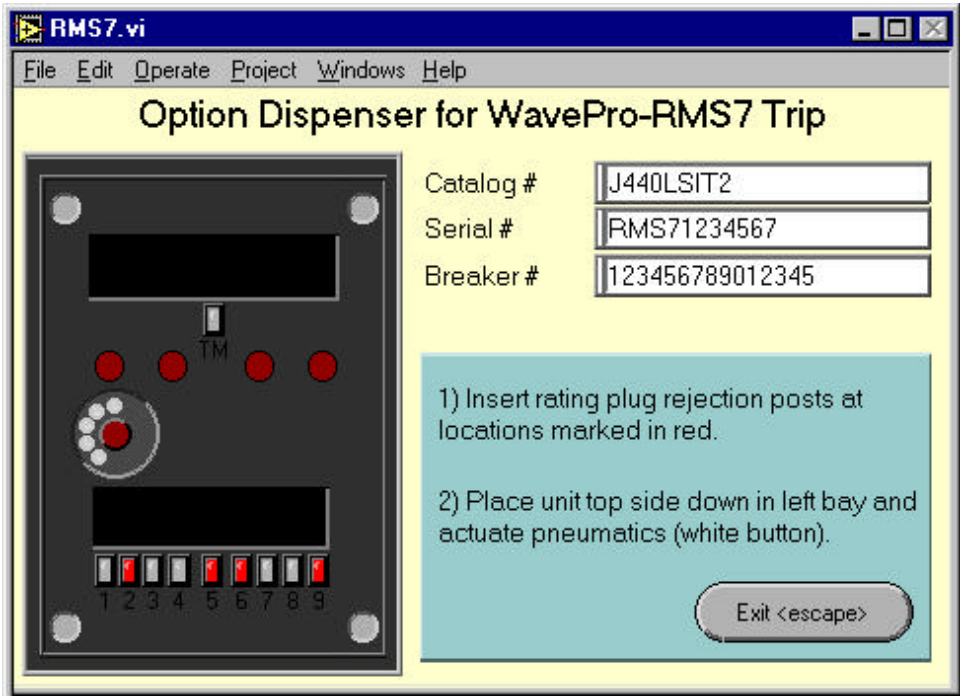
Circuit breakers for tripping 480 volts at up to 5500 amps are a few cubic feet in size, and require massive electrical contacts and 200 pound springs with about 6 inches of travel. They are controlled by “palm size” plug-in programmer modules that allow control of long time, short time, and instantaneous trip conditions, and report the cause of each trip. Each style of generic programmer module comes in about 600 different catalog numbers, depending on its rating, and the features included. Therefore, our customer needed a convenient way to convert, as each order comes in, their generic RMS7 and RMS9D programmers into the specific type ordered.

The Solution:

A single pneumatic fixture was built that works with both programmer types. The fixture has two bays, one for testing the top and one for testing the bottom of each unit. The “top side down” bay contains 19 switch probes to verify that the rating plug rejection posts are installed correctly. The “bottom side down” bay contains 18 switch probes to verify that the 2 octagonal programmer rejection posts and mounting post are installed correctly, plus 3 electrical probes for communicating with the units internal memory. The fixture is mounted on an ergonomic workstation along with a computer, monitor, laser printer and barcode scanner as shown.



Software was written in LabVIEW™ that walks the operator through the option dispensing process and verifies that each step is completed correctly. The pertinent parameters of each catalog number are read from an ACCESS™ database each time a new catalog number is entered. Two digital I/O cards are used to monitor the state of the switch probes and cycle power to programmer. Communication is performed using the customer supplied proprietary IPC Serial Card and Isolation Card, and involves writing to and reading from a shared memory location. After a programmer has been successfully converted from a generic unit to a specific catalog number type, the program prints out 4 labels onto the customers label stock. The label includes variable dial artwork for each of the 5 rotary switches along with other required information. Lastly, the program logs the catalog number, date, time, and serial numbers to an ASCII file.



- Hardware:**
- Ergonomic Work Station
 - Pentium 166 MHz Personal Computer, with 14" Monitor
 - Rivers Edge Barcode Scanner
 - HP 6L Laser Printer
 - 2 National Instruments 24 Bit Digital I/O Cards
 - Proprietary IPC Serial Card
 - Custom Test Fixture w/
 - Proprietary Isolation Card
 - 5 Volt Power Supply
 - 24 Volt Power Supply
 - 2 Compact Air Cylinders
 - 1 Aero Solenoid Valve
 - Custom Circuit Card, etc.
- Software:**
- National Instruments LabVIEW™
 - Rivers Edge Barcode Fonts