Controller Concepts

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The MYCRO 382 Logic and Sequence Controller is a stand-alone instrument that provides logic, sequencing, and profile programming control as well as standard, 3-mode PID functions. The controller consists of printed circuit boards mounted in a one-piece casing with screw terminals at the rear for connection to field wiring. A faceplate attaches to the front of the casing and provides the displays, controls, and identification information required for operation. Two models of the MYCRO 382 are available, not including options or accessories, the Model 382 Basic (382B) and Model 382 Expanded (382E).

Control strategies are implemented with the Model 382 by means of Function Blocks. Function Blocks are preprogrammed operations typical to control activities stored within memory of the Model 382. Each block includes parameters to specifically define its functioning, inputs from the field or other blocks, and outputs to the field or other blocks. Blocks are connected in a particular order to achieve the desired control effect. The process of selecting, defining, and positioning the blocks is referred to as configuring the MYCRO 382. Configuration is performed directly at the faceplate of the controller. No special devices, techniques, or disassembly is required.

Each Function Block is presented in detail, in Section 2 of this manual. A summary of all available blocks, for both Basic and Expanded models, is contained on a Function Block Master Foldout page at the end of Section 2. A comprehensive listing of each block's output is provided in Section 3 for reference.

**DISPLAYS AND CONTROLS**

**MYCRO 382 Faceplate**

1. 5-Digit Display
   Shows configuration and operating values. Both numeric and alphabetic selections can be displayed.

2. Console/Local Pushbutton
   Used to select Console or Local operating mode of controller. When in Console, no operation is permitted at the faceplate. An LED indicator displays which mode is active (Red Local).

3. Pushbuttons
   Three momentary action pushbuttons that can be configured by the user (see FB15).

4. Removable Legend Card
   Snap-in, plastic legend card that can be used to identify faceplate Status Lights. Card can be marked with pencil, pen, or marker.

5. Status Lights (L1-L20)
   Twenty LED indicators to be configured by the user (FB15) for display of separate process, logic, sequence, profile, control, or other activity.

6. Alphanumeric Display
   Identifies value on 4-Digit Display, configuration data, and error messages.

7. D (Display) Pushbutton
   Used to select configured displays of Model 382 Controller (FB15).

8. ACK (Acknowledge) Pushbutton
   Configurable pushbutton that can be used to acknowledge alarms, flashing status lights, etc.

9. Controller Identification
   Removable label on front of flip down access door allows individual controllers to be identified.

10. Configuration Controls
    Pushbuttons used to select and define Function Blocks. Refer to "Configuration" for use of each button.

11. Operating Controls
    Additional pushbutton controls used to select specific operations. Refer to "Operating the MYCRO 382".

12. Pulsar Knob
    Used to select data variables for configuration and operation.
CONFIGURATION CONTROLS

The Model 382 features a multi-mode, multi-level method of accessing the Function Blocks to allow quick and easy configuration. Selecting and defining the blocks is through a combination of the configuration pushbuttons and the faceplate displays. The Configuration Modes are:

S — Soft Configuration
When a leading S appears in the alphanumeric display, that value is a “soft configuration” selection. These values only apply to that block, and are not connected to other blocks. Soft values include profile segments, sequence steps, gain, bias, etc.

C — Calibration
The range of inputs and outputs of the Model 382 are selected in the Calibration mode of the block. Unless otherwise specified, Model 382 Controllers are shipped from the factory calibrated for 1-5 Vdc inputs and 4-20 mA dc outputs.

T — Table of Function Blocks
The T mode lists all Function Blocks available in a Model 382. This mode also allows the Execution Sequence Numbers (ESN’s) to be assigned. The ESN of a block determines when that block is to be executed in the configuration.

H — Hard Configuration
When a leading H appears in the alphanumeric display, a block’s “hard configuration” parameter is displayed. This mode includes the parameters that are used to interconnect blocks and to select among choices in a block.

R — Recipes
The Model 382 provides the ability to store up to 6 complete configurations as separate recipes. The Recipe mode is only available with Model 382E Controllers.

F — Factory Configured Options (FCO)
This mode provides access to 4 configurations that are stored in the controller at manufacture. The four FCO’s included in the Model 382 are:

FC000 — ESN Reset
FC001 — Single Loop PID Control
FC010 — Default Data
FC011 — Single Loop PID Control with Console/Local Operation (with Link option)

The selections in each mode are made at the different configuration levels. The following operations are used to access the different levels.

ENTER
CONF

Push this button to enter the Menu level of configuration. The STEP UP/STEP DOWN buttons are used to move to different levels.

Menu Level

S — Alphanumeric Display

Turn Pulser Knob to move to S, C, T, H, F, or R configuration modes.
CONFIGURATION PROCEDURE

Use the following procedure as a guide to develop a configuration for your Model 382 Logic and Sequence Controller.

Step 1. Draw a block diagram illustrating the Function Blocks that will be used in your application. Group inputs at the top, outputs at the bottom and control at the center so that the drawing represents the logical flow of the configuration.

Step 2. Determine the order that each block is to be performed. This sequence will be used to assign the ESN numbers during configuration. Use ESN numbers in multiples of 10 (e.g., 10, 20, 30, etc.) to allow future corrections, additions, or modifications to be easily entered. Record the ESN's in your Configuration Documentation (AD382-30).

Step 3. Identify the input and outputs for each Function Block in the diagram. Refer to the Function Block section of this handbook to identify input/output designations. Again, enter this information into the documentation.

Within the Model 382 Configurations there will probably be function blocks that will have unconfigured inputs due to the users particular configuration. These inputs are shown with default values. The default values are values which are configured by the Model 382 software to ensure normal operation of these function blocks when the inputs are not used. When an input is not used (e.g. HINA = 00), the function block will insert a default value into the function block algorithm to ensure normal operation.

Step 4. Select the hard (H) and soft (S) configuration parameters for each block. Refer to selections in this book for choices available for each. Record this information in the H & S columns in the documentation.

Step 5. Determine the calibration values required for inputs and outputs of the Model 382. The Model 382 is factory calibrated with 1-5 Vdc inputs and 4-20 mA outputs. If yours differ, refer to SD382. Service and Installation Instructions for the MYCR0 382 for procedures for calibrating the controller.

Step 6. Review the completed Configuration Documentation before proceeding with data entry. Make any changes. Use the controller's configuration controls to enter the data. You can enter all configuration data required, or edit one of the FC0's to develop the configuration, depending on your application. An example of the specific steps required for data entry is provided below.

Configuration Example

1. Press to enter Menu Level of configuration.

2. Turn Pulser Knob so that T (Table of Function Blocks) appears on alphanumeric display.

3. Press to select FB01, Analog Input #1 from the Table of Function Blocks.

4. Press again to select the Execution Sequence Number (ESN) for the block.

5. Press again to select the value level.

   Turn Pulser to select appropriate ESN number. Values are shown in 5-Digit Display as you turn pulser.

6. Press to enter that FB into configuration.

7. Press to leave configuration

8. Press and repeat for other (S, C, H, or F) modes for each desired Function Block to be included in configuration.
OPERATING CONTROLS

When the Operators Display block (FB15) is configured, the following information can be displayed by using the D pushbutton.

<table>
<thead>
<tr>
<th>Pushbutton Displays</th>
<th>5-Digit Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Alphanumeric Display</td>
</tr>
<tr>
<td>INS</td>
<td>S               -2.3% to 103.3%</td>
</tr>
<tr>
<td>INV</td>
<td>V               -2.3% to 103.3%</td>
</tr>
<tr>
<td>INP</td>
<td>P               -3.3% to 103.3%</td>
</tr>
<tr>
<td>INX</td>
<td>X               -3.3% to 103.3%</td>
</tr>
<tr>
<td>INY</td>
<td>Y               -3.3% to 103.3%</td>
</tr>
<tr>
<td>Program Follower 1 (FB807)</td>
<td>PF1</td>
</tr>
<tr>
<td>Program Follower 2 (FB807)</td>
<td>PF2</td>
</tr>
<tr>
<td>Sequence (FB11)</td>
<td>SE0</td>
</tr>
<tr>
<td>Totalizer 1 Counts (FB10)</td>
<td>C-T1</td>
</tr>
<tr>
<td>Totalizer 1 Hi Comparator (FB10)</td>
<td>H-T1</td>
</tr>
<tr>
<td>Totalizer 1 Lo Comparator (FB10)</td>
<td>L-T1</td>
</tr>
<tr>
<td>Totalizer 2 Counts (FB45)</td>
<td>C-T2</td>
</tr>
<tr>
<td>Totalizer 2 Hi Comparator (FB45)</td>
<td>H-T2</td>
</tr>
<tr>
<td>Totalizer 2 Lo Comparator (FB45)</td>
<td>L-T2</td>
</tr>
<tr>
<td>Time of Day (FB77)</td>
<td>TIME</td>
</tr>
</tbody>
</table>

* Segment number Time remaining  **Step number Time remaining

DISP I/O

The DISP I/O pushbutton allows the status of each of the configurable Discrete I/O on Model 382E Controllers to be shown on the faceplate. Each block (FB61-FB76) must be previously configured to use this button. Successive use of this button displays each point as On or Off.

FORCE

Control values and I/O states can be directly changed by the operator, regardless of configuration, through use of the FORCE pushbutton on the faceplate of the Model 382. Use the following procedures to force the programmer, sequencer, totalizer, timers, I/O, or clock.

DISP TIMER

The DISP TIMER pushbutton located behind the flip down access door can be used to display information from the Repeat Cycle, Delay, and One-Shot Timer blocks. These blocks must be previously configured to use this button. The value shown on the display with the DISP TIMER button is the time remaining for the timer. Timer values are rounded-up to the next displayable decimal place. Values can be changed via the FORCE button and Pulser knob.

Timer parameters are displayed in the following format when the DISP TIMER button is pressed.

<table>
<thead>
<tr>
<th>Value</th>
<th>5-Digit Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispenser (FB08)</td>
<td>TF1</td>
</tr>
<tr>
<td>On Time (FB09)</td>
<td>TN1</td>
</tr>
<tr>
<td>Off Time (FB44)</td>
<td>TF2</td>
</tr>
<tr>
<td>Delay Time 1 (FB35)</td>
<td>DT1</td>
</tr>
<tr>
<td>Delay Time 2</td>
<td>DT2</td>
</tr>
<tr>
<td>Delay Time 3</td>
<td>DT3</td>
</tr>
<tr>
<td>Delay Time 4</td>
<td>DT4</td>
</tr>
<tr>
<td>Delay Time 5 (FB36)</td>
<td>DT5</td>
</tr>
<tr>
<td>Delay Time 6</td>
<td>DT6</td>
</tr>
<tr>
<td>Delay Time 7</td>
<td>DT7</td>
</tr>
<tr>
<td>Delay Time 8</td>
<td>DT8</td>
</tr>
<tr>
<td>One-Shot Time 1 (FB39)</td>
<td>OT1</td>
</tr>
<tr>
<td>One-Shot Time 2</td>
<td>OT2</td>
</tr>
<tr>
<td>One-Shot Time 3</td>
<td>OT3</td>
</tr>
<tr>
<td>One-Shot Time 4</td>
<td>OT4</td>
</tr>
<tr>
<td>One-Shot Time 5 (FB40)</td>
<td>OT5</td>
</tr>
<tr>
<td>One-Shot Time 6</td>
<td>OT6</td>
</tr>
<tr>
<td>One-Shot Time 7</td>
<td>OT7</td>
</tr>
<tr>
<td>One-Shot Time 8</td>
<td>OT8</td>
</tr>
</tbody>
</table>

*Timer identifications appearing in the alphanumeric display will include an R (e.g. TF1R) if a timer is running.

(continued on next page)
RECIPIES

Configuration data can be used immediately by the Model 382E, or saved for subsequent use as one of six available Recipes provided in Function Block 77. A recipe consists of a complete configuration of all selected Function Blocks and associated parameter data. Configuration saved as Recipes can be loaded into memory for use, or cleared to provide additional storage.

Menu Level

Alphanumeric Display

Recipe Menu Level

Parameter Level

Alphanumeric Display

Recipe Load

Recipe Save

Recipe Clear

Value Level

5-Digit Display

Recipe Number

Turn to select

STORE

This button provides quick access to the soft configuration (S) values of the Alarm and PID Controller Function Block (FB12 & FB13). Successive use of this button will display each value if these blocks are configured.