MODEL 385
LOOP OPERATOR'S STATION

CONFIGURATION GUIDE

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INTRODUCTION

This configuration guide includes details on all function blocks and the configuration techniques for the Model 385 Loop Operator's Station (LOS). This panel mounted operator station is designed to centralize transmitter information and provide the capability to transfer this information to a computer network. The Model 385 allows the user to configure up to ten transmitters, Moore XTC™ or generic, smart or conventional, as inputs to the station. These transmitters may then be operated and configured from the face plate of the Model 385. The Loop Operator's Station can also support up to ten Model 348 FIELD PAC Field Mounted Controllers. This configuration guide was written to provide an understanding of the Model 385 so users can take advantage of this powerful interface to transmitters-controllers.

There are two models of the Loop Operator's Station.

Model 385B - Designed to be a data display station. There are 10 Loop Display blocks which accept signals from transmitters or other stations within a Local Instrument Link control system.

Model 385H - Designed to interact with the XTC Transmitter-Controllers, Model 348 FIELD PAC Field Mounted Controllers, and HART or conventional transmitters at a remote location. It displays and provides access to all loop data, including the auto/manual status, alarms, and tuning parameters, as well as transmitters parameters such as ranges and damping.

The 385 is consistent with other Local Instrument Link products in that configuration consists of selecting function blocks from a large library and connecting them together. The entire library of function blocks is described in this guide, but the actual blocks available will depend on the model and options selected.

Model 385B .................. FB01 to FB30, FB35 to FB36
Model 385H .......................... FB01 to FB36 *
Link Interface Option ......................... FB98

* Model 385H contains the HART® Interface.

Information in this configuration guide applies to software issue BBB.

Table of Contents

Section 1 explains fundamental station concepts which are crucial for operating and configuring a 385 Loop Operator's Station.

Section 2 includes the description and specifications for all the function blocks. A thorough understanding of each type of function block is essential in order to optimize the station's abilities. The configuration information contained in this section is also available in a pocket size configuration handbook for easy reference (CG385-1).

Section 3 is a listing of all available "Factory Configured Options" (FCOs). These are configurations which are stored in permanent memory and can be copied into configuration memory with just a few keystrokes.

Trademark Acknowledgments

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### Function Blocks (Numerical Order)

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<thead>
<tr>
<th>Function Block</th>
<th>Description</th>
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</thead>
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<td>FB01</td>
<td>Analog Input #1</td>
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<tr>
<td>FB02</td>
<td>Analog Input #2</td>
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<tr>
<td>FB03</td>
<td>Analog Output</td>
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<tr>
<td>FB04</td>
<td>Digital Output #1</td>
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<td>FB05</td>
<td>Digital Output #2</td>
</tr>
<tr>
<td>FB06</td>
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<tr>
<td>FB11</td>
<td>Display &amp; Alarm #1</td>
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<tr>
<td>FB12</td>
<td>Display &amp; Alarm #2</td>
</tr>
<tr>
<td>FB13</td>
<td>Display &amp; Alarm #3</td>
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<tr>
<td>FB14</td>
<td>Display &amp; Alarm #4</td>
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<td>FB15</td>
<td>Display &amp; Alarm #5</td>
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<td>Display &amp; Alarm #6</td>
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<td>Display &amp; Alarm #7</td>
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<td>FB19</td>
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<td>FB30</td>
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<td>Math Block #1</td>
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<td>10-Segment Characterizer #2</td>
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<td>General Purpose Transfer #1</td>
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<td>General Purpose Transfer #2</td>
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<td>FB56</td>
<td>General Purpose Transfer #3</td>
</tr>
<tr>
<td>FB98</td>
<td>Local Instrument Link Interface</td>
</tr>
</tbody>
</table>

### Function Blocks (by Function)

**Analog Input Blocks**
- FB01
- FB02
- FB03
- FB04
- FB05
- FB06

**Digital Output Blocks**
- FB31
- FB32
- FB33
- FB34
- FB35
- FB36
- FB37

**Math Blocks**
- FB11
- FB12
- FB13
- FB14
- FB15
- FB16
- FB17

**Alarm Blocks**
- FB18
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- FB20

**Logic Blocks**
- FB40
- FB41
- FB42

**Miscellaneous Blocks**
- FB43
- FB44
- FB45
- FB46
- FB47
- FB51
- FB52
- FB53
- FB54
- FB55
- FB56
- FB57

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SECTION 1

STATION CONCEPTS
4 Alarm LED's
Can be configured to light or flash based on a variety of alarm conditions for each display loop.

5 Loop
Selects which Loop is displayed. The selected loop number will light up. When held down, the station will scan through the configured loops until released.

6 D (Display) Pushbutton
Selects P, S or V of the selected loop when the selected loop is configured for XTC w/PID or Model 348. Otherwise, only P can be displayed and this button will not work.

7 Display Points 1 through 10
The display point will be backlit when selected by the Loop pushbutton or auto-scan.

8 A/M Pushbutton
Selects A/M status of XTC w/PID or Model 348. If transmitter is not a Moore Products Co. w/PID then both Auto and Man lights will be off and the pushbutton will not work.

9 ACK (Acknowledge) Pushbutton
Acknowledges flashing alarm LED's (See FB30). Also scrolls through alarm statuses (A1, A2, A3, A4).

10 4-Character Alphanumeric Display
Displays point tag, digital display unit, alarm statuses, error codes and configuration data.

11 Pulser Knob
Used to change the value of P, S, V and data variables during configuration and operation.

12 S (Station Status) Display
Used to display station information. (Refer to FB30 for additional information.)

13 Configuration Controls
Pushbuttons used to select and define Function Blocks. An entire list and description is contained on the following page.

14 Station Identification
Removable label on front of flip-down door allows individual stations to be identified.

5 Digit Display
Displays process variables, alarm settings, and configuration values. Both numeric and alphabetic selections can be displayed.

2 C/L (Console/Local) Pushbutton
Selects Console or Local operating mode of the loop when FB98 is configured.

3 Display Identifier (P, S, V)
Used to indicate the nature of the variable being displayed in the 5 Digit Display. D (Display) Pushbutton used to sequentially step through P (Process Variable), S (Setpoint), and V (Valve). Active Display Identifier will be backlit.
CONFIGURATION CONTROLS PUSHBUTTON DESCRIPTION

Enter
Conf

This pushbutton enters the station into the configuration mode.

Exit

This pushbutton exits configuration mode and also ends auto-scan mode. It is operable from any level of configuration.

Step
Up

This pushbutton selects a higher level in the configuration menu.

Step
Down

This pushbutton selects a lower level in the configuration menu.

Store

This pushbutton enters new parameter values into configuration memory. If changes are made to a parameter, this button should be pressed before stepping to a different menu level, or exiting configuration mode.

Tune

This pushbutton selects tuning constants of a Moore Products Co. w/PID. Repeatedly pushing this button will allow scanning of all tuning parameters. The pulser knob and store button can be used to change a parameter value. This pushbutton is also used to move the cursor or decimal point left during configuration.

Tag

This pushbutton is used to view various loop parameters, see FB11-FB20.

Alarm

This pushbutton selects alarm parameters, see FB11-FB20. Repeatedly pushing this button will allow scanning of all tuning parameters. The pulser knob and store button can be used to change a parameter value. This pushbutton is also used to move the cursor or decimal point right during configuration.

Auto
Scan

This pushbutton initiates automatic scanning through all configured points. The scan delay time is set in FB30. The EXIT pushbutton terminates the auto-scan mode.

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STATION CONCEPTS

Configuration is the procedure through which a user designs a control strategy to meet a specific control requirement. Configuration includes the selection of function blocks, determining the parameters associated with the blocks, and entering the information into the station. The following paragraphs provide a general description of the configuration procedure used for the Model 385 Loop Operator's Station (LOS).

FUNCTION BLOCK SELECTION

Function blocks are typically analogous to traditional hardware control relays (i.e. square root, multiplier, etc.). Input/Output function blocks (both analog and digital) connect the LOS to field devices through the terminal connections on the rear of the case. Computation blocks perform the desired control strategy used within each loop of the LOS. The operator's display block is used to organize the operator's interaction with the LOS via the faceplate assembly. Function blocks are identified by a unique number that is based on the function block itself.

CONFIGURATION

LOS configuration is accomplished through a menu driven configuration procedure entered directly from the faceplate of each individual display station. The configuration procedure must be performed for each of the available loops in the LOS. Following the entry of the configuration information for a loop the configuration is stored in non-volatile memory.

The highest level of the configuration is the menu level. The menu level allows for the selection of different areas of configuration as follows:

T - Table of Function Blocks
The T mode of configuration is used to select those function blocks which are needed for a particular configuration from the library of available blocks. In order for a function block to be activated, it must be assigned an Execution Sequence Number (ESN) between 01 and 99. Function blocks with an ESN of 00 are not active. The specific ESN assigned to each function block determines the order of block execution. The 385 will execute the complete table of active function blocks in 200 milliseconds.

H - Hard Configuration Mode
The H mode of configuration is used to select function block inputs and attributes. Function block attributes include such things as square root extraction for analog input blocks and mathematical operation for math blocks. Function block inputs are selected from unique output identifiers of other function blocks used in the configuration. Function block output identifiers range from 001 to 208.

S - Soft Configuration Mode
The S mode of configuration is used to define the specific numerical parameters which determine the exact algorithm the block will execute. These numerical parameters include such things as block gain and bias values, alarm trip points, etc. Not all function blocks require soft configuration entries. Soft configuration values which commonly require changing have been linked to the quick access pushbuttons on the station faceplate.

F - Factory Configured Options
Common control strategies are preconfigured and stored in memory in every LOS as a Factory Configured Option (FCO). These FCOs are permanently stored in ROM and can be recalled in a few simple steps. Generally, the only additional configuration required is in the S mode to determine exact numerical parameters for the individual blocks. The available FCOs are listed in Section 3. If the desired configuration is similar to one of the FCOs, it is usually more efficient to load the FCO and modify it than to configure from scratch. Prior to entering a new configuration, it is recommended that FCO 10 (the default configuration) be loaded to erase all previously entered data.

V - View Mode
The V mode is used to view the output value (in percent of scale units) for each of the block outputs in the LOS. This allows for inspection of intermediate block outputs for checking configuration parameters. Block outputs are limited between -3.33% and 103.31%.

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STATION CONCEPTS

C - Calibrate Mode
The C mode is used whenever the calibration data for any of the input/output function blocks is changed or verified. All stations are shipped from Moore Products Co. fully calibrated for 1-5 Vdc inputs and 4-20 mA outputs. They should not require recalibration. Detailed calibration procedures are documented in SD385, Installation and Service Instructions, located in Section 4 of this manual.

M - Smart Transmitter Mode
The M mode is used only when a loop Display and Alarm block is configured for a smart transmitter and a smart transmitter is on-line. This mode allows viewing, and in some cases changing, of certain transmitter parameters. An example of such a parameter would be the measured variable range or the damping value.

CONFIGURATION DEVELOPMENT PROCEDURE

It is strongly recommended that the following procedure be used to develop a configuration for each LOS and that CG385-3, Model 385 Configuration Documentation Booklet, be used to document the configuration.

STEP 1. Draw a loop diagram showing the function blocks to be used in the configuration. The loop diagram should be constructed with inputs at the top, outputs at the bottom, and intermediate function blocks arranged in a logical flow path between the two. For examples of loop diagrams refer to Section 3, Factory Configured Options, of this manual.

STEP 2. Assign an Execution Sequence Number (ESN) to each of the function blocks on the loop diagram. The order of block execution is normally not critical, but it is recommended that the block execution follows the order of blocks on the diagram, with inputs first, then intermediate blocks, and finally outputs. Generally, some ESN's should be skipped over to leave room for future enhancements to the configuration (i.e. use ESN's 5, 10, 15...). The ESN's should be entered in the T column of the Configuration Documentation Booklet, CG385-3.

STEP 3. Interconnect the selected function blocks on the loop diagram. The source for a block input will be an output from another block. The unique block identifier for each function block can be found in Section 2 of this manual. Block output identifiers will range between 000 and 208. All hard configuration data should be recorded in the H column of the Configuration Documentation Booklet, CG385-3.

STEP 4. Review each function block used in the configuration to determine if any block attributes (eg. square root) must be determined and added to the loop's hard configuration entries. This block attribute information should also be added to the T column of the Configuration Documentation Booklet, CG385-3.

STEP 5. The soft configuration parameters (eg. alarm limits) should be determined for those function blocks which require them. These parameter values should be recorded in the S column of the Configuration Documentation Booklet, CG385-3. It may be useful to note this information on the loop diagram as well. Certain soft parameter values may not be known at the time of configuration and will have to be added at a later time.

STEP 6. Verify values for all inputs and outputs and enter this information on both the loop diagram and Configuration Documentation Booklet, CG385-3. The LOS is shipped precalibrated for 1-5 Vdc inputs and 4-20 mA outputs and should not require recalibration. Calibration data is stored in non-volatile memory along with other configuration data.

ENTERING THE CONFIGURATION

The configuration recorded in the Configuration Documentation Booklet, CG385-3, and the loop diagram can be entered into the LOS via the pushbuttons and the pulser knob on the faceplate of the station.

STEP 1. Press the Enter Configuration pushbutton to begin configuration. This level of configuration is known as the menu level. If any of the configuration modes is followed by an X (i.e. SX), that mode has been locked out. To unlock this mode refer to SD385 the Installation and Service Instructions for the LOS, in Section 4 of this manual.

STEP 2. Select the T mode of configuration by rotating the pulser knob until T appears in the alphanumeric window of the display.

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STEP 3. Press the Step Down pushbutton to access the function block level of the configuration. This level of configuration provides access to all available function blocks. To select a particular function block, rotate the pulser knob until the desired function block number appears in the alphanumeric window of the display (eg. T 11).

STEP 4. An ESN must be assigned to those blocks used in the configuration. Each block must be individually selected at the function block level. Following block selection, press the Step Down pushbutton to enter the value level. At the value level, ESN selection can take place for each block. Rotate the pulser knob to select the ESN in the 5 Digit Display to match that chosen in the Configuration Documentation Booklet, CG385-3. Press the Store pushbutton to store the value in memory (the ESN in the 5 Digit Display will blink once signifying successful storage of the value). Push the Step Up pushbutton to return to the function block level of configuration. This procedure should be repeated for each block used in the configuration. Following the assignment of all ESN's, press the Exit pushbutton.

STEP 5. Press the Enter Configuration pushbutton and rotate the pulser knob until H appears in the alphanumeric window. This is the hard mode of configuration.

STEP 6. Press the Step Down pushbutton to enter the function block level of configuration. Only those function blocks given an ESN in STEP 4, and which have hard "H" parameters, will appear as activated function blocks.

STEP 7. Select an active function block and press Step Down to enter the parameter level of configuration. At the parameter level, function block inputs and attributes are selected. The first parameter of the block will appear in the alphanumeric window. The pulser knob can be rotated to change the parameter selected. Press the Step Down pushbutton to enter the value level of configuration.

STEP 8. At the value level of configuration rotate the pulser knob to select the desired value. The value will appear in the 5 Digit Display. Press the Store pushbutton to store the desired value in memory. The value in the 5 Digit Display will blink once signifying successful storage of the value. Press Step Up to return to the parameter level of configuration. Repeat this step as necessary for each parameter of the block. Repeat both steps 7 and 8 for each function block in the configuration. Following the configuration of all hard configuration data, press Exit.

STEP 9. Press the Enter Configuration pushbutton and rotate the pulser knob until S appears in the alphanumeric window. This is the soft mode of configuration. Press the Step Down pushbutton to enter the function block level of configuration. Only those blocks made active in STEP 4 and which require soft configuration entries will appear.

STEP 10. Select the desired function block number and press Step Down to enter the parameter level of configuration. At the parameter level, function block soft parameters are selected. The first parameter for the block will appear in the alphanumeric window. The pulser knob can be used to select the desired parameter. Press the Step Down pushbutton to enter the value level of configuration.

STEP 11. At the value level of configuration, rotate the pulser knob to choose the desired value. The value will appear in the 5 Digit Display. Press the Store pushbutton to store the desired value. The value in the 5 Digit Display will blink once signifying successful storage of the value. This procedure should be repeated for each parameter of each block used in the configuration. Following the configuration of all soft data, press the Exit pushbutton.

STEP 12. To verify the proper operation of the loaded configuration, the configuration should be tested off-line by simulating inputs to the station. If the configuration is not working properly the View mode may be used to easily verify intermediate block outputs. Using the View mode the particular configuration problem can often be pinpointed. Press the Enter Configuration pushbutton. By pressing the Step Down pushbutton once, all of the individual function block output identifiers are available. They are displayed in the alphanumeric window (eg. V101). The pulser knob can be used to toggle through all the different output identifiers. As the block output identifier is displayed in the alphanumeric window, the block output will be displayed as percent of scale in the 5 Digit Display. By rotating the pulser knob, each of the block outputs can be viewed and confirmed in accordance with the configuration.

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CONFIGURATION CONTROLS

ENTER
CONF
PUSH TO ENTER THE CONFIGURATION MODE.
ENTERS AT THE MENU LEVEL. STEP BUTTONS
WILL MOVE YOU TO A NEW LEVEL.

MENU LEVEL

ALPHANUMERIC DISPLAY

TURN PULSER TO CHANGE MENU SELECTION

STEP DOWN

STEP UP

FUNCTION BLOCK LEVEL

STEP DOWN

STEP UP

PARAMETER LEVEL

STEP DOWN

STEP UP

VALUE LEVEL

5 DIGIT DISPLAY

1 0 0 0

STORE

PUSH TO STORE VALUE IN THE DISPLAY
(ONLY ACTIVE AT THE VALUE LEVEL)

EXIT

PUSH TO EXIT CONFIGURATION
(ACTIVE AT ANY LEVEL)

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SECTION 2

FUNCTION BLOCK DESCRIPTIONS
Function Blocks (Numerical Order)

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<thead>
<tr>
<th>FB01</th>
<th>Analog Input #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB02</td>
<td>Analog Input #2</td>
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<tr>
<td>FB03</td>
<td>Analog Output</td>
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<tr>
<td>FB04</td>
<td>Digital Output #1</td>
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<td>FB05</td>
<td>Digital Output #2</td>
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<td>FB06</td>
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<td>Display &amp; Alarm #10</td>
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<td>FB24</td>
<td>Square Root Extractor #1</td>
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<td>FB54</td>
<td>General Purpose Transfer #1</td>
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<td>General Purpose Transfer #2</td>
</tr>
<tr>
<td>FB56</td>
<td>General Purpose Transfer #3</td>
</tr>
<tr>
<td>FB98</td>
<td>Local Instrument Link Interface</td>
</tr>
</tbody>
</table>
These function blocks convert an analog voltage into a 0-100% signal used by other blocks. A digital filter in each block allows process noise to be minimized. Analog inputs can be linearized through use of a selectable square root extractor.

Configuration of FB01 and FB02 consists of entering a breakpoint frequency for the digital filter, selecting square root extraction, and connecting the output to other blocks as required. Zero and full scale input information is defined during calibration. Refer to Installation and Service Instructions SD365 for calibration information.

Specifications:
Type: Single-ended
Zero and Span: 0 to 1.0 Vdc, 4 to 5 Vdc
Standard Calibration: 1 to 5 Vdc
Accuracy: ± 0.05% of span
Maximum Cont. Input: ± 30 Vdc
Input impedance: > 1 megohm
Normal Mode Rejection: 6dB at 2 Hz, 60dB at 60 Hz

Output Identifications:
FB01: 01
FB02: 02

Terminal Designations:
FB01: A1+ (A4)
AIC- (A5)
FB02: A2+ (A6)
AIC- (A5)

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FB01 ANALOG INPUT #1

<table>
<thead>
<tr>
<th>SF</th>
<th>FB</th>
<th>FILTER BREAKPOINT FREQ</th>
<th>0.001 to 10 Hz</th>
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<tbody>
<tr>
<td>CZ</td>
<td></td>
<td>ZERO INPUT</td>
<td>0.0 to 1.0 Vdc</td>
</tr>
<tr>
<td>CF</td>
<td></td>
<td>FULL SCALE INPUT</td>
<td>4.0 to 5.0 Vdc</td>
</tr>
<tr>
<td>CV</td>
<td></td>
<td>VERIFY INPUT</td>
<td>-3.3 to 103.3%</td>
</tr>
<tr>
<td>HSRE</td>
<td></td>
<td>SQUARE ROOT EXTRACTOR</td>
<td>NO/YES</td>
</tr>
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FB02 ANALOG INPUT #2

<table>
<thead>
<tr>
<th>SF</th>
<th>FB</th>
<th>FILTER BREAKPOINT FREQ</th>
<th>0.001 to 10 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td></td>
<td>ZERO INPUT</td>
<td>0.0 to 1.0 Vdc</td>
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<tr>
<td>CF</td>
<td></td>
<td>FULL SCALE INPUT</td>
<td>4.0 to 5.0 Vdc</td>
</tr>
<tr>
<td>CV</td>
<td></td>
<td>VERIFY INPUT</td>
<td>-3.3 to 103.3%</td>
</tr>
<tr>
<td>HSRE</td>
<td></td>
<td>SQUARE ROOT EXTRACTOR</td>
<td>NO/YES</td>
</tr>
</tbody>
</table>

---

BLOCK DIAGRAM

June 1994
ANALOG OUTPUT

This function block provides a 4–20 mA analog output proportional to a 0–100% input signal from another function block. The block includes an additional on/off switch input that disconnects the 4–20 mA signal from the load. This switch can be used when two or more outputs are connected to the same load.

Configuration consists of entering the appropriate block identifier used as the signal input, and, if required, the on/off switch. Zero and full scale are defined during calibration of the station. Refer to Installation and Service Instructions SD385 for calibration information.

Specifications:
- Range: 4–20 mA dc
- Zero: 4.0 mA dc ± trim
- Span: 16 mA dc ± trim
- Accuracy: ± 0.1% span
- Output Load: 0–800 ohm
- Open Circuit Voltage: 26 V ± 10%
- Output Current Limit: 20.5 mA dc ± 0.1 mA dc
- Switch Action: opens when INB >=80% closes when INB <75%

Terminal Designations:
FB03: AO+ (A7)
AOC-(A8)

FB03 ANALOG OUTPUT

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Z</td>
<td>ZERO OUTPUT</td>
<td>4.0 mA dc</td>
</tr>
<tr>
<td>C F</td>
<td>FULL SCALE OUTPUT</td>
<td>20.0 mA dc</td>
</tr>
<tr>
<td>C V</td>
<td>VERIFY OUTPUT</td>
<td>-3.33 to 103.31%</td>
</tr>
<tr>
<td>H I N A</td>
<td>INPUT A (SIGNAL)</td>
<td>000 to 208</td>
</tr>
<tr>
<td>H I N B</td>
<td>INPUT B (ON/OFF)</td>
<td>000 to 208</td>
</tr>
</tbody>
</table>

June 1994
Digital, on/off, signals to actuate field devices can be controlled with these function blocks. FB04 and FB05 provide a transistor output stage that turns on when the input to the block equals or exceeds 80% and turns off when it drops below 75%. These two function blocks can be used for loads such as relays, solid state annunciators, etc.

Configuration consists of entering another function block's output identification as the input to one of these blocks.

**Specifications:**

- **Type:** NPN open collector transistor with emitter tied to station common
- **Load Voltage:** 30 Vdc (max)
- **Load Current:** 100 mAdc (max)
- **ON** Voltage: 0.3 V (max) @ 0 mAadc load
- **OFF** Voltage: 0.6 V (max) @ 100 mAadc load
- **Off State Leakage:** 200µA @ 30 Vdc

**Terminal Designations:**

- **FB04:** DO1+ (B4)
  - DOC- (B7)
- **FB05:** DO2+ (B6)
  - DOC- (B7)

**DIGITAL OUTPUT #1**

- **Input A (ON/OFF):** 000 to 208

**DIGITAL OUTPUT #2**

- **Input A (ON/OFF):** 000 to 208

For additional Digital Outputs see FB31, FB32, FB33 and FB34

June 1994
This function block provides an on/off signal for use by other function blocks. The function block output identifier (16) is 0% when input is off and 100% when it is on. The normal input voltage is 24 Vdc.

Configuration consists of using the output identifier (16) as an input to other function blocks.

Specifications:
Type: isolated diode
Logic 1 Threshold: 15 Vdc (min)
Logic 0 Threshold: 1 Vdc (max)
Action: Input signal above logic 1 threshold produces 100% logic signal output. Input signal below logic 0 threshold produces 0% logic signal output.

Maximum Continuous Input: ±30 Vdc
Current Draw: 10 mA (max) @ 24 Vdc
Isolation: 100 Vdc
On/Off Time: 500 msec (min)

Output Identification:
FB06: 16

Terminal Designation:
FB06: DI+ (B8)
DI- (B9)

---

FB06 DIGITAL INPUT

DI+ (B8)

DI- (B9)

OUTPUT

---

June 1994
DISPLAY & ALARM

#1 through #10

Display and Alarm blocks have two major functions. They are used to display signals on the faceplate of the 385B, and provide alarming.

A Model 385B (Basic Station) possesses only signal type Display & Alarm blocks as shown below.

<table>
<thead>
<tr>
<th>Display Number</th>
<th>Function Block</th>
<th>385B Display &amp; Alarm Block Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>Signal</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Signal</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Signal</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>Signal</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>Signal</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>Signal</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>Signal</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>Signal</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>Signal</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>Signal</td>
</tr>
</tbody>
</table>

Signal type Display & Alarm block inputs are obtained from other function blocks (i.e., Analog Inputs, Link Interface, etc.) within the Model 385.

Model 385B units will have the following pushbuttons inoperable: A/M, D and TUNE.

Display Functions:
Inputs to each block can be linearized through the use of a selectable square root extractor. Process variables can be displayed in direct engineering units and the units can be assigned to the 4-character alphanumeric display. A 12-character tag name, which will scroll through the alphanumeric window, can also be assigned to each display point.

Configuration consists of selecting square root extraction and connecting the output to other blocks as required. The default display is in percent. To view in engineering unit values, configure the 0% Range Low value (HRL) and the 100% HI Range value (HRH). Also, configure the 4-character engineering units parameter (HU) to be displayed in the alphanumeric window. A 12-character tag name is configured in parameter STDN.

The LOOP pushbutton is used to select the desired loop display. Each time the button is pressed the station will advance to the next configured loop display or to the S display. If the key is held down, the station will scroll through all configured loop displays and the S display until the button is released.

(continued on next page)

June 1994
DISPLAY & ALARM

FB11 - FB20 (CONT'D)

#1 through #10

385B

Alarms Functions:

Each signal type Display & Alarm function block may be configured to provide four separate HI, LO or OR (Out of Range) alarms. An OR alarm by definition is comprised of a LO alarm set at 0% and a HI alarm set at 100%. The alarm setpoint for this type of alarm is ignored. Each alarm can have separate deadband, delay in time and delay out time. Any alarm can cause the associated LED to light and/or flash. Also, ringback may be enabled for each alarm. Ringback will cause an acknowledged alarm to re-flash when the alarm condition clears, providing the alarm has been configured to flash. If no alarm is required the alarm type should be set to NONE.

Alarm indication is divided into two levels. The first level of indication is at the loop display and is not configurable by the operator. When viewing a loop, the alphanumeric display will indicate which alarms are tripped (A1*1). The first two characters of the display indicate which alarm is tripped, is in ringback, or indicates a loop error. The third character (*) indicates if any alarms are active, the alarm bit high. The fourth character indicates how many alarms or loop errors are present. By pressing the ACK button, the currently displayed alarm is acknowledged and the next unacknowledged alarm is displayed. If all alarms are acknowledged, pressing the alarm button will scroll through the alarm stack.

The bargraph will flash if there are any un-acknowledged alarms configured to flash or loop errors. The flashing will stop when the alarm or loop error is acknowledged. If the alarm condition is cleared before being acknowledged and HSCF (Self Clearing Flashing) is set to YES, the bargraph will stop flashing. If HSCF is set to no, the bargraph will continue to flash until acknowledged.

The LED is the second level of alarm/error indication associated with each loop display. The LED is controlled by configuration of the alarm light parameter (HAL*) within FB11-FB20. The LED indicates the state of the comparators for its associated loop. If any one or all of the alarms for a loop are tripped the LED will be on if those alarms have been configured to alarm light. When an error has occurred, the LED will flash until the error is acknowledged. At that point the LED will remain steady until the error is cleared. To clear an error, a configuration store must be done (press Enter Config, press Step Down twice to the parameter level, and press Store). The alarm flasher will flash the LED and bargraph if there is an un-acknowledged alarm and the alarms have been configured for alarm flasher. The flasher is tripped when an alarm is actuated or when an alarm clears and ringback has been configured for that alarm. The flasher will continue to flash the LED and bargraph until the alarm condition is acknowledged. A ringback or an unacknowledged cleared alarm configured without self-clearing flashers will produce the identical display.

The station alarm displays will function as shown in the following tables.

Alarms Configured for: Alarm Light = YES

<table>
<thead>
<tr>
<th>Alarm Bit</th>
<th>NAK Bit</th>
<th>Alarm LED</th>
<th>Bargraph Flash</th>
<th>Alphanumeric</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
<td>Blank</td>
</tr>
<tr>
<td>Un-ACK Alarm</td>
<td>1</td>
<td>1</td>
<td>FLASH</td>
<td>A1*1</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
<td>FLASH</td>
<td>A1 1</td>
</tr>
</tbody>
</table>

Alarms Configured for: Alarm Light = NO

<table>
<thead>
<tr>
<th>Alarm Bit</th>
<th>NAK Bit</th>
<th>Alarm LED</th>
<th>Bargraph Flash</th>
<th>Alphanumeric</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
<td>Blank</td>
</tr>
<tr>
<td>Un-ACK Alarm</td>
<td>1</td>
<td>1</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
<td>OFF</td>
<td>A1**1</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
<td>OFF</td>
<td>A1 1</td>
</tr>
</tbody>
</table>

Alarms Configured for: Alarm Light = NO

<table>
<thead>
<tr>
<th>Alarm Bit</th>
<th>NAK Bit</th>
<th>Alarm LED</th>
<th>Bargraph Flash</th>
<th>Alphanumeric</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
<td>Blank</td>
</tr>
<tr>
<td>Un-ACK Alarm</td>
<td>1</td>
<td>1</td>
<td>FLASH</td>
<td>A1*1</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
<td>OFF</td>
<td>A1 1</td>
</tr>
</tbody>
</table>

(continued on next page)

June 1994
DISPLAY & ALARM

Output Identification:

<table>
<thead>
<tr>
<th>Function Block</th>
<th>Process Signal</th>
<th>Alarm 1 Status</th>
<th>Alarm 2 Status</th>
<th>Alarm 3 Status</th>
<th>Alarm 4 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB11</td>
<td>110</td>
<td>111</td>
<td>112</td>
<td>113</td>
<td>114</td>
</tr>
<tr>
<td>FB12</td>
<td>120</td>
<td>121</td>
<td>122</td>
<td>123</td>
<td>124</td>
</tr>
<tr>
<td>FB13</td>
<td>130</td>
<td>131</td>
<td>132</td>
<td>133</td>
<td>134</td>
</tr>
<tr>
<td>FB14</td>
<td>140</td>
<td>141</td>
<td>142</td>
<td>143</td>
<td>144</td>
</tr>
<tr>
<td>FB15</td>
<td>150</td>
<td>151</td>
<td>152</td>
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<td>154</td>
</tr>
<tr>
<td>FB16</td>
<td>160</td>
<td>161</td>
<td>162</td>
<td>163</td>
<td>164</td>
</tr>
<tr>
<td>FB17</td>
<td>170</td>
<td>171</td>
<td>172</td>
<td>173</td>
<td>174</td>
</tr>
<tr>
<td>FB18</td>
<td>180</td>
<td>181</td>
<td>182</td>
<td>183</td>
<td>184</td>
</tr>
<tr>
<td>FB19</td>
<td>190</td>
<td>191</td>
<td>192</td>
<td>193</td>
<td>194</td>
</tr>
<tr>
<td>FB20</td>
<td>200</td>
<td>201</td>
<td>202</td>
<td>203</td>
<td>204</td>
</tr>
</tbody>
</table>

Alphanumeric Display Character Identification:

<table>
<thead>
<tr>
<th>Character</th>
<th>Name</th>
<th>Character</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>blank</td>
<td>@</td>
<td>A</td>
<td>capital letter A</td>
</tr>
<tr>
<td>!</td>
<td>exclamation mark</td>
<td>B</td>
<td>capital letter B</td>
</tr>
<tr>
<td>&quot;</td>
<td>quotation mark</td>
<td>C</td>
<td>capital letter C</td>
</tr>
<tr>
<td>#</td>
<td>number sign</td>
<td>D</td>
<td>capital letter D</td>
</tr>
<tr>
<td>%</td>
<td>percent sign</td>
<td>E</td>
<td>capital letter E</td>
</tr>
<tr>
<td>&amp;</td>
<td>ampersand sign</td>
<td>F</td>
<td>capital letter F</td>
</tr>
<tr>
<td>'</td>
<td>apostrophe</td>
<td>G</td>
<td>capital letter G</td>
</tr>
<tr>
<td>(</td>
<td>left parenthesis</td>
<td>H</td>
<td>capital letter H</td>
</tr>
<tr>
<td>)</td>
<td>right parenthesis</td>
<td>I</td>
<td>capital letter I</td>
</tr>
<tr>
<td>*</td>
<td>asterisk</td>
<td>J</td>
<td>capital letter J</td>
</tr>
<tr>
<td>+</td>
<td>plus sign</td>
<td>K</td>
<td>capital letter K</td>
</tr>
<tr>
<td>,</td>
<td>comma</td>
<td>L</td>
<td>capital letter L</td>
</tr>
<tr>
<td>-</td>
<td>minus sign</td>
<td>M</td>
<td>capital letter M</td>
</tr>
<tr>
<td>.</td>
<td>period</td>
<td>N</td>
<td>capital letter N</td>
</tr>
<tr>
<td>/</td>
<td>slash right</td>
<td>O</td>
<td>capital letter O</td>
</tr>
<tr>
<td>0</td>
<td>zero</td>
<td>P</td>
<td>capital letter P</td>
</tr>
<tr>
<td>1</td>
<td>one</td>
<td>Q</td>
<td>capital letter Q</td>
</tr>
<tr>
<td>2</td>
<td>two</td>
<td>R</td>
<td>capital letter R</td>
</tr>
<tr>
<td>3</td>
<td>three</td>
<td>S</td>
<td>capital letter S</td>
</tr>
<tr>
<td>4</td>
<td>four</td>
<td>T</td>
<td>capital letter T</td>
</tr>
<tr>
<td>5</td>
<td>five</td>
<td>U</td>
<td>capital letter U</td>
</tr>
<tr>
<td>6</td>
<td>six</td>
<td>V</td>
<td>capital letter V</td>
</tr>
<tr>
<td>7</td>
<td>seven</td>
<td>W</td>
<td>capital letter W</td>
</tr>
<tr>
<td>8</td>
<td>eight</td>
<td>X</td>
<td>capital letter X</td>
</tr>
<tr>
<td>9</td>
<td>nine</td>
<td>Y</td>
<td>capital letter Y</td>
</tr>
<tr>
<td>:</td>
<td>colon</td>
<td>Z</td>
<td>capital letter Z</td>
</tr>
<tr>
<td>;</td>
<td>semi-colon</td>
<td>[</td>
<td>left square bracket</td>
</tr>
<tr>
<td>=</td>
<td>less than</td>
<td>\</td>
<td>slash left</td>
</tr>
<tr>
<td>&gt;</td>
<td>equal</td>
<td>]</td>
<td>right square bracket</td>
</tr>
<tr>
<td>?</td>
<td>greater than</td>
<td>^</td>
<td>caret</td>
</tr>
</tbody>
</table>

(continued on next page)
**DISPLAY & ALARM**

**FB11 - FB20 (CONT'D)**

#1 through #10

385B

Local Instrument Link Option Functions:
If a link card is present and assigned an ESN, each signal type Display & Alarm block will automatically transmit all block outputs to the Local Instrument Link. Therefore, the outputs of blocks FB11-FB20 do not have to be configured as inputs to FB98. See FB98 for LINK channel designations.

---

| SAA | SETPOINT ALARM 1 | -3.0% to 103.0% |
| SSB | SETPOINT ALARM 2 | -3.0% to 103.0% |
| SSC | SETPOINT ALARM 3 | -3.0% to 103.0% |
| SSD | SETPOINT ALARM 4 | -3.0% to 103.0% |
| SDD | DISPLAY TAG NAME | 12 CHAR (ASCII) |
| SEA | ENABLED/DISABLED ALARM 1 | ENDES |
| SEB | ENABLED/DISABLED ALARM 2 | ENDES |
| SEC | ENABLED/DISABLED ALARM 3 | ENDES |
| SED | ENABLED/DISABLED ALARM 4 | ENDES |

- **HNA** | INPUT A | 0 to 208 |
- **HRE** | SQUARE ROOT EXTRACTOR | NOYES |
- **HRU** | RANGE UNITS | 4 CHAR (ASCII) |
- **HDP** | DEG/DECIMAL POINT | 0.0,0.0 |
- **HRL** | RANGE LOW VALUE | 0.0000 to 0.0000 |
- **HRM** | RANGE HIG VALUE | 0.0000 to 0.0000 |
- **HSC** | SELF CLEARING FLASHER | NOYES |
- **HAT** | ALARM 1 TYPE | NON/MA/LO/DR |
- **HAD** | ALARM 1 DEADBAND | 0.10,5,15% |
- **HA1** | ALARM 1 DELAY IN | 00.01/05/15/30/60 |
- **HA2** | ALARM 1 DELAY OUT | 00.01/05/15/30/60 |
- **MRA** | ALARM 1 RINGBACK | NOYES |
- **MAL** | ALARM 1 LIGHT | NOYES |
- **MAB** | ALARM 1 FLASH | NOYES |
- **MA2** | ALARM 2 TYPE | NON/MA/LO/DR |
- **MAZ** | ALARM 2 DEADBAND | 0.10,5,15% |
- **HAE** | ALARM 2 DELAY IN | 00.01/05/15/30/60 |
- **HAF** | ALARM 2 DELAY OUT | 00.01/05/15/30/60 |
- **MAB** | ALARM 2 RINGBACK | NOYES |
- **MAL** | ALARM 2 LIGHT | NOYES |
- **MAB** | ALARM 2 FLASH | NOYES |
- **MAD** | ALARM 3 TYPE | NONE/40/60 |
- **MMD** | ALARM 3 DEADBAND | 0.00,5,15% |
- **HAG** | ALARM 3 DELAY IN | 00.01/05/15/30/60 |
- **HAF** | ALARM 3 DELAY OUT | 00.01/05/15/30/60 |
- **MAB** | ALARM 3 RINGBACK | NOYES |
- **MAL** | ALARM 3 LIGHT | NOYES |
- **MAB** | ALARM 3 FLASH | NOYES |
- **HAI** | ALARM 4 TYPE | NONE/40/60 |
- **HAD** | ALARM 4 DEADBAND | 0.10,5,15% |
- **HAI** | ALARM 4 DELAY IN | 00.01/05/15/30/60 |
- **HAF** | ALARM 4 DELAY OUT | 00.01/05/15/30/60 |
- **MAB** | ALARM 4 RINGBACK | NOYES |
- **MAL** | ALARM 4 LIGHT | NOYES |
- **MAB** | ALARM 4 FLASH | NOYES |

- Only available from front access key.

---

The block diagram is shown with various inputs and outputs. The table lists the available parameters with their respective settings.

Parameter Availability:
The table to the right shows parameters used in the Model 385B function blocks 11 through 20.

---

June 1994
DISPLAY & ALARM

#1 through #10

Display and Alarm blocks have two major functions. They are used to display signals on the faceplate of the 385H, and they provide alarming. When used with SMART transmitters additional transmitter variables can be viewed and changed. When used with a Moore Products XTC Transmitter-Controller with PID or Model 348, full loop operation is available from the 385H faceplate including A/M switching.

Model 385H (HART Station) Display & Alarm blocks can be configured with signal, voltage or HART inputs as shown below:

<table>
<thead>
<tr>
<th>Display Number</th>
<th>Function</th>
<th>385H Display &amp; Alarm Block Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>Signal/Voltage/HART</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>Signal/Voltage/HART</td>
</tr>
</tbody>
</table>

Signal type Display & Alarm block inputs are obtained from other function blocks (e.g. Analog Inputs, Link Interface, etc.) within the Model 385.

Voltage type Display & Alarm block inputs are obtained from hardwiring transmitters to the appropriate screw terminals on the back of the Model 385H.

HART type Display & Alarm block inputs are also obtained from hardwiring transmitters to the back of the Model 385H. In addition to the analog signal, data can be read from the transmitter via the HART Digital Communications Protocol.

The specifications for voltage and HART type inputs are shown on this page. The screw terminals for these inputs are shown on the following page.

Specifications:
- Input Range: 0-5 Vdc
- Standard Calibration: 1-5 Vdc
- Zero: 0-1 Vdc
- Span: 4-5 Vdc
- Input Type: Single ended (non-isolated)
- Normal Mode Rejection: 6dB @ 2Hz, 60dB @ 60Hz
- Input Impedance: >1 megohm
- Calibration Accuracy: ± 0.05% of span
- A/D Resolution: 12 bits
- A/D Linearity: ± 1/2 LSB
- Max. Continuous Input: ± 30 Vdc
- Ambient Temp Effect: ±0.5% span for 100F change
- Update Rate: 200 msec
- Digital Communications Protocol: HART
- Communications Topology: Point to point only

(continued on next page)
DISPLAY & ALARM

#1 through #10

FB11 - FB20 (CONT'D) 385H

Terminal Designations:

FB11: LI1+ (C1) FB16: LI6+ (D1)
LI/C- (C2) LI/C- (D2)
FB12: LI2+ (C3) FB17: LI7+ (D3)
LI/C- (C2) LI/C- (D2)
FB13: LI3+ (C4) FB18: LI8+ (D4)
LI/C- (C5) LI/C- (D5)
FB14: LI4+ (C6) FB19: LI9+ (D6)
LI/C- (C5) LI/C- (D5)
FB15: LI5+ (C7) FB20: LI10+ (D7)
LI/C- (C8) LI/C- (D8)

Input Type:
Parameter HINT configures the loop input type. Refer to the
input type list at the bottom of the parameter listing.
When HINT = 8, parameter HPLD specifies if the loop will
display Loop 1 or Loop 2 of the Model 348. Parameter
HSLD specifies which HS loop, if any, will display the
other loop in the 348. When editing the configuration of
the secondary loop, parameters HINT and HSLD are not
available. Parameter HPLD will indicate which 358 loop is
displaying the primary.

Block Inputs:
HINA is the signal input and is used only if the active
point is configured as signal input type (HINT=0). HINE is
valid only for a Moore Products Co. XTC w/PID (HINT=4
or 7). If HINE is configured to be any value other than
000, HINE will be the remote setpoint for the controller.

Block Outputs:
For every input type there are four ALARM STATUS
outputs, a LOOP ERROR status output, and a PROCESS
valve output. The ALARM STATUS outputs are a logic 1
when the associated alarm is tripped. The LOOP
ERROR output is a logic 1 when an error exists in the
loop/transmitter. The PROCESS output is the process
value in percent.

Output Identification:

<table>
<thead>
<tr>
<th>Function</th>
<th>Process</th>
<th>Alarm 1 Status</th>
<th>Alarm 2 Status</th>
<th>Alarm 3 Status</th>
<th>Alarm 4 Status</th>
<th>Setpoint</th>
<th>Valve</th>
<th>A/M</th>
<th>Loop Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB11</td>
<td>110</td>
<td>111</td>
<td>112</td>
<td>113</td>
<td>114</td>
<td>115</td>
<td>116</td>
<td>117</td>
<td>118</td>
</tr>
<tr>
<td>FB12</td>
<td>120</td>
<td>121</td>
<td>122</td>
<td>123</td>
<td>124</td>
<td>125</td>
<td>126</td>
<td>127</td>
<td>128</td>
</tr>
<tr>
<td>FB13</td>
<td>130</td>
<td>131</td>
<td>132</td>
<td>133</td>
<td>134</td>
<td>135</td>
<td>136</td>
<td>137</td>
<td>138</td>
</tr>
<tr>
<td>FB14</td>
<td>140</td>
<td>141</td>
<td>142</td>
<td>143</td>
<td>144</td>
<td>145</td>
<td>146</td>
<td>147</td>
<td>148</td>
</tr>
<tr>
<td>FB15</td>
<td>150</td>
<td>151</td>
<td>152</td>
<td>153</td>
<td>154</td>
<td>155</td>
<td>156</td>
<td>157</td>
<td>158</td>
</tr>
<tr>
<td>FB16</td>
<td>160</td>
<td>161</td>
<td>162</td>
<td>163</td>
<td>164</td>
<td>165</td>
<td>166</td>
<td>167</td>
<td>168</td>
</tr>
<tr>
<td>FB17</td>
<td>170</td>
<td>171</td>
<td>172</td>
<td>173</td>
<td>174</td>
<td>175</td>
<td>176</td>
<td>177</td>
<td>178</td>
</tr>
<tr>
<td>FB18</td>
<td>180</td>
<td>181</td>
<td>182</td>
<td>183</td>
<td>184</td>
<td>185</td>
<td>186</td>
<td>187</td>
<td>188</td>
</tr>
<tr>
<td>FB19</td>
<td>190</td>
<td>191</td>
<td>192</td>
<td>193</td>
<td>194</td>
<td>195</td>
<td>196</td>
<td>197</td>
<td>198</td>
</tr>
<tr>
<td>FB20</td>
<td>200</td>
<td>201</td>
<td>202</td>
<td>203</td>
<td>204</td>
<td>205</td>
<td>206</td>
<td>207</td>
<td>208</td>
</tr>
</tbody>
</table>

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### DISPLAY & ALARM

**Parameter Availability:**
The following tables show the parameters used in the 385H Function Blocks 11-20. Refer to the list of parameter availability vs. input types on the following pages.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARM 1</td>
<td>Flash</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Type</td>
<td>NONE</td>
<td>L</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Delay</td>
<td>0.10,5/15%</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Delay In</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Delay Out</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Ringback</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 2</td>
<td>Light</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Flash</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Type</td>
<td>NONE</td>
<td>L</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Delay</td>
<td>0.10,5/15%</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Delay In</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Delay Out</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Ringback</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Light</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 3</td>
<td>Flash</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Type</td>
<td>NONE</td>
<td>L</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Delay</td>
<td>0.10,5/15%</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Delay In</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Delay Out</td>
<td>0.4/1/25/15/30/60</td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Ringback</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Light</td>
<td></td>
<td>NOYES</td>
</tr>
<tr>
<td>ALARM 4</td>
<td>Flash</td>
<td></td>
<td>NOYES</td>
</tr>
</tbody>
</table>

The table on the following page shows the parameters which are read from the transmitter. These parameters may be viewed and/or changed from the M menu of the 385H.

---

**Input Types:**
- 0: Signal
- 1: Commercial
- 2: Smart
- 3: MFCs: Smart
- 4: MFCs: Smart/FID

(continued on next page)
DISPLAY & ALARM
#1 through #10

When configuring the measured or process variable range (parameters MML, MMH, MPL, MPH) the LEFT ARROW (TUNE) and RIGHT ARROW (ALARM) pushbuttons can be used in conjunction with the pulsers knobs to enter the value. The LEFT & RIGHT ARROW pushbuttons will shift the decimal point to the left and right, respectively. This feature will considerably reduce the amount of "rotating" of the pulsers knob required to enter a large value. Be advised that this feature only shifts the decimal point and once a digit has been shifted off the display it will be lost. For example, if a value of 100.00 is displayed, repeatedly pressing the LEFT ARROW pushbutton will eventually lead to a value of .0001. Pressing the LEFT ARROW pushbutton once more will cause the value to become .0000. Pushing the RIGHT ARROW pushbutton will not retrieve the *1*. It must be re-entered with the pulsers knob.

Display Functions:
Inputs to each block can be linearized through the use of a selectable square root extractor. Process variables can be displayed in direct engineering units and the units can be assigned to the 4-character alphanumeric display. A 12-character tag name can also be assigned to each display point which will scroll through the alphanumeric window when the loop is selected.

Configuration consists of connecting the output to other blocks as required. The default display is in percent. To view in engineering units, configure the 0% range low value (HRL) and the 100% range high value (HRH). Also, configure the 4-character engineering units parameter (HRU) to be displayed in the alphanumeric window. The 12-character tag name is configured in parameter SDTN.

The Loop pushbutton is used to select the desired loop display. Each time the button is pressed the station will advance to the next configured loop, or the S display, until the button is released.

Once the active loop has been selected, the station will display the process variable for that loop. If a link board is installed and being used in the station, the CF status will be shown for that loop.

---

(continued on next page)
DISPLAY & ALARM
#1 through #10

If the configured transmitter is a Moore Products Co. XTC w/PID, or a Model 348, then the A/M pushbutton will display the auto-manual status of the device. Pushing the A/M button will switch the device between A/M. The D pushbutton will switch the display between P, S, and V. When a loop is selected, the last variable (P, S or V) selected for that loop is displayed. When the loop is switched to automatic the display will switch to S. When the loop is switched to manual the display will switch to V.

If the transmitter is a Smart Transmitter without PID, then the display will only show P and the D, A/M and TUNE buttons will not function. All alarms will be station alarms.

Auto-configuration:
For input types 3, 4, 6, & 7, each loop can be configured for auto-configuration by setting HAC=EN. By doing this certain loop parameters are automatically made to equal their transmitter counterparts. The parameters which are auto-configured when HAC=EN are shown in the following table.

385 PARAMETERS READ FROM THE TRANSMITTER
WHEN HAC=EN

<table>
<thead>
<tr>
<th>SDTN</th>
<th>DISPLAY TAG NAME .......... 8 CHAR (ASCII)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRU</td>
<td>RANGE UNITS ................. 4 CHAR (ASCII)</td>
</tr>
<tr>
<td>HDP</td>
<td>DECIMAL POINT .................. 0.0.0.0</td>
</tr>
<tr>
<td>HRL</td>
<td>RANGE LOW VALUE .............. +18750 TO 18750</td>
</tr>
<tr>
<td>HRR</td>
<td>RANGE HIGH VALUE ............. +18750 TO 18750</td>
</tr>
</tbody>
</table>

These parameters will not be accessible through the S and H configuration menus if HAC=EN. SDTN is actually a 12-character tag-name in the 385H. Transmitters only use 8-character tag-names, therefore the first eight characters of the tag-name will be filled in with the transmitter tag-name and the last four characters will be left blank.

For input type 8 (Model 348), parameter "HAC" does not appear in the H Configuration menu. The 385 will auto-configure (AC) the loop whenever a configuration change is made to the Model 348.

Other transmitter parameters can be viewed and changed through the M menu of the configuration.

Quick Tune:
The TUNE button allows the PID parameters in the XTC transmitter-controller or Model 348 to be viewed and changed. These parameters can also be found in the M menu of configuration. The following table shows which transmitter parameters are accessible from the TUNE button. MACT cannot be altered from the TUNE key.

TUNING PARAMETERS ACCESSIBLE THROUGH TUNE KEY

<table>
<thead>
<tr>
<th></th>
<th>CONTROLLER ACTION .......... DR/REV</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACT</td>
<td>PROPORTIONAL GAIN .............. 0.01 TO 100.0</td>
</tr>
<tr>
<td>MPG</td>
<td>INTEGRAL TIME ................. 0.01 TO 1000 MR</td>
</tr>
<tr>
<td>MTTI</td>
<td>DERIVATIVE TIME ............... 0.00 TO 100 MIN</td>
</tr>
<tr>
<td>MMDG</td>
<td>DERIVATIVE GAIN ............ 1.00 TO 30.0</td>
</tr>
<tr>
<td>MMR</td>
<td>MANUAL RESET .................. 0-100%</td>
</tr>
</tbody>
</table>

Quick Alarm:
The ALARM button allows the alarm parameters in the 385, XTC and Model 348 to be viewed and changed. For alarms to appear in the Quick Alarm function, the alarm must be configured. Alarms 1 & 2 reside in the XTC. When the loop is configured for the primary loop (HLPD) in a Model 348, alarms 1, 2, 3, and 4 of FB12 in the 348 are mapped to the loop alarms in the 385. If configured as the secondary loop (HSLD) in the Model 348, alarms 5, 6, 7, and 8 of FB73 of the 348 are mapped to the loop alarms in the 385.

Alphanumeric Display:
The alphanumeric display will show the engineering units if no alarm is active. If an alarm occurs the alphanumeric display will show the alarm status. The ACK button can be used to acknowledge and step through the alarms for the displayed loop. A common acknowledge can be accomplished for all loops if they are configured as such. Refer to FB30, Station Controls, for more information. The TAG button can be pressed to display the tagname and engineering units. If any transmitter error occurs, the LOOP ERROR status is displayed in the alphanumeric window and the LOOP ERROR output of the Display & Alarm block will go high until the error condition is cleared. A list of Loop errors which can occur when communicating to a transmitter follows.

Loop Transmitter Error Codes

<table>
<thead>
<tr>
<th>CH</th>
<th>Transmitter Configuration Hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Communication Failure</td>
</tr>
<tr>
<td>T2</td>
<td>Input Overrange</td>
</tr>
<tr>
<td>T3</td>
<td>RAM Error</td>
</tr>
<tr>
<td>T4</td>
<td>ROM Error</td>
</tr>
<tr>
<td>T5</td>
<td>Fixed Current Mode</td>
</tr>
<tr>
<td>T6</td>
<td>EEPROM Error</td>
</tr>
<tr>
<td>T7</td>
<td>Watchdog Timer Error</td>
</tr>
<tr>
<td>T8</td>
<td>Sensor Error</td>
</tr>
</tbody>
</table>

(continued on next page)
DISPLAY & ALARM

#1 through #10

Alarm Functions:
Each Display & Alarm function block may be configured to provide four separate Hi, LO or OR (Out of Range) alarms. An OR alarm by definition is comprised of a LO alarm set at 1% and a Hi alarm set at 100%. The alarm trip point for this type of alarm is ignored. Each alarm can have separate deadband, delay in time and delay out time. Any alarm can cause the associated LED to light and/or flash. Also, ringback may be enabled for each alarm. Ringback will cause an acknowledged alarm to reflash when the alarm condition clears, providing the alarm has been configured to flash. If no alarming is required, the alarm type should be set to NONE.

If the input type, HINT, selected is 4 or 7, XTC w/PID, then alarms 1 and 2 will display the alarm settings within the XTC controller. Alarms 3 and 4 are generated by the 385. Station alarms 1 & 2 for the loop will not be used, however, their alarm settings will be saved. If an input type other than 4 or 7 is re-selected, station alarms 1 and 2 will be restored. A table of modified H parameters for input types 4 and 7 is shown on the following pages.

If the input type, HINT, selected is 8, Model 348, then the 385 alarms will display the alarm settings in the Model 348. The primary loop display alarms will represent Alarms 1-4 in FB12 of the 348. The secondary loop display alarms will represent loop 2 alarms in FB73 of the 348.

For all other input types, all four alarms are generated by the 385.

ENABLE and DISABLE will enable or disable an alarm. The Alarm Enable Statuses (SEA1, SEA2, SEA3 and SEA4) can only be accessed and changed over the Local Instrument Link, or with the quick access pushbutton, defaulting to enable. If SEA1 is selected as DIS, the Alarm 1 Output, alphanumeric status and flashing bargraph (if configured) will not be active until SEA1 is changed to EN.

Alarm indication is divided into two levels. The first level of indication is at the loop display and is not configurable by the operator. When viewing a loop, the alphanumeric display will indicate which alarms are tripped (A**1). The first two characters of the display indicate which alarm is tripped, is in ringback, or indicates a loop error. The third character (*) indicates if any alarms are active, the alarm bit high. The fourth character indicates how many alarms or loop errors are present. By pressing the ACK button, the currently displayed alarm is acknowledged and the next un-acknowledged alarm is displayed. If all alarms are acknowledged, pressing the alarm button will scroll through the alarm stack.

The bargraph will flash if there are any un-acknowledged alarms configured to flash or loop errors. The flashing will stop when the alarm or loop error is acknowledged. If the alarm condition goes away before being acknowledged and HSCF (Self Clearing Flasher) is set to NO, the bargraph will continue to flash until acknowledged.

The LED is the second level of alarm/error indication associated with each loop display. The LED is controlled by configuration of the alarm light (NAL-) within FB11-FB20. The LED indicates the state of the comparators for its associated loop. If any one or all of the alarms for a loop are tripped, the LED will be on if those alarms have been configured to alarm light. When an error has occurred, the LED will flash until the error is acknowledged. At that point, the LED will remain steady until the error is cleared. To clear an error, a configuration store must be done (press Enter config, press Step Down twice to the parameter level, and press Store).

The alarm flasher will flash the LED and bargraph if there is an un-acknowledged alarm and the alarms have been configured for alarm flasher. The flasher is tripped when an alarm is actuated or when an alarm clears and ringback has been configured for that alarm. The flasher will continue to flash the LED until the alarm condition is acknowledged. A ringback or an unacknowledged cleared alarm configured without self-clearing flashers will produce the identical display.

The station alarm displays will function as shown in the following tables.

D1 Transmitter/Input Type Mismatch
This status indicates that the input type (HINT) is not valid for the attached transmitter.

Device Status
D1, Model 348 in Local. This status is valid for the Model 348 only. This status is displayed if C/L is invoked in the Model 348 and the 348 is in Local.

Local Instrument Link Option Functions:
If a link card is present and assigned an ESN, each signal type Display & Alarm block will automatically transmit all block outputs to the Local Instrument Link. Therefore, the outputs of blocks FB11-FB20 do not have to be configured as Inputs to FB98. See FB98 for channel designations.

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DISPLAY & ALARMS

Each loop will also have its own console/local function.
To make operator changes, the C/L button must be in the
Local position. To make changes through the U/L, the
button must be in the Console position. For a Model 348
with C/L function invoked, the C/L button will work as
follows: Pressing the C/L button will switch the 348 into C
mode. The 385 will function as normal. However, if the
385 is in L and the 348 is in C, changes from the 385 loop
display will not be accepted by the 348. Note that the DL
status should appear in the alphanumeric display. To
make changes from the 385 faceplate, you must press
the C/L button twice. First to send the 348 into Console
and second to place the 385 loop in Local.

Fixed Current Mode:
Parameter MFCL is used to place the transmitter in fixed
current mode. Whenever this parameter is STORED, the
transmitter is fixed at the current value stored.
Parameter MFC is used to end the fixed current mode. If
the transmitter is not in fixed current mode, parameter
MFC can also be used to enter this mode. When MFC is
enabled, the transmitter will fix its output at its present
value. These parameters are not valid for the Model 348.

<table>
<thead>
<tr>
<th>Alarms Configured for:</th>
<th>Alarm Light = YES</th>
<th>Alarm Flasher = YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Bit</td>
<td>NAK Bit</td>
<td>Alarm LED</td>
</tr>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Un-Ack Alarm</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarms Configured for:</th>
<th>Alarm Light = YES</th>
<th>Alarm Flasher = NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Bit</td>
<td>NAK Bit</td>
<td>Alarm LED</td>
</tr>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Un-Ack Alarm</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarms Configured for:</th>
<th>Alarm Light = NO</th>
<th>Alarm Flasher = YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Bit</td>
<td>NAK Bit</td>
<td>Alarm LED</td>
</tr>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Un-Ack Alarm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>OFF</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarms Configured for:</th>
<th>Alarm Light = NO</th>
<th>Alarm Flasher = NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Bit</td>
<td>NAK Bit</td>
<td>Alarm LED</td>
</tr>
<tr>
<td>No Alarm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Un-Ack Alarm</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ACK Alarm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ringback/ Cleared Alarm (NSCF)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

(continued on next page)
## DISPLAY & ALARM

**#1 through #10**

### Function Block Descriptions

**FB11 - FB20 (CONT'D)**

**385H**

Parameter Availability Vs. Input Type Table:
Due to the wide variety of transmitter types, not every parameter will function with every transmitter type. The following table cross-references which parameters are functional for each possible transmitter type.

<table>
<thead>
<tr>
<th>HINT</th>
<th>Parameter Code</th>
<th>Parameter Name</th>
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<tbody>
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<td>SSA1</td>
<td>Alarm #1 Setpoint</td>
</tr>
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<td>Alarm #2 Setpoint</td>
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<tr>
<td>7</td>
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<td>Alarm #3 Setpoint</td>
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</tr>
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<td>HRH</td>
<td>Range High Value</td>
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<td>Self Clearing Flasher</td>
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<td>HINE</td>
<td>Remote Setpoint</td>
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<td>HPLD</td>
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<tr>
<td></td>
<td>HSDL</td>
<td>Secondary Loop Display</td>
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<td>HCWM</td>
<td>Clock Wise Manual</td>
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<td></td>
<td>HA1D</td>
<td>Alarm #1 Deadband</td>
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<td>HA1I</td>
<td>Alarm #1 Delay In Time</td>
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<tr>
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<td>HA1O</td>
<td>Alarm #1 Delay Out Time</td>
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<td>HA1R</td>
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<td>HAL1</td>
<td>Light On Alarm Enabled</td>
</tr>
<tr>
<td></td>
<td>HAL2</td>
<td>Light On Alarm Enabled</td>
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<tr>
<td></td>
<td>HAL3</td>
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</tr>
<tr>
<td></td>
<td>HAF1</td>
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</tr>
<tr>
<td></td>
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<tr>
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</tbody>
</table>

(continued on next page)
## DISPLAY & ALARM

**#1 through #10**

**FB11 - FB20 (CONT'D)**

**385H**

### Parameter Availability Vs. Input Type Table (continued):

<table>
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<tr>
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<th>4.7</th>
<th>3.6</th>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Notes: | **- Parameter is available**  
|       | **1 - Parameter is available if HAC=NO**  
|       | **HAC=YES means these parameters read from transmitter.**  
|       | **2 - Parameter value can be seen but not changed (READ ONLY)**

**HINT:**

- 0 - No HART board attached, signal display only
- 1 - Transmitter is conventional
- 2, 5 - Transmitter is generic smart
- 3, 6 - Transmitter is MPCo smart
- 4, 7 - Transmitter is MPCo smart w/ controller
- 8 - Moore Products Co. Model 348

### H PARAMETER MODIFICATIONS FOR MPCo W/PID TRANSMITTER

<table>
<thead>
<tr>
<th>H</th>
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<th>T</th>
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<td>T</td>
<td>1</td>
<td>ALARM 1 TYPE</td>
</tr>
<tr>
<td>A1</td>
<td>D</td>
<td>1</td>
<td>ALARM 1 DEADBAND</td>
</tr>
<tr>
<td>A1</td>
<td>I</td>
<td>1</td>
<td>ALARM 1 DELAY IN</td>
</tr>
<tr>
<td>A1</td>
<td>O</td>
<td>1</td>
<td>ALARM 1 DELAY OUT</td>
</tr>
<tr>
<td>A1</td>
<td>R</td>
<td>1</td>
<td>ALARM 1 RINGBACK</td>
</tr>
<tr>
<td>A1</td>
<td>L</td>
<td>1</td>
<td>ALARM 1 LIGHT</td>
</tr>
<tr>
<td>A1</td>
<td>F</td>
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</tr>
<tr>
<td>A2</td>
<td>T</td>
<td>2</td>
<td>ALARM 2 TYPE</td>
</tr>
<tr>
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<td>D</td>
<td>2</td>
<td>ALARM 2 DEADBAND</td>
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<td>ALARM 2 DELAY IN</td>
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<td>O</td>
<td>2</td>
<td>ALARM 2 DELAY OUT</td>
</tr>
<tr>
<td>A2</td>
<td>R</td>
<td>2</td>
<td>ALARM 2 RINGBACK</td>
</tr>
<tr>
<td>A2</td>
<td>L</td>
<td>2</td>
<td>ALARM 2 LIGHT</td>
</tr>
<tr>
<td>A2</td>
<td>F</td>
<td>2</td>
<td>ALARM 2 FLASH</td>
</tr>
</tbody>
</table>

*Alarm Types Hi Lo dLo dLo are valid only when interfacing with a Model 348*
DISPLAY & ALARM

Controller Option of a MPCo Smart Transmitter

The interface to a controller transmitter will be identical to
the standard smart transmitter interface with respect to
operation, parameters and LINK operation, except for the
following:

1. Digitally read PV - Since the 4-20 mA signal from a
controller transmitter is the valve signal, the display
process output will not be the 4-20 mA signal. The
process output will instead be the digitally read process
variable from the transmitter converted to a 0-100%
signal for use with other function blocks. It will be
updated automatically 3 times a second.

2. Displaying and Entering IEEE Floating Point Numbers
- All numbers between 19999 and .0001 will be displayed.
If a number larger than 19999 is encountered, "HI" will be
displayed. If a number smaller than -19999, a "LO" will
be displayed. If a number between .0001 and -.0001 is
encountered a .0000 will be displayed. If a number within
this range is encountered, but the number requires more
resolution than can be displayed (150.47883), the number
will be rounded to fit in the display (150.5). If this number
is downloaded to the transmitter, the truncated decimal
places will be lost (150.5000). The pulser knob is used to
change the number. If the number is decremented so the
first digit becomes a 1, the display will shift to show an
additional decimal place (200.0 to 199.99). If the number
is incremented until the first digit is a 1 and all other digits
are 9's, the display will drop the last decimal place to
accommodate the larger number (199.99 to 200.0).

3. Auto Configure Parameters Out of Range - The
following guidelines are for auto configuring out of range
parameters to FB11-FB20.

A. If a value, when combined with the FB11-FB20
decimal point position, is out of range, the decimal
point position should be moved.

B. If a value is specified to a greater resolution than
can be displayed, round off the value.

C. If a value is greater than 18750 then FB11-FB20
will be converted to 0.00 - 100.00%.

Measured Variable Units Table

<table>
<thead>
<tr>
<th>Code</th>
<th>Units</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>undefined</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>inches H2O O 68F</td>
<td>in_H2O</td>
</tr>
<tr>
<td>2</td>
<td>inches Hg O 0F</td>
<td>in Hg</td>
</tr>
<tr>
<td>3</td>
<td>feet H2O O 68F</td>
<td>ft H2O</td>
</tr>
<tr>
<td>4</td>
<td>millimeters H2O O 68F</td>
<td>mm H2O</td>
</tr>
<tr>
<td>5</td>
<td>millimeters Hg O 0F</td>
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<td>bars</td>
<td>bars</td>
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<tr>
<td>8</td>
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<td>mbar</td>
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<td>g/sq cm</td>
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(continued on next page)
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<th>Abbreviation</th>
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<td>STon/day</td>
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<tr>
<td>79</td>
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<td>130</td>
<td>feet-in-sixteens</td>
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<td>lb/sec</td>
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<td>% Plato</td>
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<td>STOn/day</td>
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<tr>
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<tr>
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<td>140</td>
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<td>92</td>
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<td>g/Cu cm</td>
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</table>
SQUARE ROOT EXTRACTORS

#1, #2 & #3

These function blocks will extract the square root of a 0-100% signal. In addition, the output will be limited to 0% if input "A" drops below 0%.

Configuration of FB24, FB25 or FB26 consists of using another function block’s output identifier as INPUT A.

Output Identification:
FB24: 24
FB25: 25
FB26: 26
This function block controls several features that pertain to the Model 385 as a whole. This block controls the point tag scroll time which is the total time configured for the tag information to scroll through the alpha-numeric display. This block also controls the time delay from advancing from one display point to the next while in the AUTO SCAN mode. The 12-character configuration identification is part of this block.

Common Acknowledge:
Points in alarm can be acknowledged in one of two ways. Either the point must first be selected with the loop pushbutton as the current display point to be acknowledged by pressing the ACK button, or a point can be acknowledged without having to first select that specific point with the loop pushbutton. The latter is referred to as "common acknowledge" and can be enabled or disabled for each display point. Acknowledgement of alarms can either be done by pushing the ACK pushbutton on the faceplate, or by a logic signal from another function block brought into INPUT A of FB30.

Common Pulse:
The Station Control block has two outputs that are controlled by the "common pulse" feature. When common pulse is enabled, the outputs will behave in the following fashion. The PULSE ON output will pulse hi (100%) for 1.0 seconds whenever an alarm LED begins to flash providing no other alarm LED is flashing. The PULSE OFF output will flash hi (100%) for 1.0 seconds whenever the last flashing alarm LED is acknowledged and stops flashing. When the common pulse feature is disabled, alarms occurring for that display point will have no effect on the two block outputs.

Display Point S:
(Station Status Display):
The Station Status Display contains some information from the Station Control block. The point tag of the S display is the Configuration Identification. When the TAG pushbutton is depressed, the Link Station Address (LSA), Database Revision Number (DRN), Station Identification Number (SID) and Configuration File Name (CFN) will be scrolled through the alphanumeric display.

It should be noted that there is no Common Acknowledge parameter for the S point display. This is due to the seriousness of the conditions that cause the S alarm LED to flash. Any on-line error code (refer to SD385), any non-updating link input configured as such, and any Emergency Local message will cause the alarm LED to flash. The STATION ERROR output of the block goes high whenever the S LED flashes. Alarm messages can be viewed in the 4-character alphanumeric display in the following format: the first two characters will be the message code (NU, EL, etc.), the next character will be blank and the final character will be the number of active messages. All Non-Updating Link Inputs (NU) will count as only one message. All messages can be viewed by pushing the ACK pushbutton. However, when displaying a NU status, the 5-digit display will display the Link Station Address of the NU source followed by the Model 385 FB98 output number that is currently not updating. Emergency Local (EL) will only appear if FB98 is assigned an ESN and the S85 is not communicating on the Local Instrument Link.

Loop Error:
The LOOP ERROR output of FB30 will go high whenever any one of the Display & Alarm Blocks, FB11-FB20, report a loop error. Note that each Display & Alarm block also has its own LOOP ERROR output. All individual LOOP ERROR outputs are ORed together to make the LOOP ERROR output of FB30.

(continued on next page)
<table>
<thead>
<tr>
<th>FB30</th>
<th>STATION CONTROL / S DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S T S T TAG SCROLL TIME ........................................ 1 to 10 SEC</td>
</tr>
<tr>
<td></td>
<td>S A S D AUTO SCAN DELAY TIME ...................................... 1 to 20 SEC</td>
</tr>
<tr>
<td></td>
<td>H S I D STATION IDENTIFICATION ... 12 CHAR. (ASCII)</td>
</tr>
<tr>
<td></td>
<td>H I N A INPUT A (ACK) .................................................. 000 to 208</td>
</tr>
<tr>
<td>A 1</td>
<td>COMMON ACK. DISPLAY 1 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 2</td>
<td>COMMON ACK. DISPLAY 2 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 3</td>
<td>COMMON ACK. DISPLAY 3 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 4</td>
<td>COMMON ACK. DISPLAY 4 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 5</td>
<td>COMMON ACK. DISPLAY 5 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 6</td>
<td>COMMON ACK. DISPLAY 6 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 7</td>
<td>COMMON ACK. DISPLAY 7 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 8</td>
<td>COMMON ACK. DISPLAY 8 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 9</td>
<td>COMMON ACK. DISPLAY 9 ................................................. NO/YES</td>
</tr>
<tr>
<td>A 10</td>
<td>COMMON ACK. DISPLAY 10 ............................................... NO/YES</td>
</tr>
<tr>
<td>P 1</td>
<td>COMMON PULSE DISPLAY 1 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 2</td>
<td>COMMON PULSE DISPLAY 2 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 3</td>
<td>COMMON PULSE DISPLAY 3 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 4</td>
<td>COMMON PULSE DISPLAY 4 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 5</td>
<td>COMMON PULSE DISPLAY 5 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 6</td>
<td>COMMON PULSE DISPLAY 6 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 7</td>
<td>COMMON PULSE DISPLAY 7 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 8</td>
<td>COMMON PULSE DISPLAY 8 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 9</td>
<td>COMMON PULSE DISPLAY 9 ................................................ NO/YES</td>
</tr>
<tr>
<td>P 10</td>
<td>COMMON PULSE DISPLAY 10 ............................................... NO/YES</td>
</tr>
</tbody>
</table>

June 1994
Digital, on/off, signals to actuate field devices can be controlled with these function blocks. These FB’s provide a transistor output stage that turns on when the input to the block equals or exceeds 80% and turns off when it drops below 75%. These four function blocks can be used for loads such as relays, solid state annunciators, etc.

Configuration consists of entering another function block’s output identification as the input to one of these blocks.

Specifications:
Type: NPN open collector transistor with emitter tied to station common
Load Voltage: 30 Vdc (max)
Load Current: 100 mA (max)
Switch Action: On when INA >= 80%
Off when INA < 75%
*ON* Voltage: 0.3 V (max) @ 0 mA load
0.6 V (max) @ 100 mA load
Off State Leakage: 200µA @ 30 Vdc

Terminal Designations:
FB31: DO3+ (D9)
DOC- (D10)
FB32: DO4+ (C9)
DOC- (C10)
FB33: DO5+ (B10)
DOC- (A10)
FB34: DO6+ (A9)
DOC- (A10)

For additional Digital Outputs see FB04 and FB05

(continued on next page)
This block can add, subtract, multiply or divide up to three input signals. The basic signal equation is given below. SA, SB and SC are the 0-100% A, B and C inputs normalized to a 0-1 range. SO is the normalized signal output. An output range of 0-1 is converted to a 0-100% block output. The block output is limited at -3.3% and 103.3%. The default value for inputs A, B and C is 0%. The bias values default to 0, the gains default to 1, and the operators default to ADD.

Output Identification:
FB35: 35

Signal Equation:
\[ S_O = G_O ((G_A \times S_A + B_A) \times (G_B \times S_B + B_B)) \times (G_C \times S_C + B_C)) + B_O \]

For additional Math Blocks see FB36 and FB37
This block can add, subtract, multiply or divide up to three input signals. The basic signal equation is given below. \( S_A, S_B \) and \( S_C \) are the 0-100% \( A, B \) and \( C \) inputs normalized to a 0-1 range. \( S_O \) is the normalized signal output. An output range of 0-1 is converted to a 0-100% block output. The block output is limited at -3.3% and 103.3%. The default value for inputs \( A, B \) and \( C \) is 0. The bias values default to 0, the gains default to 1, and the operators default to ADD.

Output Identification:

**FB36** - 36

**Signal Equation:**

\[
S_O = G_O((G_A S_A + B_A) - \text{OPERATION A} (G_B S_B + B_B) - \text{OPERATION B} (G_C S_C + B_C)) + B_O
\]

**DEFAULT VALUES**

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>( A )</th>
<th>( B )</th>
<th>( C )</th>
</tr>
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<td></td>
<td></td>
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<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**BLOCK DIAGRAM**

For additional Math Blocks see FB35 and FB37

June 1994
This block can add, subtract, multiply or divide up to three input signals. The basic signal equation is given below. SA, SB and SC are the 0-100% A, B and C inputs normalized to a 0-1 range. SO is the normalized signal output. An output range of 0-1 is converted to a 0-100% block output. The block output is limited at -3.3% and 103.3%. The default value for inputs A, B and C is 0%. The bias values default to 0, the gains default to 1, and the operators default to ADD.

Output Identification:
FB37: 37

Signal Equation:
\[ S_O = G_O ((G_A \times S_A + B_A) \times \text{OPERATION A} (G_B \times S_B + B_B) \times \text{OPERATION B} (G_C \times S_C + B_C)) + B_O \]

For additional Math Blocks see FB35 and FB36
QUAD LOGIC BLOCK #1

This logic block provides the ability to perform logic functions on four pairs of inputs to provide four separate outputs. Logic elements are individually selected for a designated pair of inputs. Functions include AND, NAND, OR, NOR and EOR (Exclusive OR).

Configuration consists of selecting the required type of logic for a pair of inputs and entering output identifiers as block inputs. An unconfigured input to an AND/NAND logic element will default to 100%. An unconfigured input to an OR/NOR/XOR logic element will default to 0%.

Inputs 1 and 2 in the truth table can be any pair of inputs (A&B, C&D, E&F, G&H) to the quad logic block.

Output Identification:

FB40: 40
  41
  42
  43

Truth Table:

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<thead>
<tr>
<th>Inputs</th>
<th>Outputs Logic Types</th>
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<tbody>
<tr>
<td>1 2</td>
<td>AND NAND OR NOR EOR</td>
</tr>
<tr>
<td>0 0</td>
<td>0 1 0 1 0</td>
</tr>
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For additional Quad Logic Blocks see FB41 and FB42

June 1954
This logic block provides the ability to perform logic functions on four pairs of inputs to provide four separate outputs. Logic elements are individually selected for a designated pair of inputs. Functions include AND, NAND, OR, NOR and EOR (Exclusive OR).

Configuration consists of selecting the required type of logic for a pair of inputs and entering output identifiers as block inputs. An unconfigured input to an AND/NAND logic element will default to 100%. An unconfigured input to an OR/NOR/XOR logic element will default to 0%.

Inputs 1 and 2 in the truth table can be any pair of inputs (A&B, C&D, E&F, G&H) to the quad logic block.

Output Identification:
FB41:  44
       45
       46
       47

Truth Table:

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<thead>
<tr>
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<td>1 2</td>
<td>AND NAND OR NOR EOR</td>
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For additional Quad Logic Blocks see FB40 and FB42
This logic block provides the ability to perform logic functions on four pairs of inputs to provide four separate outputs. Logic elements are individually selected for a designated pair of inputs. Functions include AND, NAND, OR, NOR and EOR (Exclusive OR).

Configuration consists of selecting the required type of logic for a pair of inputs and entering output identifiers as block inputs. An unconfigured input to an AND/NAND logic element will default to 100%. An unconfigured input to an OR/NOR/XOR logic element will default to 0%.

Inputs 1 and 2 in the truth table can be any pair of inputs (A&B, C&D, E&F, G&H) to the quad logic block.

Output Identification:
FB42: 48
49
50
51

Truth Table:

<table>
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<td>NAND</td>
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<tr>
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For additional Quad Logic Blocks see FB40nd FB41

June 1994
This block provides 4 SR (Set-Reset) flip flops which can be used to toggle an output between two states.

Configuration consists of supplying an output identifier as input to one of these blocks. Unconfigured inputs will be set to 0%.

Truth Table:

<table>
<thead>
<tr>
<th>S</th>
<th>R</th>
<th>Previous Output</th>
<th>Output</th>
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</thead>
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</table>

Output Identification:

FB45 Flip/Flop 1: 60
Flip/Flop 2: 61
Flip/Flop 3: 62
Flip/Flop 4: 63

For additional Quad Flip/Flop Blocks see FB46 and FB47
This block provides 4 SR (Set-Reset) flip-flops which can be used to toggle an output between two states. Configuration consists of supplying an output identifier as input to one of these blocks. Unconfigured inputs will be set to 0%.

Truth Table:

<table>
<thead>
<tr>
<th>S</th>
<th>R</th>
<th>Previous Output</th>
<th>Output</th>
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</thead>
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</tbody>
</table>

Output Identification:

FB46
- Flip/Flop 1: 64
- Flip/Flop 2: 65
- Flip/Flop 3: 66
- Flip/Flop 4: 67

For additional Quad Flip/Flop Blocks see FB46 and FB47

June 1994
This block provides 4 SR (Set-Reset) flip flops which can be used to toggle an output between two states.

Configuration consists of supplying an output identifier as input to one of these blocks. Unconfigured inputs will be set to 0%.

Truth Table:

<table>
<thead>
<tr>
<th>S</th>
<th>R</th>
<th>Previous Output</th>
<th>Output</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
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<td>1</td>
</tr>
</tbody>
</table>

Output identification:

FB47 Flip/Flop 1: 68
Flip/Flop 2: 69
Flip/Flop 3: 70
Flip/Flop 4: 71

For additional Quad Flip/Flop Blocks see FB45 and FB46
This function block provides X, Y coordinate selections that can be used to form various input/output characterizations. The input A is X while the output O is Y.

Configuration consists of defining the input/output relationship at ten different input points. An output identifier must also be supplied as the block input.

The input/output relationship of this block is limited as follows: For an input value less than X0, the output will be Y0. For an input value greater than X10, the output will be Y10. X0 and X10 need not coincide with 0% and 100%, respectively. See Block Diagram.

Output Identification:
FB51: 90

For additional 10-Segment Characterizers see FB52 and FB53

June 1994
This function block provides X, Y coordinate selections that can be used to form various input/output characterizations. The input A is X while the output O is Y.

Configuration consists of defining the input/output relationship at ten different input points. An output identifier must also be supplied as the block input.

The input/output relationship of this block is limited as follows: For an input value less than X0, the output will be Y0. For an input value greater than X10, the output will be Y10. X0 and X10 need not coincide with 0% and 100%, respectively. See Block Diagram.

Output Identification:
FB52: 91

For additional 10-Segment Characterizers see FB51 and FB53

June 1994
This function block provides X, Y coordinate selections that can be used to form various input/output characterizations. The input A is X while the output O is Y.

Configuration consists of defining the input/output relationship at ten different input points. An output identifier must also be supplied as the block input.

The input/output relationship of this block is limited as follows: For an input value less than X0, the output will be Y0. For an input value greater than X10, the output will be Y10. X0 and X10 need not coincide with 0% and 100%, respectively. See Block Diagram.

Output Identification:
FB53: 92

<table>
<thead>
<tr>
<th>FB53</th>
<th>10-SEGMENT CHARACTERIZER #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td>OUTPUT</td>
</tr>
<tr>
<td>S X 0</td>
<td>INPUT CO-ORDINATE X0 0.0 to 100.0%</td>
</tr>
<tr>
<td>S X 1</td>
<td>INPUT CO-ORDINATE X1 0.0 to 100.0%</td>
</tr>
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<td>S X 2</td>
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<td>S Y 10</td>
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For additional 10-Segment Characterizers see FB51 and FB52

June 1994
The transfer switch function block will select as its output, input A or B depending on the level of input C. When input C is equal to or greater than 80% input B will be transferred to the output. If input C drops below 75% input A will be transferred to the output.

If input A is not configured the default value will be set to 100%. If input B and C are not configured the default value will be set to 0%.

Configuration consists of supplying output identifiers as inputs A, B and C.

Output Identification:
FB54: 54

For additional General Purpose Transfer Blocks see FB55 and FB56
The transfer switch function block will select as its output, input A or B depending on the level of input C. When input C is equal to or greater than 80% input B will be transferred to the output. If input C drops below 75% input A will be transferred to the output.

If input A is not configured the default value will be set to 100%. If input B and C are not configured the default value will be set to 0%.

Configuration consists of supplying output identifiers as inputs A, B and C.

Output Identification:
FB55: SS

For additional General Purpose Transfer Blocks see FB54 and FB56

June 1994
The transfer switch function block will select as its output, input A or B depending on the level of input C. When input C is equal to or greater than 80% input B will be transferred to the output. If input C drops below 75% input A will be transferred to the output.

If input A is not configured the default value will be set to 100%. If input B and C are not configured the default value will be set to 0%.

Configuration consists of supplying output identifiers as inputs A, B and C.

Output Identification:
FB56: 56

For additional General Purpose Transfer Blocks see FB54 and FB55
This block is contained within the optional Local Instrument Link (LIL) data communication interface available for the Model 385. The LIL is an enhanced HDLC RS-422 serial communications protocol that can be used for communications/data transfer between a Model 385 and:

Model 320 ICI
Model 321 LES
Model 324 PSC
Model 351 TLDC
Model 352 SLDC
Model 363 VIEWPAC
Model 382 LSC
Model 383 MDS

All 10 variables that can be displayed on the faceplate are automatically transmitted as channel outputs to the Link. The user may also configure up to 2 additional Link channel outputs. Up to 10 variables can be specified as inputs to the interface from other Link stations. All Link variables are transmitted/updated every 0.5 seconds.

The interface also transmits alarm information from the Display & Alarm Function Blocks over the Link. These signals can be used by consoles, computers, etc. to provide external alarm detection, logging and acknowledgement. Transmitted and received data channel assignments for this block are listed in the following:

Details concerning transmitted data, parameters, as well as complete interfacing details for the Model 385 and Local Instrument Link are provided in the Model 385 Link Interface Communications User's Manual.

(continued on next page)
# LOCAL INSTRUMENT LINK INTERFACE FB98 (CONT'D)

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* Only available if loop connected to a MPCo, XTC w/PID or Model 348

(continued on next page)

June 1994
LOCAL INSTRUMENT LINK INTERFACE  FB98 (CONT'D)

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<th>Channel</th>
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<td>Channel A Alarm #4 Limit</td>
<td>-3.3 to 103.3%</td>
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<td>Channel B Alarm #4 Type Word</td>
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ATW - Alarm Type Word is a 12-bit word that defines the alarm type. Details on each word type can be found in the Model 385 Link User's Manual, CG385-4.

June 1994
ADDITIONAL FUNCTION BLOCKS INCLUDED WITH THE 385H ONLY

FB11
DISPLAY & ALARM #1
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB12
DISPLAY & ALARM #2
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB13
DISPLAY & ALARM #3
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB14
DISPLAY & ALARM #4
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB15
DISPLAY & ALARM #5
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB16
DISPLAY & ALARM #6
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB17
DISPLAY & ALARM #7
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB18
DISPLAY & ALARM #8
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB19
DISPLAY & ALARM #9
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

FB20
DISPLAY & ALARM #10
ALARM 1
ALARM 2
ALARM 3
ALARM 4
PV
SP
V
AM
VXTR

June 1994
SECTION 3

FACTORY CONFIGURED OPTIONS
FACTORY CONFIGURED OPTIONS (FCO'S)

These are configurations stored in permanent memory (EPROM) that can be transferred to the configuration memory with a single keystroke. A complete listing of all the factory configured options is given below. As an example, the complete documentation for FCO 01 is listed on the following pages. Complete documentation can be found in the MODEL 385 Configuration Guide, CG385-2.

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<td>ESN Reset (ESN=00)</td>
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<tr>
<td>01</td>
<td>Loop Operator Station with HI/LO Alarms</td>
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<tr>
<td>10</td>
<td>Default Configuration</td>
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<td>11</td>
<td>Loop Operator Station with HI/LO Alarms and Link Interface</td>
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</table>
ESN RESET

Reset all ESN's to 00 except FB30 which is set to 28
MODEL 385B
BASIC STATION WITH HI/LO ALARMS
Loop Diagram

Active FB's

A ➞ FB11 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB12 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB13 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB14 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB15 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB16 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB17 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB18 Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB19 Display & Alarm
   Hi Alarm
   LO Alarm

FB30 Station Control
   Common Acknowledge
   Common Pulse

June 1994
MODEL 385H
HART STATION WITH HI/LO ALARMS

Loop Diagram

Active FB's

C1+ [FB11] HI Alarm Display & Alarm
C2- [FB12] LO Alarm

C3+ [FB13] HI Alarm Display & Alarm
C2- [FB14] LO Alarm

C4+ [FB15] HI Alarm Display & Alarm
C5- [FB16] LO Alarm

C6+ [FB17] HI Alarm Display & Alarm
C5- [FB18] LO Alarm

D4+ [FB19] HI Alarm Display & Alarm
D5- [FB20] LO Alarm

D6+ [FB21] HI Alarm Display & Alarm
D5- [FB22] LO Alarm

D7+ [FB23] HI Alarm Display & Alarm
D8- [FB24] LO Alarm

FB30 Station Control Common Acknowledge
Common Pulse

June 1994
## FACTORY CONFIGURED OPTIONS

### FCO 01

#### CONFIGURATION PARAMETERS

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## FACTORY CONFIGURED OPTIONS

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June 1994
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DEFAULT CONFIGURATION

Reset all FB's to factory settings

Active FB's

FB30
Station Control

June 1994
### FACTORY CONFIGURED OPTIONS

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| HRL | 0.00 | | | | | | |
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| HINE | 00 | | | | | | |
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|      |        | HCWM | YES        |      |        |      |      |      |      |      |      |
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|      |        | HA1I | 0.0 SEC    |      |        |      |      |      |      |      |      |
|      |        | HA1O | 0.0 SEC    |      |        |      |      |      |      |      |      |
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|      |        | HAF1 | YES        |      |        |      |      |      |      |      |      |
|      |        | HA2T | LO         |      |        |      |      |      |      |      |      |
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|      |        | HA2O | 0.0 SEC    |      |        |      |      |      |      |      |      |
|      |        | HA2R | NO         |      |        |      |      |      |      |      |      |
|      |        | HAL2 | YES        |      |        |      |      |      |      |      |      |
|      |        | HAF2 | YES        |      |        |      |      |      |      |      |      |
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--- LINK SETTABLE ONLY -----:

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- AA2L 100.0% AA2T 000000000000
- AA3L 100.0% AA3T 000000000000
- AA4L 100.0% AA4T 000000000000
- BA1L 100.0% BA1T 000000000000
- BA2L 100.0% BA2T 000000000000
- BA3L 100.0% BA3T 000000000000
- BA4L 100.0% BA4T 000000000000

June 1994
MODEL 385B
BASIC STATION WITH HI/LO ALARMS AND FB98
Loop Diagram

Active FB's

A ➞ FB11  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB12  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB13  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB14  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB15  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB16  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB17  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB18  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB19  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB20  Display & Alarm
   Hi Alarm
   LO Alarm

A ➞ FB30  Station Control
   Common Acknowledge
   Common Pulse

FB98 ➞ LINK ➞ To LIL

Each connection between FB98 and a Display & Alarm block is actually a separate connection

June 1994
MODEL 385H
HART STATION WITH HI/LO ALARMS AND FB98

Loop Diagram

Active FB's

C1+  FB11 Display & Alarm HI Alarm
C2-  FB12 Display & Alarm LO Alarm

D4+  FB18 Display & Alarm HI Alarm
D5-  FB19 Display & Alarm LO Alarm

C3+  FB12 Display & Alarm HI Alarm
C2-  FB13 Display & Alarm LO Alarm

D6+  FB20 Display & Alarm HI Alarm
D5-  FB20 Display & Alarm LO Alarm

C4+  FB13 Display & Alarm HI Alarm
C5-  FB14 Display & Alarm LO Alarm

D7+  FB20 Display & Alarm HI Alarm
D8-  FB20 Display & Alarm LO Alarm

C6+  FB14 Display & Alarm HI Alarm
C5-  FB15 Display & Alarm LO Alarm

FB30 Station Control Common Acknowledge
Common Pulse

C7+  FB15 Display & Alarm HI Alarm
C8-  FB16 Display & Alarm LO Alarm

FB98 LINK To LIL

Each connection between FB98 and a Display & Alarm block is actually a separate connection
### FACTORY CONFIGURED OPTIONS

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