

Function Sequence Table Applications Software

The Function Sequence Table Applications Software adds analog and discrete sequencing control capability to Remote Operations Controllers (ROCs) and FloBoss™ Flow Managers. This programmable control is implemented in a Function Sequence Table (FST). Using a series of steps, the FST defines the actions the ROC or FloBoss performs.

The software consists of an FST editor and ROC or FloBoss firmware. The FST editor is part of the ROCLINK™ 800 Configuration Software. The firmware is contained in ROC or FloBoss permanent memory.

Functions

The basic building block of an FST is a function. Functions are organized in a sequence of steps to form a control algorithm. As shown below, each function step can consist of a label, a command (CMD), and arguments.

Labels – Labels to identify functions and allow branching to specific steps within an FST.

Commands – The command, which is the heart of each function, is selected from a library of mathematical, logical, and other commands. Commands are identified by a name consisting of up to three characters or symbols. Most commands require arguments that further define the operation to be performed.

Arguments – Arguments provide the means to access process I/O points and retrieve real-time values. A function may have no arguments, one argument, or two arguments.

As the sequence of functions executes, the system uses two storage locations to store the results of one function and pass them along to the next. One storage location keeps track of analog or floating-point operations. Another location keeps track of logical or discrete operations.

The system provides ten additional “global” storage locations per FST for storing calculated or manually entered values or for passing values between FSTs, as required.

FST Editor

The FST Editor is a program that allows you to create new FSTs, modify existing FSTs, copy FSTs to and from the ROC or disk, start and stop FSTs, change runtime parameters in FSTs, and monitor and debug FSTs while running.

STEP	LABEL	CMD	ARGUMENT 1	ARGUMENT 2
000	CKHIAL	VAL	@IOB9, TANK LEVEL,EU	
001		>=	@IOB9, TANK LEVEL,HIAL	PUMPON
002		GO	CKHIAL	
003	PUMPON	DO	@IOA5,PUMP1,STATUS	1
004	CKLOAL	VAL	@IOB9,TANK LEVEL,EU	
005		<=	@IOB9,TANK LEVEL,LOAL	PMPOFF
006		GO	CKLOAL	
007	PMPOFF	DO	@IOA5,PUMP1,STATUS	0
008		END		

Function Sequence Table Example

Function Sequence Table Applications Software Specifications

FST STEPS	FST EDITOR MENU OPTIONS
<p>Up to 300 steps allowed in each of the four possible FSTs.</p> <p>FST COMMAND LIBRARY</p> <p>Logical: NOT, AND, OR, Exclusive OR.</p> <p>Mathematical: Add, Subtract, Multiply, Divide, Raise to a Power, Absolute Value, Exponent (base e), Integer Value, Base 10 Logarithm, Natural Logarithm, Square Root, 3rd Order Polynomial.</p> <p>Comparison: Test if Equal, Not Equal, Less Than, Less Than Or Equal, Greater Than, Greater Than Or Equal.</p> <p>Time-Related: Set Timer, Check Timer, Wait (Suspend), Break (Delay), Day of Week; Minutes Past Midnight.</p> <p>Control-Related: Analog Output, Discrete Output, Timed Discrete Output.</p> <p>Database: Read from Historical Database, Write to Historical Database, Write Time to Historical Database.</p> <p>General: Load Value into Results Register (RR), Store (Save) RR into Database, Go To Indicated Step, Write Message to Local Display Panel, End of FST, Log Alarm, Log Event.</p>	<p>FST Operations:</p> <ul style="list-style-type: none"> ▪ Compile FST and Transmit Code to the device. ▪ Display the Current Workspace. ▪ Delete an FST from the device. ▪ Save Workspace to a Disk File. ▪ Load Workspace from the Disk/ROC Memory. ▪ Select FST Number. ▪ Select Function Sequence Table Workspace (1 to 4). ▪ Select Function Sequence Table Monitor (1 to 4). <p>FST Workspace Options:</p> <ul style="list-style-type: none"> ▪ Insert Line at Cursor Location. ▪ Delete Line at Cursor Location. ▪ Erase Contents of Current Workspace. ▪ Position Cursor to New Row Location. ▪ Display Directory Listing of the FSTs. ▪ Print Present FST Contents. <p>Display Point Tags</p> <p>Display Point Parameters</p> <p>Display List of FST Commands</p> <p>Exit to ROCLINK Main Menu</p>

The FST Editor provides a workspace for each FST. The workspace accepts the entry of up to 300 functions. Each function is entered into the editor next to a step number. The modes of operation for the FST Editor are: Ready, Edit, Menu, Monitor, and Trace.

Ready is the initial and default mode of operation. The other modes are accessible from this mode. In the Ready mode, the FST Editor normally displays the FST workspace.

Edit mode allows data to be input for use by the FST Editor. Edit mode becomes active when characters are typed on the keyboard while in Ready mode.

Menu mode provides operations for the FST Editor, such as loading, storing, printing, compiling, and monitoring an FST. The specifications table lists some of the menu options available in this mode.

Monitor mode allows you to continually monitor the updating of values in an FST while variables are being modified. The FST functions cannot be edited in this mode.

Trace mode allows you to “debug” an FST. In this mode, the FST is executed one step at a time, allowing the user to view the intermediate results.

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