

TULSA Water and Sewer Department

SCADA System Improvements

Module Add-On Instruction

FINAL

PRESENTED TO

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Revision History

After the Add-On Instruction has been modified or updated, this document should be revised to reflect the changes. The version is broken into two parts: major (**X.0**) and minor (**1.X**). A major version is reserved for adding or removing sections of this document. A minor version is reserved for modifications to existing sections.

Version	Date	Description
1.0	July 9, 2021	AOI created in Studio 5000 Version 21.11, Draft submitted to client
1.0	April 4, 2022	Final submitted to client.

1 INTRODUCTION

The Module Add-On Instruction (AOI) monitors the status of a remote PLC rack. The AOI includes alarms that indicate if the rack is faulted or not running.

Table 1-1 Embedded AOIs

Embedded AOIs	
Discrete Alarm	

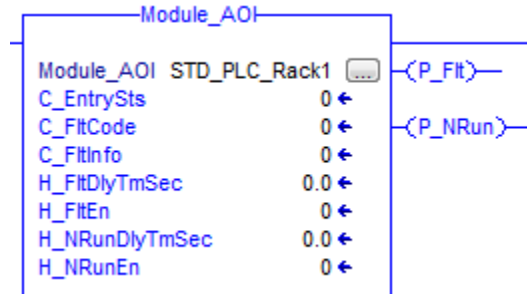


Figure 1-1 Module AOI as it appears in ladder logic

2 TEMPLATE

Template logic can be found in the Unscheduled Programs/Phases task folder of the Tulsa ControlLogix Standard PLC file. Because the template task is unscheduled, the routines within it do not execute during runtime. The intention of the template routine is to provide a standard logic structure for the AOIs that can be copied into the executable tasks of the MainProgram.

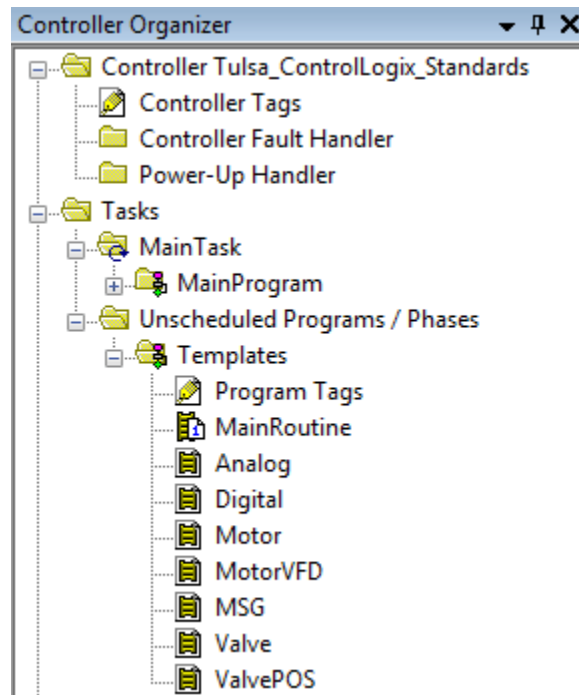


Figure 2-1 Unscheduled Standard Logic Templates

The MainRoutine template displays the standard logic for using the Module AOI. The first rung needs to be updated with the text from the rung comment. This will create three GSV instructions that look at the ethernet card to be monitored, as shown in Figure 2-3.

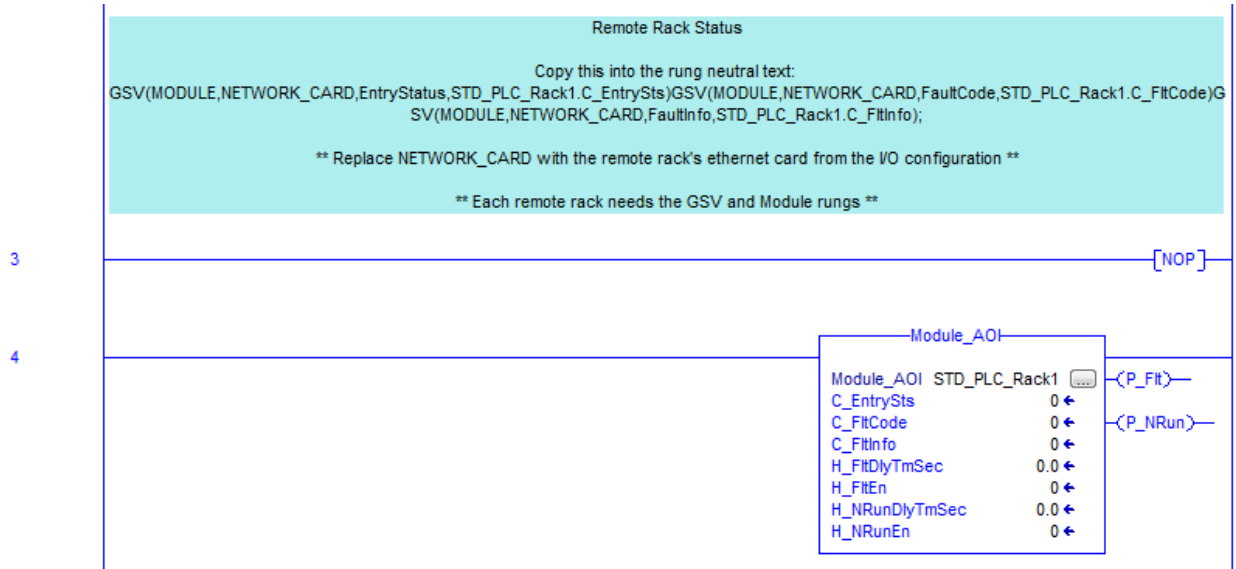


Figure 2-2 Standard Template Logic for the Module AOI

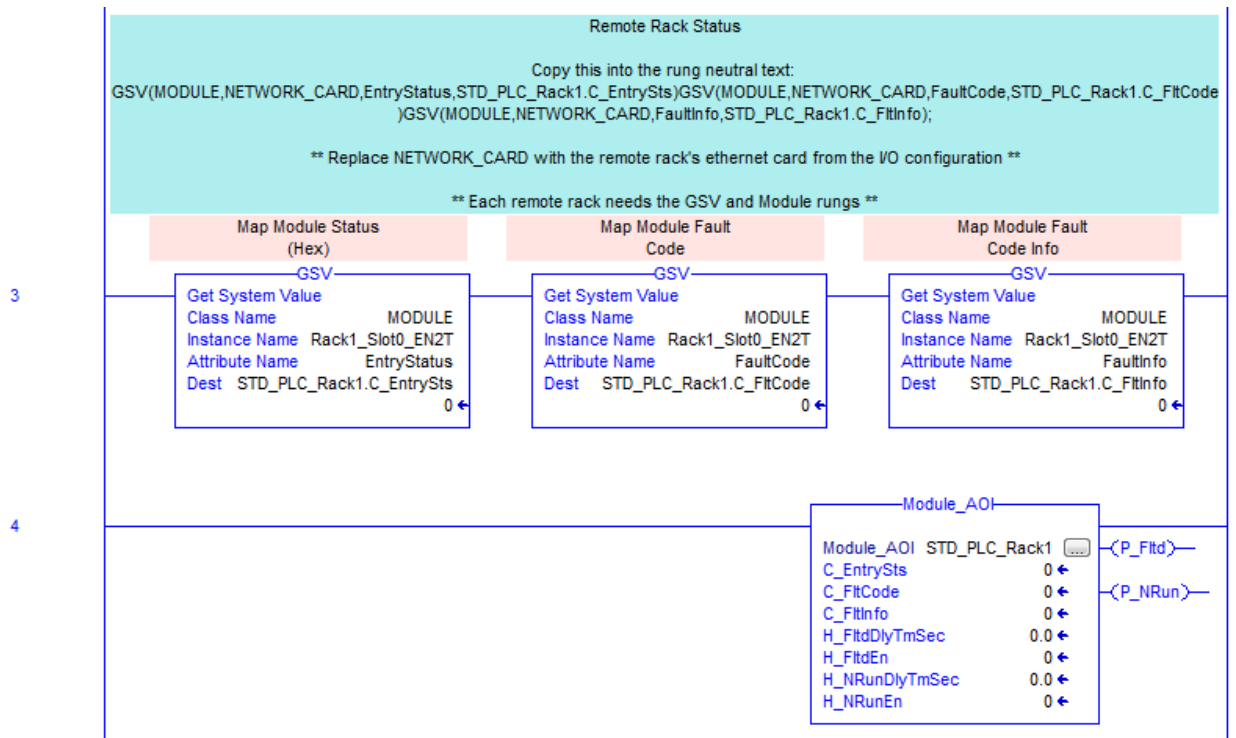


Figure 2-3 GSV Configuration for Module AOI Logic

3 FEATURES

3.1 Configuration Tags

Configuration tags are inputs to the AOI that are set by the engineer during programming and equipment start-up. A “C_” prefix is used to indicate that the tag modifies the configuration of an equipment or instrument.

Table 3-1 Configuration Tags

Parameter	Data Type	Description	Default Value
C_EntrySts	DINT	Module status (hex) mapped into the AOI from the ethernet card of the remote rack.	0
C_FltCode	DINT	Module fault code mapped into the AOI from the ethernet card of the remote rack.	0
C_FltInto	DINT	Module fault code information mapped into the AOI from the ethernet card of the remote rack.	0

3.2 Input Tags

Input tags are inputs to the AOI that are set by the I/O and indicate equipment status. The “I_” prefix is used to indicate that the tag is displaying an equipment or instrument status. The PLC AOI does not contain any input tags.

3.3 Output Tags

Output tags are outputs from the AOI that are used to control equipment. The “O_” prefix is used to indicate that the tag controls a real-world output within the PLC. The PLC AOI does not contain any output tags.

3.4 HMI Tags

HMI tags are inputs to the AOI that are set by the operator. The “H_” prefix is used to indicate that the tag modifies a PLC register from the operator interface.

Table 3-2 HMI Tags

Parameter	Data Type	Description	Default Value
H_FltDlyTmSec	REAL	Faulted alarm delay time in seconds.	5
H_FltEn	BOOL	Faulted alarm enable.	False
H_NRunDlyTmSec	REAL	Not running alarm delay time in seconds.	5
H_NRunEn	BOOL	Not running alarm enable.	False

3.5 PLC Logic Tags

PLC Logic tags are attributes internal to the AOI. The “P_” prefix is used to indicate that the tag is modified or calculated within the PLC.

Table 3-3 PLC Logic Tags

Parameter	Data Type	Description	Alarm
P_Flt	BOOL	Module faulted alarm.	Yes
P_NRun	BOOL	Module not running alarm.	Yes

