TULSA Water and Sewer Department

SCADA System Improvements

Communication Fail 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 Communication Fail Add-On Instruction (AOI) reads a heartbeat tag from a remote PLC and triggers an alarm if the heartbeat does not change for the duration of the alarm delay timer.

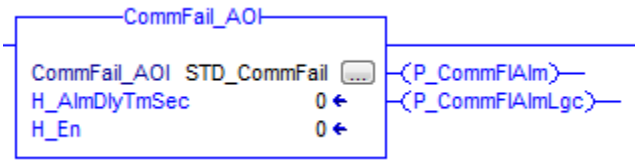

Figure 1-1 Communication Fail AOI as it appears in ladder logic

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.

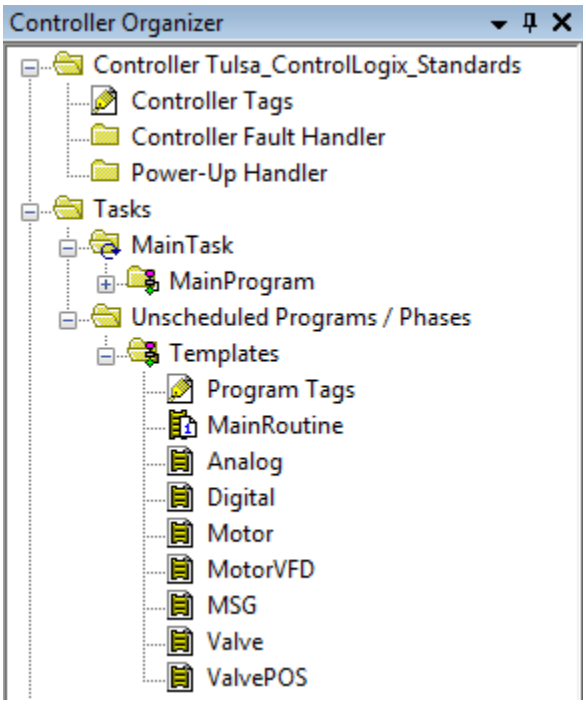

Figure 2-1 Unscheduled Standard Logic Templates

The MSG template routine displays the standard logic for using the Communication Fail AOI. In the first rung, a heartbeat from the remote PLC is written to the heartbeat input of the AOI.

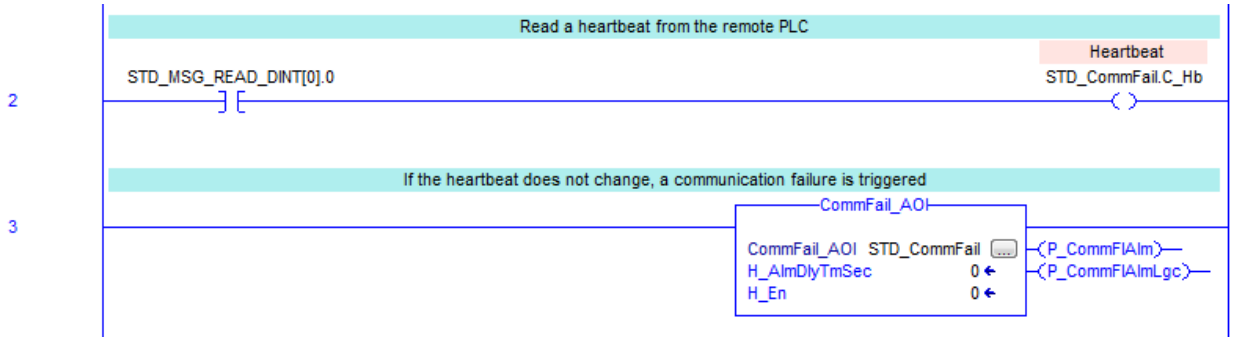

Figure 2-2 Standard Template Logic for the Communication Fail AOI

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
C_Hb	BOOL	Heartbeat from remote PLC.

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 indicated that the tag is displaying an equipment or instrument status. The Communication Fail 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 Communication Fail 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_AlmDlyTmSec	REAL	Alarm delay timer in seconds.	60
H_En	BOOL	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_CommFlAlm	BOOL	In alarm.	Yes
P_CommFlAlmLgc	BOOL	Alarm indication that is not affected by H_En.	No