

TULSA Water and Sewer Department

SCADA System Improvements

Analog Feedback Fail Add-On Instruction

FINAL

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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. No changes from the draft.

1 INTRODUCTION

The Analog Feedback Fail Add-On Instruction (AOI) reads an analog input tag and an analog output tag and triggers an alarm if the two tag values differ by a configurable value for a configurable amount of time. The AOI also checks for I/O faults, which inhibit the Feedback Failure alarm.

The Analog Feedback Fail AOI is used inside the Motor VFD AOI to monitor if the speed feedback matches the speed command. Similarly, it is used inside the Valve Position AOI to monitor if the position feedback matches the position command.

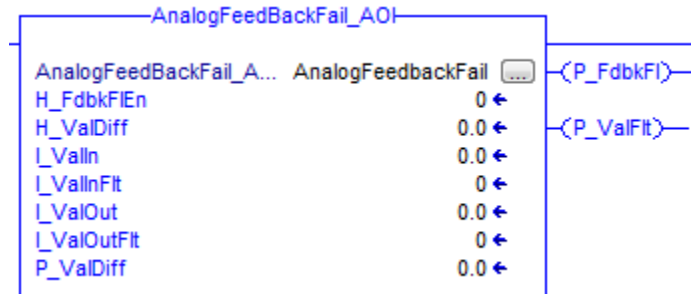


Figure 1-1 Analog Feedback Fail AOI as it appears in ladder logic

2 FEATURES

2.1 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. The Analog Feedback Fail AOI does not contain any configuration tags.

2.2 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.

Table 2-1 Input Tags

Parameter	Data Type	Description
I_ValIn	REAL	Scaled input value mapped into the AOI.
I_ValInFit	BOOL	External signal mapped into the AOI for determining if input value is good.
I_ValOut	REAL	Scaled output value mapped into the AOI.
I_ValOutFit	BOOL	External signal mapped into the AOI for determining if the output value is good.

2.3 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 Analog Feedback Fail AOI does not contain any output tags.

2.4 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 2-2 HMI Tags

Parameter	Data Type	Description	Default Value
H_FdbkFIDlyTm	REAL	Feedback fail delay time in seconds.	60
H_FdbkFIEn	BOOL	Feedback fail enable.	False
H_Rst	BOOL	Alarm reset	False
H_ValDiff	REAL	Input and output value difference setpoint.	5

2.5 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 2-3 PLC Logic Tags

Parameter	Data Type	Description	Alarm
P_FdbkFI	BOOL	Feedback fail in alarm	Yes
P_ValDiff	REAL	The actual difference between I_ValIn and I_ValOut	No
P_ValFit	BOOL	Indicates that the input or output value is faulted.	No