

# TULSA Water and Sewer Department

## SCADA System Improvements

### Heartbeat 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 Heartbeat Add-On Instruction (AOI) continuously toggles a bit on and off for a certain duration. This function can be used to monitor communication with remote PLCs.

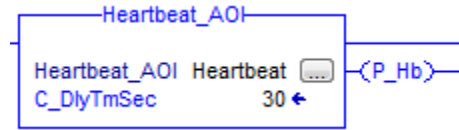


Figure 1-1 Heartbeat AOI as it appears in ladder logic

## 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.

Table 2-1 Configuration Tags

Parameter	Data Type	Description	Default Value
C_DlyTmSec	DINT	Heartbeat time in seconds.	30

### 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. The Heartbeat AOI does not contain any input tags.

### 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 Heartbeat 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. The Heartbeat AOI does not contain any HMI tags.

### 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 2-2 PLC Logic Tags

Parameter	Data Type	Description
P_Hb	BOOL	PLC Heartbeat. Toggles on and off based on C_DlyTmSec.