



$SiteID $Name

$Assettype

$revisionDocument\_Rev\_$revisionClass

Site Specific Functional Specification

**Revision Control**

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| **Rev** | **Project** | **Date** | **Purpose** | **Company** | **Prepared** | **Reviewed** | **Approved** |
|  |  |  |  |  |  |  |  |

* Approver must be an electrical RPEQ

**Document Consultation**

Please review this document and add your comments where necessary. To ensure that this project is completed on time, please forward your comments by the requested date to: Document Administrator

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Table of Contents

[1 Introduction 7](#_Toc95985078)

[1.1 Purpose 7](#_Toc95985079)

[1.2 References and Inputs 7](#_Toc95985080)

[1.3 Assumptions 8](#_Toc95985081)

[2 Site Location and Process Description 9](#_Toc95985082)

[2.1 Site Location 9](#_Toc95985083)

[2.2 Process Description 9](#_Toc95985084)

[2.3 Site SCADA Overview 9](#_Toc95985085)

[3 Design Options 11](#_Toc95985086)

[4 Site Details 12](#_Toc95985087)

[4.1 Network Details 12](#_Toc95985088)

[4.2 Network Overview 12](#_Toc95985089)

[4.3 Pump Details 12](#_Toc95985090)

[4.3.1 Pump 1 12](#_Toc95985091)

[4.3.2 Pump 2 12](#_Toc95985092)

[4.4 Generator 12](#_Toc95985093)

[4.5 Communications / Telemetry Network Information 13](#_Toc95985094)

[4.5.1 IP Network Information 13](#_Toc95985095)

[4.5.2 DNP3 Network Information 13](#_Toc95985096)

[4.5.3 Modbus Information 13](#_Toc95985097)

[4.6 Site Control Values 13](#_Toc95985098)

[4.6.1 General 13](#_Toc95985099)

[4.6.2 Wet Well 13](#_Toc95985100)

[4.6.3 Flow Meter – FIT0001 – Delivery Flow Meter 14](#_Toc95985101)

[4.6.4 Flow Meter – FIT0002 – Delivery Flow Meter 14](#_Toc95985102)

[4.6.5 Pressure Gauge - PIT0001 - Delivery Pressure Transmitter 14](#_Toc95985103)

[4.6.6 Pressure Gauge - PIT0002 - Delivery Pressure Transmitter 15](#_Toc95985104)

[4.6.7 Sewer Pump 15](#_Toc95985105)

[4.6.8 PMP0001 - Pump 1 15](#_Toc95985106)

[4.6.9 PMP0002 - Pump 2 16](#_Toc95985107)

[4.6.10 Wet Well Level vs Volume Lookup Table 17](#_Toc95985108)

[4.6.11 Key Wet Well Levels 17](#_Toc95985109)

[4.7 Alarms and Events 18](#_Toc95985110)

[4.8 Data Logging 18](#_Toc95985111)

[5 Peer Site Communications 20](#_Toc95985112)

[5.1 Legacy Communications 20](#_Toc95985113)

[5.2 Peer Communications Data Map 20](#_Toc95985114)

[6 Non-Standard Design 21](#_Toc95985115)

[6.1 Non-Standard Control Functions 21](#_Toc95985116)

[6.1.1 Alarms and Events 21](#_Toc95985117)

[6.1.2 Parameters and Setpoints 21](#_Toc95985118)

[6.1.3 Calculations and Statistics 21](#_Toc95985119)

[6.1.4 SCADA Points 21](#_Toc95985120)

[6.2 Non-Standard Equipment 22](#_Toc95985121)

[6.2.1 Physical I/O 22](#_Toc95985122)

[6.2.2 Alarms and Events 22](#_Toc95985123)

[6.2.3 Parameters and Setpoints 22](#_Toc95985124)

[6.2.4 Calculations and Statistics 22](#_Toc95985125)

[6.2.5 SCADA Points 22](#_Toc95985126)

[6.3 Non-Standard Instrumentation 22](#_Toc95985127)

[6.3.1 Physical I/O 23](#_Toc95985128)

[6.3.2 Alarms and Events 23](#_Toc95985129)

[6.3.3 Parameters and Setpoints 23](#_Toc95985130)

[6.3.4 Calculations and Statistics 23](#_Toc95985131)

[6.3.5 SCADA Points 23](#_Toc95985132)

[6.4 Non-Standard Control System Hardware 24](#_Toc95985133)

[6.5 Non-Standard RTU Program 24](#_Toc95985134)

[6.6 Non-Standard RTU Communications 24](#_Toc95985135)

[6.7 Non-Standard SCADA 24](#_Toc95985136)

[Appendix A: Drawing List 25](#_Toc95985137)

[Appendix B: Physical IO 26](#_Toc95985138)

[Appendix C: Pump Data Sheet(s) 27](#_Toc95985139)

[Appendix D: Equipment Configuration 28](#_Toc95985140)

[Appendix E: Radio Configuration 29](#_Toc95985141)

Table of Figures

[Figure 1: Site Location Map 9](#_Toc95985142)

[Figure 2: SCADA Image 10](#_Toc95985143)

Table of Tables

[Table 1: Reference Documents 7](#_Toc97102681)

[Table 2: Assumptions 8](#_Toc97102682)

[Table 3: SPS Design Sewage Flows 9](#_Toc97102683)

[Table 4: Design Options 11](#_Toc97102684)

[Table 5: $assetAbbreviation Network Details 12](#_Toc97102685)

[Table 6: Site Network 12](#_Toc97102686)

[Table 7: Site Pump Overview 12](#_Toc97102687)

[Table 10: Generator Details 13](#_Toc97102688)

[Table 11: Network IP Addressing 13](#_Toc97102689)

[Table 12: Network DNP3 Addressing 13](#_Toc97102690)

[Table 13: Modbus Devices 13](#_Toc97102691)

[Table 14: General Site Control Values 13](#_Toc97102692)

[**Table 14: Station Duty Setpoints** 15](#_Toc97102693)

[Table 30: Wet Well Lookup Table 16](#_Toc97102694)

[Table 31: Key Wet Well Levels 16](#_Toc97102695)

[Table 32: Non-Standard Control Functions Alarms and Events 19](#_Toc97102696)

[Table 33: Non-Standard Control Functions Parameters (Site Specific Parameters) 19](#_Toc97102697)

[Table 34: Non-Standard Control Functions Setpoints 19](#_Toc97102698)

[Table 35: Non-Standard Control Functions Calculations and Statistics 19](#_Toc97102699)

[Table 36: Non-Standard Control Functions SCADA Points 19](#_Toc97102700)

[Table 37: Non-Standard Equipment Physical IO 20](#_Toc97102701)

[Table 38: Non-Standard Equipment Alarms and Events 20](#_Toc97102702)

[Table 39: Non-Standard Equipment Parameters (Site Specific Parameters) 20](#_Toc97102703)

[Table 40: Non-Standard Equipment Setpoints 20](#_Toc97102704)

[Table 41: Non-Standard Equipment Calculations and Statistics 20](#_Toc97102705)

[Table 42: Non-Standard Equipment SCADA Points 20](#_Toc97102706)

[Table 43: Non-Standard Instrumentation Physical IO 21](#_Toc97102707)

[Table 44: Non-Standard Instrumentation Alarms and Events 21](#_Toc97102708)

[Table 45: Non-Standard Equipment Instrumentation (Site Specific Parameters) 21](#_Toc97102709)

[Table 46: Non-Standard Instrumentation Setpoints 21](#_Toc97102710)

[Table 47: Non-Standard Instrumentation Calculations and Statistics 21](#_Toc97102711)

[Table 48: Non-Standard Instrumentation SCADA Points 21](#_Toc97102712)

Abbreviations

In this document, the following acronyms and abbreviations apply:

|  |  |  |  |
| --- | --- | --- | --- |
| **Abbreviation** | **Meaning** | **Abbreviation** | **Meaning** |
| ADWF | Average Dry Weather Flow | MPC | Multi-Pump Controller |
| AI | Analogue Input | PID | Proportional Integral Derivative |
| AO | Analogue Output | ppm | Parts per million |
| BPS | Booster Pump Station | RTU | Remote Terminal Unit |
| BRTU | Boundary RTU | RR | Radio Repeater |
| BWL | Bottom Water Level | SAT | Site Acceptance Test |
| CB | Circuit Breaker | SCADA | Supervisory Control and Data Acquisition |
| CT | Current Transformer | SP | Setpoint |
| DI | Digital Input | SPS | Sewage Pump Station |
| DNP3 | Distributed Network Protocol 3 | TBA | To be advised |
| DO | Digital Output | TBC | To be confirmed |
| DOL | Direct On Line | TWL | Top Water Level |
| DT | Desktop Analysis Result (Radio Survey) | UPDWF | Ultimate Peak Dry Weather Flow |
| ESTOP | Emergency Stop | UUTS | Urban Utilities telemetry system |
| EU | Engineering Unit | VAC | Voltage - Alternating Current |
| FAT | Factory Acceptance Test | VDC | Voltage - Direct Current |
| FEI | Field Existing UHF Installation (Radio Survey) | VFD | Variable Frequency Drive |
| GPS | Global Positioning System | VSD | Variable Speed Drive |
| HMI | Human Machine Interface | VT | Voltage Transformer |
| I/O | Input / Output | WAN | Wide Area Network |
| IP | Internet Protocol | WB | Water Booster |
| LAN | Local Area Network | WM | Water Monitoring |
| LTE | Long-Term Evolution | WPS | Water Pumping Station |
| LTE | Long-Term Evolution | WR | Water Reservoir |
| mAHD | Metres above Australian Height Datum |  |  |

# Introduction

## Purpose

$UpgradeTypeText

The purpose of this document is to describe the site-specific functional requirements and equipment associated with the local station control system. It should be read in conjunction with the documents listed in Table 1: Reference Documents.

The requirements detailed in the site-specific Functional Specification shall be implemented using the standard blocks and functionality described in C1282B-WP01-IDD-00000-EL20-SPC-0001 - Derived Function Block Specification and $stdAssetDocumentDesignNum - $stdAssetDocumentDesignName.

## References and Inputs

The inputs and reference documents listed in Table 1: Reference Documents below have been relied upon in compiling this site-specific functional specification.

Table : Reference Documents

|  |  |  |
| --- | --- | --- |
| **Input** | **Title** | **Document ID** |
|  |  |  |

## Assumptions

Table 2: Assumptions lists assumptions made in the development in this functional specification.

Table : Assumptions

|  |  |
| --- | --- |
| **Item** | **Assumption** |
|  |  |

# Site Location and Process Description

## Site Location

|  |  |
| --- | --- |
| Item | Value |
| Site ID: | $siteID |
| Site Name: | $name |
| Site Address: | $address |
| GPS Coordinates: | $GPS |

An aerial image of the location is shown in the figure below.

$siteImage

Figure : Site Location Map

## Process Description

$processNarrative

Table : Overall Site Information

|  |  |  |
| --- | --- | --- |
| **Description** | **Value** | **Units** |
|  |  |  |

## Site SCADA Overview

This site has a standard $assetType SCADA display. Refer to $stdAssetDocumentDesignNum and C1282B-WP01-PLT-00000-PL19-GUI-0001 for details on the standard $assetType SCADA display.

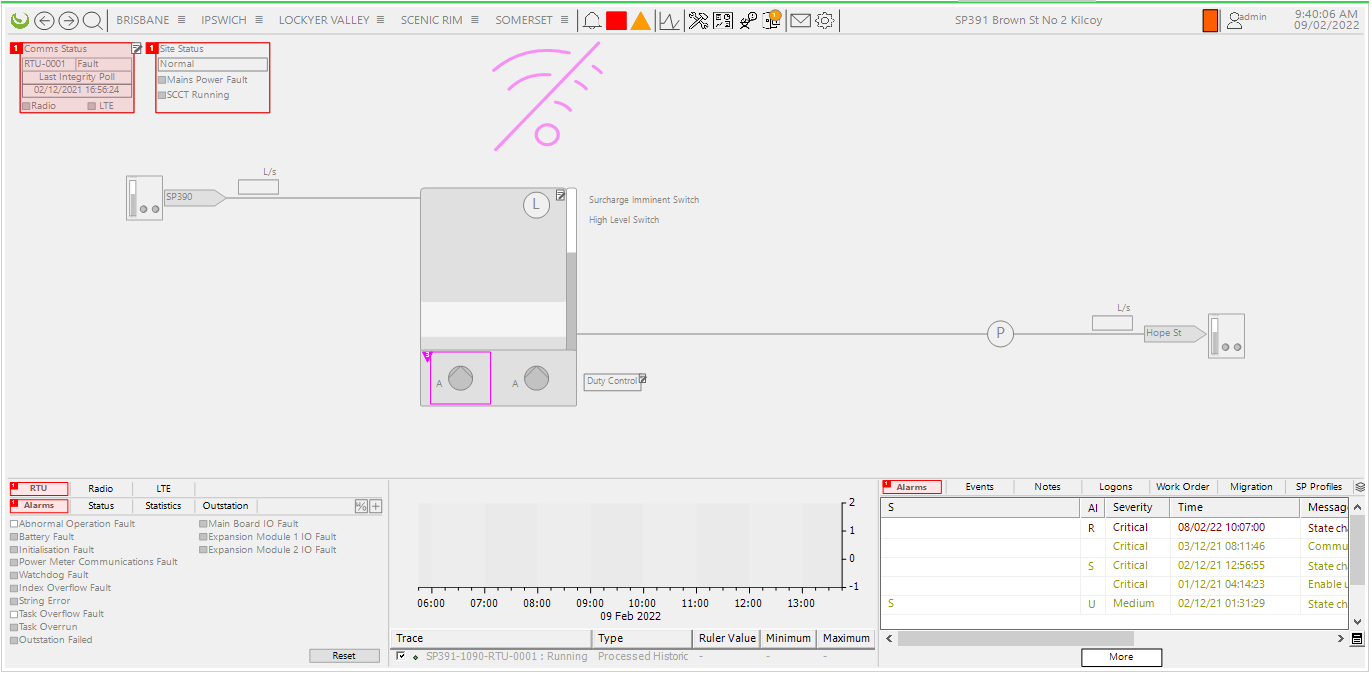


Figure : SCADA Image

Note: Sample from SP391. Programmer to update image with actual site page post commissioning as part of the as built functional specification preparation.

# Design Options

The standard design options selected in the table below have been included in the design for $siteID $name. Standard design options are described in the electrical schematics for this site (See Appendix A: Drawing List).

Table : Design Options

|  |  |  |
| --- | --- | --- |
| **Option ID** | **Selected Option** | **Description** |
|  |  |  |

# Site Details

$siteDetails

## Network Details

Table 5: $assetAbbreviation Network Details

|  |  |  |
| --- | --- | --- |
| **Item** | **Value** | **Units** |
|  |  |  |

## Network Overview

$peerCommunicationsText

$networkImage

Figure 2: Network Diagram

$networkDetails

Table 6: Site Network

|  |  |  |
| --- | --- | --- |
| **Upstream Sites** | **Site** | **Downstream Sites** |
|  |  |  |

$$PUMP\_TABLES:START$$

## Pump Details

Table 7: Site Pump Overview

|  |  |  |
| --- | --- | --- |
| **Description** | **Value** | **Units** |
| Number of Pumps | $numPumps | Pumps |
| Max Concurrent Pumps Running | $concurrentPumpsRunning | Pumps |

|  |  |
| --- | --- |
| **Description** | **Value** |
| Equipment |  |
| Make |  |
| Model |  |
| Duty Point |  |
| Power |  |
| Current |  |

$$PUMP\_TABLES:END$$

$$PUMP\_TABLES$$

$$GENERATOR\_TABLE:START$$

## Generator

Table 10: Generator Details

|  |  |
| --- | --- |
| **Description** | **Value** |
| Generator Size | $generatorSize |
| Number of pumps that can run | $generatorMaxPumpsRunning |

$$GENERATOR\_TABLE:END$$

## Communications / Telemetry Network Information

### IP Network Information

Table : Network IP Addressing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **ID** | **Port** | **Description** | **Address** |
|  |  |  |  |  |

### DNP3 Network Information

Table : Network DNP3 Addressing

|  |  |
| --- | --- |
| **Description** | **Address** |
| DNP3 Master | $DNP3MasterAddr |
| DNP3 Slave | $DNP3SlaveAddr |

### Modbus Information

Table : Modbus Devices

|  |  |
| --- | --- |
| **Interface** | **Device** |
| - | - |

## 

## Site Control Values

$$GENERAL\_SITE\_CONTROL:START$$

### General

Table : General Site Control Values

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Tag** | **Value** | **Units** |
|  |  |  |  |

$$GENERAL\_SITE\_CONTROL:END$$

$$STATION\_DUTY\_SETPOINTS:START$$

### Station Duty Setpoints

Table : Station Duty Setpoints

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Default Setpoint** | **Min Setpoint** | **Max Setpoint** | **Units** |
|  |  |  |  |  |  |

$$STATION\_DUTY\_SETPOINTS:END$$

$$EQUIPMENT\_TABLES:START$$

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Tag** | **Value** | **Units** |
|  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Default Setpoint** | **Min Setpoint** | **Max Setpoint** | **Units** |
|  |  |  |  |  |  |

$$EQUIPMENT\_TABLES:END$$

$$STANDARD\_EQUIPMENT$$

$$WET\_WELL\_LEVEL\_VOLUME\_LOOKUP\_TABLE:START$$

### Wet Well Level vs Volume Lookup Table

The following table will allow the RTU to perform calculations to determine the inflow rates, outflow rates and time to surcharge.

|  |  |  |  |
| --- | --- | --- | --- |
| **Tag number (XX)** | **Primary Wet Well Wet Well Level (m)**  **LIT0001\_krWWLLookupXX** | **Primary Wet Well Remaining Storage Capacity (ML)**  **LIT0001\_krRemStorCapXX** | **Primary Wet Well Current Storage Capacity (ML)**  **LIT0001\_krCurrStorVolXX** |
| 20 |  |  |  |
| 19 |  |  |  |
| 18 |  |  |  |
| 17 |  |  |  |
| 16 |  |  |  |
| 15 |  |  |  |
| 14 |  |  |  |
| 13 |  |  |  |
| 12 |  |  |  |
| 11 |  |  |  |
| 10 |  |  |  |
| 09 |  |  |  |
| 08 |  |  |  |
| 07 |  |  |  |
| 06 |  |  |  |
| 05 |  |  |  |
| 04 |  |  |  |
| 03 |  |  |  |
| 02 |  |  |  |
| 01 |  |  |  |

Table 30: Wet Well Lookup Table

$$WET\_WELL\_LEVEL\_VOLUME\_LOOKUP\_TABLE:END$$

$$WET\_WELL\_LEVELS\_TABLE:START$$

### Key Wet Well Levels

Table 31: Key Wet Well Levels

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Tag Name** | **Value** | **Units** |
|  |  |  |  |

$$WET\_WELL\_LEVELS\_TABLE:END$$

## Alarms and Events

Alarms and evens for this site are as described in the asset standard functional specification, $stdAssetDocumentDesignNum.

## Data Logging

Data logging and dead band settings are detailed in the asset standard functional specification, $stdAssetDocumentDesignNum.

# Peer Site Communications

## Legacy Communications

Not Applicable

## Peer Communications Data Map

$peerDataMap

Table 15: Peer to Peer DNP3 Signals Received by RTU

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Description** | **Tag** | **EU** | **Data Type** | **DNP3 Point** | **Send at Change of** | **Source** | **Site DNP3** |
|  |  |  |  |  |  |  |  |

Table 15: Peer to Peer DNP3 Signals Sent by RTU

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Description** | **Tag** | **EU** | **Data Type** | **DNP3 Point** | **Send at Change of** | **Source** | **Site DNP3** |
|  |  |  |  |  |  |  |  |

NOTE: PEER COMMUNICATIONS ARE TO BE CONFIRMED.

# Non-Standard Design

$nonStandardHighLevelText

## Non-Standard Control Functions

$nonStandardText

### Alarms and Events

Table : Non-Standard Control Functions Alarms and Events

|  |  |  |
| --- | --- | --- |
| **Description** | **Tag Name** | **Priority** |
| - | - | - |

### Parameters and Setpoints

Table : Non-Standard Control Functions Parameters (Site Specific Parameters)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Type** | **Value** | **Units** |
| - | - | - | - | - |

Table : Non-Standard Control Functions Setpoints

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Default Setpoint** | **Min Setpoint** | **Max Setpoint** | **Units** |
| - | - | - | - | - | - |

### Calculations and Statistics

Table : Non-Standard Control Functions Calculations and Statistics

|  |  |
| --- | --- |
| **Point** | **Description** |
| - | - |

### SCADA Points

Table : Non-Standard Control Functions SCADA Points

|  |  |  |
| --- | --- | --- |
| **Tag Name** | **Description** | **DNP3 Point** |
| - | - | - |

## Non-Standard Equipment

$nonStandardEquipment

### Physical I/O

Table : Non-Standard Equipment Physical IO

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module** | **Point** | **Data Type** | **Description** | **Electrical Description** |
| - | - | - | - |  |

### Alarms and Events

Table : Non-Standard Equipment Alarms and Events

|  |  |  |
| --- | --- | --- |
| **Description** | **Tag Name** | **Priority** |
| - | - | - |

### Parameters and Setpoints

Table : Non-Standard Equipment Parameters (Site Specific Parameters)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Type** | **Value** | **Units** |
| - | - | - | - | - |

Table : Non-Standard Equipment Setpoints

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Default Setpoint** | **Min Setpoint** | **Max Setpoint** | **Units** |
| - | - | - | - | - | - |

### Calculations and Statistics

Table : Non-Standard Equipment Calculations and Statistics

|  |  |
| --- | --- |
| **Point** | **Description** |
| - | - |

### SCADA Points

Table : Non-Standard Equipment SCADA Points

|  |  |  |
| --- | --- | --- |
| **Tag Name** | **Description** | **DNP3 Point** |
| - | - | - |

## Non-Standard Instrumentation

$nonStandardInstrumentation

### Physical I/O

Table : Non-Standard Instrumentation Physical IO

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module** | **Point** | **Data Type** | **Description** | **Electrical Description** |
| - | - | - | - |  |

### Alarms and Events

Table : Non-Standard Instrumentation Alarms and Events

|  |  |  |
| --- | --- | --- |
| **Description** | **Tag Name** | **Priority** |
| - | - | - |

### Parameters and Setpoints

Table : Non-Standard Equipment Instrumentation (Site Specific Parameters)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Type** | **Value** | **Units** |
| - | - | - | - | - |

Table : Non-Standard Instrumentation Setpoints

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Tag Name** | **Default Setpoint** | **Min Setpoint** | **Max Setpoint** | **Units** |
| - | - | - | - | - | - |

### Calculations and Statistics

Table : Non-Standard Instrumentation Calculations and Statistics

|  |  |
| --- | --- |
| **Point** | **Description** |
| - | - |

### SCADA Points

Table : Non-Standard Instrumentation SCADA Points

|  |  |  |
| --- | --- | --- |
| **Tag Name** | **Description** | **DNP3 Point** |
| - | - | - |

## Non-Standard Control System Hardware

$nonstandardControlSystem

## Non-Standard RTU Program

$nonstandardProgram

## Non-Standard RTU Communications

$nonstandardCommunication

Table : Non-Standard Communications Sent to SEQ Water

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **MODBUS Tag** | **Data Type** | **MODBUS Address** |
|  |  |  |  |

Table : Non-Standard Communications Received from SEQ Water

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **MODBUS Tag** | **Data Type** | **MODBUS Address** |
|  |  |  |  |

$$NS\_RTU\_COMMUNICATIONS:START$$

Notes:

Modbus ranges 400000-401999 reserved for SEQWater to QUU, reserved for QUU to SEQWater. Nominally, the first ten registers are allocated for Boolean signals and all following registers are allocated as IEEE Real signals.

$$NS\_RTU\_COMMUNICATIONS:END$$

## Non-Standard SCADA

$nonstandardSCADA

# Appendix A: Drawing List

To determine the latest revision of each drawing, refer to the drawing index on the first drawings listed below.

|  |  |  |
| --- | --- | --- |
| **Sheet #** | **Drawing #** | **Title** |
|  |  |  |

# Appendix B: Physical IO

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module** | **Point** | **Data Type** | **Description** | **Electrical Description** |
|  |  |  |  |  |

# Appendix C: Pump Data Sheet(s)

TBC - Comdain to provide.

# Appendix D: Equipment Configuration

TBC - Comdain to provide.

# Appendix E: Radio Configuration

TBC - Comdain to provide.