

FactoryTalk SE/ME and View Designer Visualization for Modbus TCP Server and Modbus TCP Client Add-On Instructions

Introduction

This document describes the application and use of the FactoryTalk SE/ME and View Designer Displays for use with Modbus TCP Client and Modbus TCP Server Add-On Instructions.

Modbus TCP Client Add-On Instruction (AOI) allows users to implement Modbus TCP Client functionality into the Logix family of controllers. Starting with version 2.03.00, the optional FactoryTalk View SE, ME and View Designer HMI displays provided to simplify implementation and troubleshooting.

These displays allow users to see Modbus TCP Client status, settings of the individual transactions and Modbus Data arrays.

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Requirements

HMI Requirements

The Modbus TCP Displays implemented using FactoryTalk SE/ME version 11.00 and higher.

View Designer Displays implemented using version 5.02 or higher.

AOI Requirements

The Modbus TCP Displays require the matching revision of the Add-On instruction. The minimum AOI revision is 2.03.00

FactoryTalk ME/SE Implementation

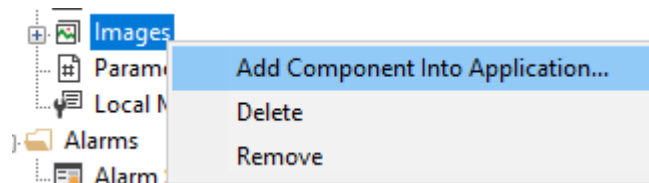
The following steps describe the implementation using FactoryTalk ME.

Implementation steps for FactoryTalk SE are similar.

The following steps assume that you already created blank or using existent application and created Device Shortcut in FTLink that is pointing to your controller that executes the Modbus TCP AOI.

Import Images

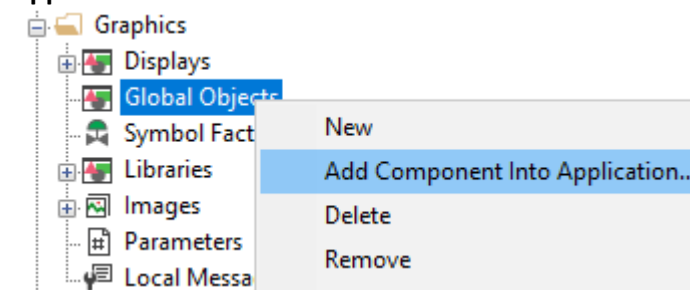
In FactoryTalk Explorer window right click on **Images** folder and select **Add Component Into Application**



Navigate to **Visualization/Images** folder, select PGN image type, then use CTRL+A to select all images Open. Skip import of any duplicate images.

Import Global Objects

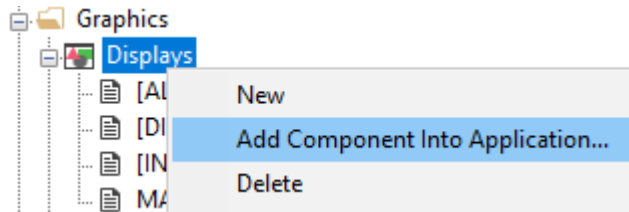
In FactoryTalk Explorer window right click on **Global Objects** folder and select **Add Component Into Application**



Navigate to **Visualization/ME/Global Objects** folder, select **ModbusTCP-Global.ggfx** file, then click Open.

Import Displays

In FactoryTalk Explorer window right click on **Displays** folder and select **Add Component Into Application**



Navigate to **Visualization/ME/Gfx** folder

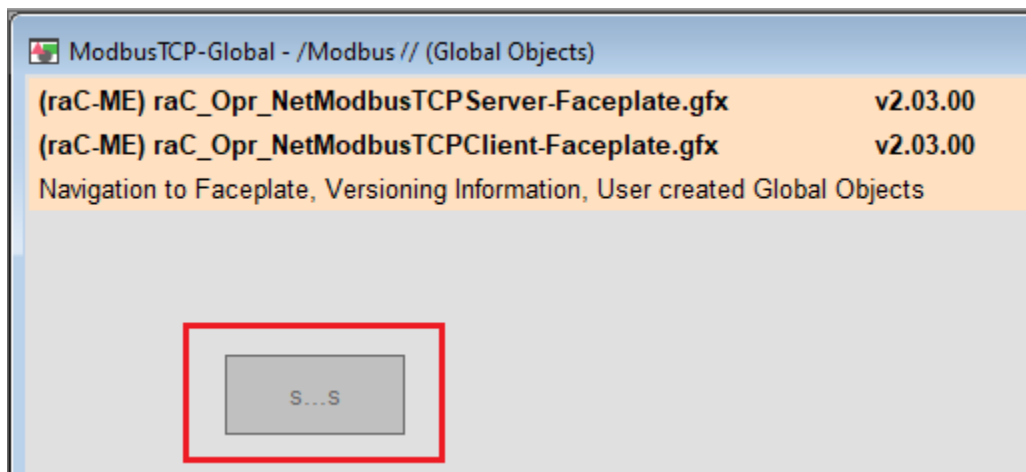
For Client select **(raC-ME) raC_Opr_ModbusTCPClient-Faceplate.gfx** file, then click Open.

For Server select **(raC-ME) raC_Opr_ModbusTCPServer-Faceplate.gfx** file, then click Open.

Please note that both displays can co-exist in the same application.

Create Display Call Button

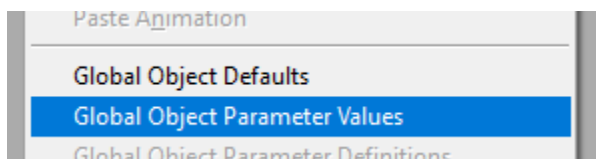
In FactoryTalk Explorer window navigate to Global Objects folder and open **ModbusTCP-Global** display.



Right click on the call button global object and select Copy.

Open a display where you want to have the call button. In this example we will be using the **Main** display. Paste call button global object.

Right click on the call button and select Global Object Parameter Value



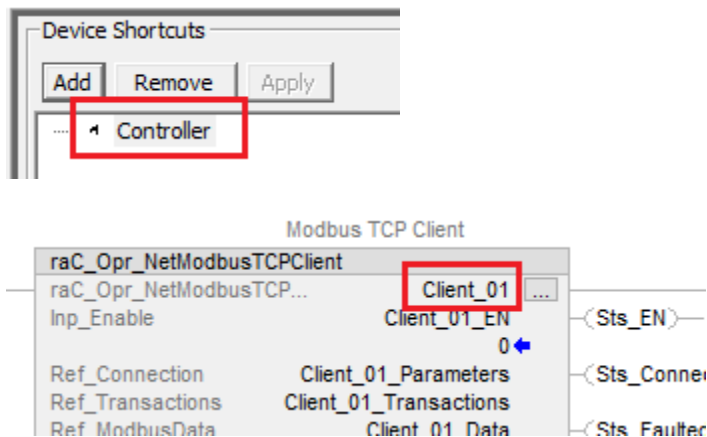
Populate parameters as follows:

Client application

Global Object Parameter Values

	Name	Value	Tag	Description
1	#102	[Controller]Client_01	...	Backing Tag
2	#104	Client	...	Navigation Button Label
3	#120	10	...	Display's left position (e.g. 100) (optional)
4	#121	10	...	Display's top position (e.g. 100) (optional)

#102 –[<Shortcut>]<AOI Backing Tag Name>. Example below uses shortcut “Controller” and AOI tag Client_01



#104 – Enter text for navigation button label

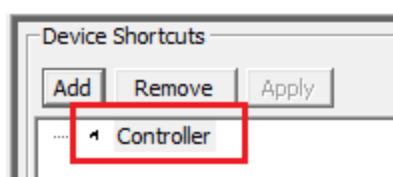
#120, #121 – Window position on the screen

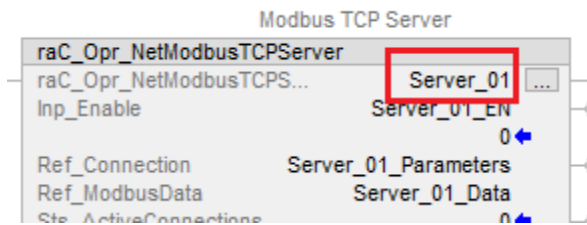
Server Application

Global Object Parameter Values

	Name	Value	Tag	Description
1	#102	[Controller]Server_01	...	Backing Tag
2	#104	Server	...	Navigation Button Label
3	#120	10	...	Display's left position (e.g. 100) (optional)
4	#121	10	...	Display's top position (e.g. 100) (optional)

#102 –[<Shortcut>]<AOI Backing Tag Name>. Example below uses shortcut “Controller” and AOI tag Server_01





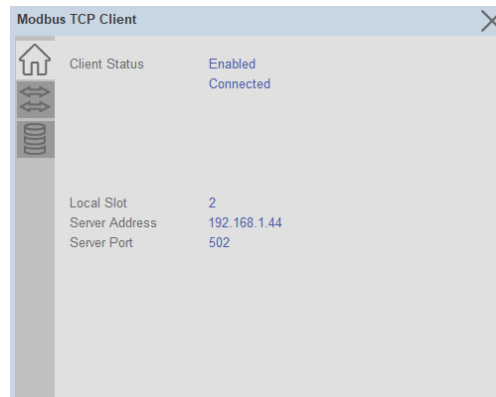
#104 – Enter text for navigation button label

#120, #121 – Window position on the screen

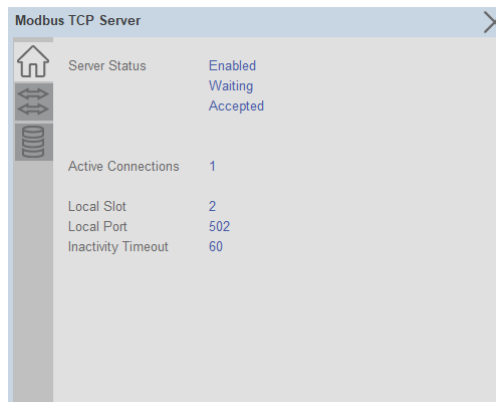
Verify Display Functionality

Run Test Application to verify that HMI can read data from the AOI

Client



Server





View Designer Implementation

The following steps describe the implementation using View Designer.


Copy Screens and launch button.


1. Open provided VPD file side by side with your application.
2. Expand User-Defined Screens and copy **raC_Opr_NetModbusTCPServer_FP** or **raC_Opr_NetModbusTCPClient_FP** screen, then paste it to your application.

 raC_Opr_NetModbusTCPServer_FP

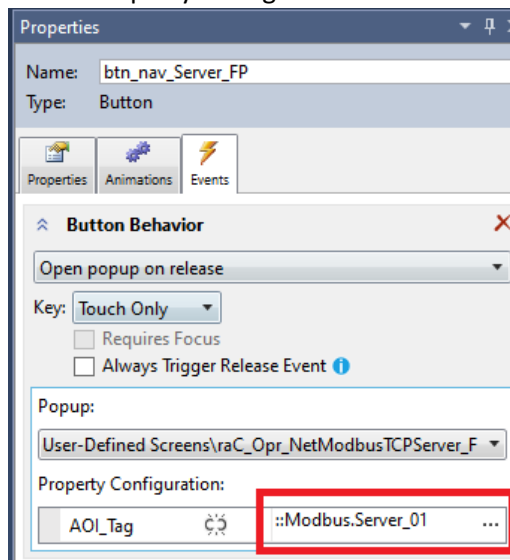
 raC_Opr_NetModbusTCPClient_FP

3. Open ToolBox screen. Select and copy the appropriate Launch button, then paste it into your application.





4. In your application select launch button. In properties window select Events Tab. Under Property Configuration select PLC AIO backing tag.



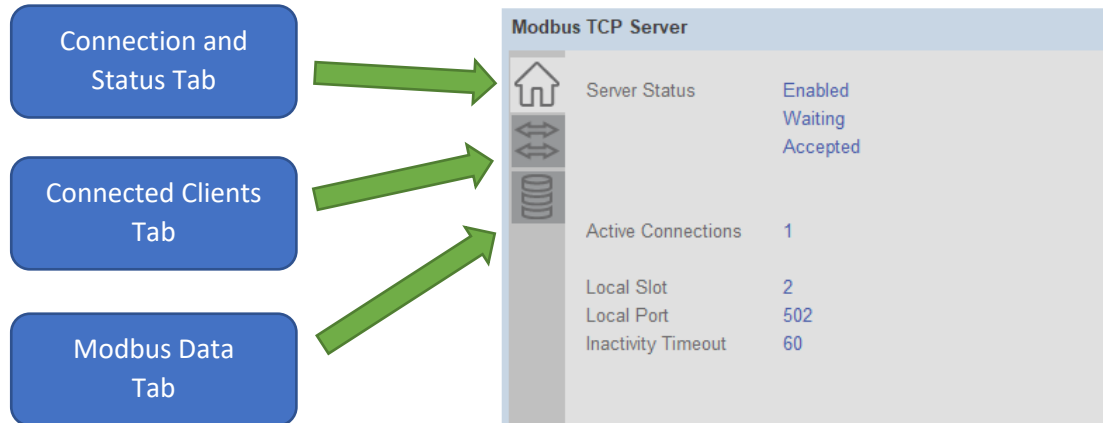
Verify Display Functionality

Use Emulate Project feature to test the display.

Display Overview

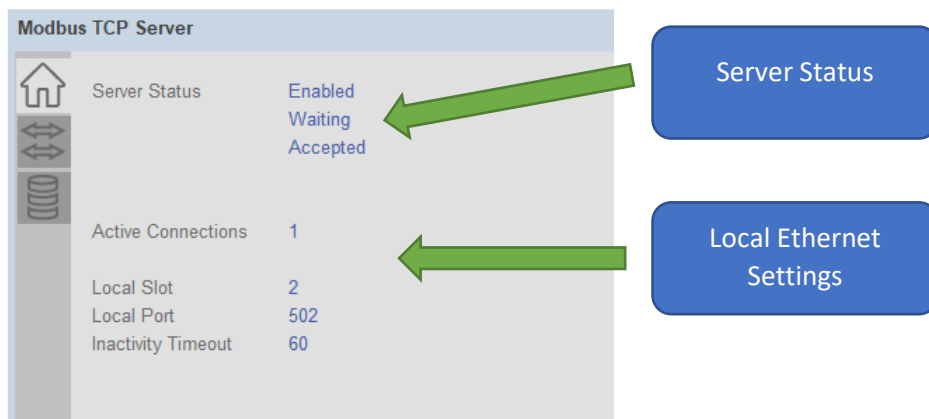
Modbus TCP Server HMI Display

Navigation Tabs



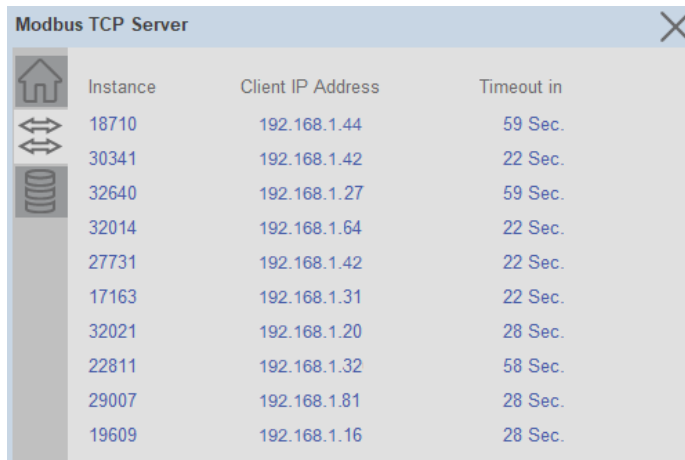
Connection and Status Tab (Home Tab)

This tab shows configured local server parameters and current server status, including the number of currently active clients. Depending on the state of the server, the additional fields may be visible on the HMI display.



Connected Clients Tab

This tab show detailed information about each connected client. Up to 10 clients will be shown.

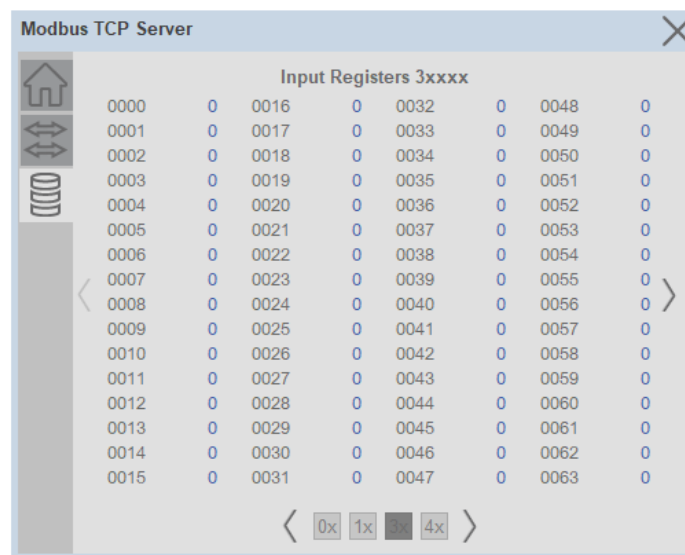


The screenshot shows the 'Modbus TCP Server' window with the 'Connected Clients' tab selected. The tab displays a list of 10 connected clients, each with an instance number, a client IP address, and a timeout value. The left sidebar contains three icons: a house (Home), a double-headed arrow (Connected Clients), and a stack of coins (Data Tables). The 'Connected Clients' icon is highlighted.

Instance	Client IP Address	Timeout in
18710	192.168.1.44	59 Sec.
30341	192.168.1.42	22 Sec.
32640	192.168.1.27	59 Sec.
32014	192.168.1.64	22 Sec.
27731	192.168.1.42	22 Sec.
17163	192.168.1.31	22 Sec.
32021	192.168.1.20	28 Sec.
22811	192.168.1.32	58 Sec.
29007	192.168.1.81	28 Sec.
19609	192.168.1.16	28 Sec.

Modbus Data Tab

This tab show data for each of four data tables.



The screenshot shows the 'Modbus TCP Server' window with the 'Modbus Data' tab selected. The tab displays a table of input registers (3xxxx) with 16 rows and 8 columns. The left sidebar contains three icons: a house (Home), a double-headed arrow (Connected Clients), and a stack of coins (Data Tables). The 'Data Tables' icon is highlighted.

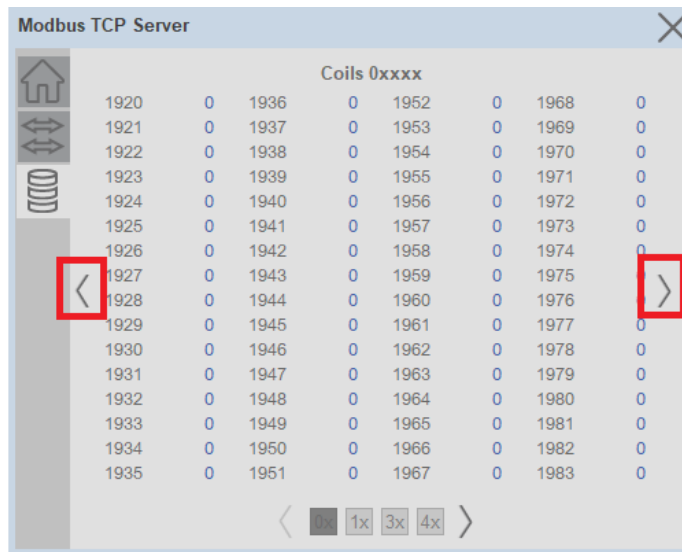
Input Registers 3xxxx							
0000	0	0016	0	0032	0	0048	0
0001	0	0017	0	0033	0	0049	0
0002	0	0018	0	0034	0	0050	0
0003	0	0019	0	0035	0	0051	0
0004	0	0020	0	0036	0	0052	0
0005	0	0021	0	0037	0	0053	0
0006	0	0022	0	0038	0	0054	0
0007	0	0023	0	0039	0	0055	0
0008	0	0024	0	0040	0	0056	0
0009	0	0025	0	0041	0	0057	0
0010	0	0026	0	0042	0	0058	0
0011	0	0027	0	0043	0	0059	0
0012	0	0028	0	0044	0	0060	0
0013	0	0029	0	0045	0	0061	0
0014	0	0030	0	0046	0	0062	0
0015	0	0031	0	0047	0	0063	0

At the bottom of the screen, there is a data table selector with four buttons: 0x, 1x, 3x, and 4x. The 3x button is currently selected.

Data Table selector at the bottom of the screen allows quick selection of one of four data tables.

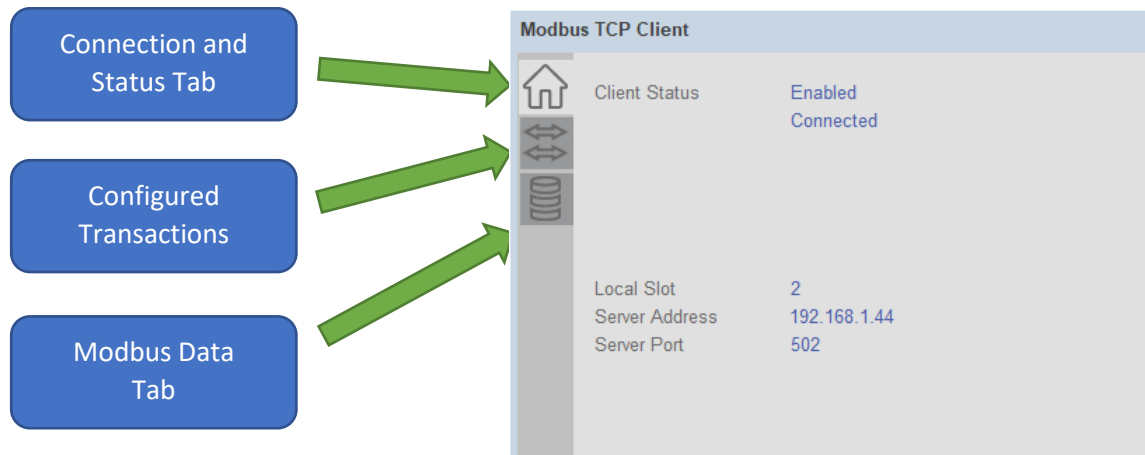


Navigation buttons on the right and left side of the display allow you to select desired address range.



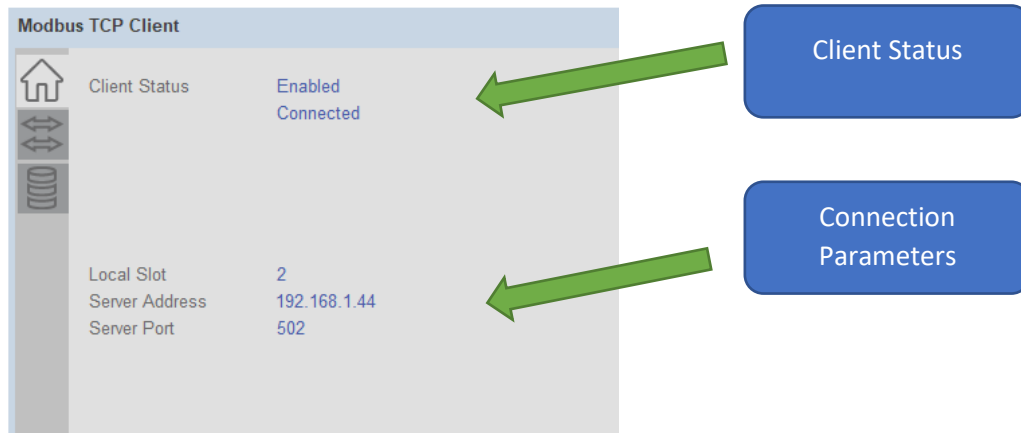
Modbus TCP Client HMI Display

Navigation Tabs



Connection and Status Tab (Home Tab)

This tab shows configured local parameters, remote client address and current client status. Depending on the state of the client, the additional fields may be visible on the HMI display.



Transactions Tab

This tab show detailed information about each of 5 configured transactions.

Transaction 0

Enabled
Completed Success

Poll Interval (ms)

1000

Modbus Function

FNC3 - Holding Register Read

Station ID

0

Remote Server Data

Beginning Address 100

Count 3

Modbus Range 400101 - 400103

Local Client Data

Local Address 10

Local Tag Range HoldRegisters_4xxx [10] - [12]

0

1

2

3

4

>

Transaction Status

Configured Command

Remote Server Address Ranges

Local (Client) Address Ranges

Transaction selector is available at the bottom of the screen.

<

0

1

2

3

4

>

Modbus Data Tab

This tab show data for each of four data tables.

Coils 0xxxx

0000	0	0016	0	0032	0	0048	0
0001	0	0017	0	0033	0	0049	0
0002	0	0018	0	0034	0	0050	0
0003	0	0019	0	0035	0	0051	0
0004	0	0020	0	0036	0	0052	0
0005	0	0021	0	0037	0	0053	0
0006	0	0022	0	0038	0	0054	0
0007	0	0023	0	0039	0	0055	0
0008	0	0024	0	0040	0	0056	0
0009	0	0025	0	0041	0	0057	0
0010	0	0026	0	0042	0	0058	0
0011	0	0027	0	0043	0	0059	0
0012	0	0028	0	0044	0	0060	0
0013	0	0029	0	0045	0	0061	0
0014	0	0030	0	0046	0	0062	0
0015	0	0031	0	0047	0	0063	0

<

0x

1x

3x

4x

>

Data Table selector at the bottom of the screen allows quick selection of one of four data tables.

<

0x

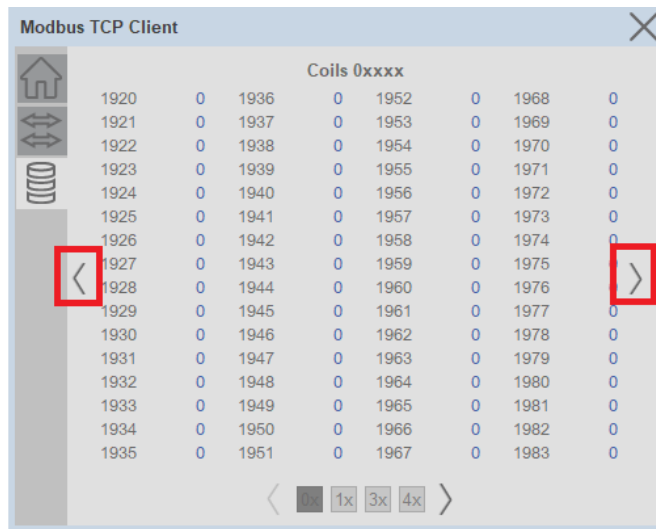
1x

3x

4x

>

Navigation buttons on the right and left side of the display allow you to select desired address range.



Revision History

1. HMI display Revision 2.03.00 – Initial release April 2021
 - 1.1. Enhancements
 - 1.1.1. New release
 - 1.2. Corrected Anomalies
 - 1.2.1. None
 - 1.3. Known Anomalies
 - 1.3.1. None
 - 1.3.2.
2. HMI display Revision 2.04.00 – Update September 2022
 - 2.1. Enhancements
 - 2.1.1. None
 - 2.2. Corrected Anomalies
 - 2.2.1. All image file extensions renamed from BMP to PNG.
The actual files remain the same.
 - 2.3. Known Anomalies
 - 2.3.1. None