

i³ Modbus TCP Slave Tutorial

Introduction

The purpose of this tutorial is to demonstrate the Modbus TCP slave communication functions of the i³.

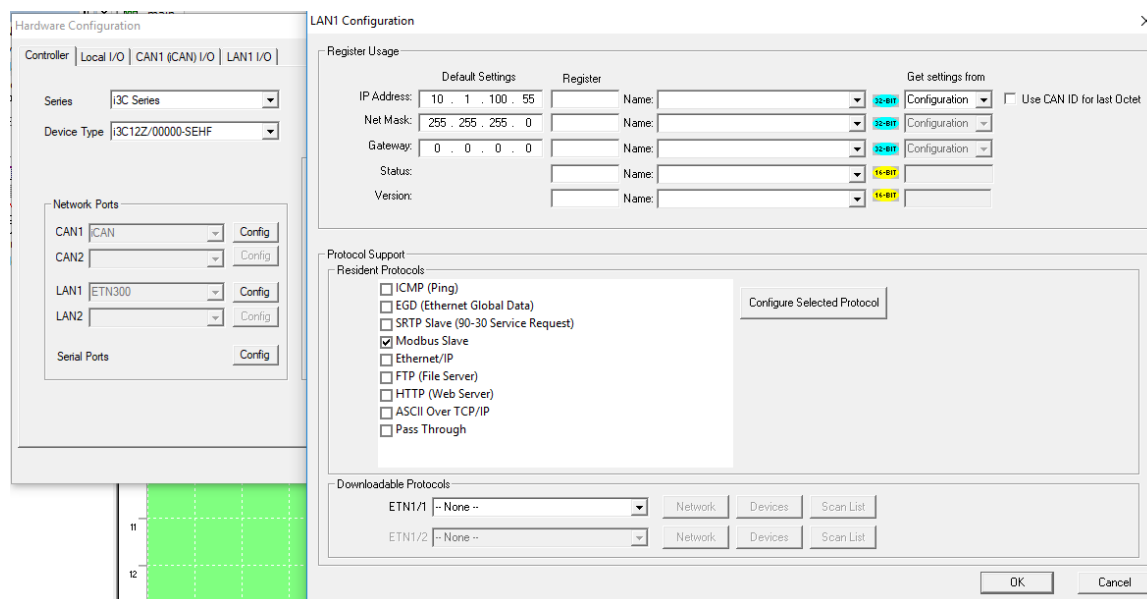
In this tutorial we will demonstrate the i³ as a Modbus slave with a HMI connected to the i³ controlling it. The advantage of having the capability of connecting to an external HMI allows data to be represented in different aspects in another location. To demonstrate the connection between an i³ and a HMI we will connect an i³ to an iView. This gives us the advantage of being able to provide the user with another and more graphical interface.

i³ Modbus Map

Modbus Master Mapping					
iHMI Reference	Maximum Range	Traditional Modbus Reference	Expanded Modbus Reference	Modbus Command(s)	Modbus Offset
%I1	2048	10001	100001	Read Input Status (2)	00000
%IG1	256	13001	103001		03000
%S1	256	14001	104001		04000
%K1	256	15001	105001		05000
%Q1	2048	00001	000001	Red Coil Status (1) Force Coil (5) Force Multiple Coils (15)	00000
%M1	2048	03001	003001		03000
%T1	2048	06001	006001		06000
%QG1	256	09001	009001		09000
%AI1	512	30001	300001	Read Input Register (4)	00000
%AIG1	32	33001	303001		03000
%SR1	32	34001	304001		04000
%AQ1	512	40001	400001	Read Holding Register (3) Load Register (6) Load Multiple Registers (16)	00000
%R1	2048	43001	403001		03000
%AQG1	32	46001	406001		06000
%R1*	9999	-	410001		10000

Connecting via i3-Configurator

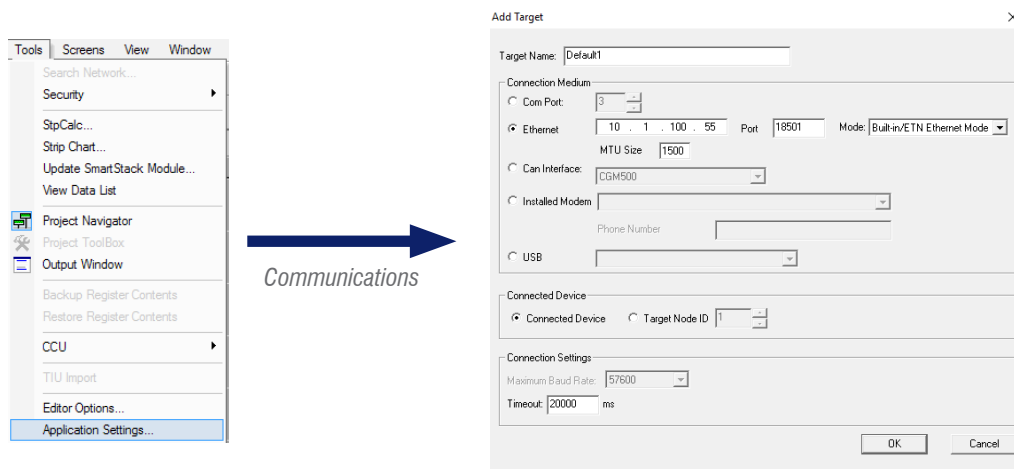
On this tutorial, we are going to set i³ IP address to:10.1.100.55. To set the IP address and the control, go to hardware configuration and click Lan1. Assign an IP address to i³ and from the protocol Support options tick Modbus/Slave.



The screenshot shows the 'LAN1 Configuration' window in the i3-Configurator software. The 'Register Usage' section is active, showing fields for IP Address (10.1.100.55), Net Mask (255.255.255.0), Gateway (0.0.0.0), Status, and Version. The 'Protocol Support' section is also visible, with 'Modbus Slave' checked under 'Resident Protocols'. The 'Downloadable Protocols' section at the bottom shows 'ETN1/1' and 'ETN1/2' both set to 'None'.

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To assign the IP to the controller. Open the Configurator software. Select 'Tools' -> Application Settings -> Communications . Select the Ethernet option, input the correct IP address, and Set the Connection Type to i³ –E Ethernet Mode.



There will be a short delay while the connection is established. Then the traffic lights should show the current state of the i³ Controller, as one will depress automatically.

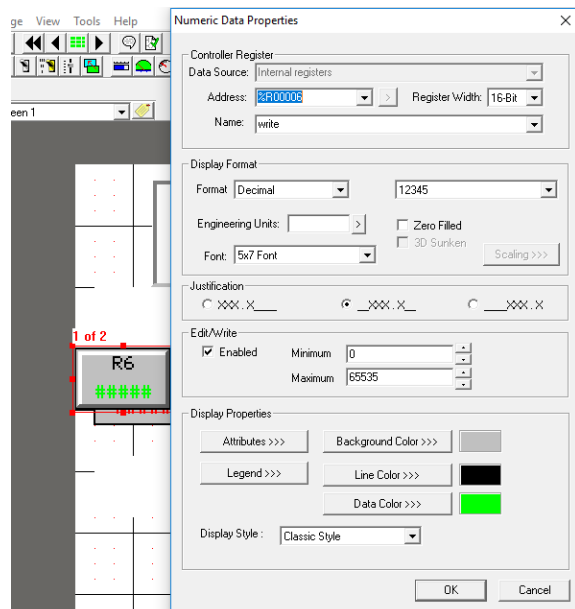


If this does not happen then there is no communication, and all settings should be rechecked. Including the Target and Local network ID's if the i³ is a CAN enabled type.

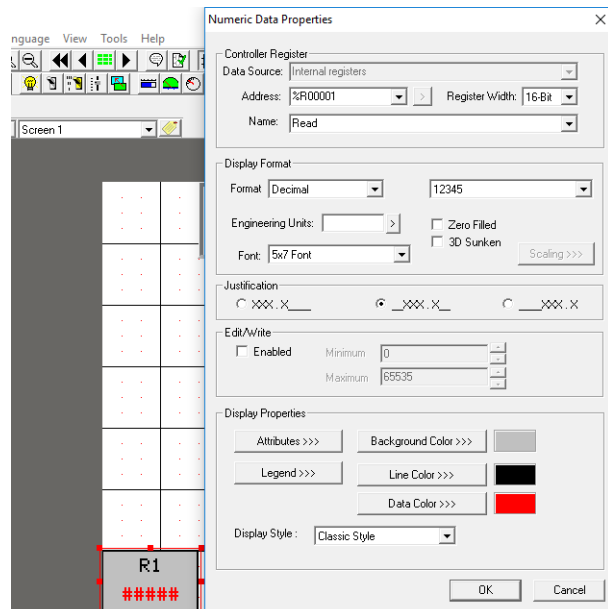
Screen Editor Programming

Let us now configure the screen by adding two numeric data.

-Numeric entry R6 to write data to the HMI



-Numeric entry R1 to read data from HMI



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iView network Configuration

Open the Project Manager under View > Project Manager

In the Project Manager > Open the Application Program Section (AP_1) > Links. Right Click Links > Add Link. Configure the link table as below

-Link Properties

-Parameter

Screen Editor Programming

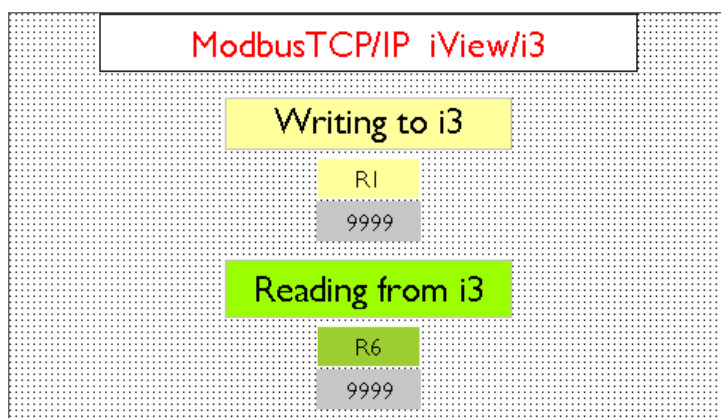
We need to set up one screen with two objects:

1-Numeric entry for entering a value and writing to i3

2-Numeric display for reading value from the i3

The iView addresses will refer to the Modbus reference of the registers in the i3.

R1	43001
R6	43006



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