



ezTCP Technical Documents

Internet Switch

Version 1.4

☞ *Caution: Specifications of this document may be changed without prior notice for improvement*

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Contents

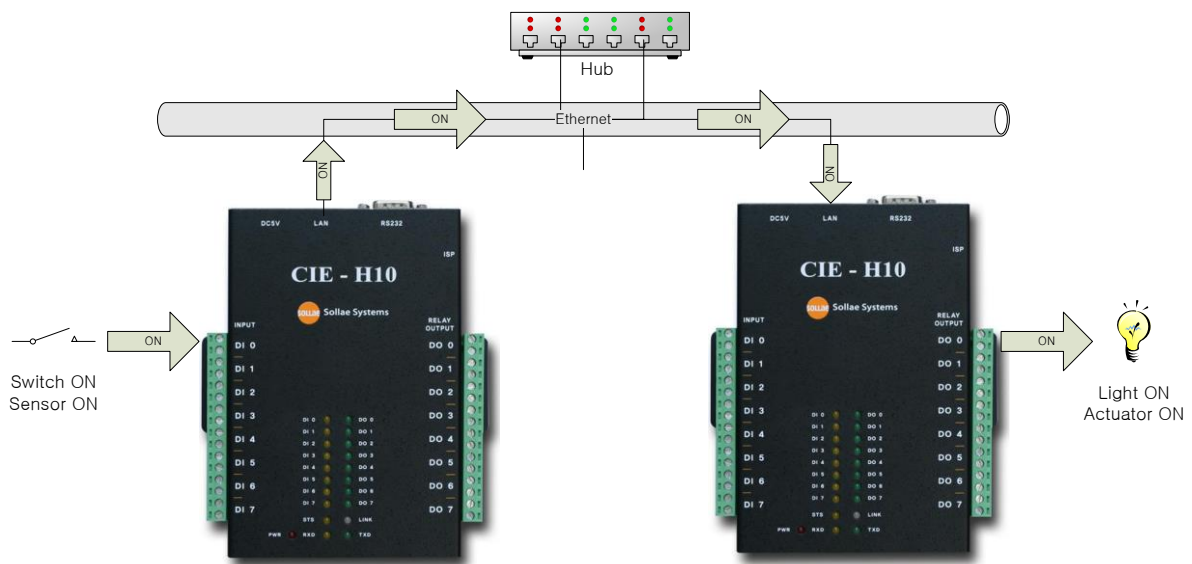
CONTENTS.....	- 1 -
1 OPERATION CONCEPT	- 2 -
1.1 Overview	- 2 -
1.2 Related products	- 3 -
2 CONFIGURATION	- 4 -
2.1 Configuring IP Address related parameters	- 4 -
2.2 Configuring TCP connection related parameters	- 4 -
2.2.1 Configuration.....	- 4 -
2.2.2 Example.....	- 4 -
2.2.3 Cautions.....	- 4 -
2.3 Configuring Modbus/TCP related parameters	- 5 -
2.3.1 Configuration.....	- 5 -
2.3.2 Example.....	- 5 -
2.4 Example	- 6 -
2.4.1 Slave.....	- 7 -
2.4.2 Master.....	- 8 -
2.5 Advanced Operation	- 9 -
3 REVISION HISTORY	- 10 -

1 Operation Concept

1.1 Overview

MODBUS is a communication protocol widely used in the world for monitoring and control of various types of automation devices such as PLC (Programmable Logic Controller). MODBUS is an application layer messaging protocol that provides client/server communication between devices connected on different types of buses or networks. This document introduces the MODBUS messaging service over TCP/IP which is called Modbus/TCP and used in ezTCP to manage its I/O ports.

You can make a system that transfers input information through the TCP/IP network and outputs the value. This function is called as "Internet Switch".



You can turn on or off the devices remotely through Ethernet or Internet with two I/O products.

- ☞ **Officially, I/O products provide only DC for input and output power source.**
- ☞ **Refer to the manual for interfacing remote I/O controllers to the user device.**

1.2 Related products

- CIE-H10
 - CIE-M10
 - CIE-H12
 - CIE-H14
 - EZI-10
- Refer to "Internet switch (EZI-10)" technical document.

2 Configuration

2.1 Configuring IP Address related parameters

Input IP address related parameters (Local IP Address, Subnet Mask, Gateway, etc) in the [NETWORK] tab of the ezManager. Users have to ask to the network administrator for IP address related parameters.

Refer to the corresponding user manual of each product for the [NETWORK] tab information.

2.2 Configuring TCP connection related parameters

2.2.1 Configuration

To do a Modbus/TCP communication, a TCP connection should be established between two I/O products. The TCP connection is 1 to 1 connection. A server should be listening from a port (Passive connection) while a client tries to make a TCP connection to the server's port (Active connection), then the connection will be established.

You can set the TCP connection information for Modbus/TCP in the [Active/Passive Connection] field in the [I/O Port]-[Basic Settings] tab of the ezManager.

2.2.2 Example

The following example is that the (#2) device trying to make a TCP connection to the (#1) device (port number: 502) for Modbus/TCP communication.

Device	CIE-H10 #1	CIE-H10 #2
Local IP Address	10.1.0.1	10.1.0.2
Active/Passive	Passive	Active
Peer Address	-	10.1.0.1
Port	502	502

Table 2-1 example

2.2.3 Cautions

- A device working as passive mode should use static IP address.
- The Internet Switch does not work if you set Communication Mode to Serial Modbus/TCP in the [TCP / IP Communication Settings] section of the [Serial Port] tab of ezManager,.

2.3 Configuring Modbus/TCP related parameters

2.3.1 Configuration

You can set the Modbus/TCP related information in the [Basic Settings] in the [I/O Port]tab of the ezManager.

Field	Description	
Modbus/TCP	Modbus/TCP enable field. (should be set)	
Mater/Slave	Master	A master transmits its input information to the salve and outputs the slave's input value to its output port after reading the value periodically.
	Slave	If a slave gets a [Read] command from the master, it sends its input port's value to the master and if the slave gets [Write] command from the master, it outputs the value to its output port.
Poll Interval	The period that the master is polling for [Read] and [Write] operations. Recommended value: 1000 (1 second / unit: ms)	
Unit ID	The unit ID of two devices Recommended value: 1	
Input Port Address	The input port addresses of two devices Recommended value: 0	
Output Port Address	The output port addresses of two devices Recommended value: 8	
Input Change Notification	Do not set.	

Table 2-2 variables of Modbus/TCP

2.3.2 Example

Device	CIE-H10 #1	CIE-H10 #2
Modbus/TCP	Check	Check
Master/Slave	Slave	Master
Poll Interval		1000
Unit ID	1	1
Input Port Address	0	0
Output Port Address	8	8

Table 2-3 example

2.4 Example

Modbus/TCP consists of a master and slaves. A master sends queries to the slaves and slaves reply to the queries. You have to designate which one will be a master or which ones will be slaves considering your network environment.

Device	CIE-H10 #1	CIE-H10 #2
Local IP Address	10.1.0.1	10.1.0.2
Active/Passive	Passive	Active
Peer Address	-	10.1.0.1
Port	502	502
Modbus/TCP	Check	Check
Master/Slave	Slave	Master
Poll Interval		1000
Unit ID	1	1
Input Port Address	0	0
Output Port Address	8	8

Table 2-4 setting parameters

2.4.1 Slave

- Setting IP address

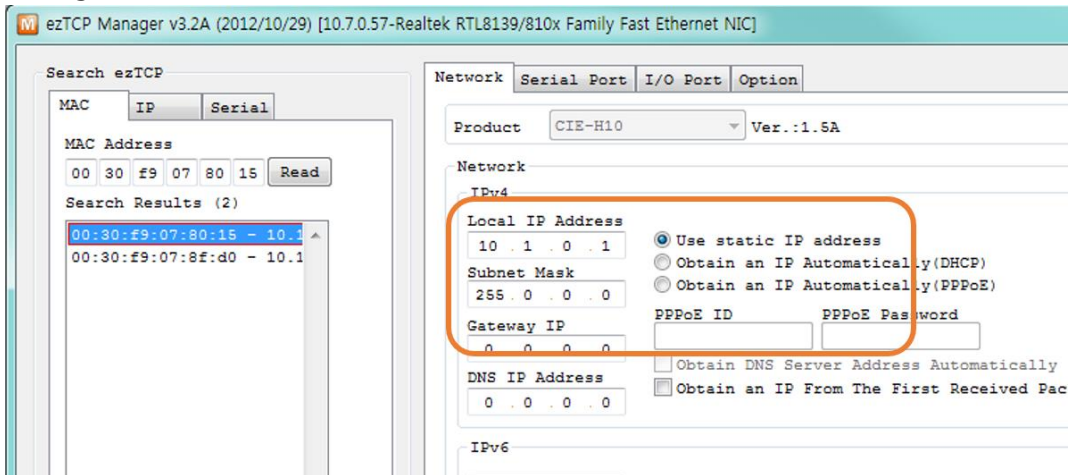


Figure 2-1 IP address setting of Slave

- Setting Modbus/TCP

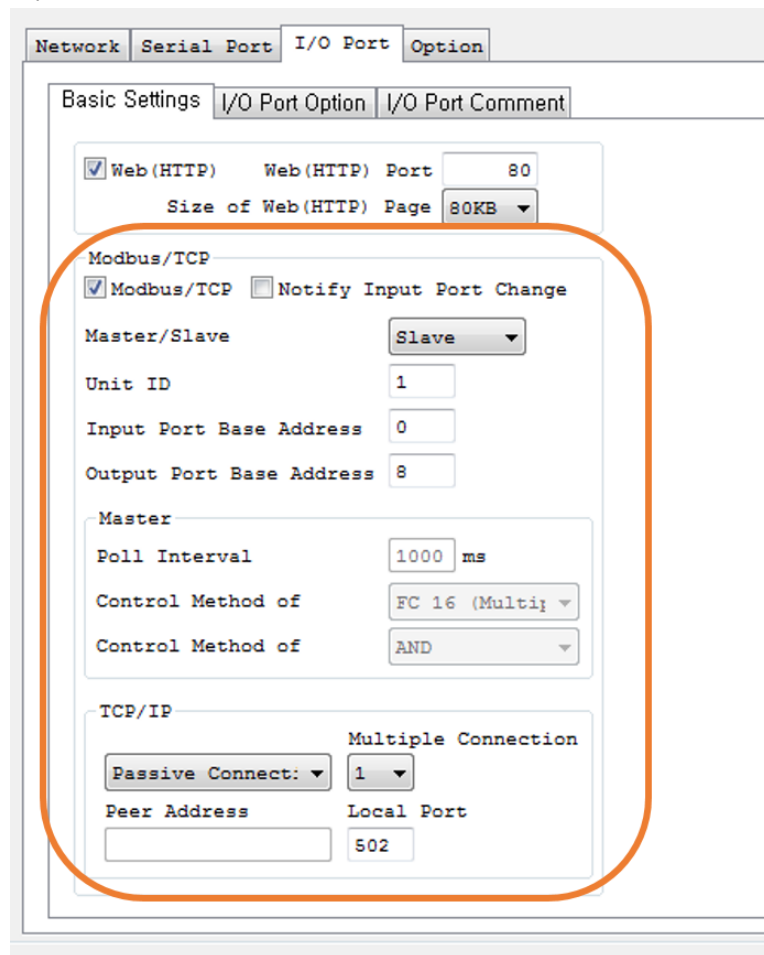


Figure 2-2 Modbus/TCP settings of Slave

2.4.2 Master

- Setting IP address

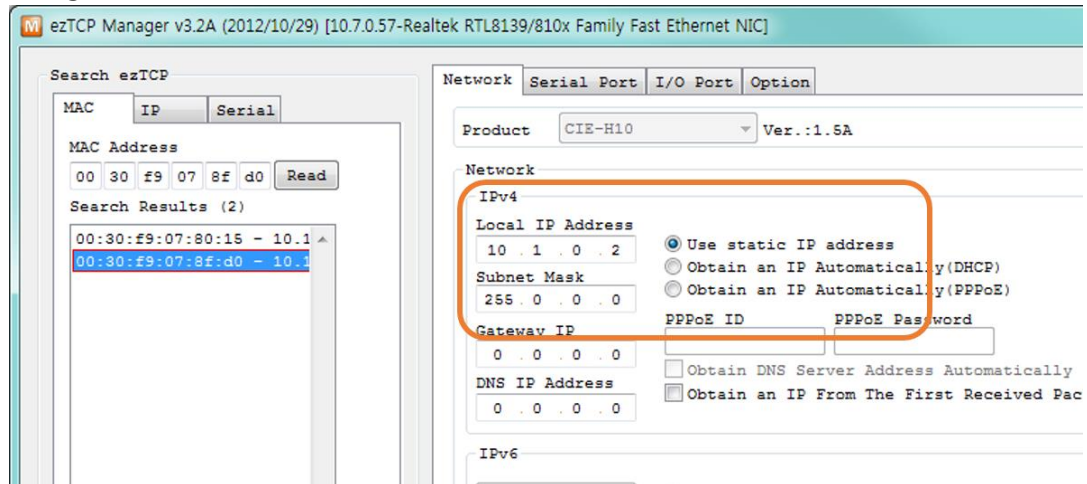


Figure 2-3 IP address setting of Master

- Setting Modbus/TCP

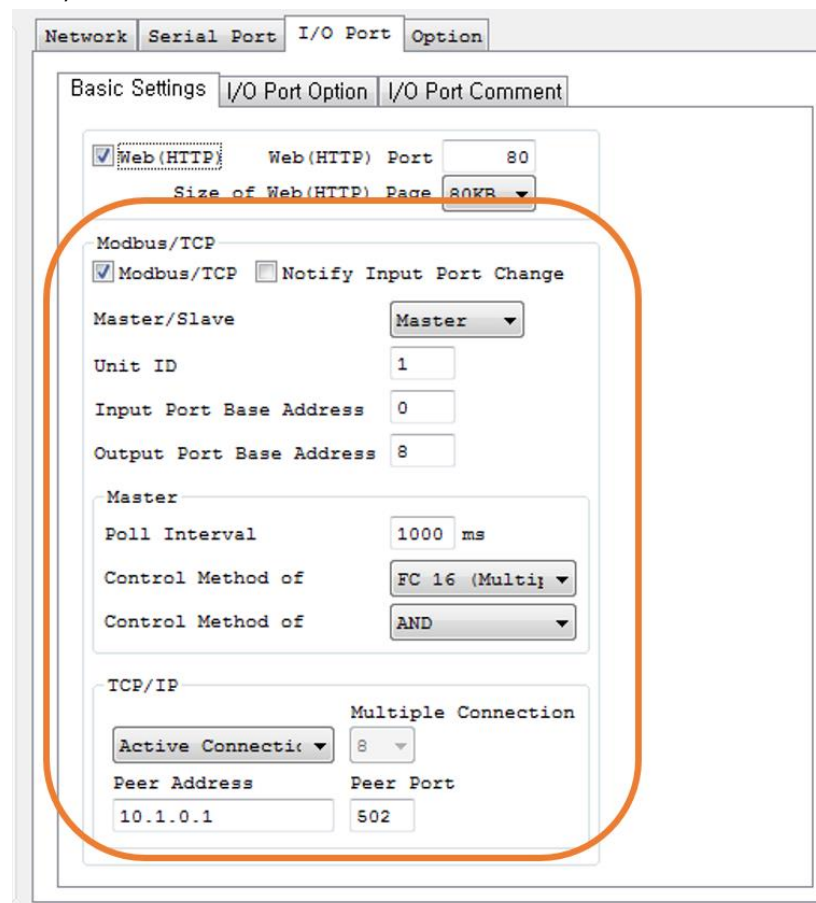


Figure 2-4 Modbus/TCP settings of Master

2.5 Advanced Operation

You can use this application in detail by using the parameters below.

The screenshot shows a configuration window with tabs for Network, Serial Port, I/O Port, and Option. Under the I/O Port tab, there are sub-tabs for Basic Settings, I/O Port Option, and I/O Port Comment. The I/O Port Option sub-tab is active and contains two main sections: Digital Input and Digital Output.

Digital Input Section:

	Valid Time (ms)
Di0	0
Di1	0
Di2	0
Di3	0
Di4	0
Di5	0
Di6	0
Di7	0

Digital Output Section:

	Macro	Delay (ms)	Initial State
<input type="checkbox"/>	Do0	0	Off
<input type="checkbox"/>	Do1	0	Off
<input type="checkbox"/>	Do2	0	Off
<input type="checkbox"/>	Do3	0	Off
<input type="checkbox"/>	Do4	0	Off
<input type="checkbox"/>	Do5	0	Off
<input type="checkbox"/>	Do6	0	Off
<input type="checkbox"/>	Do7	0	Off

Figure 2-5 advanced operation

- Valid Time

The input signal is valid only if the signal keeps HIGH for the value of [Valid Time]. That means any signals shorter than the value of [Valid Time] are ignored. The unit is 1ms.

- Delay

I/O products delay output as long as time set to the value of [Delay]. The output signal should be maintained by the point of operation time and it can not be controlled when timer is running by this option. The unit is 1ms.

3 Revision History

Date	Version	Comments	Author
2008.08.13	1.0	○ Initial release	
2013.02.12	1.1	○ Update terms ○ Remove descriptions about AC power control	Roy LEE
2014.07.29	1.2	○ Add the ezManager screenshots ○ Update items	Amy Kim
2015.04.20	1.3	○ Modify wrong expressions	Amy Kim
2017.10.26	1.4	○ Add an item to 2.2.3 Cautions.	Jack Kim