# MDC-700 Series User Manual

Aug. 2021, Version 1.0.4



### SUPPORT

MDC-711 MDC-714/MDC-714i MDC-741 MDC-771

Written by Liam Lin Edited by Sunny Chiu

#### Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

#### Warning

ICP DAS assumes no liability for damages consequent to the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

### Copyright

Copyright © 2014 by ICP DAS. All rights are reserved.

#### **Contact Us**

If you have any questions, please feel free to contact us via email at:

Service@icpdas.com

### Contents

1. Introduction
2. Hardware Information
2.1. Specifications
2.2. Appearance
2.3. Pin Assignments
2.4. Wiring Connections14
2.5. Dimensions
2.6. Mounting the Hardware
3. Getting Started 18
4. Configuration
4.1. Exporting and importing config.csv file
4.2. Editing the config.csv file
5. MDC-700 Web Interface
6. Troubleshooting
7. FAQ
01: What are the maximum numbers of polling definition and local register? 47
Q1. What are the maximum numbers of poining demittion and local register
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum numbers of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum numbers of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q2: What is the maximum number of registers can be accessed in one Modbus command? 47 Q3: How are the local registers mapped to the polled data in a MDC-700?
Q1: What are the maximum numbers of poining definition and local register summaries of poining definition and local register register register summaries of poining definition and local register register register register summaries of poining definition and local register reg

### **1. Introduction**

The MDC-700 series module is a Modbus Data Concentrator which can concentrate data from several Modbus RTU slave devices with RS232/RS-485 interface and allows Modbus TCP masters to read/write data via Ethernet/LAN. The Modbus master can use one Modbus command to get all data on those Modbus RTU slave devices via the MDC-700 concentrator. In other words, through the help of a MDC-700 module, the Modbus RTU slave devices can be accessed over Ethernet with better read and write performance.

The MDC-700 series module has the ability to perform up to 250 Modbus RTU commands to read/write data from/to Modbus RTU slave devices and allows up to 8 Modbus TCP masters to get the polled data. The support for Modbus TCP protocol makes the MDC-700 well integrated into PC-based applications such as SCADA (Supervisor Control and Data Acquisition) and HMI (Human Machine Interface) programs.



#### **Features**

#### HTML5 Web-based User Interface

HTML5 is the latest version of the HTML markup language. It is supported by most current browsers including Mozilla Firefox, Apple Safari, Google Chrome and so on.

For the reason, the Web-based user interface of the MDC-700 is accessible from a wide variety of devices anywhere. Users can configure the module and monitor connection status of each polling definition through their smart phones, tablets or desktops without a line of code.

		MDC-7	<b>14</b> Intrator
	THIS COMPUTER	- ( ) - MDC-700	Admin   LOGOUT
Modbus Con	nection		
+ COM1 (Now 113 ms	Omax. 2273 ms Omax. 102 ms	RESET	
+ COM2 0 NOW 110 ms	Omax. 2272 ms Omin. 102 ms	RESET	
+ COM3 (Now 147 ms	Omax. 2287 ms Omin. 124 ms	RESET	
+ COM4 ON 147 ms	Omax. 2289 ms Omax. 125 ms	RESET	
+ COM5 🖉 NOW 143 ms	(MAX. 2337 ms) (MIN. 139 ms	RESET	

#### Great Capability of Shared Memory

The MDC-700 series module can perform up to 250 polling definitions. And the internal shared memory has four tables to store the polled AI, AO, DI and DO data. Each table can store up to 9600 registers.



#### Config.csv to Ease Hard Work of Editing a Lot of Definition

Editing and checking a lot of polling definitions is a hard work and it may make mistakes. Users can easy to manage so many definitions in a CSV format file with Excel and import or export the config.csv via a simple mouse-click action.

💌 M	icrosoft Exce	l - config.csv									×
	A	В	С	D	E	F	G	Н	I		~
1	#	TCPPort	ModbusID							$\square$	
2	*	502	1								
3	#	ModuleInfo									
4	*	this is my data (	concentrator								
5	#	ComPortNo	BaudRate	DataBit	Parity	StopBit	TimeOut	PollDelay	OperatingMode		
6	*	1	115200	8	0	1	120	20	master		
7	*	2	115200	8	0	1	120	20	master		Ξ
8	*	3	9600	8	0	1	120	20	master		
9	*	4	9600	8	0	1	120	20	master		
10	*	5	9600	8	0	1	120	20	master		
11	#	UseComPort	SlaveModbusID	FunctionCode	RegStartAddr	RegCount	TimeoutEventProcess	Preset Valu	e		
12	*	1	1	3	0	8	2	0			
13	*	2	2	4	0	8	2	0			
14	*	3	3	2	0	8	2	0			
15	*	4	4	1	0	8	2	0			
16	*	5	5	3	8	8	2	0			
17											~
	► ► ► \\ config	IJ				<				Σ	
											ļ

#### Built-in Definition Validation

One of the polling definitions may not be executed due to invalid parameters is given in the imported config.csv file. MDC-700 provides the function of validating and displaying invalid parameters with line information in config.csv file on its web interface.



#### Support for Modbus TCP Master and Modus RTU Master

The MDC-700 can be accessed by Modbus TCP Master and Modus RTU Master. Changing the mode for a COM port from Master to Slave allows a connected Modus RTU Master to read/write data from/to the Modbus RTU slave devices on the other COM ports.

### 2. Hardware Information

### 2.1. Specifications

	MDC-711	MDC-714	MDC-714 i	MDC-741	MDC-771
Ethernet					
Port	x 1, 10/100 B	ase-TX			
Protocol	Modbus/TCP	Slave			
Max. Connection	8				
COM Port					
RS-232	x 1 (5-wire)	x 1 (5-wire)	x 1 (5-wire)	x 4 (5-wire)	x 1 (5-wire) + x 6 (3-wire)
RS-485	x 1 (2-wire)	x 4 (2-wire)	x 4 (2-wire) (3 isolated ports)	x 1 (2-wire)	x 1 (2-wire)
Baud Rate	1200, 2400, 4	800, 9600, 192	200, 38400, 5760	0, 115200 (bps)	
Data Format	N81, E81, O8	1, N82, E82, O8	82		
Protocol	Modbus RTU	Master/Slave			
Max. Node	32 nodes for	each RS-485 p	ort		
Polling Definition	250 definitio	ns for all RS-23	2/485 ports		
Shared Memory	9600 register	s for each of A	I, AO, DI and DO	Data	
System					
5-Digit 7 Segment LED Display	Yes, to displa	y IP address			
System LED Indicator	Yes, to displa	y heartbeat			
Mechanical					
Casing	Metal				
Dimension	102 mm x 12	5 mm x 28 mm	(W x H x D)		
Installation	Wall Mount				
Power					
Input Range	+10 VDC ~ +3	0 VDC (non-re	gulated)		
Consumption	2.5 W				
Environmental					
Operating Temperature	-25°C ~ +75°C				
Storage Temperature	-30°C ~ +80°C	2			
Humidity	10 ~ 90% RH,	non-condensi	ng		

#### 2.2. Appearance



#### LED Indicator

The LED is used as a heartbeat indicator and slows to approximately one flash per second.

#### Ethernet Port



The MDC-700 is equipped with a RJ45 port for Ethernet LAN connection. When 100BASE-TX is operating, the 10/100M LED is lit orange. When 10BASE-T is operating or the machine is not connected to the network, it is turned off. When an Ethernet link is detected and an Ethernet packet is received, the Link/Act LED is lit green.



#### Configuration Display

Power Connector

MDC-700 includes a 5-digit 7-Segment LED display to indicate configuration in a module as below:

11111. 1. 192 2. 168 3. 255 4. 1	<ul> <li>The IP address for the MDC-700 (192.168.255.1)</li> </ul>
22222. 502 001	<ul> <li>Modbus TCP communication settings Port: 502 Net ID: 1</li> </ul>
33333. 1.1152 2.1152	<ul> <li>Baud rate setting for each COM port COM1: 115200 bps COM2: 115200 bps</li> </ul>
44444. 1. 801 2. 801	<ul> <li>Data format setting for each COM port COM1: 8N1 COM2: 8N1</li> </ul>
55555. 00	<ul> <li>The count of TCP/IP connection</li> <li>0: No TCP/IP connection</li> </ul>

#### Reset

Shorting the RESET pin to GND pin over 3 seconds can reset the IP/Subnet Mask/Gateway addresses to the factory default settings.

![](_page_9_Figure_2.jpeg)

### 2.3. Pin Assignments

#### **MDC-711**

![](_page_10_Picture_2.jpeg)

![](_page_10_Figure_3.jpeg)

#### MDC-714/MDC-714i

COM3, COM4 and COM5 of MDC-714i are provided with 2500 VDC high voltage isolation protection.

![](_page_11_Picture_2.jpeg)

Termi	nal	Pin
No.		Assignment
E1		E1 10/100M
	01	CTS1
COM1	02	RTS1
CONT	03	RxD1
	04	TxD1
	05	RESET
CON42	06	D2+
COIVIZ	07	D2-
	08	(R)+Vs
	09	(B)GND

Termi	nal	Pin
No.		Assignment
CONT	23	DATA+
COIVIS	22	DATA-
	21	
	20	
	19	
	18	
CON44	17	DATA+
COIVI4	16	DATA-
	15	
	14	
	13	
	12	
COM3	11	DATA+
COIVIS	10	DATA-

#### **MDC-741**

	23 10		Termi	nal	Pin	Termi	nal	Pin
	0000000000000000		No		Assignment	No.		Assignment
. 1					Link(Act		23	RxD
	ICEAS					COME	22	TxD
			E1		E1	CONS	21	RTS
							20	СТЅ
							19	GND
	_			01	CTS1		18	RxD
			CON41	02	RTS1	CON44	17	TxD
			COIVIT	03	RxD1	COIVI4	16	RTS
				04	TxD1		15	СТЅ
				05	RESET		14	GND
	F1		CON42	06	D2+		13	RxD
		Ð	COMZ	07	D2-	COM2	12	TxD
				08	(R)+Vs	COIVIS	11	RTS

09

(B)GND

Copyright © 2014 ICP DAS Co., Ltd. All Rights Reserved. \* E-mail: service@icpdas.com

10

CTS

**MDC-771** 

![](_page_12_Figure_1.jpeg)

Termi	nal	Pin
No		Assignment
E1		E1 10/100M
	01	CTS1
CON41	02	RTS1
CONT	03	RxD1
	04	TxD1
	05	RESET
CON42	06	D2+
	07	D2-
	08	(R)+Vs
	09	(B)GND

Termi	nal	Pin
No.		Assignment
CON49	23	TxD
COIVIO	22	RxD
CON47	21	TxD
COIVI7	20	RxD
	19	GND
COME	18	TxD
COIVID	17	RxD
COME	16	TxD
COIVIS	15	RxD
	14	GND
CON44	13	TxD
COIVI4	12	RxD
COM2	11	TxD
COIVIS	10	RxD

### **2.4. Wiring Connections**

#### RS-232 Wiring

![](_page_13_Figure_2.jpeg)

MDC-700

![](_page_13_Figure_4.jpeg)

#### **5-wire Connection Wiring**

**3-wire Connection Wiring** 

![](_page_13_Figure_6.jpeg)

MDC-700

![](_page_13_Figure_8.jpeg)

#### RS-485 Wiring

![](_page_13_Figure_10.jpeg)

### 2.5. Dimensions

Unit: mm

![](_page_14_Figure_2.jpeg)

![](_page_14_Figure_3.jpeg)

**Bottom View** 

![](_page_14_Figure_4.jpeg)

<u>\_\_\_\_\_</u>

### 2.6. Mounting the Hardware

#### Wall/Panel mounting

**Step 1**: Install the four mounting screws into the 4 keyhole mounting holes.

Step 2: Fasten the screws securely.

![](_page_15_Figure_4.jpeg)

#### **DIN Rail mounting**

**Step 1**: Align the screw holes of the DIN-rail clip with the holes on the back side of the module, and then fasten the screws securely.

![](_page_15_Picture_7.jpeg)

**Step 2**: Hook upper tab over upper flange of DIN rail.

Step 3: Tilt the module toward DIN rail until it snaps securely to DIN rail

![](_page_16_Figure_2.jpeg)

### **3. Getting Started**

A new MDC-700 comes with a default IP address of 192.168.255.1; therefore, a valid IP address should be assigned for the module to join your network. Then you can configure the MDC module from its web user interface.

#### The factory default settings

IP Address	Subnet Mask	Gateway
192.168.255.1	255.255.0.0	192.168.0.1

**STEP 1:** Connect the MDC module to the same network as your computer and power on all the devices. You can also connect the module to PC directly with an Ethernet cable.

![](_page_17_Picture_5.jpeg)

**STEP 2:** Set the IP configuration on your computer.

If the MDC module is new with default IP address of 192.168.255.1, your pc should pick up an IP address in the range of 192.168.255.2 to 192.168.255.253 that is not in use.

#### 🚺 ΝΟΤΕ

Details on how to change the IP address on your computer depend upon the type architecture and operating system you are using. Use the Help and Support functionality on your computer and search for "IP Addressing".

#### **STEP 3:** Enter the IP address of the module into the web browser.

(For example, http://192.168.255.1)

![](_page_18_Picture_6.jpeg)

**STEP 4:** Create your account (for the first time login)

Upon initial login through the web interface, you will be prompted to create your username and password as an administrator. Both username and password must be at least four characters; they can be composed only of alphanumeric (A-Z, a-z, 0-9, case-sensitive) characters and dot (.), dash (-), underline (\_) and at (@) symbols.

![](_page_18_Figure_9.jpeg)

**STEP 5:** Enter your username and password to log in to the MDC module.

USERNAME   PASSWORD  A 2. Enter	
PASSWORD 2. Enter	your username
	your password
LOGIN - 3. Click	LOGIN

**STEP 6:** Choose a valid IP address of the network for your MDC-700 module

Scroll down to **Ethernet Configuration** section, input the IP/Subnet mask and Gateway addresses, and then click "**Apply**". Make sure that the IP address you pick is not currently in use by another device on the network.

	THIS COMPUTER - ( ) - MDC-700	$\sim$ Admin   LOGOUT
Ethernet Configuration		
IP address	Subnet mask	Gateway
10.1.112.1	255.255.0.0	10.1.0.254

STEP 7: After the success message is displayed, restore the IP address of your computer,

log in the MDC again via its new IP address.

✓ New settin	♥	to this MDC-700 with the new IP address.
IP address	Subnet mask	Gateway
10.1.112.1	255.255.0.0	10.1.0.254

#### ΝΟΤΕ

The IP/Subnet mask/Gateway modified in a MDC-700 can be reset to factory defaults by shorting the RESET pin to GND pin over 3 seconds. The LED display will show "RESET" as below and the IP address set previously will be cleared and returned to the factory default.

![](_page_20_Picture_5.jpeg)

### 4. Configuration

The necessary configuration for Modbus TCP/Modbus RTU communication and polling definition is handled by a single file named "config.csv". Just follow the easy-to-use format defined in the config.csv file to edit the configuration parameters and import the new file via a simple mouse-click, the data on connected Modbus RTU slave devices can be accessed via Ethernet.

Only the Function code 01/02/03/04 can be used in the config.csv file:

- 01: Read Coil Status (Read DO)
- 02: Read Input Status (Read DI)
- 03: Read Holding Registers (Read AO)
- 04: Read Input Registers (Read AI)

If you would like to write data to a digital or analog output channel on a Modbus RTU slave device, the output channel needs be mapped with a local register address in the MDC-700 by editing the polling definition with using corresponding read function code (01 or 03). Refer to section <u>6. FAQ-Q4</u> for more detailed steps.

The following section intends to guide you to set up your MDC-700 module. After completing the following steps, you can obtain configuration and other information related to the MDC module and associated slave devices in your browser.

#### **Basic operating procedure**

- Step 1: Export the config.csv file from MDC-700.
- Step 2: Edit the config.csv file.

Note that before editing this file, you should confirm the parameter value for all associated slave devices.

**Step 3:** Import the config.csv file to the MDC-700.

### 4.1. Exporting and importing config.csv file

Open the web browser and enter the IP address of the MDC-700. Any standard browser such as Mozilla Firefox, Internet Explorer or Google Chrome can be used to access the web interface.

#### Exporting the config.csv file

STEP 1: Scroll down the web page to the "Import/Export Config.csv" section.

**STEP 2**: Click **Export** to export the config.csv file from the MDC-700. The config.csv file will be exported to the download directory configured in the web browser.

Import/Export Config.csv	
To upload a CSV file, click CHOOSE FILE to search for your file. After you select your file, click Import button.	To export a CSV file, click <b>Export</b> button and save config.csv file to local computer.
Last-Modified: Jul. 03, 2017	EXPORT
select a CSV file for import	
CHOOSE FILE	
IMPORT	

#### 🚺 ΝΟΤΕ

• If you haven't changed the default IP address in the MDC-700, refer to section 3 to configure it.

#### Importing the config.csv file

**STEP 1:** Scroll down the web page to the "**Import/Export Config.csv**" section.

STEP 2: Click CHOOSE FILE, then select your config.csv file.

![](_page_23_Picture_3.jpeg)

STEP 3: Click IMPORT to import the config.csv file to the MDC-700..

![](_page_23_Picture_5.jpeg)

After the success message is displayed, waiting 10 seconds for reloading the web page or click **RELOAD NOW** to refresh the page immediately

Last-	Modified: Aug. 02, 2021 3:34 PM
sele	CHOOSE FILE
	MPORT
~	File upload successful. In order for the changes to take effect, the current page will be reloaded after waiting 10 seconds or clicking on RELOAD NOW
	RELOAD NOW

### 4.2. Editing the config.csv file

The MDC module is configured by a config.csv file to work with your master and RTU slave devices. The Comma Separated Values (CSV) files can be viewed and edited in spreadsheet applications like Microsoft Excel, or in any text editor, in which the comma character (,) typically separates each field of text. In a text editor, it looks like this:

![](_page_24_Picture_2.jpeg)

The file name "config.csv" cannot be changed; it contains four main sections that need to be edited: (1) Modbus Connection, (2) Module information, (3) COM Port Configuration and (4) Polling Definition. Each section starts with a "#" character; follows are names for parameters in this section. A row starting with a "\*" character is a set of parameter values in a section.

### 🚺 ΝΟΤΕ

• The name for each parameter cannot be changed.

#### Modbus Connection

In Modbus Connection section, you can configure the Modbus ID of the MDC-700 and the TCP port number for Modbus TCP communication.

#	TCPPort	ModbusID	
*	502		1

**TCPPort:** Defines the TCP/IP Port number, in the example set to 502. (Default value) **ModbusID:** Defines the Modbus ID of the MDC-700, in the example set to 1. (Default value)

#### Module Information

A longer description or alias can be set for a MDC-700 in this Module Information section. It will be displayed on the main page of the MDC-700, and can be used to identify one MDC-700 from the others.

![](_page_25_Picture_6.jpeg)

#### COM Port Configuration

The COM Port Configuration is used to configure the parameters for Modbus communication connection between the MDC-700 and Modbus RTU slave devices.

![](_page_26_Picture_2.jpeg)

#	ComPortNo	BaudRate	DataBit	Parity	<b>StopBit</b>	Timeout	PollDelay	<b>OperatingMode</b>
*	1	115200	8	0	1	100	20	Master
*	2	115200	8	0	1	100	20	Master
*	3	115200	8	0	1	100	20	Master
*	4	115200	8	0	1	100	20	Master
*	5	115200	8	0	1	100	20	Master

The connection configuration for a COM port consists of 8 parameters defined as follows.

ComPortNo	Specifies the COM port number in MDC module. The COM port number can be 1 or 2 for MDC-711, 1 ~ 5 for MDC-714 and MDC-741 and so on.
BaudRate	Defines the transmission speed between the MDC module and the RTU slave devices. The BaudRate can be set to 1200/ 2400/ 4800/ 9600/ 19200/ 34800/ 57600/ 115200 (bps) depending on the RTU slave device being used.
DataBit	Defines the number of data bits in each character. It is fixed to 8 and the RTU slave devices need be set to 8-bit data, too.
Parity	Defines the Parity bit. The parity bit can be set to 0 (none), 1 (even) or 2 (odd).
StopBit	Defines the Stop bits. The stop bit can be set to 1 (1 stop bit) or 2 (2 stop bits).
Timeout	Defines the period of time that the MDC module will wait for a response from the RTU slave device. The available range is from 50 to 6000 (ms).
PollDelay	Defines the Poll Delay between each scan for Modbus RTU communication. The available range is from 20 to 6000 (ms).
OperatingMode	<ul> <li>Defines the operating mode.</li> <li>Master: the com port is used to connect Modbus RTU slave devices.</li> <li>The MDC-700 is acting as a master to send requests to slave devices.</li> <li>Slave: the com port is used to connect Modbus RTU master devices.</li> <li>The master devices can read/write data from/to the MDC-700.</li> </ul>

#### Polling Definition

The Polling Definition is used to define Modbus commands to read data from the slave devices. Before attempting to configure the parameters for the Polling Definition, be sure to check the COM port number that the target device is connected to, the Modbus ID setting for the target device, and the function code, starting address, and the quantity for reading data.

#	UseComPort	SlaveModbusID	FunctionCode	RegStart Addr	RegCount	Timeout EventProcess	Preset Value
*	1	1	3	0	8	2	0
*	2	2	4	0	8	2	0
*	3	3	2	0	8	2	0
*	4	4	1	0	8	2	0
*	5	5	3	8	8	2	0
	-	-		-			

Each Polling Definition consists of 8 parameters listed as below:

#	Defines the type for a polling definition. In the MDC-700, it provides three types:							
	"*": Asterisk symbol means that this is a valid polling definition. The MDC-700 will							
	assign local register for data defined in the definition and save the polled							
	data to the mapping local register.							
	"-": Minus sign means that this is a disabled polling definition. The MDC-700 will							
	assign local register for data defined in the definition but will not poll data.							
	": Empty means that this is a null polling definition. The MDC-700 will neither							
	assign local register for data defined in the definition nor poll data.							
UseComPort	Defines the COM port number to which the slave device is connected. The COM							
	port number is from 1 to the total number of COM ports on the MDC-700.							
SlaveModbusID	Defines the identification of the remote slave. The valid range is from 1 to 255.							
FunctionCode	Defines the request function code. A valid code can be 1 (Read DO), 2 (Read DI), 3							
	(Read AO) or 4 (Read AI) depending on the I/O features of the slave device.							
RegStartAddr	Defines the starting address, i.e. the address of the first register specified.							
	The available range is from 0 to 65535.							
RegCount	Defines the quantity of registers to be read. The available range is from 1 to 125.							
Timeout	Defines which data will be read while a timeout error is occurred:							
EventProcess	0: the exception code							
	1: the latest data before the timeout error occurred							
	2: a preset value							
PresetValue	Defines the preset value applied when the <i>TimeoutEventProces</i> s is set to 2.							

### 📝 ΝΟΤΕ

- The maximum number of all the polling definitions is 250.
- The MDC-700 provides 9600 internal Modbus registers each table (DI/DO/AI/AO) to hold data collected from the RTU slave devices.
- The Modbus ID for the MDC-700 is defined in Modbus Connection section.
- By setting different types for a polling definition to retain register space mapped for specific devices, or to release those space mapped but reserve the definition, the main program on the Modbus master device can be applied in different applications where users would like to change or stop some devices without modification or with minimum level of modification.
- The *TimeoutEventProcess* and the *PresetValue* parameters are only available to firmware version 1.08 and later. If a config.csv file for firmware version 1.06 or prior is imported to a MDC-700 with firmware version 1.08 or later, the *TimeoutEventProcess* parameter is auto set to 2, and the *PresetValue* parameter is set to 0.

#### Displaying Comments for Polling Definition

After firmware 2.00.001 released in 2021, users can annotate polling definitions by adding comments in the field after each definition.

Modbus Connection				
- COM1 ( Now 222 ms	<b>MAX.</b> 640 ms	Č <sub>MIN.</sub> 221 ms	RESET	
Def. #001 - ID [01] Register [	[400000:400007] → Lo	ocal Register [40000	0:400007] GOOD	this is comment.
- COM2 ( NOW 223 ms	<b>O</b> MAX. 530 ms	Č <sub>MIN.</sub> 221 ms	RESET	
Def. #002 - ID [02] Register [	[300000:300007] → L	ocal Register [30000	0:300007] GOOD	Power Meter #1
- COM3 ( Now 222 ms	<b>MAX.</b> 635 ms	Č <sub>MIN.</sub> 221 ms	RESET	

#### In spreadsheet software

	M	26	• (*	$f_{x}$											
	A	В	С	D	E	F	G	Н	Ι	J	K	L	М	N	0
1	#	TCPPort	ModbusID												
2	*	502	2 1												
3	#	ModuleInf	o												
4	*	this is my	data concen	trator											
5	#	ComPortN	BaudRate	DataBit	Parity	StopBit	TimeOut	PollDelay	Operating	víode					
6	*	1	115200	8	0	1	120	100	master						
7	*	2	2 115200	8	0	1	120	100	master						
8	*	3	9600	8	0	1	120	100	master						
9	*	4	. 9600	8	0	1	120	100	master						
10	*	5	9600	8	0	1	120	100	master						
11	#	UseComPo	o SlaveModł	FunctionCo	RegStartAd	RegCount	TimeoutEv	Preset Valu	e						
12	*	1	. 1	3	0	8	2	C	;this is con	nment.;this i	s full comm	ent but not	visible.		
13	*	2	2 2	4	0	8	2	C	;Power Me	ter #1;this n	neter is used	to monitor	units voltag	e and curre	nt consumed
14	*	3	3 3	2	0	8	2	0							
15	*	4	. 4	1	0	8	2	0							
16	*	5	5 5	3	8	8	2	0							

#### In text editor

#	,TCPPort,ModbusID,,,,,,
*	,502,1,,,,,
#	,ModuleInfo,,,,,,
*	,this is my data concentrator,,,,,,
#	,ComPortNo,BaudRate,DataBit,Parity,StopBit,TimeOut,PollDelay,OperatingMode
*	,1,115200,8,0,1,120,100,master
*	,2,115200,8,0,1,120,100,master
*	,3,9600,8,0,1,120,100,master
*	,4,9600,8,0,1,120,100,master
*	,5,9600,8,0,1,120,100,master
#	, UseComPort, SlaveWodbusID, FunctionCode, RegStartAddr, RegCount, TimeoutEventProcess, PresetValue,
*	,1,1,3,0,8,2,0,;this is comment.;this is full comment but not visible.
*	,2,2,4,0,8,2,0,;Power Meter #1;this meter is used to monitor units voltage and current consumed
*	,3,3,2,0,8,2,0,
*	,4,4,1,0,8,2,0,
*	,5,5,3,8,8,2,0,

#### Displaying Comments for Polling Definitions on MDC-700 web page

Enter the note text in the field after its related definition. Text starts with a semicolon will be displayed on the MDC-700 web page (up to 48 characters with spaces), while text after the second semicolon will not be displayed. Users can add comments that do not need to be displayed after the second semicolon.

	*,1,1,3,0,8,2,0, <mark>;this</mark> i	is comment.
Modbus Connection		
- COM1 (222 ms) (MAX, 640 ms) (MIN, 221 ms)	RESET	
Def. #001 - ID [01] Register [400000:400007] → Local Register [400000:40000 - COM2 $_{NOW}$ 223 ms $_{MAX.}$ 530 ms $_{MIN.}$ 221 ms	RESET	this is comment.
Def. #002 - ID [02] Register [300000:300007] → Local Register [300000:3000 - COM3 $\textcircled{O}_{NOW}$ 222 ms $\textcircled{O}_{MAX.}$ 635 ms $\textcircled{O}_{MIN.}$ 221 ms	07] GOOD	Power Meter #1
*,2,2,4,0,8,2,0,;Power Meter #1;	this meter is used to m	nonitor units
	Text after the second ser be displayed.	micolon will not

### 5. MDC-700 Web Interface

Go to the web interface at http://xxx.xxx.xxx, where xxx.xxx.xxx is the IP address in your MDC-700. Any standard browser such as Mozilla Firefox, Internet Explorer or Google Chrome can be used to access the MDC-700.

The MDC-700 web interface includes the following sections:

- 1. The connection status between the user device and the MDC-700
- 2. The connection information for each polling definition
- 3. The communication configuration information on the MDC-700
- 4. Ethernet configuration
- 5. Authentication / User Management
- 6. Importing/exporting the config.csv file and file validation
- 7. OS version, firmware version and MAC address information

#### Connection status between your device and the MDC-700

![](_page_31_Figure_11.jpeg)

#### Modbus Connection

In the Modbus Conncetion section, it provides the scan time information for each COM port (available in firmware 1.08 and later). The Master device can refer to the scan time to extend or shorten the time interval for each requesting data command.

![](_page_32_Figure_2.jpeg)

Expand the polling definitions by clicking [**+COMn**] item, information including the polling definition number, SlaveModbusID, Starting Address of Register and Count of Register on both slave client and MDC-700, and the connection status are provided.

- COM1 $\textcircled{O}_{NOW}$ 151 ms $\textcircled{O}_{MAX}$ 155 ms $\textcircled{O}_{MIN}$ 141 ms RESET Def. #001 - ID [01] Register [400000:400007] → Local Register [400000:400007] (6000) - COM2 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 155 ms $\textcircled{O}_{MIN}$ 141 ms Connection Status: Good Def. #002 - ID [02] Register [300000:300007] → Local Register [300000:300007] (6000) - COM3 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 152 ms $\textcircled{O}_{MIN}$ 149 ms RESET Def. #003 - ID [03] Register [100000:100007] → Local Register [100000:100007] TIMEOUT - COM4 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 160 ms $\textcircled{O}_{MIN}$ 149 ms RESE
Def. #001 - ID [01] Register [400000:400007] → Local Register [400000:400007] GOOD - COM2 $\textcircled{0}_{NOW}$ 150 ms $\textcircled{0}_{MAX}$ 155 ms $\textcircled{0}_{MIN}$ 141 ms Connection Status: Good Def. #002 - ID [02] Register [300000:300007] → Local Register [300000:300007] GOOD - COM3 $\textcircled{0}_{NOW}$ 150 ms $\textcircled{0}_{MAX}$ 152 ms $\textcircled{0}_{MIN}$ 149 ms RESET Def. #003 - ID [03] Register [100000:100007] → Local Register [100000:100007] TIMEOUT - COM4 $\textcircled{0}_{NOW}$ 150 ms $\textcircled{0}_{MAX}$ 160 ms $\textcircled{0}_{MIN}$ 149 ms RESET Connection Failed
• COM2 $\bigodot_{NOW}$ 150 ms $台_{MAX}$ 155 ms $台_{MIN}$ 141 msConnection Status: GoodDef. #002 - ID [02] Register [300000:300007] → Local Register [300000:300007] $\bigcirc_{MIN}$ $\bigcirc_{M$
Def. #002 - ID [02] Register [300000:300007] → Local Register [300000:300007] GOOD• COM3 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 152 ms $\textcircled{O}_{MIN}$ 149 msRESETDef. #003 - ID [03] Register [100000:100007] → Local Register [100000:100007] TIMEOUT• COM4 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 160 ms $\textcircled{O}_{MIN}$ 149 msRESET
- COM3 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX.}$ 152 ms $\textcircled{O}_{MIN.}$ 149 ms RESET Def. #003 - ID [03] Register [100000:100007] $\rightarrow$ Local Register [100000:100007] TIMEOUT - COM4 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX.}$ 160 ms $\textcircled{O}_{MIN.}$ 149 ms RESE Connection Failed
Def. #003 - ID [03] Register [100000:100007] → Local Register [100000:100007] TIMEOUT - COM4 $\textcircled{O}_{NOW}$ 150 ms $\textcircled{O}_{MAX}$ 160 ms $\textcircled{O}_{MIN}$ 149 ms RESE Connection Failed
- COM4 ON 150 ms OMAX. 160 ms OMIN. 149 ms RESE Connection Failed
Def. #004 - ID [04] Register [000000:000007] → Local Register [000000:0000017] [600-
- COM5 🖉 NOW 151 ms 🕅 MAX. 161 ms 🖉 MIN. 149 ms RESET
Def. #005 - ID [05] Register [400008:400015] $\rightarrow$ Local Register [400008:400015] GOOD

**NOTE** The contents of the section may be different depending on the settings in the config.csv file.

Copyright © 2014 ICP DAS Co., Ltd. All Rights Reserved. \* E-mail: service@icpdas.com

#### Connection Configuration

The **Connection Configuration** section provides the configuration information including Modbus ID, Modbus TCP port on the MDC-700, and Baud Rate. Data Format, Response Timeout, Delay Between Polls, Operation Mode settings for each COM port.

P Mod	bus ID	Moc	lbus TCP Port		
Connection Co	onfiguration	, /			
Modbus ID: 1	Modbus TCP F	<b>Port:</b> 502			
	COM1	COM2	COM3	COM4	COM5
Baud Rate	115200 bps	115200 bps	9600 bps	9600 bps	9600 bps
Data Format	8 Data Bits None Parity 1 Stop Bit				
Response Timeout	120 ms				
Delay Between Polls	100 ms				
Operating Mode	Master	Master	Master	Master	Master
	1				

![](_page_33_Picture_3.jpeg)

In this section you can obtain or set the Ethernet Configuration. To change the Ethernet parameters, you just need to input the valid IP, Subnet mask and Gateway addresses and then click **APPLY**.

Ethernet Configuration						
IP address	Subnet mask	Gateway				
10.1.112.1	255.255.0.0	10.1.0.254				
APPLY						

COM Port Settings

#### Authentication / User Management

In the **Authentication / User Management** section, you can change the username and password of the administrator account, create a read only user account, and set security questions and answers for password recovery.

#### Changing the username and password of the administrator

Enter new username and/or password and click **SAVE** 

Authentication / User Management							
Active	Role	Username	Password	Click SAVE			
	administrator	Admin	Admin	SAVE			
	user	Username	Password	SAVE			

You will see a success message displayed.

		✓ New settings are properly configured.				
Active	Role	Username	Password			
	administrator	Admin	Admin	SAVE		

#### Creating a read only user account

In order to avoid unexpected changes to the settings of a running MDC-700 module, you can create a user account with only read permission, and specify which information can be accessed.

Activ	re Role	Username	Password
	administrator	Admin	Admin Click SAVE
	user	Sunny	Sunny
	Enable the checkbox	Enter Username	Enter Password

You will see a success message displayed.

		✓ New settings are prope	rly configured.	
Active	Role	Username	Password	
	administrator	Admin	Admin	SAVE

#### Specifying the information for the read-only user account

If the user account is created without specifying which information can be accessed, the content that can be accessed is shown as the picture below.

![](_page_36_Figure_2.jpeg)

#### **Connection Configuration**

Modbus ID: 1	Modbus TCP F	Port: 502			
	COM1	COM2	COM3	COM4	COM5
Baud Rate	115200 bps	115200 bps	9600 bps	9600 bps	9600 bps
Data Format	8 Data Bits None Parity 1 Stop Bit				
Response Timeout	120 ms				
Delay Between Polls	100 ms				
Operating Mode	Master	Master	Master	Master	Master
Ethernet Config	guration	bnet mask		Gateway	
Ethernet Config IP address 10.1.112.1	guration Sul	<b>bnet mask</b> 55.255.0.0		<b>Gateway</b> 10.1.0.254	
Ethernet Config IP address 10.1.112.1 Import / Export	guration Sul 24 t Config.cs	bnet mask 55.255.0.0 ✔		Gateway 10.1.0.254	

The section for specifying information for the read only user to access is enabled only when the checkbox for user account has been activated.

x.

user	Sunny	SAVE
What information should	I be allowed for the user to see.	]
Def. #001 - ID [01] Regi	ister [400000:400000] $\rightarrow$ Local Register [400000:400000] GOOD Comments	
Show/Hide	ltem	
	Description of Modbus slave device polled by MDC-700	
	Description of internal register map in the MDC-700	
	Comments	
APPLY		

Check the checkbox for allowing the information to be accessed by the user account, the example of information checked will be shown in the next line of "What information should be allowed for the user to see". After completing the operation, click **APPLY** to make the settings take effect.

us us	ser	sunny		sunny	] (	SAVE			
What information	What information should be allowed for the user to see.								
Def. #001 - ID [0	)1] Register [400000:400000	] $\rightarrow$ Local Register [40		GOOD Comment					
Show/Hide	ltem								
	Description of	Modbus slave device	polled by MDC	C-700					
	Description of	internal register map i	n the MDC-70	0					
	Comments								
والس									

The success message will be displayed.

Authe	ntication / Use	r Managemer	nt	
		✓ New settings a	re properly configured.	
Active	Role	Username	Password	
	administrator	Admin	Admin	SAVE

Log in with the user account, now the information checked is displayed on the page.

Modbus Connection							
- COM1 06 ms	<b>O</b> MAX. <b>575 ms</b>	Č <sub>MIN.</sub> 103 ms	RESET				
Def. #001 - ID [01] Register	[400000:400007] GOO	DD					
- COM2 🕅 NOW 105 ms	<b>MAX.</b> 566 ms	Č <sub>MIN.</sub> 103 ms	RESET				
Def. #002 - ID [02] Register	[300000:300007] GOO	DD					
+ COM3 💍 NOW 145 ms	MAX. 410 ms	Č <sub>MIN.</sub> 125 ms	RESET				
+ COM4 ONV 145 ms	MAX. 430 ms	Č <sub>MIN.</sub> 125 ms	RESET				
+ COM5 💍 NOW 142 ms	MAX. 514 ms	Č <sub>MIN.</sub> 139 ms	RESET				

#### Setting security questions and answers

The MDC-700 allows you to set security questions and answers that you can use should you forget your password. Two sets of security questions and answers are provided. You can enter a maximum of 38 characters in the Question field and a maximum of 14 characters in the Answer field. Note that the answer is case sensitive when it is used to log in to the MDC module.

#### Enter the question and answer, and click **SAVE**.

Password Recovery Question		
Password recovery questions apply to the administrator verify your indetify so that you can retrieve your password	account only. If you ever forget your password, these qu rd.	etions will be used to
Question	Answer	Click SAVE
What is your favorite color?	white	SAVE
Enter the question	Enter the answer	SAVE

#### The success message will be displayed.

Password Recovery Question	w settings are properly configured.
Password recovery questions apply to the administrative verify your indetify so that you can retrieve your pass	or account only. If you ever forget your password, these quetions will be used to word.
Question	VIISMEI
What is your favorite color?	white
	SAVE

#### How to log in to the module when you forgot your password?

If you are an administrator and you have forgotten your password, click Forgot Password?

Log in t	o MDC-	714
PASSWORD		
Forgot Passwo	rd?	LOGIN
MD	C-714 Ver 2.01	.001

Enter your username and click **CONTINUE** 

Forgot Password?
MDC-714 Ver 2.01.001

Select your question from the drop down menu

![](_page_41_Picture_1.jpeg)

Enter the answer (case sensitive) and click **CONTINUE**. Now you have logged into your account on the module.

Select the	se security questions below. The	se
questions your passv	helps verify your identity if you f vord.	orget
What is	your favorite color?	
white		
	CONTIN	, L
		Ľ

#### Import/Export Config.csv and file validation

You can import/export the config.csv file in this section. Refer to <u>section 4.1</u> for the detailed steps.

Import / Export Config.csv	
To import a CSV file, click CHOOSE FILE to search for your file. Then click IMPORT button after you select the file.	To export a CSV file, click <b>EXPORT</b> button and save config.csv file to local computer.
To import a CSV file containing non English characters or special characters, the supported encoding format is UTF-8.	EXPORT
Last-Modified: Aug. 03, 2021 2:14 PM	
Select CONFIG.CSV file to import	
IMPORT	
✓ File validation completed successfully.	
File validation success message	

After firmware 2.00.001, MDC-700 provides the function of validating the polling definitions in its config.csv file. If the validation is failed, the failure message with line number and position of invalid parameters will be shown as below.

![](_page_42_Picture_4.jpeg)

#### **Fimware Version/OS Version and MAC Address**

Information about Firmware version, OS version and MAC address is located in the footer.

ICP DAS CO., LTD.	Firmware Ver. 1.08.001 (Jun. 26, 2017)
www.icpdas.com	MiniOS7 Ver. 2.02.028 (Nov. 18, 2013)
service@icpdas.com	MAC Address 00:0D:E0:20:72:6F

#### Logging out

The current username is displayed at the right of the connection status. Click **LOGOUT** to log out from the MDC-700.

![](_page_43_Figure_5.jpeg)

### 6. Troubleshooting

In this chapter, we will explain how to troubleshoot the communication problems.

#### Possible causes of TIMEOUT

![](_page_44_Picture_3.jpeg)

- Situation #1: The slave device is not active or the transfer function of the slave site may fail.
   Solution: Check the slave device is powered up and the communication function is enabled.
- Situation #2: The COM port number to which the slave device is connected is not the same with the UseComPort setting in the polling definition.
  - Solution: Connect the slave device to the COM port number that is defined in the polling definition, or fix the *UseComPort* parameter to the virtual COM port number that the slave device is connected to.

![](_page_44_Picture_7.jpeg)

Situation #3: The wiring for communication is wrong.

Solution: Exchange the D+ and D- wiring of RS-485 connection, or exchange the Rx and Tx wiring of RS-232 connection, and check the GND pin on the slave device is properly connected to the MDC-700.

Situation #4: An incorrect Baud Rate or/and Data Format setting is being specified. Solution: Check and fix the difference of the Baud Rate and Data Format settings between the polling definition and the slave device.

ComPortNo	BaudRate	DataBit	Parity	StopBit	Timeout	PollDelay	Operating
							Mode
1	9600	8	0	1	120	100	Master
2	9600	8	0	1	3000	1000	Master
3	9600	8	0	1	3000	1000	Master
4	9600	8	0	1	120	100	Master
5	9600	8	0	1	120	100	Master

Situation #5: An incorrect ID of the Modbus slave device is being specified.

Solution: Check and fix the difference of ID number between the polling definition and the slave device.

![](_page_45_Picture_2.jpeg)

#### Situation #6: The Timeout or PollDelay setting is not long enough.

Solution: Lengthen the Timeout or PollDelay setting until it is suitable for communication with the slave device.

ComPortNo	BaudRate	DataBit	Parity	StopBit	Timeout	PollDelay	Operating
							Mode
1	9600	8	0	1	120	100	Master
2	9600	8	0	1	3000	1000	Master
3	9600	8	0	1	3000	1000	Master
4	9600	8	0	1	120	100	Master
5	9600	8	0	1	120	100	Master

### 7. FAQ

#### Q1: What are the maximum numbers of polling definition and local register?

A1: The maximum number of polling definition in a MDC-700 is 250, each definition can access up to 125 registers. Each of the four tables (DI/DO/AI/DO) can store up to 9600 registers for polled data.

## Q2: What is the maximum number of registers can be accessed in one Modbus command?

A2: By following the Modbus protocol, the maximum amount of registers that one command can access is 255 of function code 01 and 02, and 126 of function code 03 and 04.

#### Q3: How are the local registers mapped to the polled data in a MDC-700?

A3: Only the function code 01/02/03/04 can be used in the polling definition section

- 01: Read Coil Status (Read DO)
- 02: Read Input Status (Read DI)
- 03: Read Holding Registers (Read AO)
- 04: Read Input Registers (Read AI)

Refer to the example below,

#	UseComPort	SlaveModbusID	FunctionCode	RegStart Addr	RegCount	Timeout EventProcess	Preset Value
*	1	1	1	0	8	2	0
*	1	1	2	0	8	2	0
*	2	1	1	0	4	2	0
*	2	2	2	0	4	2	0
*	2	3	3	0	4	2	0
*	2	4	4	0	4	2	0

The MDC-700 will sort the order of polling data by COM port number and the sequence of polling definition; and then map the local registers corresponding to the data type (DI/DO/AI/AO) by the order of polling data. So the data comes from different slave devices with the same type will be saved in continuous registers, and a Modbus mater device and read the data on a variety of slave devices with one Modbus command.

![](_page_47_Figure_9.jpeg)

Copyright © 2014 ICP DAS Co., Ltd. All Rights Reserved. \* E-mail: service@icpdas.com

The local registers mapping is listed on the main page of the MDC-700 module.

![](_page_48_Figure_1.jpeg)

The MDC-700 allows users to enable/disable a polling definition by changing the first field of the polling definition section in the config.csv file. There are three types that users can use:

- "\*": Asterisk symbol means that this is a valid polling definition. The MDC-700 will assign local register for data defined in the definition and save the polled data to the mapping local register.
- "-": Minus sign means that this is a disabled polling definition. The MDC-700 will assign local register for data defined in the definition but will not poll the data.
- "": Empty means that this is a null polling definition. The MDC-700 will neither assign local register for data defined in the definition nor poll data.

#	UseComPort	SlaveModbusID	FunctionCode	RegStartAddr	RegCount
*	1	1	1	0	8
*	1	1	2	0	8
*	2	2	1	0	4

With the function of retaining register space mapped for specific devices, or releasing those spaces mapped but reserving the definition, the main program on the Modbus master device can be applied in similar applications where users would like to change or stop some devices without modification or with minimum level of modification.

#### Q4: How to write data to output channels on a Modbus RTU slave device?

A4:

**Step 1:** Edit the polling definition for the output channels with read function code in the config.csv file. (For example, use 01 to read DO channels, 03 to read AO channels)

#	UseComPort	SlaveModbusID	FunctionCode	RegStart Addr	RegCount	Timeout EventProcess	Preset Value
*	1	1	3	0	8	2	0
*	2	2	4	0	8	2	0
*	3	3	2	0	8	2	0
*	4	4	1	0	8	2	0
*	5	5	3	8	8	2	0
١.	_	_	ب	^			

**Step 2:** Import the config.csv file into the MDC-700, wait the MDC-700 reboot in 5 seconds, and then check the addresses for the local registers mapped to the output channels.

Modbus Connection									
- COM1	<b>Ö</b> NOW	151 ms	Мах.	155 ms	Ömin.	141 ms	RESET		
Def. #00	01 - ID (01	] Register [40	10000:4000	IO7] →Local	Register [4	400000:4000	07] <b>GOOD</b>		
- сом2	<b>Ö</b> NOW	150 ms	ČМАХ.	155 ms	Čтыл.	141 ms	RESET		
Def. #00	)2 - ID (02	] Register [30	0000:3000	07] → Local	Register [3	300000:30000	07] <b>GOOD</b>		
- сомз	ÖNOW.	150 ms	Мах.	152 ms	Ōмін.	149 ms	RESET		
Def. #00	03 - ID (03	) Register [10	10000:1000	IO7] → Local	Register [	100000:1000	07] <b>GOOD</b>		
- сом4	<b>O</b> NOW	150 ms	<b>О</b> мах.	160 ms	ČMIN.	149 ms	RESET		
Def. #00	)4 - ID [04	] Register [00	0000:0000	07] → Local	Register ((	00000:00000	07] <b>GOOD</b>		
- сом5	Ö NOW	151 ms	Čтмах.	161 ms	Čтын.	149 ms	RESET		
Def. #00	05 - ID (05	i] Register [40	10008:4000	115) <mark>—</mark> Local	Register [/	400008:4000	15] <b>GOOD</b>		

**Step 3:** Write data with corresponding function code (05/06/15/16) on your Modbus master device to the local registers mapped for the output channels, the MDC-700 will process writing operations to the slave devices.

#### Q5: How to read the status of each connection?

A5: The status for each connection is saved in the sequence of polling definition from local register address 39600. The maximum number of polling definition in the config.csv file is 250, so the available address for the connection status is from 39600 to 39849. A Modbus master use function code 04 to read the status, up to 126 register of status can be read in one command. For example, the status of the graph shown above is presented as the third column in the following table.

Def.	Address	Status	Status display on web page
number			
Def.#001	39600	0	GOOD
Def.#002	39601	0	GOOD
Def.#003	39602	OxFFFF	TIMEOUT
Def.#004	39603	0x8201	ERROR: ILLEGAL FUNCTION
Def.#005	39604	0	GOOD
Def.#006	39605	0x8402	ERROR: ILLEGAL DATA ADDRESS

The value of status:

**0**: Good

**0xFFFF**: Timeout

**0x8XYY**: Exception Rresponse. X - Modbus Function Code. YY - Exception Code.

Exception	Name	Meaning
Code		
01	Illegal Function	The function code received is not an allowable action.
02	Illegal Data Address	The data address received in the query is not an
		allowable address.
03	Illegal Data Value	A value contained in the query data field is not an
		allowable value.
04	Illegal response	The request would generate a response with size bigger
	length	than that available for MODBUS protocol.

#### Q6: How to update firmware?

A6: The upgrade procedure of the firmware consists of the following main steps:

- Install the MiniOS7 Utility on your computer
- Upload the latest firmware to MDC-700 through the MiniOS7 Utility
- Check the firmware version and the configuration settings via web interface

Here we will introduce how to update firmware of the MDC-700 step-by-step.

#### 1. Install MiniOS7 Utility

- STEP 1: Download the installation file of the MiniOS7 Utility to your computer The installation file can be obtained from: <u>https://www.icpdas.com/en/download/show.php?num=1053</u>
- **Step 2:** Run the downloaded file to start the installation process. It will lead you through the installation step by step

🚏 Setup - [MiniOS7 Utility Ver	3.27] — 🗆 🗙
	Welcome to the [MiniOS7 Utility Ver 3.27] Setup Wizard
	This will install MiniOS7 Utility Ver 3.27 on your computer.
	It is recommended that you close all other applications before continuing.
	Click Next to continue, or Cancel to exit Setup.
	Next > Cancel

Step 3: After the installation is finished, a "MiniOS7 Utility Ver 3.27" icon will appear on your desktop. You can run the program by double-clicking the icon or clicking MiniOS7 Utility Ver 3.27 item in the ICPDAS folder in the Start menu.

![](_page_51_Picture_11.jpeg)

#### 2. Upgrade Firmware using the MiniOS7

The firmware update requires a TCP/IP connection. Connect the MDC-700 to a network whenever possible.

- Step 1: Use an Ethernet cable to connect the MDC-700 to the computer After plugging the Ethernet cable, the Link/Act and 10/100 indicator LEDs come on or start flashing to indicate a connection was made.
- **Step 2:** Establishing a connection between the MiniOS7 Utility and the MDC-700 Launch the MiniOS7 Utility and then select **New Connection** on the Connection menu.

MiniOS7 Utility Version 3.2.7									
1	Connection 두 🚸	Command	🗂 Configuration 🛛 🔂	ools 🛷 Help 🔻					
Looki	<u>N</u> ew connection	F2							
LOOK IN	Last Connection	Alt+F2							
Name	<u>D</u> isconnect	Ctrl+F2 ze	Туре	Modified					
📙 bin	Search	F12	File Folder	9/21/2017 3:30 PM					
EIBMV	1L	1.12	File Folder	9/21/2017 3:30 PM					
📙 OS_IMAG	E		File Folder	9/21/2017 3:30 PM					
🧧 icpdas		1KB	URL File	9/21/2017 3:30 PM					
\mid 🚳 load232.d	I	88KB	DLL File	1/31/2007 12:52 PM					
😭 MiniOS7_	Utility.chm	1,015KB	CHM File	10/15/2009 9:38 AM					
MiniOS7_	Utility.exe	2,544KB	EXE File	7/13/2015 5:33 PM					
🔄 MiniOS7_	Utility.ini	1KB	INI File	7/13/2015 5:29 PM					
art.dll		56KB	DLL File	12/8/2006 10:07 AM					
unins000.dat		18KB	DAT File	9/21/2017 3:30 PM					
🐻 unins000.	exe	1,166KB	EXE File	9/21/2017 3:29 PM					

On the "**Connection**" tab of the "Connection" dialog, select "**TCP**" from the dropdown list, type the IP address of MDC-700, and then click OK button.

	🚵 Connection		_	-		×
	Connection History					
2	ТСР	•				
	Serial Port			UDP-		
	Baud Rate: 115200	<b>3</b>	IP:	10.1.	112.1	
	Data Bit: 8	-	Port:	1000	0	
	Parity: 0(None)	-				
	Stop Bit:	-				
	OK Cancel				He	lp

Step 3: Look for the connector symbol at the upper right-hand corner of the MiniOS7 Utility to

ensure the co	Connection	successf	ul					
🚵 MiniOS7 Utility Version 3.2.7	🚵 MiniOS7 Utility Version 3.2.7							
🔯 File 🌓 Connection 👻 🚸	🔯 File 🕨 Connection 👻 🛦 Command 🗷 Configuration 🔤 Tools 🛷 Help 🗸							
Look in: ET-7260_M12-CBC	💽 🕝 🦻 🖻			Lock in: Disk A	~	118,210 bytes available		efe
Name	Size Type	Modified	No	Name		Size		Moairiea
ET7260M12_V300.HEX	146KB HEX File	9/25/2017 3:20 PM	0	acce_ip.htm		5,820	2/20/2017 10	):24:24 AM
			<b> </b> ]1	autoexec.bat		6	9/22/2017 2	2:15:22 PM

If the connection fails, make sure that:

- An Ethernet cable is connected securely to both the MDC-700 and your computer
- The MDC-700 is active (powered on)
- The IP address of MDC-700 is correct
- No firewall is blocking the connection

#### Step 4: Delete the original files from the MDC-700

After establishing a connection, select "Erase Disk" from Command menu (or right-click on the right of window) to delete all files existed on the MDC-700.

🚵 MiniOS7 Utility Version	3.2.7						-	٥	×
🔯 File 🌓 Connection	🕶 🚸 Command 🕎	Configuration	🛅 Tools 🥔 Help 🔻						
Look in: 🔀 MiniOS7_Util	lity	💽 🔇 🍺 🖻	۶		Lock in: Disk A	<ul> <li>219,564 bytes available</li> </ul>			9f
Name	Size	Туре	Modified	No	Name	Size			Modified
bin I FIRMWARE OS_IMAGE i codas i codas i codas MiniOS7_Utilty.chm MiniOS7_Utilty.exe MiniOS7_Utilty.ini i uart.dll	1KB 88KB 1,015KB 2,544KB 1KB 56KB	File Folder File Folder File Folder URL File DLL File CHM File EXE File INI File DLL File	9/21/2017 3:30 PM 9/21/2017 3:30 PM 9/21/2017 3:30 PM 1/21/2017 3:30 PM 1/31/2007 12:52 PM 10/15/2009 9:38 AM 7/13/2015 5:33 PM 3/5/2018 11:03 AM 12/8/2006 10:07 AM	0 1 2 3 4 5 6 7 8	autoexec.bat conn.png custom.css icons.png index.htm main.htm MDC108.exe modbus.js module.nng	Run Run with parameters Reset MiniOS	6/26/20 7/5/20	017 12: 016 11: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10:09 PM 39:20 AM 36:16 PM 33:01 PM 26:24 AM 37:14 PM 10:06 PM 03:09 PM 16:06 PM
unins000.dat	18KB 1,166KB	DAT File EXE File	9/21/2017 3:30 PM 9/21/2017 3:29 PM	9 9 10	normaliz.css skeleton.css	Erase Disk Quit Firmware			30:00 AM 30:00 AM
<b>`</b>				Error Co	mmand>IP:10.1.112.	1 Port:10000 via TCP, 11 files(s) 173,268 bytes			
Connection(F2)	Jpload(F5) 🧕 💐 Disk T	ool(F6) 📑 Info	(F7) 😢 Delete(F8) <i>蓉</i> Refresh	(F9) 📇	Console(F10)	DOS(F11)			

Copyright © 2014 ICP DAS Co., Ltd. All Rights Reserved. \* E-mail: service@icpdas.com

Step 5: Upload the firmware file to MDC-700

Right-click on the MDC7XXV109.HEX file and select Upload from the menu.

MiniOS7 Utility Version 3.2.7	,							_	ð	×
😥 File 🕨 Connection 👻 🛦 Command 🗾 Configuration 🛅 Tools 🛷 Help 🗸										
Look in: MDC-700	✓ 3 p <sup>*</sup>	<b>P</b>			Lock in: Disk A		<ul> <li>393,184 bytes available</li> </ul>			ęß
Name	Size Type	Modified	[	No	Name		Size			Modified
MDC711V109.HEX	Upload	F5	11:18 AM							
	DOS	F11								
<			>							
				Error Co	mmand>IP:10.1.11	2.1 Port:10000	via TCP, 0 files(s) 0 bytes			
Connection(F2) 🧊 Upload	d(F5) 💐 DiskTool(F6) 📑 Ii	nfo(F7) 😢 Delete(F8)	🛃 Refresh(	-9) 📇	Console(F10)	🛋 DOS(F11)	🚧 Search(F12)			

Step 6: Wait until the firmware update is finished, and then power cycle the MDC-700.

#### 3. Check the Firmware Version

Step 1: Open a web browser and enter the IP address of the MDC-700 in the URL.

$\leftrightarrow$ $\rightarrow$ $\circlearrowright$ $\Leftrightarrow$	① 10.1.112.1	
---	--------------	--

**Step 2:** Check the version information at the bottom of the page.

	THIS COMPUTER - ( ) - MDC-700	Admin   LOGOUT
Last-Modified: Aug. 04, 2021 11:10 AM		
select CONFIG.CSV file to import	CHOOSE FILE	
IMPORT		
✓ File validation completed success	fully.	
ICP DAS CO., LTD. www.icpdas.com service@icpdas.com	Vare Ver. 2.01.001 (Jul. 20, MinIOS7 Ver. 2.02.032 (Aug. 21, 2018) MAC Address 00:0D:E0:20:67:89	2021)

#### Q7: Why does the page not display correctly in my browser?

A7: After the firmware version 1.08 was released, the MDC module adopts HTML5 in place of Flash. HTML5 is supported in all modern browsers, but not the older browsers like IE8 and below. If your browser does not support the HTML5, it cannot render the page correctly. It is recommended to use a newer browser.

The browsers support HTML5:

![](_page_55_Picture_3.jpeg)

If the MDC-700 module is running with firmware version 1.06 or earlier, the page requires the Adobe Flash Player to be installed. The latest version of the Adobe Flash Player can be downloaded by accessing the Adobe Systems Incorporated website. The following instructions will help you to install the Adobe Flash Player in your web browser.

**STEP 1:** Go to the Adobe Flash Player Download Center The address for Adobe Flash Player Download Center is <u>http://get.adobe.com/flashplayer/</u>

![](_page_55_Picture_6.jpeg)

**NOTE** The Adobe Flash Player is subject to change without notice; refer to <u>http://www.adobe.com/support/flashplayer/debug\_downloads.html</u> for the latest version of this software.

STEP 2: Follow the instructions to download the installation file and install it on your PC.

### **Appendix**

#### The differences between Firmware V. 1.08 and V. 2.00

	Firmware V. 1.08	Firmware V. 2.00		
Authentication / User Management				
Security authentication	-	Account and password login		
		Security question and answer login		
Access permission management	-	One Full Access Administrator and		
		one view-only user		
Polling Definition				
Definition validation	-	Yes		
Support for displaying	-	Yes		
definition comments				

#### The differences between Firmware V. 1.06 and V. 1.08

	Firmware V. 1.06	Firmware V. 1.08		
Modbus RTU				
Polling Definition	240 Max.	250 Max.		
Max. Register Count in one	64 Max.	125 Max.		
Polling Definition				
The data that Master will obtain	Exception Code	Exception Code, the last		
while timeout error is occurred		correct data or the preset		
		value selectable		
Web Interface				
Web technique	Flash	HTML5		
Scan Time for each COM port	-	Yes		

### **Revision History**

Revision	Date	Description
1.0.0	2014/11	First released
1.0.1	2015/07	Added description for MDC-741.
1.0.2	2015/11	Added dimensions, appearance information and Troubleshooting, FAQ sections.
1.0.3	2018/02	<ul> <li>Modified the description for web page for firmware V1.08</li> <li>Added Section 2.5. Mounting the Hardware.</li> </ul>
1.0.4	2021/08	<ul> <li>Added specifications of MDC-714, MDC-714i and MDC-771i</li> <li>Added the description for new functions in firmware v. 2.00</li> </ul>