C-Series MFC
Modbus TCP/IP
Register Map & Specifications

PRELIMINARY

C-Series MFC Modbus Register Map & Specification

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Document Revision History

Document Revision	Description of Changes	Date
1.0	Initial	5/15/2018
1.1	Change MEMS to C-Series in document	9/10/2018
1.2	Change MEMS in Modbus Response FC43 to C Series	9/27/2018

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Modbus TCP/IP Interface

The C-Series Modbus MFC will interface using Modbus/TCP with RTU protocol over Port 502. Upon closing of the connection the device set point will transition to zero.

The Host processor will be the Modbus Master and the C-Series MFC Modbus MFC will be the Modbus slave. Refer to the "Modicon Modbus Protocol Reference Guide" for detailed descriptions of the Modbus protocol.

The C-Series MFC Modbus MFC supports the following function codes. The reference column specifies the sections from "Modbus Application Protocol Specification V1.1a" (http://www.Modbus-IDA.org), where more details are available.

Function Code	Function Name	Reference Section
3	Read holding registers	6.3
16	Write multiple registers	6.12
1	Read coils	6.1
4	Read input registers	6.4
5	Write single coil	6.5
43 (MEI type = 14)	Read device identification	6.21

MEI = Modbus Encapsulated Interface

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Modbus Register Map

The following table describes the input/output information and register map for the device.

I/O description	Modbus Function Code (Write)	Modbus Function Code (Read)	Reference Register Number	Number of Registers	Unit	Data Type
Flow	-	4	0x4000	2	units(E)	float 4 byte
Temperature	-	4	0x4002	2	degC	float 4 byte
Valve Position	-	4	0x4004	2	0-100 %	float 4 byte
Flow Hours	-	4	0x4008	2	hrs	long 4 byte
Flow Total	-	4	0x400A	2	units(E)	long 4 byte
Flow Set point	16	3	0xA000	2	units(E)	float 4 byte
Ramp Rate(A)	16	3	0xA002	2	ms	long 4 byte
Reset(B)	5	-	0xE000	1(B)	-	int 2 byte
Open Valve(C)	5	1	0xE001	1(C)	-	int 2 byte
Close Valve(C)	5	1	0xE002	1(C)	-	int 2 byte
Flow Zero(D)	5	-	0xE003	1(D)	-	int 2 byte

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Modbus Read Device Identification Map

MKS supports Modbus command FC43 Read Device Identification.

Object Id	Object Name / Description	Data Type	Category	Example Response String
0x00	Vendor Name	ASCII String	Basic	MKS
0x01	Produce Code (Part #)	ASCII String	Basic	Dynamically Update
0x02	Firmware Revision	ASCII String	Basic	1.0.0
0x03	Url	ASCII String	Regular	www.mksinst.com
0x04	Product Name	ASCII String	Regular	MFC
0x05	Model Name	ASCII String	Regular	CSERIES
0x06	User Application Name (Gas Symbol)	ASCII String	Regular	N2
0x80	Serial Number	ASCII String	Extended	100
0x81	Size	ASCII String	Extended	500 sccm

Note (A):   *For (Ramp Rate = 0), ramping is disabled. If setting ramp rate while ramping, the new ramp rate will not take effect until ramping is complete. To disable ramping while in the middle of a ramp, set the ramp rate value to -1. The ramp rate is non-volatile.*

Note (B):   *Reset command issued through Force Single Coil (05) to ON (0xFF00) will reset the device's set point to zero, and place the valve state to "controlled by flow set point", i.e. Open Valve = 0, Close Valve = 0.*

Note (C):   *For (Open Valve = 1, Close Valve = 0), open valve.*
For (Open Valve = 0, Close Valve = 1), close valve.
For (Open Valve = 1, Close Valve = 1), close valve.
For (Open Valve = 0, Close Valve = 0), controlled by flow set point.

Note (D):   *For zeroing, create a no-flow condition and issue a Force Single Coil (05) to ON (0xFF00)*

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IP Address Modification

      The IP address can be reassigned through the devices web browser. Launch the web browser using Internet Explorer with the default IP address 192.168.2.155. The screen in figure 1 will display. Using the mouse, left-click and select the 'Configuration' tab, see figure 2 on next page.
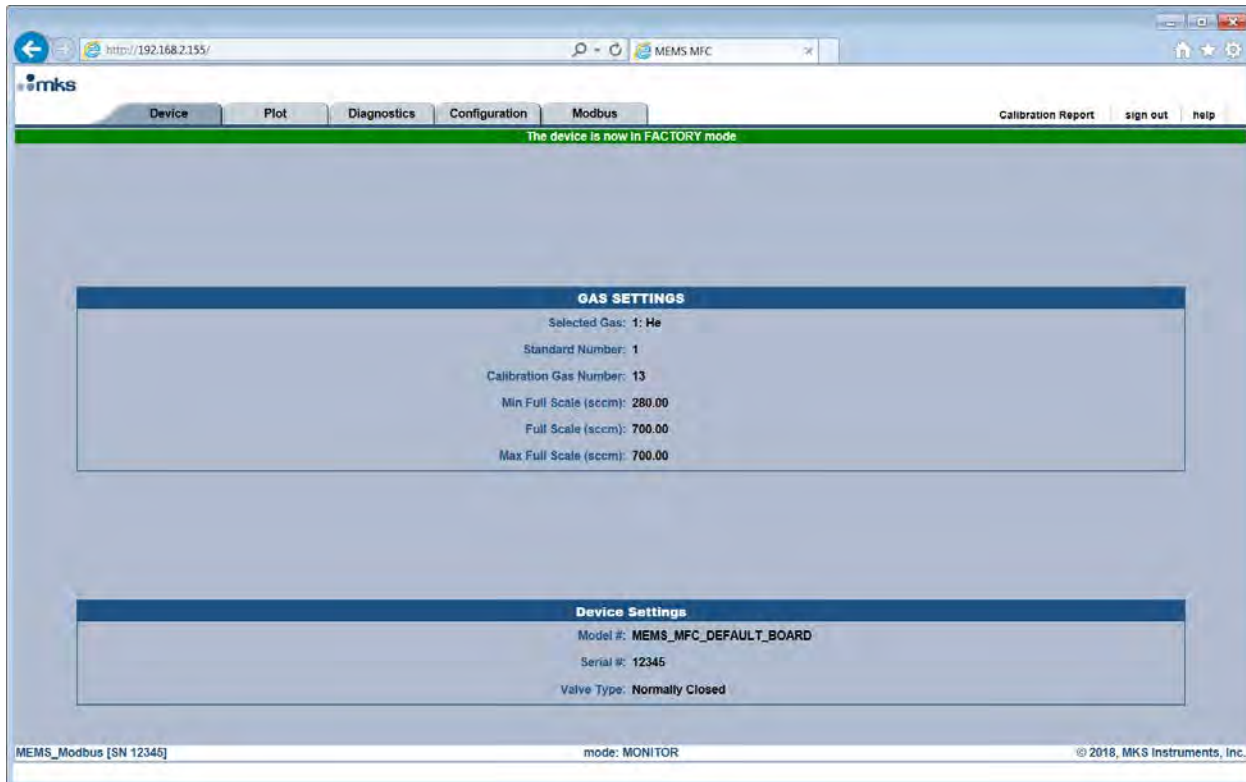

Figure 1. Device home page.

IP Address Modification (Cont)

Enter configuration password("config") and you should see a screen shown below.
Input the new IP Address, and if required a Subnet Mask and Default Gateway then left-click on the Submit button. A return screen will appear and indicate if the operation was successful, see figure 3. Click the reset button and closed internet explorer, the device is now ready to operated on the modbus network.
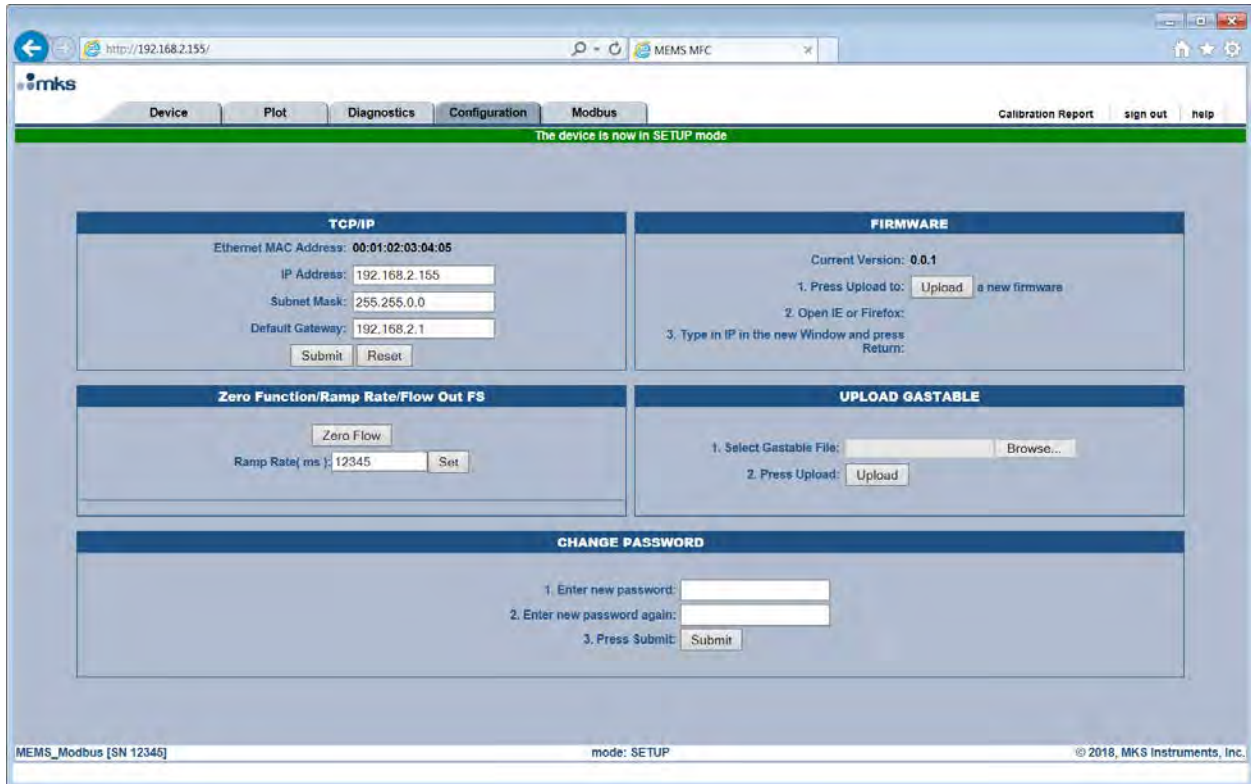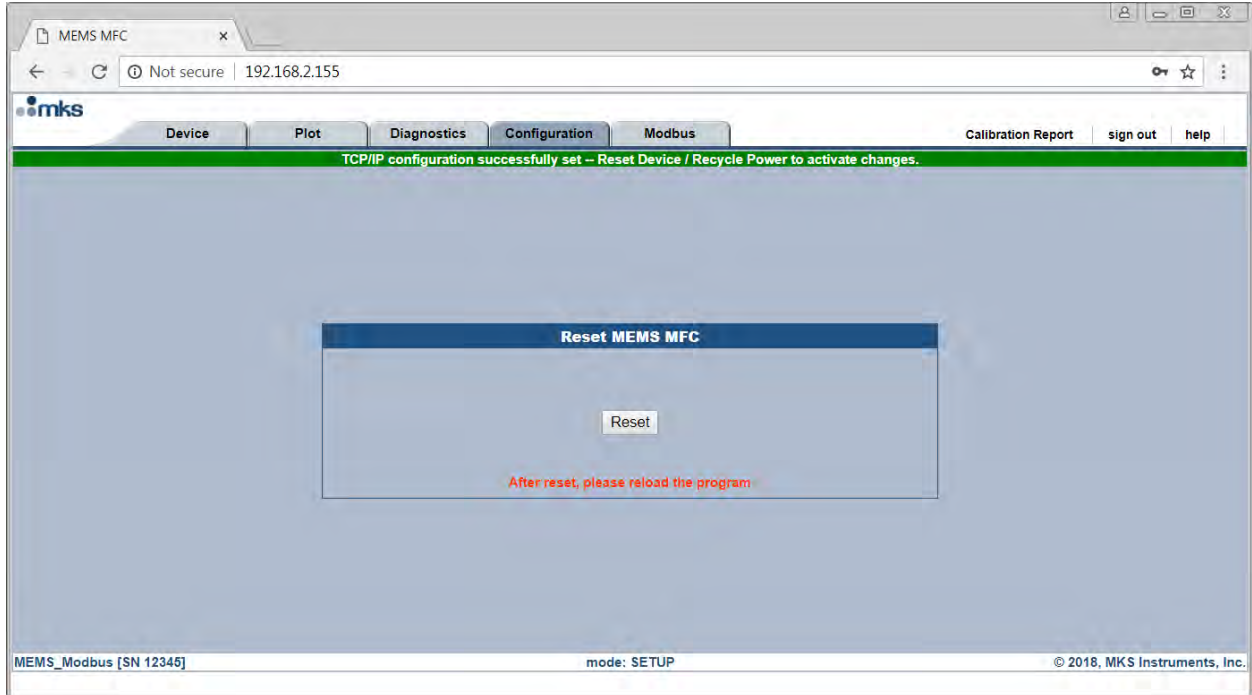

Figure 2. Device IP configuration screen

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Figure 3 Reset screen