



FieldServer Driver – Serial FS-8700-80 McQuay Microtech Open Protocol

Driver Code: McQ
Version: 1.00a

Interface: RS-232 / RS-485
Data Rate: 110 – 9600 (Vendor Limited)
Data Format: 7-bit, even parity ASCII characters with one stop bit.

Description :

This is an active client protocol. The driver is capable of acting as a master or slave. As a master, the Fieldserver polls to read or write the McQuay device. As a slave the FieldServer accepts read/write request and responds appropriately.

The vendor equipment id limited to a maximum of 9600 baud. Given that each message packet can only transfer one byte of data and that some data of interest is multi-byte, user's of this protocol should expect low data transfer rates.

The driver can poll for one or more specific data fields of interest at a rate set by the user or all available data can be read at a rate determined by the driver.

Scaling :

The driver scales data read/written by a factor identified in the driver manual. The value stored in many data fields are stored to allow for real numbers with fractional components to be stored as whole numbers. For example: **Oil Pressure – Feed (stored at memory location 0446-0447)** is stored as a number between 0 and 4500. The driver reports the value by storing a real number in the range 0.0-450.0 in a data array.

Additional scaling may be applied by the user by specifying scaling factors in the FieldServer configuration.

Functions:

Function	Description
Read	Reads a single data field.
Write	Writes a single data field to the McQuay device. Only some data fields in the McQuay device may be written to.



McQuay Devices Supported:

Data Type	Description
Series 200 Centrifugal Chiller	Data fields of interest may be specified using the data field name or by specifying the 'address / memory location'
Other devices	<p>Any other device which supports McQuay's Open Protocol™ Data Communications Information Packet Version 1.4 April, 1996 can be read or written using this driver.</p> <p>However, when read or writing these 'other' devices , the data fields of interest are specified using the 'address / memory location' specified as a hexadecimal number (obtained for the product specification.)</p> <p>At a customer's request the driver can be updated to allow the fields to be specified by their field names.</p>

Known Exclusions / Limitation:

As a slave the driver can have a maximum of one master connected per port.
<p>The following important points and limitations should be noted.</p> <ol style="list-style-type: none"><li data-bbox="277 1434 1541 1598">1. Arising from a feature of the McQuay open protocol is the peculiarity, that when a multi-byte value is written to a McQuay device, the write is done one byte at a time (one byte of data can be transferred per poll/response message pair.) allowing for the possibility (at least for a short period) that the multi byte value is only partially correct until all the messages have been completed.<li data-bbox="277 1633 1541 1734">2. The vendor equipment is limited to a maximum of 9600 baud. Given that each message packet can only transfer one byte of data and that some data of interest is multi-byte, user's of this protocol should expect low data transfer rates.<li data-bbox="277 1770 1541 1799">3. Port expansion is not supported for this driver.<li data-bbox="277 1835 1541 1890">4. A document identified as Ed15050 MicroTech Network Operations contains important and useful information regarding the connection requirements of 3rd party equipment (like the



FieldServer) to a Microtech network. The document also defines a number of limitations for such connections.

The following quotations from this document outline some of this information.

PC Connection

The PC connection to a MicroTech controller is through an available port A that is configured as TTY. It is best to connect the PC to a level-1 controller because data transmission is the fastest. However, a PC can be connected to any level-2 controller that does not have level-3 controllers connected to it or to any MicroTech level-3 controller. Regardless of where you connect the PC, you have access to the entire network.

You can connect two or more PCs to the network, but only one PC can be connected to a particular controller. The PC that you use most often should be connected to the level-1 controller for best performance. For example, you may have one PC that you use on site and another PC that you use off site. In this situation, you may want to connect the on-site PC to the level-1 controller and the modem for the off-site PC to a level-2 or level-3 controller.

If a PC is connected to a level-2 controller, a level-1 controller must poll that level-2 controller connected to the PC so that the PC has access to the entire network.

Defining a level-2 controller in the level-1 controller slave list causes the level-1 controller to poll the level-2 controller.

Port Configuration: *The communications port that the PC is connected to must be configured as a TTY port. As shown in **Error! Reference source not found.**, the default port configuration for most MicroTech controllers sets port A as TTY. The port configuration is a software setting.*

A separate software setting defines the communications rate of each port. In most controllers, the default rate is 9600 bps.

TTY: *A TTY port is used to connect a PC for monitoring purposes. It uses the RS232C interface standard and the Data Terminal Communications protocol.*

5. The following quote from "MicroTech® Data Terminal Communication Packets, Open Protocol™ Data Communications Information Packet Version 1.4" is an important limitation of the protocol.

Data terminal communications may be sent via RS-232C or RS-485. Regardless of the electrical standard used for communications, this protocol is a single ended type (i.e., communications to one MicroTech controller maximum).

6. Each MicroTech controller is shipped from the factory with a unique job site password. The passwords are provided by the McQuay International representative at the time of startup.



7. The driver does not validate passwords when configured as a server. This means that requests to read or write data will succeed even if the password supplied with the request is incorrect.

Series 200 Chillers, Data Fields Supported by the driver.

Array location refers to the position in the array when 'everything' is read from the McQuay device.

R
ea
d/
Array W
Locat rit

ion e	Data Field Name	Address	Units
1 r	Model	0A08, 0A09, 0A0A	
4 r	Refrigerant	0A0B	
5 r	Units of Measure	0A0C	
6 r	Software Version	0A0D, 0A0E	
8 r	Software Revision	0A0F	
9 r			
10 r	Chilled Water Temperature- Active Setpoint	905	°F
11 r	Chiller Unit Temperature Type	084B	
12 r	Communication Status	040C	
13 r	Compressor Lift Pressure	046A-046B	PSIG
15 r	Compressor Motor Current	044C-044D	Amps
17 r	Compressor Motor Current Percent	044A	%
18 r	Compressor Number of Starts	085F-0860	Compressor starts
20 r	Compressor Operating Hours	0851-0852	hrs
22 r	Compressor Suction Temperature	043A-043B	°F
24 r	Compressor Superheat - Discharge	046E-046F	°F
26 r	Compressor Superheat -Suction	046C-046D	°F
28 r	Condenser Approach Temperature	0484-0485	°F
30 r	Condenser Heat Recovery Unit Present	083F	



Protocol Driver



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31 r	Condenser Heat Recovery Temperature - Delta	048A-048B	°F
33 r	Condenser Heat Recovery Water Temp. - Entering	0454-0455	°F
35 r	Condenser Heat Recovery Water Temp. - Leaving	0456-0457	°F
37 r	Condenser Pump Status	425	See Below
38 r	Condenser Pump # 1 Operating Hours	085A-085B	hrs
40 r	Condenser Pump # 2 Operating Hours	085D-085E	hrs
42 r	Condenser Refrigerant Pressure	0440-0441	PSIG
44 r	Condenser Refrigerant Temperature	0466-0467	°F
46 r	Condenser Subcooling Temperature	0480-0481	°F
48 r	Condenser Water Flow Rate	0452-0453	GPM 0 = No Flow1 = Flow
50 r	Condenser Water Flow Status	045F	
51 r	Condenser Water Rate Sensor	083D	
52 r	Condenser Water Temperature - Delta	0488-0489	°F
54 r	Condenser Water Temperature - Entering	0436-0437	°F
56 r	Condenser Water Temperature - Leaving	0434-0435	°F
58 r	Cooling Tower Control	926	
59 r	Cooling Tower Stage	049A	stages
60 r	Cooling Tower Valve Position	049B	%
61 r	Discharge Refrigerant Temperature	043E-043F	°F
63 r	Evaporator Approach Temperature	0482-0483	°F
65 r	Evaporator Pump Status	423	See Below
66 r	Evaporator Pump #1 Operating Hours	0854-0855	hrs
68 r	Evaporator Pump #2 Operating Hours	0857-0858	hrs
70 r	Evaporator Refrigerant Pressure	0438-0439	PSIG
72 r	Evaporator Refrigerant Temperature	0464-65	°F
74 r	Evaporator Water Flow Rate	0450-0451	GPM
76 r	Evaporator Water Flow Status	045E	
77 r	Evaporator Water Rate Sensor	083C	
78 r	Evaporator Water Temperature - Delta	0486-0487	°F
80 r	Evaporator Water Temperature - Entering	0432-0433	°F
82 r	Evaporator Water Temperature - Leaving	0430-0431	°F
84 r	Fault - Current Active	1C00	See Below
85 r	Last Start Hour	861	hour
86 r	Last Start Minute	862	minute
87 r	Last Start Month	863	month
88 r	Last Start Date	864	day
89 r	Last Start Year	865	year
90 r	Last Stop Hour	866	hour
91 r	Last Stop Minute	867	minute
92 r	Last Stop Month	868	month
93 r	Last Stop Date	869	day
94 r	Last Stop Year	086A	year
95 r	Liquid Line Refrigerant Temperature	043C-043D	°F

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97 r	Oil Pressure - Feed	0446-0447	PSIG
99 r	Oil Pressure - Net	0468-0469	PSIG
101 r	Oil Pressure - Vent	04AC-04AD	PSIG
103 r	Oil Temperature - Feed	0442-0443	°F
105 r	Oil Temperature - Sump	0444-0445	°F
107 r	Outdoor Air Temperature - Network	474	°F
108 r	Refrigerant Detection Sensor	083E	
109 r	Refrigerant Leak Detection Limit	044B	PPM
110 r	Unit Status	420	See Below
111 rw	Capacity Limit Percent	0475	%
112 rw	Clear Current Fault	041E	
113 rw	Chiller Operation Mode	0477	
114 rw	Chilled Water Temperature Setpoint	0476	°F
115 rw	Communications Signal	047D	
116 rw	Outdoor Air Temperature - BAS	0473	°F
117 rw	Master/Slave Setpoint	093C	
118 rw	Lead/Lag Mode Setpoint	093D	
119 rw	Enable Lag Setpoint	093E	
120 rw	Disable Lag Setpoint	093F	
121 rw	Lag Standby Setpoint	0942	
122 rw	Lead/Lag Switch Setpoint (Day)	0948	
123 rw	Lead/Lag Switch Setpoint (Hour)	0949	
124 r	Lead/Lag Status	0401	
125 r	Lead Unit	0402	
126 r	Lead Unit Status	0403	
127 r	Lag Unit Status	0404	
128 r	Lead Motor Current	0405	
129 r	Lag Motor Current	0406	
130 r	Lead Status	0407	
131 r	Lag Status	0408	

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