A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8700-55 MDA-16

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after May 1, 2001

Instruction Manual Part Number FS-8700-55

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Table of Contents

1. MDA System 16 Description

The MDA System 16 driver allows the FieldServer to transfer data to and from devices over RS485 using MDA System 16 protocol. The FieldServer can emulate Server with the System 16.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

1.1 Hardware/Software

Supplied by FieldServer Technologies.

FieldServer Technologies PART #	DESCRIPTION
8915-10	UTP cable (7 foot) for Ethernet connection
8915-10	UTP cable (7 foot) for RS232 use
8917-02	RJ45 to DB9F connector adapter
8917-01	RJ45 to DB25M connector adapter
SPA59132	RS485 connector adapter

Provided by user

PART #	DESCRIPTION
	MDA System 16

2. FieldServer as a MDA System 16 Client

2.1 Hardware Connections

Configure the MDA System 16 client according to manufacturer's instructions

System setup information
The protocol specifies the MDA SYSTEM 16 instrument (device) as network master, which sends various data report commands to the FieldServer as remote node 0x49.

- Most of the commands report configuration data. Command 0x30 causes the FieldServer to store ten UInt16s, among them gas concentration, from one of the 16 points.
- Select serial mode by setting 'remote devices y/n' to yes and 'bidirectional y/n' to yes.
- Select transmit only mode by setting 'remote devices y/n' to yes and 'bidirectional y/n' to no.
- In serial mode the device expects an ACK/NAK response. The FieldServer always responds.
- Connect to J-15 NETWORK INTERFACE DB-25 on the back, where RS-422 pins 7=GND, 14=Tx-,15=Tx+, 16=Rx-, and 17=Rx+.
- The 0x30 (Sequential Sample Result) packet is 0x49, 0x2a, 0x30, 2 byte date, 2 byte time, 1 byte point#, 1 byte analyzer#, 1 byte MDA gas#, 1 byte format code, 2 byte concentration, 1 byte current loop drive, 1 byte alarm flag, (repeat from 0x30 twice), checksum.
- MDA gas#, format code, concentration, current loop drve, alarm flag, and a driver generated boolean concensus vote. For each attribute, sixteen data array locations are set aside for the 16 points. E.g. A1 concentration at 0x60, A1 alarm flag at 0x80
- In general, point P attribute A can be found at A*16+P.
- The standard address structure for the System 16 output string is at the end of this section

2.2 Configuration File Structure

2.2.1 Data Arrays

Section Title		
Data_Arrays		
Column Title	**Function**	**Legal Values**
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Format	Provides data format	UINT16
Data_Array_Length	Number of Data Objects	320

Example:

```
//    Data Arrays
//

Data_Arrays
Data_Array_Name,  Data_Format,      Data_Array_Length
DA_AI_05,         Uint16,           320
DA_AI_06,         Uint16,           320
DA_AI_07,         Uint16,           320
DA_AI_08,         Uint16,           320
DA_AI_15,         Uint16,           320
DA_AI_16,         Uint16,           320
DA_AI_17,         Uint16,           320
DA_AI_18,         Uint16,           320
```

2.2.2 Client Side Connections

Section Title
Connections

Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer	R1-R2, P1-P8
Baud	Specify baud rate	**9600**
Parity	Specify parity	**None**
Data_Bits	Specify data bits	**8**
Handshaking	Specify hardware handshaking	**None**

Examples:

```
//    Client Side ConnectionS
//

Connections
Port,  Baud,  Parity,   Data_Bits,   Stop_Bits,  Protocol
P5,    9600,  None,     8,           1,          S16
P6,    9600,  None,     8,           1,          S16
P7,    9600,  None,     8,           1,          S16
P8,    9600,  None,     8,           1,          S16
```

2.2.3 Client Side Nodes

Section Title
Nodes

Column Title	Function	Legal Values
Node_Name	Provide name for node	Up to 32 alphanumeric characters
Node_ID	Node ID of physical server node	73
Protocol	Specify protocol used	S-16

Example:

```
//    Client Side Nodes
//

Nodes
Node_Name,  Protocol,  Connection
S16_5,      S16,       P5
S16_6,      S16,       P6
S16_7,      S16,       P7
S16_8,      S16,       P8
```

2.2.4 Client Side Map Descriptors

Section Title
Map_Descriptors

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor	Up to 15 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer	One of the Data Array names from "Data Array" section above
Data_Array_Offset	Starting location in Data Array	0
Function	Function of Client Map Descriptor	Passive
Node_Name	Name of Node to fetch data from	One of the node names specified in "Server Node Descriptor" above
Data_Type	Message types*	Sequential Sample, Fault

* Refer to section number for data array offsets.

Example:

```
//    Client Side Map Descriptors
//

Map_Descriptors
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_Name,  Address,  Length,  Data_Type
CMD_AI_01,            DA_AI_05,         0,                  Passive,   S16_5,      0,        320,     SS*
CMD_AI_02,            DA_AI_06,         0,                  Passive,   S16_6,      0,        320,     SS*
CMD_AI_03,            DA_AI_07,         0,                  Passive,   S16_7,      0,        320,     SS*
CMD_AI_04,            DA_AI_08,         0,                  Passive,   S16_8,      0,        320,     SS*

CMD_AI_15,            DA_AI_15,         0,                  Passive,   S16_5,      0,        320,     Fault
CMD_AI_16,            DA_AI_16,         0,                  Passive,   S16_6,      0,        320,     Fault
CMD_AI_17,            DA_AI_17,         0,                  Passive,   S16_7,      0,        320,     Fault
CMD_AI_18,            DA_AI_18,         0,                  Passive,   S16_8,      0,        320,     Fault
```

```
*-> Sequential Sample
```

2.3 Driver Notes

2.3.1 System Set up

2.3.1.1 Data Array Offsets for Sequential Sample

Data Array Offset	Point ID	Attribute
00	a1	date
01	a2	date
02	a3	date
03	a4	date
04	b1	date
05	b2	date
06	b3	date
07	b4	date
08	c1	date
09	c2	date
10	c3	date
11	c4	date
12	d1	date
13	d2	date
14	d3	date
15	d4	date
16	a1	time
17	a2	time
18	a3	time
19	a4	time
20	b1	time
21	b2	time
22	b3	time
23	b4	time
24	c1	time
25	c2	time
26	c3	time
27	c4	time
28	d1	time
29	d2	time
30	d3	time
31	d4	time
32	a1	point#
33	a2	point#
34	a3	point#
35	a4	point#
36	b1	point#
37	b2	point#
38	b3	point#
39	b4	point#
40	c1	point#
41	c2	point#

Data Array Offset	Point ID	Attribute
42	c3	point#
43	c4	point#
44	d1	point#
45	d2	point#
46	d3	point#
47	d4	point#
48	a1	analyzer#
49	a2	analyzer#
50	a3	analyzer#
51	a4	analyzer#
52	b1	analyzer#
53	b2	analyzer#
54	b3	analyzer#
55	b4	analyzer#
56	c1	analyzer#
57	c2	analyzer#
58	c3	analyzer#
59	c4	analyzer#
60	d1	analyzer#
61	d2	analyzer#
62	d3	analyzer#
63	d4	analyzer#
64	a1	MDA gas#
65	a2	MDA gas#
66	a3	MDA gas#
67	a4	MDA gas#
68	b1	MDA gas#
69	b2	MDA gas#
70	b3	MDA gas#
71	b4	MDA gas#
72	c1	MDA gas#
73	c2	MDA gas#
74	c3	MDA gas#
75	c4	MDA gas#
76	d1	MDA gas#
77	d2	MDA gas#
78	d3	MDA gas#
79	d4	MDA gas#
80	a1	format code
81	a2	format code
82	a3	format code
83	a4	format code
84	b1	format code
85	b2	format code
86	b3	format code
87	b4	format code
88	c1	format code

Data Array Offset	Point ID	Attribute
89	c2	format code
90	c3	format code
91	c4	format code
92	d1	format code
93	d2	format code
94	d3	format code
95	d4	format code
96	a1	concentration
97	a2	concentration
98	a3	concentration
109	a4	concentration
100	b1	concentration
101	b2	concentration
102	b3	concentration
103	b4	concentration
104	c1	concentration
105	c2	concentration
106	c3	concentration
107	c4	concentration
108	d1	concentration
119	d2	concentration
110	d3	concentration
111	d4	concentration
112	a1	current loop drive
113	a2	current loop drive
114	a3	current loop drive
115	a4	current loop drive
116	b1	current loop drive
117	b2	current loop drive
118	b3	current loop drive
129	b4	current loop drive
120	c1	current loop drive
121	c2	current loop drive
122	c3	current loop drive
123	c4	current loop drive
124	d1	current loop drive
125	d2	current loop drive
126	d3	current loop drive
127	d4	current loop drive
128	a1	alarm flag
139	a2	alarm flag
130	a3	alarm flag
131	a4	alarm flag
132	b1	alarm flag
133	b2	alarm flag
134	b3	alarm flag
135	b4	alarm flag

Data Array Offset	Point ID	Attribute
136	c1	alarm flag
137	c2	alarm flag
138	c3	alarm flag
149	c4	alarm flag
140	d1	alarm flag
141	d2	alarm flag
142	d3	alarm flag
143	d4	alarm flag
144	a1	concensus vote
145	a2	concensus vote
146	a3	concensus vote
147	a4	concensus vote
148	b1	concensus vote
159	b2	concensus vote
150	b3	concensus vote
151	b4	concensus vote
152	c1	concensus vote
153	c2	concensus vote
154	c3	concensus vote
155	c4	concensus vote
156	d1	concensus vote
157	d2	concensus vote
158	d3	concensus vote
159	d4	concensus vote
160	a1	date
161	a1	time
162	a1	point#
163	a1	analyzer#
164	a1	MDA gas#
165	a1	Format code
166	a1	Concentration
167	a1	Current loop
168	a1	Alarm flag
169	a1	Concensus vote
170	a2	Date
171	a2	Time
172	a2	point#
173	a2	analyzer#
174	a2	MDA gas#
175	a2	Format code
176	a2	Concentration
177	a2	Current loop drive
178	a2	Alarm flag
179	a2	Concensus vote
180	a3	Date
181	a3	Time
182	a3	point#

Data Array Offset	Point ID	Attribute
183	a3	analyzer#
184	a3	MDA gas#
185	a3	Format code
186	a3	Concentration
187	a3	Current loop drive
188	a3	Alarm flag
189	a3	Concensus vote
190	a4	Date
191	a4	Time
192	a4	point#
193	a4	analyzer#
194	a4	MDA gas#
195	a4	Format code
196	a4	Concentration
197	a4	Current loop drive
198	a4	Alarm flag
199	a4	Concensus vote
200	b1	Date
201	b1	Time
202	b1	point#
203	b1	analyzer#
204	b1	MDA gas#
205	b1	Format code
206	b1	Concentration
207	b1	Current loop drive
208	b1	Alarm flag
209	b1	Concensus vote
210	b2	Date
211	b2	Time
212	b2	point#
213	b2	analyzer#
214	b2	MDA gas #
215	b2	Format code
216	b2	Concentration
217	b2	Current loop drive
218	b2	Alarm flag
219	b2	Concensus vote
220	b3	Date
221	b3	Time
222	b3	point#
223	b3	analyzer#
224	b3	MDA gas#
225	b3	Format code
226	b3	Concentration
227	b3	Current loop drive
228	b3	Alarm flag
229	b3	Concensus vote

Data Array Offset	Point ID	Attribute
230	b4	Date
231	b4	Time
232	b4	point#
233	b4	analyzer#
234	b4	MDA gas#
235	b4	Format code
236	b4	Concentration
237	b4	Current loop drive
238	b4	Alarm flag
239	b4	Concensus vote
240	c1	Date
241	c1	Time
242	c1	point#
243	c1	analyzer#
244	c1	MDA gas#
245	c1	Format code
246	c1	Concentration
247	c1	Current loop drive
248	c1	Alarm flag
249	c1	Concensus vote
250	c2	Date
251	c2	Time
252	c2	point#
253	c2	analyzer#
254	c2	MDAgas#
255	c2	Format code
256	c2	Concentration
257	c2	Current loop drive
258	c2	Alarm flag
259	c2	Concensus vote
260	c3	Date
261	c3	Time
262	c3	point#
263	c3	analyzer#
264	c3	MDA gas#
265	c3	Format code
266	c3	Concentration
267	c3	Current loop drive
268	c3	Alarm flag
269	c3	Concensus vote
270	c4	Date
271	c4	Time
272	c4	point#
273	c4	analyzer#
274	c4	MDA gas#
275	c4	Format code
276	c4	Concentration

Data Array Offset	Point ID	Attribute
277	c4	Current loop drive
278	c4	Alarm flag
279	c4	Concensus vote
280	d1	Date
281	d1	Time
282	d1	point#
283	d1	analyzer#
284	d1	MDA gas#
285	d1	Format code
286	d1	Concentration
287	d1	Current loop drive
288	d1	Alarm flag
289	d1	Concensus vote
290	d2	Date
291	d2	Time
292	d2	point#
293	d2	analyzer#
294	d2	MDA gas#
295	d2	Format code
296	d2	Concentration
297	d2	Current loop drive
298	d2	Alarm flag
299	d2	Concensus vote
300	d3	Date
301	d3	Time
302	d3	point#
303	d3	analyzer#
304	d3	MDA gas#
305	d3	Format code
306	d3	Concentration
307	d3	Current loop drive
308	d3	Alarm flag
309	d3	Concensus vote
310	d4	Date
311	d4	Time
312	d4	point#
313	d4	analyzer#
314	d4	MDA gas#
315	d4	Format code
316	d4	Concentration
317	d4	Current loop drive
318	d4	Alarm flag
319	d4	Concensus vote

Data Array Offsets for Fault Message

This table shows the offsets of data points if the Data_Type field of a Map Descriptor is set to "Fault".

Data Array Offset	Description
0	Date Year
1	Month
2	Day
3	Time Hours
4	Minutes
5	Seconds
6	Fault #
7	Module Code
8	Point Group
9	Switch Mask