

FieldServer Driver - Serial FS-8700-47 DNP 3.0

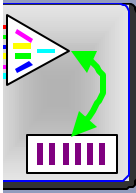
Driver Code: DNP
Version: 1.01a
Protocol Version: N/A
This Document Version Rev 1
Devices Supported:

Device	Tested
Schweitzer Engineering Laboratories SEL351A.	Factory
Multilin Generator	Factory
Management Relay	Factory
Energyline 5800 IntelliTeam	Factory

Physical Interface: EIA485 (EIA-232 with converter) (Half-Duplex)
Baud Rates: All Standard Baud Rates
Data Bits: 7, 8
Stop Bits: 0,1
Parity: None, Even, Odd
Handshaking: None, RTS/CTS

The DNP 3 Driver allows the FieldServer to transfer data to and from devices over either RS232 or RS485 using the DNP 3 protocol. There are eight RS232 and two RS485 ports standard on the Bridge. The Bridge can emulate either a Server or Client.

DNP V3.00	
DEVICE PROFILE DOCUMENT	
Vendor Name : FieldServer Technologies	
Device Name : FS-B40 and FS-B20 Series	
Highest DNP Level Supported: For Requests : 1 For Responses: 1	Device Function: ? Master ? Slave
Notable objects, functions and or qualifiers supported in addition to the highest DNP Levels Supported.	
Although the highest level implemented is level 1 there are very few functions and objects that have not been implemented that would allow classification as level 2 compliance. These exceptions include some functions on the analog output objects, no processing of the time delay objects, setting internal indications and no handling of object type 101.	
In addition to being compliant with most level 2 requirements the Bridge can parse a greater number of qualifiers than are required for level 2 compliance.	
The attached table indicates the objects, object variations, functions and qualifiers that can be processed.	

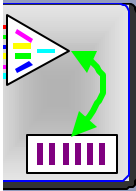


Protocol Driver

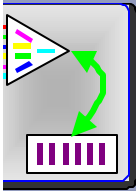


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Maximum Data Link Frame Size (Octets) Transmitted : 242 Received : 292	Maximum Application Fragment Size Transmitted: 242 Received : 2048
Maximum Data Link Re-Tries ? None ? Fixed at 3 ? Configurable	Maximum Application Layer Retries ? None ? Fixed ? Configurable
Requires Application Layer Confirmation ? Never ? Always ? When reporting event data ? When sending multi-fragment responses (Slaves Only) ? Sometime _____ ? Configurable _____	
Timeouts while waiting for: Data Link Confirm : ? None ? Fixed at ____ ? Variable ? Configurable (Use timeout param in CSV file.) Complete App Fragment: ? None ? Fixed at ____ ? Variable ? Configurable (Use timeout param in CSV file.) App Confirm: ? None ? Fixed at ____ ? Variable ? Configurable (Use timeout param in CSV file.) Complete App Response: ? None ? Fixed at ____ ? Variable ? Configurable (Use timeout param in CSV file.)	
Sends / Executes Control Operations Write Binary Outputs: ? Never ? Always ? Sometimes ? Configurable (May Over-ride default) Select/Operate : ? Never ? Always ? Sometimes ? Configurable (May Over-ride default) Direct Operate: ? Never ? Always ? Sometimes ? Configurable (May Over-ride default) Direct Operate No Ack? Never ? Always ? Sometimes ? Configurable Count > 1 ? Never ? Always ? Sometimes ? Configurable Pulse On ? Never ? Always ? Sometimes ? Configurable Pulse Off ? Never ? Always ? Sometimes ? Configurable Latch On ? Never ? Always ? Sometimes ? Configurable Latch Off ? Never ? Always ? Sometimes ? Configurable Queue ? Never ? Always ? Sometimes ? Configurable Clear Queue ? Never ? Always ? Sometimes ? Configurable	
Configurable using CSV file parameters and data array values.	
Fill Out the following for Master Devices Only	
Expects Binary Change Events ? Either time tagged or non-time tagged for a single event. ? Both time tagged or non-time tagged for a single event. ? Configurable _____	



Fill Out the following for Slave Devices Only	
Reports Binary Change Events when no specific variation requested. ? Never ? Only Time Tagged ? Only Non Time Tagged ? Configurable	Reports Binary Input Events when no specific variation requested. ? Never ? Only Time Tagged ? Only Non Time Tagged ? Configurable
Send Unsolicited Messages ? Never ? Configurable (Active Server with wrbc/wrbc functions) ? Only certain Objects ? Sometimes ? Enable / Disable	Sends Static Data in Unsolicited Responses ? Never ? When device restarts ? When status flags change



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Default Counter Object Variation ? No Counters Reported ? Configurable ? Default Object ____ ? Default variation _____ ? Point by Point List Attached.	Counters Roll Over at ? No Counters Reported ? Configurable ? 16 bits ? 32 Bits ? Other Value ____ ? List attached.
Sends Multi-fragment Responses :? No ? Yes	

FieldServer Technologies, 1991 Tarob Court, Milpitas, CA 95035 USA

■ Tel: 408-262-2299, ■ Fax: 408-262-9042 ■ Toll-Free: 888-509-1970

Email: sales@fieldserver.com

Website: www.fieldserver.com

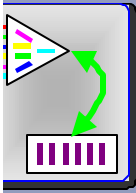
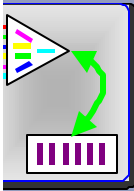


Table 2.3-1
Level 2 Implementation (DNP -L2)

Note:
Underline indicates exception to level 2 compliance.
Black indicates level 2 compliance requirement.
Bold indicates additional functions qualifiers supported.

OBJECT			REQUEST		RESPONSE				
			(slave must parse)		(master must parse)				
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)		Func Codes	Qual Codes (hex)		
1	0	Binary Input - All Variations	1	6		00,01,07,08,17,28			
1	1	Binary Input			1	01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
1	2	Binary Input with Status			1	01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
2	0	Binary Input Change - All Variations	1	06,07,08		00,01,07,08,17,28			
2	1	Binary Input Change without Time	1	06,07,08	2	00,01,17,28	129, 130	17, 28	00,07,08
2	2	Binary Input Change with Time	1	06,07,08	2	00,01,17,28	129, 130	17, 28	00,07,08
2	3	Binary Input Change with Relative Time	1	06,07,08	2	00,01,17,28	129, 130	17, 28	00,07,08
10	0	Binary Output - All Variations	1	6		00,01,07,08,17,28			129, 130
10	1	Binary Output			1,2	01,06,07,08,17,28			129, 130
10	2	Binary Output Status			1,2	01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
12	0	Control Block - All Variations			1	00,01,07,08,17,28			129, 130
12	1	Control Relay Output Block	3,4,5,6	17, 28	1,2	01,06,07,08	129	echo of request	
12	2	Pattern Control Block							
12	3	Pattern Mask							
20	0	Binary Counter - All Variations	1,7,8,9,10	6		00,01,07,08,17,28			
20	1	32-Bit Binary Counter			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	2	16-Bit Binary Counter			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	3	32-Bit Delta Counter			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	4	16-Bit Binary Counter			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	5	32-Bit Binary Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	6	16-Bit Binary Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	7	32-Bit Delta Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
20	8	16-Bit Delta Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
21	0	Frozen Counter - All Variations	1	6		00,01,07,08,17,28			
21	1				1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
21	2	16-Bit Frozen Counter			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
21	3	32-Bit Frozen Delta Counter			1,2	00,01,06,07,08,17,28			129, 130
21	4	16-Bit Frozen Delta Counter			1,2	00,01,06,07,08,17,28			129, 130
21	5	32-Bit Frozen Counter with Time of Freeze			1,2	00,01,06,07,08,17,28			129, 130



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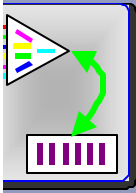
OBJECT			REQUEST		RESPONSE				
			(slave must parse)		(master must parse)				
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)		Func Codes	Qual Codes (hex)		
21	6	16-Bit Frozen Counter with Time of Freeze			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
21	7	32-Bit Frozen Delta Counter with Time of Freeze			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
21	8	16-Bit Frozen Delta Counter with Time of Freeze			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
21	9	32-Bit Frozen Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
21	10	16-Bit Frozen Counter without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
21	11	32-Bit Frozen Delta Counter without Flag			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
21	12	16-Bit Frozen Delta Counter without Flag			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	0	Counter Change Event - All Variations	1	06,07,08		00,01,17,28			
22	1	32-Bit Counter Change Event without Time			1,2	00,01,06,07,08,17,28	129, 130	17, 28	00,01,07,08
22	2	16-Bit Counter Change Event without Time			1,2	00,01,06,07,08,17,28	129, 130	17, 28	00,01,07,08
22	3	32-Bit Delta Counter Change Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	4	16-Bit Delta Counter Change Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	5	32-Bit Counter Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	6	16-Bit Counter Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	7	32-Bit Delta Counter Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
22	8	16-Bit Delta Counter Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	0	Frozen Counter Event - All Variations			1,	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	1	32-Bit Frozen Counter Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	2	16-Bit Frozen Counter Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	3	32-Bit Frozen Delta Counter Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	4	16-Bit Frozen Delta Counter Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	5	32-Bit Frozen Counter Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	6	16-Bit Frozen Counter Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	7	32-Bit Frozen Delta Counter Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
23	8	16-Bit Frozen Delta Counter Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
30	0	Analog Input - All Variations	1	6		00,01,07,08,17,28			
30	1	32-Bit Analog Input			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
30	2	16-Bit Analog Input			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
30	3	32-Bit Analog Input without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
30	4	16-Bit Analog Input without Flag			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
31	0	Frozen Analog Input - All Variations			1	00,01,06,07,08,17,28			
31	1	32-Bit Frozen Analog Input			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28

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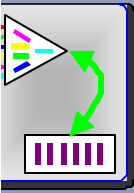
■ Tel: 408-262-2299, ■ Fax: 408-262-9042 ■ Toll-Free: 888-509-1970

Email: sales@fieldserver.com

Website: www.fieldserver.com



OBJECT			REQUEST		RESPONSE				
			(slave must parse)			(master must parse)			
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)		Func Codes	Qual Codes (hex)		
31	2	16-Bit Frozen Analog Input			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
31	3	32-Bit Frozen Analog Input with Time of Freeze			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
31	4	16-Bit Frozen Analog Input with Time of Freeze			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
31	5	32-Bit Frozen Analog Input without Flag			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
31	6	16-Bit Frozen Analog Input without Flag			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
32	0	Analog Change Event - All Variations	1	06,07,08		00,01,06,17,28			
32	1	32-Bit Analog Change Event without Time			1,2	00,01,06,07,08,17,28	129,130	17,28	00,01,07,08
32	2	16-Bit Analog Change Event without Time			1,2	00,01,06,07,08,17,28	129,130	17,28	00,01,07,08
32	3	32-Bit Analog Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
32	4	16-Bit Analog Change Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
33	0	Frozen Analog Event - All Variations			1	00,01,06,07,08,17,28			
33	1	32-Bit Frozen Analog Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
33	2	16-Bit Frozen Analog Event without Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
33	3	32-Bit Frozen Analog Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
33	4	16-Bit Frozen Analog Event with Time			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
40	0	Analog Output Status - All Variations	1	6		00,01,07,08,17,28			
40	1	32-Bit Analog Output Status			1,2	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
40	2	16-Bit Analog Output Status			1,2	00,01,06,07,08,17,28	129, 130	00, 01	07,08,17,28
41	0	Analog Output Block - All Variations			1,	00,01,06,07,08,17,28			
41	1	32-Bit Analog Output Block			1,2,4,6	00,01,06,07,08,17,28		129, 130	00,01,07,08,17,28
41	2	16-Bit Analog Output Block	3,4,5,6	17, 28	*3 *5 1 2	00,01,06,07,08	129	echo of request	
50	0	Time and Date - All Variations			1,2	00,01,06,07,08,17,28			
50	1	Time and Date	2 (see 4.14)	07 where quantity = 1	1,	00,01,06,08,17,28		129,	00,01,07,08,17,28
50	2	Time and Date with Interval			1,2	00,01,06,07,08,17,28		129,	00,01,07,08,17,28
51	0	Time and Date CTO - All Variations			1,	00,01,06,07,08,17,28			
51	1	Time and Date CTO			1,2	00,01,06,07,08,17,28	129, 130	07, quantity=1	129**
51	2	Unsynchronized Time and Date CTO			1,2	00,01,06,07,08,17,28	129, 130	07, quantity=1	129**
52	0	Time Delay - All Variations							
52	1	Time Delay Coarse					129	07, quantity=1	129*
52	2	Time Delay Fine					129	07, quantity=1	129*
60	0								
60	1	Class 0 Data	1	6					



OBJECT			REQUEST		RESPONSE		
			(slave must parse)		(master must parse)		
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)		Func Codes	Qual Codes (hex)
60	2	Class 1 Data	1	06,07,08			
60	3	Class 2 Data	1	06,07,08			
60	4	Class 3 Data	1	06,07,08			
70	1	File Identifier					
80	1	Internal Indications	2	0	<u>2</u> *		
				index=7			
81	1	Storage Object					
82	1	Device Profile					
83	1	Private Registration Object					
83	2	Private Registration Object Descriptor					
90	1	Application Identifier					
100	1	Short Floating Point					
100	2	Long Floating Point					
100	3	Extended Floating Point					
101	1	Small Packed Binary-Coded Decimal					
101	2	Medium Packed Binary-Coded Decimal					
101	3	Large Packed Binary-Coded Decimal					
		No Object	13		<u>13</u> *		
		No Object	23 (see 4.14)				