FreyrSCADA Embedded Solution

Software Document

DNP / IEEE1815 Driver Object and variation Support

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[Distributed Network Protocol (DNP3)- IEEE 1815-2012 Product]

1 Object and Variation

This section provides the table containing the supported objects and variation.

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
1	0	Binary Input - All Variations (Variation 0 is used to request default variation)	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
1	1	Binary Input - Packed Format	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
1	2	Binary Input with Status	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
2	0	Binary Input Change - All Variations (Default variation)	1	06,07,08	129	17, 18,27,28
2	1	Binary Input Change without Time	1	06,07,08	129, 130 (Unsolicited Response)	17, 18,27,28
2	2	Binary Input Change with Time	1	06,07,08	129, 130	17, 18,27,28
2	3	Binary Input Change with Relative Time	1	06,07,08	129, 130	17, 18,27,28
3	0	Double-bit Binary Input - All Variations (Variation 0 is used to request default variation)	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
3	1	Double-bit Binary Input – Packed Format	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
3	2	Double-bit Binary Input	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129	00, 01, 02, 17, 18,27,28
4	0	Double-bit Binary Input Change - All Variations (Default variation)	1	06,07,08	129	17, 18,27,28
4	1	Double-bit Binary Input Change without Time	1	06,07,08	129, 130 (Unsolicited Response)	17, 18,27,28
4	2	Double-bit Binary Input Change with Time	1	06,07,08	129, 130	17, 18,27,28
4	3	Double-bit Binary Input Change with Relative Time	1	06,07,08	129, 130	17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
10	0	Binary Output - All Variations	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129	00, 01, 02, 17, 18,27,28
10	1	Binary Output	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
10	2	Binary Output Status	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
12	0	Control Block - All Variations				
12	1	Control Relay Output Block	3(Select), 4(Operate), 5 (Direct Operate), 6 (Direct Operate NR)	17, 28	129	echo of request
20	0	Binary Counter - All Variations	1(Read), 22(Assign Class) 7(Immediate Freeze), 8 (Immediate Freeze - No Response), 9 (Freeze and Clear), 10 (Freeze and Clear – No Response)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
20	1	32-Bit Binary Counter	1,	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
20	2	16-Bit Binary Counter	1,	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
20	5	32-Bit Binary Counter without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
20	6	16-Bit Binary Counter without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
				17, 18,27,28 (index)		
21	0	Frozen Counters - All Variations	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
21	1	32-Bit Frozen Counter	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
21	2	16-Bit Frozen Counter	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
21	5	32-Bit Frozen Counter with Time of Freeze	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
21	6	16-Bit Frozen Counter with Time of Freeze	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
21	9	32-Bit Frozen Counter without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
21	10	16-Bit Frozen Counter without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
22	0	Counter Change Event - All Variations	1	06,07,08	129	17, 18,27,28
22	1	32-Bit Counter Change Event without Time	1	06,07,08	129, 130	17, 18,27,28
22	2	16-Bit Counter Change Event without Time	1	06,07,08	129, 130	17, 18,27,28
22	5	32-Bit Counter Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
22	6	16-Bit Counter Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
23	0	Frozen Counter Events - All Variations	1	06,07,08	129	17, 18,27,28
23	1	32-Bit Frozen Counter Event without Time	1	06,07,08	129, 130	17, 18,27,28
23	2	16-Bit Frozen Counter Event without Time	1	06,07,08	129, 130	17, 18,27,28
23	5	32-Bit Frozen Counter Event with Time	1	06,07,08	129, 130	17, 18,27,28
23	6	16-Bit Frozen Counter Event with Time	1	06,07,08	129, 130	17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
30	0	Analog Input - All Variations	1(Read), 22(Assign Class) 7(Immediate Freeze), 8 (Immediate Freeze - No Response), 9 (Freeze and Clear), 10 (Freeze and Clear – No Response)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
30	1	32-Bit Analog Input	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
30	2	16-Bit Analog Input	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
30	3	32-Bit Analog Input without flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
30	4	16-Bit Analog Input without flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
30	5	Single-precision float – point with flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
31	0	Frozen Analog Input - All Variations	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
31	1	32-Bit Frozen Analog Input	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
31	2	16-Bit Frozen Analog Input	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
31	3	32-Bit Frozen Analog Input with Time of Freeze	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
				17, 18,27,28 (index)		
31	4	16-Bit Frozen Analog Input with Time of Freeze	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
31	5	32-Bit Frozen Analog Input without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
31	6	16-Bit Frozen Analog Input without Flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
31	7	Single-precision float – point with flag	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
32	0	Analog Change Event - All Variations	1	06,07,08	129	17, 18,27,28
32	1	32-Bit Analog Change Event without Time	1	06,07,08	129, 130	17, 18,27,28
32	2	16-Bit Analog Change Event without Time	1	06,07,08	129, 130	17, 18,27,28
32	3	32-Bit Analog Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
32	4	16-Bit Analog Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
32	5	Single-precision float – point Analog Change Event with out Time	1	06,07,08	129, 130	17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
32	7	Single-precision float – point Analog Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
33	0	Frozen Analog Event - All Variations	1	06,07,08	129	17, 18,27,28
33	1	32-Bit Frozen Analog Event without Time	1	06,07,08	129, 130	17, 18,27,28
33	2	16-Bit Frozen Analog Event without Time	1	06,07,08	129, 130	17, 18,27,28
33	3	32-Bit Frozen Analog Event with Time	1	06,07,08	129, 130	17, 18,27,28
33	4	16-Bit Frozen Analog Event with Time	1	06,07,08	129, 130	17, 18,27,28
33	5	Single-precision float – point Frozen Analog Change Event with out Time	1	06,07,08	129, 130	17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
33	7	Single-precision float – point Frozen Analog Change Event with Time	1	06,07,08	129, 130	17, 18,27,28
40	0	Analog Output Status - All Variations	1(Read), 22(Assign Class)	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129(Response)	00, 01, 02, 17, 18,27,28
40	1	32-Bit Analog Output Status	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
40	2	16-Bit Analog Output Status	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
40	3	Single-precision float – point Analog Output Status	1	00, 01 ,02 (start-stop) 06 (no range, or all) 07, 08 ,(limited qty) 17, 18,27,28 (index)	129,	00, 01, 02, 17, 18,27,28
41	1	32-Bit Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
41	2	16-Bit Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
41	3	Analog Output – Single-precision float –point	3, 4, 5, 6	17, 28	129	echo of request
50	1	Time and Date	2(Write)	07 (Quantity = 1)	129	07 (quantity = 1)
60	1	Class 0 Data	1	06	129	
60	2	Class 1 Data	1	06,07,08	129	
			20 (Enable Unsolicited), 21,(Disable Unsolicited)	06		

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object	**Variation**	**Description**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**	**Application Layer Function Codes (Decimal)**	**Qualifier Codes (hex)**
60	3	Class 2 Data	1	06,07,08	129	
			20 (Enable Unsolicited), 21,(Disable Unsolicited)	06		
60	4	Class 3 Data	1	06,07,08	129	
			20 (Enable Unsolicited), 21,(Disable Unsolicited)	06		
80	1	Internal Indications		00		
			2(write)	index=7		