USER MANUAL

HART

IDP24-A
IDP24-AF

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1 General

This manual covers software version:

> Software ID (HART): DDP-SW-004
> Software Version: 2.07

1.1 Safety instructions

For a safe installation of a positioner, the following must be observed. The module must only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this product as well as all instructions in this manual.

The information in this user manual is subject to changes without notice.

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2 Device Identification

Manufacturer Name:	Val Controls	**Model Name(s):**	IDP24-A
Manufacture ID Code:	24622 (602E Hex)	**Device Type Code:**	57558 (E0D6 Hex)
HART Protocol Revision	7.1	**Device Revision:**	1
Number of Device Variables	6		
Physical Layers Supported	FSK		
Physical Device Category	Control loop/transmitter loop, DC-isolated Bus Device		

Default node ID: 0

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3 Dynamic Variable

Three Dynamic Variables are implemented.

	Meaning	Units
PV	Control loop (Not used)	%
SV	Transmitter loop	%
TV	Position transmitter	%
QV	Pressure transmitter	Bar

4 Specifications

4.1 Electrical specifications

Transmitter loop	
Impedance	< 470 ohm @20mA and 9.4VDC
Linearity	< 0.1%
Temperature coefficient	0.015% / 1°C
Galvanic isolated	

Note: Transmitter loop equipment must be HART compatible.

4.1.1 Terminals

The chart below shows how to connect to the terminals on the positioner.

Transmitter loop
3. Transmitter loop (+)
4. Transmitter loop (-)

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5 Menu

Node id can be changed in the Menu at the following location.

6 HART			HART configuration
1 ID	0	0-63	Change the HART ID
2 Disable HART by DI2	Off	on/off	Disable HART communication with DI2

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6   Universal Commands

All universal commands are implemented

Command	Description
0	Read unique identifier
1	Read primary variable
2	Read loop current and percent of range
3	Read dynamic variables and loop current
6	Write polling address
7	Read loop current mode
8	Read Dynamic Variable Classification
9	Read Device Variables with Status
11	Read loop configuration
12	Read message
13	Read device variable status
14	Read unique identifier associated with tag
15	Read Primary Variable output information
16	Read final assembly number
17	Write message
18	Write TAG, descriptor, date
19	Write final assembly number
20	Read Long Tag
21	Read unique identifier associated with long tag
22	Write long tag
38	Reset configuration changed flag
48	Read additional device status (Not used)

Val Controls Definitions:
- Universal Primary Variable : Control Signal
- Universal Secondary Variable : Transmitter Signal
- Universal Tertiary Variable: Position Signal
- Universal Quaternary Variable : Pressure Sensor

6.1   Burst Mode

The field device does not support burst mode

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7 Common-Practice Commands

The following common-practice commands are implemented:

Command	Description
42	Perform device reset
59	Write number of response preambles
89	Set real-time clock
90	Read real-time clock

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8 Device specific Commands

The following device specific commands are implemented by Val Controls.

8.1 Live Status – Identification

8.1.1 Read (139) Software Version

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
1-4	U32	Software Version Format: Decimal Example : 10203 decimal = '1.02.03'

8.1.2 Read (140) Software Id

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-13	ASCII14	Software – ID Format: ASCII 14 Example 'DDP-SW-004'

8.1.3 Read (141) Manufacturer ID

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-13	ASCII14	Manufacturer ID Format: ASCII 14 Default Value: 'Val Controls '

8.1.4 Read (143) Type Name

Request data bytes

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Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-13	ASCII	Type Name Format: ASCII 14 Default Value: 'IHP24-B'

8.1.5 Read (144) PCB Number

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	U32	PCB Number Value: 0 – 4294967295 Format: U32 MSB First

8.1.6 Read (20) Long Tag

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-31	ASCII32	Long TAG

8.1.7 Write (22) Long Tag

Request data bytes

Byte	Format	Description
0-31	ASCII32	Long TAG

Response data bytes

Byte	Format	Description
0-31	ASCII32	Long TAG

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8.2 Clock Functions

8.2.1 Read (128) Read Clock

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Seconds Values: 0 – 59
1	U8	Minutes Values: 0 – 59
2	U8	Hour Values 0 – 23
3	U8	Reserved
4	U8	Day Values: 1 - 31
5	U8	Month Values: 1 – 12
6-7	U16	Year Values: 0 -2200

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8.2.2 Write (129) Write Clock

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Seconds Values: 0 – 59
1	U8	Minutes Values: 0 – 59
2	U8	Hour Values 0 – 23
3	U8	Reserved
4	U8	Day Values: 1 - 31
5	U8	Month Values: 1 – 12
6-7	U16	Year Values: 0 -2200

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8.3   Live Status – Error Log Functions

8.3.1   Read (130) Error Log

This command reads the entries in the error log and the arguments

See manual for Error messages

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Number of errors in the error log
1-2	U16	Error 1
3-4	U16	Error 2
5-6	U16	Error 3
7-8	U16	Error 4
9-10	U16	Error 5
11-12	U16	Error 6
13-14	U16	Error 7
15-16	U16	Error 8
17-18	U16	Error 9
19-20	U16	Error 10

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8.4 Live Status – Diagnostic Log Functions

8.4.1 Read (131) Diagnostic Log

This command reads the entries in the error log and the arguments

See manual for Log messages

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Number of logs
1-2	U16	Diagnostic log 1
3-4	U16	Diagnostic log 2
5-6	U16	Diagnostic log 3
7-8	U16	Diagnostic log 4
9-10	U16	Diagnostic log 5
11-12	U16	Diagnostic log 6
13-14	U16	Diagnostic log 7
15-16	U16	Diagnostic log 8
17-18	U16	Diagnostic log 9
19-20	U16	Diagnostic log 10

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8.5 Live Status – Event Log Functions

8.5.1 Read (132) Read Event 1 – 2

See manual for Event messages

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Event type – for Event number 1 Values: See manual for values
2-5	U32	Event Date – for Event number 1 Values: Bit 0 – 7 = Day (1 .. 31) Bit 8 – 15 = Month (1 .. 12) Bit 16-31 = Year (2010 .. 2100)
6-9	U32	Event Time – for Event number 1 Bit 0 – 7 = Seconds (0 .. 59) Bit 8 – 15 = Minutes (0 - 59) Bit 16-31 = Hour (0 - 23)
10-11	U16	Event Error – for Event number 1
12-13	U16	Event type – for Event number 2
14-17	U32	Event Date – for Event number 2
18-21	U32	Event Time – for Event number 2
22-23	U16	Event Error – for Event number 2

8.5.2 Read (133) Read Event 3 - 4

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Event type – for Event number 3
2-5	U32	Event Date – for Event number 3
6-9	U32	Event Time – for Event number 3
10-11	U16	Event Error – for Event number 3
12-13	U16	Event type – for Event number 4
14-17	U32	Event Date – for Event number 4
18-21	U32	Event Time – for Event number 4
22-23	U16	Event Error – for Event number 4

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8.5.3 Read (134) Read Event 5 - 6

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Event type – for Event number 5
2-5	U32	Event Date – for Event number 5
6-9	U32	Event Time – for Event number 5
10-11	U16	Event Error – for Event number 5
12-13	U16	Event type – for Event number 6
14-17	U32	Event Date – for Event number 6
18-21	U32	Event Time – for Event number 6
22-23	U16	Event Error – for Event number 6

8.5.4 Read (135) Read Event 7 - 8

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Event type – for Event number 7
2-5	U32	Event Date – for Event number 7
6-9	U32	Event Time – for Event number 7
10-11	U16	Event Error – for Event number 7
12-13	U16	Event type – for Event number 8
14-17	U32	Event Date – for Event number 8
18-21	U32	Event Time – for Event number 8
22-23	U16	Event Error – for Event number 8

8.5.5 Read (136) Read Event 9 - 10

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Event type – for Event number 9
2-5	U32	Event Date – for Event number 9
6-9	U32	Event Time – for Event number 9
10-11	U16	Event Error – for Event number 9
12-13	U16	Event type – for Event number 10
14-17	U32	Event Date – for Event number 10

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| 18-21 | U32 | Event Time – for Event number 10 |
| 22-23 | U16 | Event Error – for Event number 10 |

8.5.6 Read (137) Read number of events

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Number of events in the event log

8.6 Live Status – Live Status

8.6.1 Read (146) Pulse Counter on DO1 – DO4

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	U32	CNT DO1 Value: 0 – 4294967295 Format: U32 MSB First
4-7	U32	CNT DO2 Value: 0 – 4294967295 Format: U32 MSB First
8-11	U32	CNT DO3 Value: 0 – 4294967295 Format: U32 MSB First
12-15	U32	CNT DO4 Value: 0 – 4294967295 Format: U32 MSB First

8.6.2 Read (145) DO1-DO6 Status

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description

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0	U8	DO1 Status Default: 2 = Off Values: 1 = On 2 = Off
1	U8	DO2 Status Default: 2 = Off Values: 1 = On 2 = Off
2	U8	DO3 Status Default: 2 = Off Values: 1 = On 2 = Off
3	U8	DO4 Status Default: 2 = Off Values: 1 = On 2 = Off
4	U8	DO5 Status Default: 2 = Off Values: 1 = On 2 = Off
5	U8	DO6 Status Default: 2 = Off Values: 1 = On 2 = Off

8.6.3   Read (210) Live Status – Read AI1-AI4

8.6.4   Read (210) Live Status – Read DI1 – DI8

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U16	Read AI1 Values: Value: 0 – 2150 Unit: 0.00 mA – 21.50mA

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2	U16	Read AI2
4	U16	Read AI3
6	U16	Read AI4
8	U8	Read DI1 Values: 3 = Not Used 1 = On 2 = Off
9	U8	Read DI2
10	U8	Read DI3
11	U8	Read DI4
12	U8	Read DI5
13	U8	Read DI6
14	U8	Read DI7
15	U8	Read DI8

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8.7 Filesystem - Commands

8.7.1 Write (150) Val Controls SDCard filesystem Command line

This command writes Val Controls SDCard filesystem Command line

Request data bytes

Byte	Format	Description
0-31	ASCII	CD\ CD DIR READ FILENAME.EXT DEL FILENAME.EXT DEL *.*

Respons data bytes

Byte	Format	Description
0-31	ASCII	CD\ CD DIR READ FILENAME.EXT DEL FILENAME.EXT DEL *.*

8.7.2 Write (151) Write Val Controls SDCard filesystem Read Dir part number

This command writes the dir part number that will be read with command 153
Note: A dir is splitted up in a lot of Dir parts.

Request data bytes

Byte	Format	Description
0	U32	1 .. 4294967295

Respons data bytes

Byte	Format	Description
0	U32	1 .. 4294967295

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8.7.3 Write (152) Val Controls SDCard filesystem Read File part number

This command writes the dir part number that will be read with command 154
Note: A file has the size of 32Kbyte it is splittet up in 969 file parts of 32 bytes

Request data bytes

Byte	Format	Description
0	U32	1 .. 4294967295

Respons data bytes

Byte	Format	Description
0	U32	1 .. 4294967295

8.7.4 Read (153) Val Controls SDCard filesystem Read Dir part

Note: A dir is splitted up in a lot of Dir parts. The last dir part reads [EOD], this means that it's the last dir part.

Request data bytes

Byte	Format	Description
		None

Respons data bytes

Byte	Format	Description
0-31	U8	Returns the Dir part of 32 bytes specified in command #151

8.7.5 Read (154) Val Controls SDCard filesystem Read File part

The number file parts to read is calculated from the filesize / 32 read in the Dir

Request data bytes

Byte	Format	Description
		None

Respons data bytes

Byte	Format	Description
0-31	U8	Returns the File part of 32 bytes specified in command #152

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8.8   Live Status - Commands

8.8.1   Read (159) last stroke test information

This command reads the values recorded during the last partial stroke test

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	Time	Reserved
4-7	Date	Reserved
8-9	U16	Last PST Status Values: 0 = Never Run 1 = Ok 2 = Warning 3 = Error
10-13	Time	Reserved
14-17	Date	Reserved
18-19	U16	Last FST Status Values: 0 = Never Run 1 = Ok 2 = Warning 3 = Error
20-23	Time	Reserved
24-27	Date	Reserved
28-29	U16	Last SOT Status Values: 0 = Never Run 1 = Ok 2 = Warning 3 = Error

8.8.2   Read (160) Live test information

This command reads the values recorded during the last partial stroke test

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description

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0-1	U16	ESD Line Power Status Values: 0 = Not used 1 = Power on ESD Line (On) 2 = No Power on ESD Line (Off)	
2-3	U16	PST in Progress Values: 0 = Not used 1 = Yes 2 = No	
4-5	U16	FST in Progress Values: 0 = Not used 1 = No 2 = Yes	
6-7	U16	SOT in Progress Values: 0 = Not used 1 = No 2 = Yes	
8-9	U16	Test Lamps Status Values: 0 = Undefined 1 = All Lamps Off 2 = Lamp Ok On 3 = Lamp Error On 4 = Lamp Test On	
10-11	U16	Test Lamp Ready to Reset Values: 0 = Not used 1 = On 2 = Off	
12-13	U16	ESD state Values: 0 = Undefined 1 = Operational 2 = Fail position	

8.8.3 Read (163) last PST test data

This command reads the values recorded during the last full stroke

Request data bytes

Byte	Format	Description

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None

Response data bytes

Byte	Format	Description
0-1	U16	Start pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16	Breakaway pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
4-7	U32	Breakaway time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
8-11	U32	Closing time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
12-15	U32	Opening time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
16-17	U16	Pressure at SP Range: 0 – 50000 Units: 0.00 – 500.00 bar
18-19	U16	Minimum Pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
20-21	U16	Maximum Travel Range: 0 – 10000 Units: 0.00 – 100.00 %

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8.8.4 Read (225) last PST test data continued

This command reads the values recorded during the last full stroke

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	U32	SOV reaction time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
4-7	U32	Pressurising time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
8-11	U32	Actuator fill time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
12-15	U32	Total time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek

8.8.5 Read (164) last FST test data

This command reads the values recorded during the last full stroke

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Start pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16	Breakaway pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
4-7	U32	Breakaway time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
8-11	U32	Closing time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
12-15	U32	Opening time Range 0 - 4294967295 mSek

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		Units: 0 – 4294967295 mSek
16-19	U32	Depressuring timeout
		Range 0 - 4294967295 mSek
		Units: 0 – 4294967295 mSek

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8.8.6 Read (226) last FST test data continued

This command reads the values recorded during the last full stroke

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	U32	SOV reaction time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
4-7	U32	Pressurising time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
8-11	U32	Actuator fill time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek
12-15	U32	Total time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek

8.8.7 Read (212) last SOT test data

This command reads the values recorded during the last full stroke

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Solenoid Start pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16	Solenoid Pressure Drop Range: 0 – 50000 Units: 0.00 – 500.00 bar
4-7	U32	Solenoid Reaction Time Range 0 - 4294967295 mSek Units: 0 – 4294967295 mSek

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8.8.8 Read (165) Partial stroke "Test settings"

This command reads the partial stroke "Test settings"

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Test setting: Pressure deadband in Bar Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16 MSB First	Test setting: Pressure deadband in Pct Range: 0 – 1000 MSB First Units: 0.00 – 10.00 %
4-5	U16 MSB First	Test setting: Position deadband Range: 0 – 1000 Units: 0.00 – 100.00 %
6-7	U16 MSB First	Test setting: PST travel Range: 0 – 10000 Units: 0.00 – 100.00 %
8-9	U16	Error Parameters – Start Pressure Low Range: 0 – 50000 Units: 0.00 – 500.00 bar
10-11	U16	Error Parameters – Start Pressure High Range: 0 – 50000 Units: 0.00 – 500.00 bar
12-13	U16	Error Parameters –Min Breakaway pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar
14-17	U32	Error Parameters – Breakaway timeout Units: milliseconds
18-21	U32	Error Parameters – Closing timeout Units: milliseconds
22-25	U32	Error Parameters – Total Timeout Units: milliseconds
26-27	U16	Error Parameters – Minimum allowed pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.9 Read (166) Partial stroke "Warning parameters"

This command reads the partial stroke "Warning parameters"

Request data bytes

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Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Breakaway time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek
4-7	U32 MSB First	Warning parameter: Breakaway time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek
8-11	U32 MSB First	Warning parameter: Closing time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek
12-15	U32 MSB First	Warning parameter: Closing time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

16-17	U16
	MSB First
		Warning parameter: Maximum travel
		    Range: 0 – 1000
		    Units: 0.00 – 100.00 %

18	U8 MSB First	Warning parameter: Hide warnings Values: 0 = Not used 1 = Yes 2 = No
19-20	U16 MSB First	Warning parameter: Breakaway pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar
21-22	U16 MSB First	Warning parameter: Breakaway pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.10 Read (167) Full stroke "Configuration parameters"

This command reads the partial stroke "Warning parameters"

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Test setting: FST Pressure Dead band Bar Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16 MSB First	Test setting: FST Pressure Dead band PCT Range: 0 - 10000

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		Units: 0.00 % - 100.00%
4-5	U16	Test setting: FST Position Deadband Range: 0 – 1000 Units: 0.00 – 100.00 %
6	U8	Test setting: FST Wait at fail position Units: Seconds
7-8	U16	Error parameter: FST Start Pressure Low Units: Bar
9-10	U16	Error parameter: FST Start Pressure High Units: Bar
11-12	U16	Configuration parameter: FST Pressure Min allowed break Units: Bar
13-16	U32	Error parameter: FST Timeout Breakaway Units: milliseconds
17-20	U32	Error parameter: FST Timeout Moving Units: milliseconds
21-24	U32	Error parameter: FST Timeout De Pressuring Units: milliseconds
25-28	U32	Error parameter: FST Timeout Total Units: milliseconds

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8.8.11 Read (168) Full stroke "Configuration parameters"

This command reads the partial stroke "Warning parameters"

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8 MSB First	Warning parameter: FST Hide warnings Values: 0 = Not used 1 = Yes 2 = No
1-2	U16	Warning parameter: FST Breakaway pressure low Units: Bar
3-4	U8	Warning parameter: FST Breakaway pressure high Units: Bar
5-8	U32	Warning parameter: FST Breakaway time Low Units: milliseconds
9-12	U32	Warning parameter: FST Breakaway time high Units: milliseconds
13-16	U32	Warning parameter: FST Closing time Low Units: milliseconds
17-20	U32	Warning parameter: FST Closing time high Units: milliseconds

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8.8.12 Read (169) Solenoid"Configuration parameters"

This command reads the partial stroke "Warning parameters"

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0-1	U16	Test setting: SOT Pressure Dead band Bar Range: 0 – 50000 Units: 0.00 – 500.00 bar
2-3	U16 MSB First	Test setting: SOT Pressure Dead band PCT Range: 0 - 10000 Units: 0.00 % - 100.00%
4-5	U16	Test setting: SOT Position Deadband Range: 0 – 1000 Units: 0.00 – 100.00 %
6-7	U16	Error parameter: SOT Start Pressure Low Units: Bar
8-9	U16	Error parameter: SOT Start Pressure High Units: Bar
10-13	U32	Error parameter: Max TIme Units: milliseconds

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8.8.13 Read (215) Configuration

This command reads IDP configuration

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Fail signal timeout status 0 = Undefined 1 = On 2 = Off
1	U8	Fail signal timeout time Default: 10 min Range: 1-240 Unit: min
2	U8	Pass signal timeout status 0 = Undefined 1 = On 2 = Off
3	U8	Pass signal timeout time Default: 10 min Range: 1-240 Unit: min

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8.8.14 Read (220) Scheduler Configuration

This command reads IDP PST scheduler configuration

Request data bytes

Byte	Format	Description
None		

Response data bytes

Byte	Format	Description
0	U8	Scheduler status 0 = Undefined 1 = On 2 = Off
1	U8	Scheduler month, January Default: 2 (off) 0 = Undefined 1 = On 2 = Off
2	U8	Scheduler month, February Default: 2 (off) 0 = Undefined 1 = On 2 = Off
3	U8	Scheduler month, March Default: 2 (off) 0 = Undefined 1 = On 2 = Off
4	U8	Scheduler month, April Default: 2 (off) 0 = Undefined 1 = On 2 = Off
5	U8	Scheduler month, May Default: 2 (off)

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| | | 0 = Undefined |
| | | 1 = On |
		2 = Off
6	U8	Scheduler month, June
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
7	U8	Scheduler month, July
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
8	U8	Scheduler month, August
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
9	U8	Scheduler month, September
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
10	U8	Scheduler month, October
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
11	U8	Scheduler month, November
		Default: 2 (off)
		0 = Undefined
		1 = On
		2 = Off
12	U8	Scheduler month, December
		Default: 2 (off)

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		0 = Undefined 1 = On 2 = Off	
13	U8	Scheduler Day 1 Default: 0 (not used) Range: 0 – 31, 0 = not used	
14	U8	Scheduler Day 2 Default: 0 (not used) Range: 0 – 31, 0 = not used	
15	U8	Scheduler Day 3 Default: 0 (not used) Range: 0 – 31, 0 = not used	
16	U8	Scheduler Day 4 Default: 0 (not used) Range: 0 – 31, 0 = not used	
17	U8	Scheduler Hour Default: 9 Range 0-23	

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8.8.15 Write (170) Partial stroke "Test settings: Pressure deadband"

This command writes the partial stroke "Test settings"

Request data bytes

Byte	Format	Description
0-1	U16	Test setting: Pressure deadband Range: 0 – 1000 MSB First Units: 0.00 – 10.00 %

Response data bytes

Byte	Format	Description
0-1	U16	Test setting: Pressure deadband Range: 0 – 1000 MSB First Units: 0.00 – 10.00 %

8.8.16 Write (171) Partial stroke "Test settings: Position deadband"

This command writes the partial stroke "Test settings"

Request data bytes

Byte	Format	Description
0-1	U16	Test setting: Position deadband Range: 0 – 1000 Units: 0.00 – 100.00 %

Response data bytes

Byte	Format	Description
0-1	U16	Test setting: Position deadband Range: 0 – 1000 Units: 0.00 – 100.00 %

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8.8.17 Write (172) Partial stroke "Test settings: PST travel"

Request data bytes

Byte	Format	Description
0-1	U16	Test setting: PST travel Range: 0 – 10000 Units: 0.00 – 100.00 %

Response data bytes

Byte	Format	Description
0-1	U16	Test setting: PST travel Range: 0 – 10000 Units: 0.00 – 100.00 %

8.8.18 Write (173) Partial stroke "Error parameter Start pressure low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Start pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Start pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.19 Write (174) Partial stroke "Error parameter Start pressure high"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Start pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Start pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.20 Write (175) Partial stroke "Error parameter: Min. breakaway pressure"

Request data bytes

Byte	Format	Description
0-1	U16	Error parameter: Min. breakaway pressure

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MSB First		Range: 0 – 50000
		Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Min. breakaway pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.21 Write (176) Partial stroke "Error parameter: Breakaway timeout"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Breakaway timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Breakaway timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.22 Write (177) Partial stroke "Error parameter: Closing timeout"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Closing timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Closing timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.23 Write (178) Partial stroke "Error parameter: Total timeout"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Opening timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

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Byte	Format	Description
0-1	U16 MSB First	Error parameter: Opening timeout Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.24 Write (179) Partial stroke "Error parameter: : Min. allowed pressure"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Min. allowed pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameter: Min. allowed pressure Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.25 Write (180) Partial stroke "Warning parameter: Hide Warnings "

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Hide warnings Values: 0 = Not used 1 = Yes 2 = No

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Hide warnings Values: 0 = Not used 1 = Yes 2 = No

8.8.26 Write (181) Partial stroke "Warning parameter: Breakaway pressure low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

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Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.27 Write (182) Partial stroke "Warning parameter: Breakaway pressure high"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.28 Write (183) Partial stroke "Warning parameter: Breakaway time low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.29 Write (184) Partial stroke "Warning parameter: Breakaway time high"

Request data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Breakaway time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Breakaway time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

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8.8.30 Write (185) Partial stroke "Warning parameter: Closing time low"

Request data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Closing time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Closing time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.31 Write (186) Partial stroke "Warning parameter: Closing time high"

Request data bytes

Byte	Format	Description
0-3	U32 MSB First	Warning parameter: Closing time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U32 MSB First	Warning parameter: Closing time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.32 Write (187) Partial stroke "Warning parameter: Maximum travel"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Maximum travel Range: 0 – 1000 Units: 0.00 – 100.00 %

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Maximum travel Range: 0 – 1000 Units: 0.00 – 100.00 %

8.8.33 Write (188) Full stroke "Test Setting: Pressure Deadband"

Request data bytes

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Byte	Format	Description
0-1	U16 MSB First	Configuration parameter: FST Pressure Deadband PCT Range: 0 - 10000 Units: 0.00 % - 100.00%

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Configuration parameter: FST Position Deadband PCT Range: 0 - 10000 Units: 0.00 % - 100.00%

8.8.34 Write (189) Full stroke "Test Setting: Position Dead band"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Configuration parameter: FST Position Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Configuration parameter: FST Position Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

8.8.35 Write (190) Full stroke "Test Setting: Wait at fail pos"

Request data bytes

Byte	Format	Description
0-3	U32 MSB First	Configuration parameter: FST Wait at fail position Units: Seconds

Response data bytes

Byte	Format	Description
0-3	U32 MSB First	Configuration parameter: FST Wait at fail position Units: Seconds

8.8.36 Write (191) Full stroke "Error Parameters: Start Pressure Low"

Request data bytes

Byte	Format	Description

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Byte	Format	Description
0-1	U16 MSB First	FST Start Pressure Low Units: Bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	FST Start Pressure Low Bar

8.8.37 Write (192) Full stroke "Error Parameters: Start Pressure High"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	FST Start Pressure High Units: Bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	FST Start Pressure High Units: Bar

8.8.38 Write (193) Full stroke "Error Parameters: Min breakaway pressure"

Request data bytes

Byte	Format	Description
0-1	U6 MSB First	FST Min breakaway pressure Units: Bar

Response data bytes

Byte	Format	Description
0--1	U16 MSB First	FST Min breakaway pressure Units: Bar

8.8.39 Write (194) Full stroke "Error Parameters: Breakaway timeout"

Request data bytes

Byte	Format	Description

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0 -3	U32 MSB First	FST Breakaway timeout Units: milliseconds

Response data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST Breakaway timeout Units: milliseconds

8.8.40 Write (195) Full stroke "Error Parameters: Closing timeout"

Request data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST Closing timeout Units: milliseconds

Response data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST Closing timeout Units: milliseconds

8.8.41 Write (196) Full stroke "Error Parameters: Depressuring timeout"

Request data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST DePressuring timeout Units: milliseconds

Response data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST DePressuring timeout Units: milliseconds

8.8.42 Write (197) Full stroke "Error Parameters: Total opening timeout"

Request data bytes

Byte	Format	Description

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Byte	Format	Description
0 -3	U32 MSB First	FST Total opening timeout Units: milliseconds

Response data bytes

Byte	Format	Description
0 -3	U32 MSB First	FST Total opening timeout Units: milliseconds

8.8.43 Write (198) Full stroke "Warning parameter: Hide Warnings "

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Hide warnings Values: 0 = Not used 1 = Yes 2 = No

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Hide warnings Values: 0 = Not used 1 = Yes 2 = No

8.8.44 Write (199) Full stroke "Warning parameter: Breakaway pressure low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure low Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.45 Write (200) Full stroke "Warning parameter: Breakaway pressure high"

Request data bytes

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Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway pressure high Range: 0 – 50000 Units: 0.00 – 500.00 bar

8.8.46 Write (201) Full stroke "Warning parameter: Closing time low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Closing time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Closing time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.47 Write (202) Full stroke "Warning parameter: Closing time high"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Closing time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Closing time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

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8.8.48 Write (203) Solenoid "Test settings: Pressure Dead band"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Test settings: Pressure Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Test settings: Pressure Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

8.8.49 Write (204) Solenoid "Test settings: Position Dead band"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Test settings: Position Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Test settings: Position Dead band Range: 0 - 10000 Units: 0.00 % - 100.00%

8.8.50 Write (205) Solenoid "Error parameters: Start Pressure Low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameters: Start Pressure Low Units: Bar

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Error parameters: Start Pressure Low Units: Bar

8.8.51 Write (206) Solenoid "Error parameters: Start Pressure High"

Request data bytes

Byte	Format	Description
0-1	U16	Error parameters: Start Pressure High

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| | MSB First | Units: Bar |

Response data bytes

Byte	Format	Description
0-1	U16	Error parameters: Start Pressure High
	MSB First	Units: Bar

8.8.52 Write (207) Solenoid "Error parameters: Max time"

Request data bytes

Byte	Format	Description
0-3	U32	Error parameters: Max time
	MSB First	Units: milliseconds

Response data bytes

Byte	Format	Description
0-3	U32	Error parameters: Max time
	MSB First	Units: milliseconds

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8.8.53 Write (211) Start test and calibration commands

This command starts a system test

Request data bytes

Byte	Format	Description
0-1	U16	1: Start partial stroke 2: Start full stroke 3: Start solenoid test 4: Abort test 5: Operational 6: Fail position 7: Start auto calibration 8: Start partial stroke reference 9: Start full stroke reference 10: Start solenoid reference

Response data bytes

Byte	Format	Description
0-1	U16	1: Start partial stroke 2: Start full stroke 3: Start solenoid test 4: Abort test 5: Operational 6: Fail position 7: Start auto calibration 8: Start partial stroke reference 9: Start full stroke reference 10: Start solenoid reference

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8.8.54 Write (213) Full stroke "Warning parameter: Breakaway time low"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Break time low Range: 0 – 65535 Units: 0 mSek – 65535 mSek

8.8.55 Write (214) Full stroke "Warning parameter: Breakaway time high"

Request data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

Response data bytes

Byte	Format	Description
0-1	U16 MSB First	Warning parameter: Breakaway time high Range: 0 – 65535 Units: 0 mSek – 65535 mSek

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8.8.56 Write (216) Configuration "Fail signal timeout status"

Request data bytes

Byte	Format	Description
0	U8 MSB First	0 = Undefined 1 = On 2 = Off

Response data bytes

Byte	Format	Description
0	U8 MSB First	0 = Undefined 1 = On 2 = Off

8.8.57 Write (217) Configuration "Fail signal timeout time"

Request data bytes

Byte	Format	Description
0	U8 MSB First	Default: 10 min Range: 1-240 Unit: min

Response data bytes

Byte	Format	Description
0	U8 MSB First	Default: 10 min Range: 1-240 Unit: min

8.8.58 Write (218) Configuration "Pass signal timeout status"

Request data bytes

Byte	Format	Description
0	U8 MSB First	0 = Undefined 1 = On 2 = Off

Response data bytes

Byte	Format	Description
0	U8 MSB First	0 = Undefined 1 = On 2 = Off

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8.8.59 Write (219) Configuration "Pass signal timeout status"

Request data bytes

Byte	Format	Description
0	U8 MSB First	Default: 10 min Range: 1-240 Unit: min

Response data bytes

Byte	Format	Description
0	U8 MSB First	Default: 10 min Range: 1-240 Unit: min

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8.8.60 Write (221) Scheduler Configuration Status

This command write IDP PST scheduler configuration

Request data bytes

Byte	Format	Description
0	U8	Scheduler status 0 = Undefined 1 = On 2 = Off

Response data bytes

Byte	Format	Description
0	U8	Scheduler status 0 = Undefined 1 = On 2 = Off

8.8.61 Write (222) Scheduler Configuration Month

This command write IDP PST scheduler configuration

Request data bytes

0	U8	Scheduler month, January Default: 2 (off) 0 = Undefined 1 = On 2 = Off
1	U8	Scheduler month, February Default: 2 (off) 0 = Undefined 1 = On 2 = Off
2	U8	Scheduler month, March Default: 2 (off) 0 = Undefined 1 = On 2 = Off
3	U8	Scheduler month, April Default: 2 (off) 0 = Undefined 1 = On

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			2 = Off
4	U8	Scheduler month, May Default: 2 (off) 0 = Undefined 1 = On 2 = Off
5	U8	Scheduler month, June Default: 2 (off) 0 = Undefined 1 = On 2 = Off
6	U8	Scheduler month, July Default: 2 (off) 0 = Undefined 1 = On 2 = Off
7	U8	Scheduler month, August Default: 2 (off) 0 = Undefined 1 = On 2 = Off
8	U8	Scheduler month, September Default: 2 (off) 0 = Undefined 1 = On 2 = Off
9	U8	Scheduler month, October Default: 2 (off) 0 = Undefined 1 = On 2 = Off
10	U8	Scheduler month, November Default: 2 (off) 0 = Undefined

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		1 = On
		2 = Off
11	U8	Scheduler month, December Default: 2 (off) 0 = Undefined 1 = On 2 = Off

Response data bytes

0	U8	Scheduler month, January Default: 2 (off) 0 = Undefined 1 = On 2 = Off
1	U8	Scheduler month, February Default: 2 (off) 0 = Undefined 1 = On 2 = Off
2	U8	Scheduler month, March Default: 2 (off) 0 = Undefined 1 = On 2 = Off
3	U8	Scheduler month, April Default: 2 (off) 0 = Undefined 1 = On 2 = Off
4	U8	Scheduler month, May Default: 2 (off) 0 = Undefined 1 = On 2 = Off
5	U8	Scheduler month, June

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		Default: 2 (off) 0 = Undefined 1 = On 2 = Off
6	U8	Scheduler month, July Default: 2 (off) 0 = Undefined 1 = On 2 = Off
7	U8	Scheduler month, August Default: 2 (off) 0 = Undefined 1 = On 2 = Off
8	U8	Scheduler month, September Default: 2 (off) 0 = Undefined 1 = On 2 = Off
9	U8	Scheduler month, October Default: 2 (off) 0 = Undefined 1 = On 2 = Off
10	U8	Scheduler month, November Default: 2 (off) 0 = Undefined 1 = On 2 = Off
11	U8	Scheduler month, December Default: 2 (off) 0 = Undefined 1 = On 2 = Off

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8.8.62 Write (223) Scheduler Configuration Day

This command write IDP PST scheduler configuration

Resuest data bytes

0	U8	Scheduler Day 1 Default: 0 (not used) Range: 0 – 31, 0 = not used
1	U8	Scheduler Day 2 Default: 0 (not used) Range: 0 – 31, 0 = not used
2	U8	Scheduler Day 3 Default: 0 (not used) Range: 0 – 31, 0 = not used
3	U8	Scheduler Day 4 Default: 0 (not used) Range: 0 – 31, 0 = not used

Response data bytes

0	U8	Scheduler Day 1 Default: 0 (not used) Range: 0 – 31, 0 = not used
1	U8	Scheduler Day 2 Default: 0 (not used) Range: 0 – 31, 0 = not used
2	U8	Scheduler Day 3 Default: 0 (not used) Range: 0 – 31, 0 = not used

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3	U8	Scheduler Day 4 Default: 0 (not used) Range: 0 – 31, 0 = not used

8.8.63 Write (224) Scheduler Configuration Hour

This command write IDP PST scheduler configuration

Request data bytes

0	U8	Scheduler Hour Default: 9 Range 0-23

Response data bytes

0	U8	Scheduler Hour Default: 9 Range 0-23

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9 HART Response Codes

All commands can return all the following response codes

Byte	Class	Description
0	Success	
2	Error	Invalid poll address
2	Error	Invalid selection
3	Error	Passed parameter too large
4	Error	Passed parameter too small
5	Error	Too few data bytes received
6	Error	Device specific command error
7	Error	In write protect mode
8	Warning	Update failure
8	Warning	Update in progress
8	Warning	Set to nearest possible value
9	Error	Invalid data code detected
9	Error	Configuration counter mismatch
12	Error	Invalid mode selection
14	Warning	Dynamic variable returned
16	Error	Access restricted
30	Warning	Command response truncated
32	Error	Busy
33	Error	Device initiated
34	Error	Device running
35	Error	Device dead
36	Error	Device conflict
64	Warning	Command not implemented

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