VBus Protocol Specification

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RESOL – Elektronische Regelungen GmbH

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A. General

The RESOL VBus is a 2-wire bus system used by RESOL electronic controllers to communicate with each other and – e.g. using a PC interface – with external components.

· One module on the bus system is the **master**, all other modules are **slaves**.

B. Hardware

· The master supplies the bus system with electric energy using a constant current source. This allows partial power supply of slave modules as well.

· The maximum current is specified as 35 mA (normal version) or 52 mA (special version).

· The maximum volDaye is capped at approx. 8,2 V.

· During transmission a module pulls the bus volDaye to ground level (GND) using a transistor in order to send a logical „1“ (MARK). To send a logical „0“ (SPACE) the bus volDaye has to be kept at the specified maximum level.

· During reception a module uses an analog comparator to distinguish between the two states MARK and SPACE (see below for details). The volDaye difference between MARK and SPACE is used as a hysteresis.

· Slave modules rectify the bus volDaye to ensure reverse-polarity protection. Due to the volDaye drop over the rectifier diodes the master and slave modules use different trigger volDayes for MARK and SPACE detection.

Trigger volDayes at the comparator input:

	Master	**Slave**
SPACE	3,25 V	2,25 V
MARK	3,00 V	2,00 V

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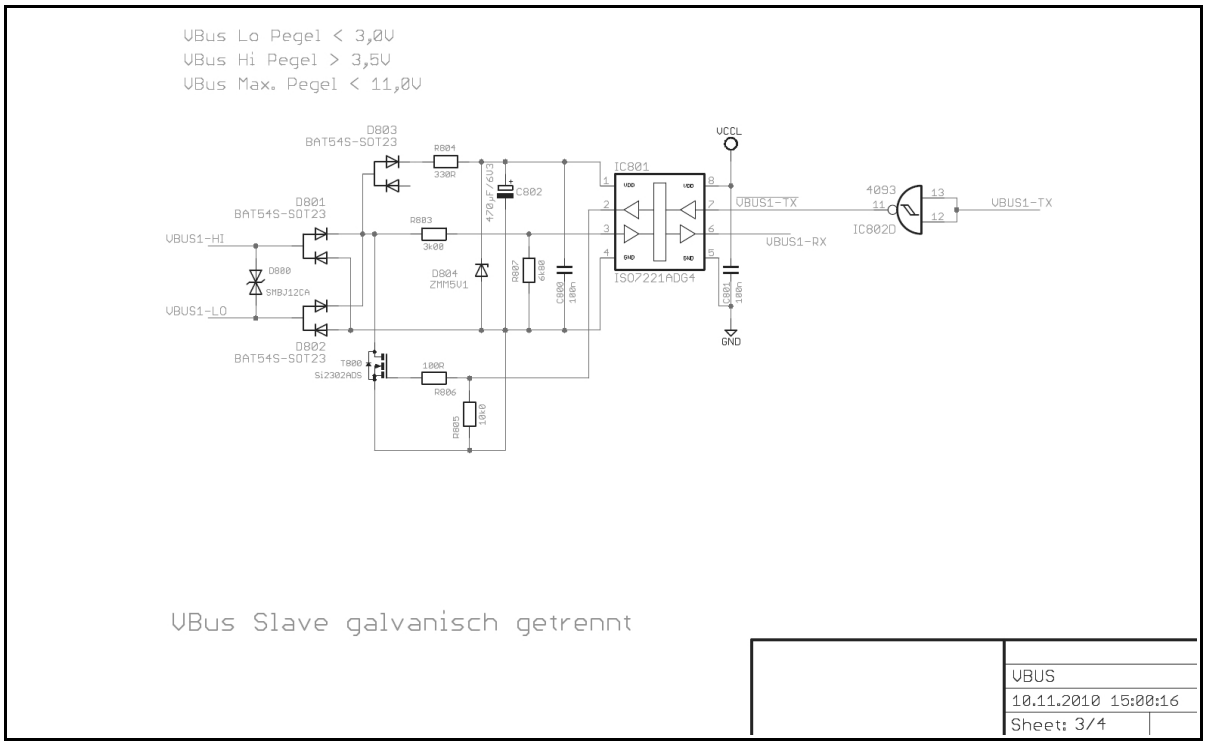

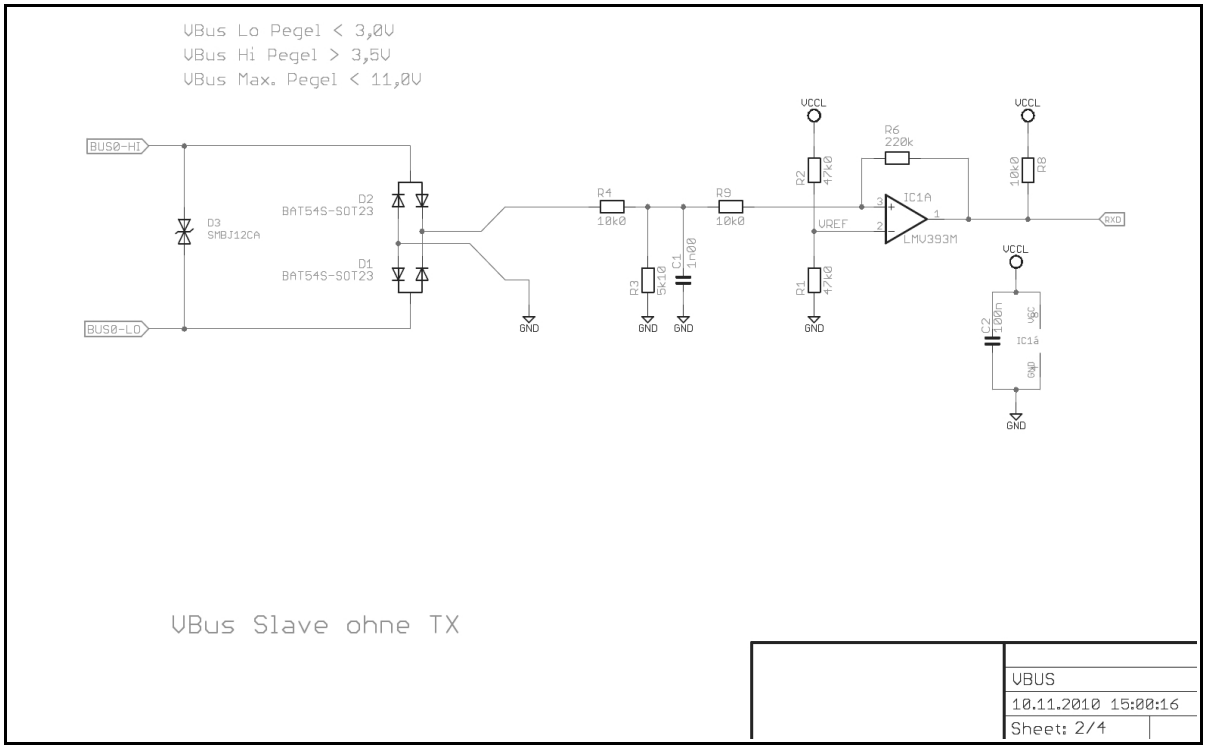

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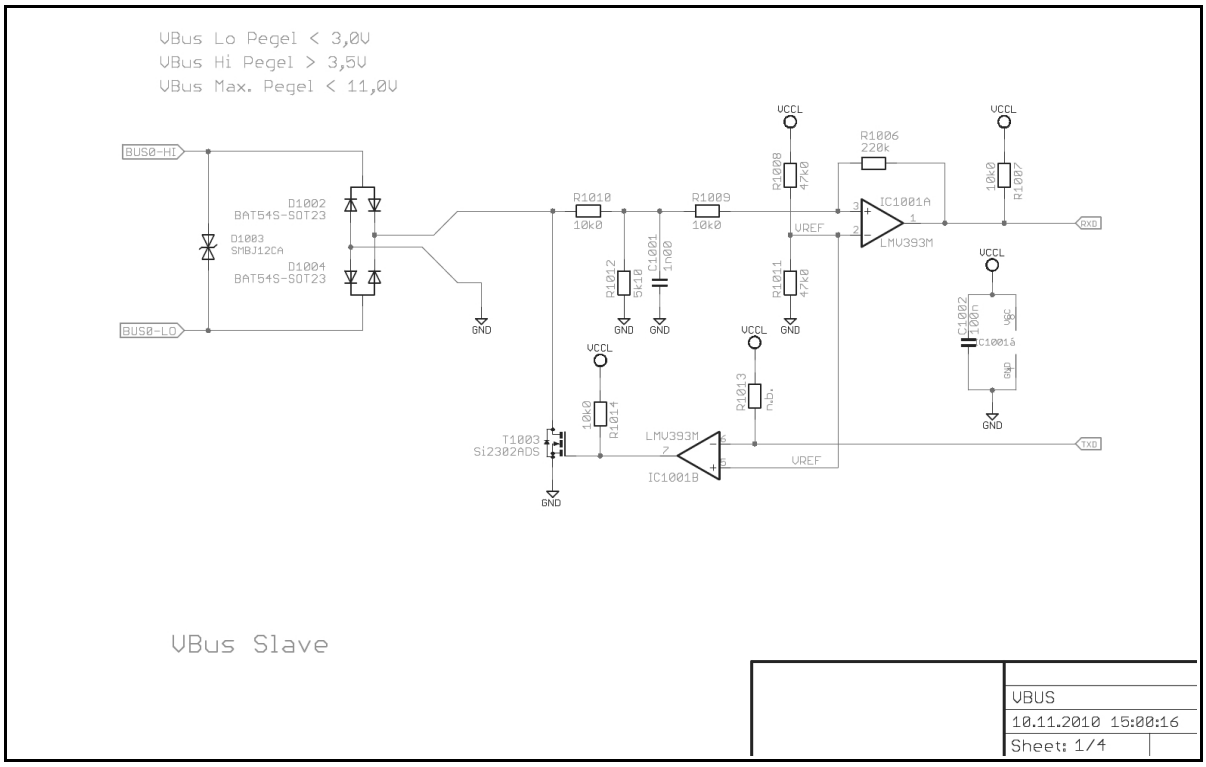

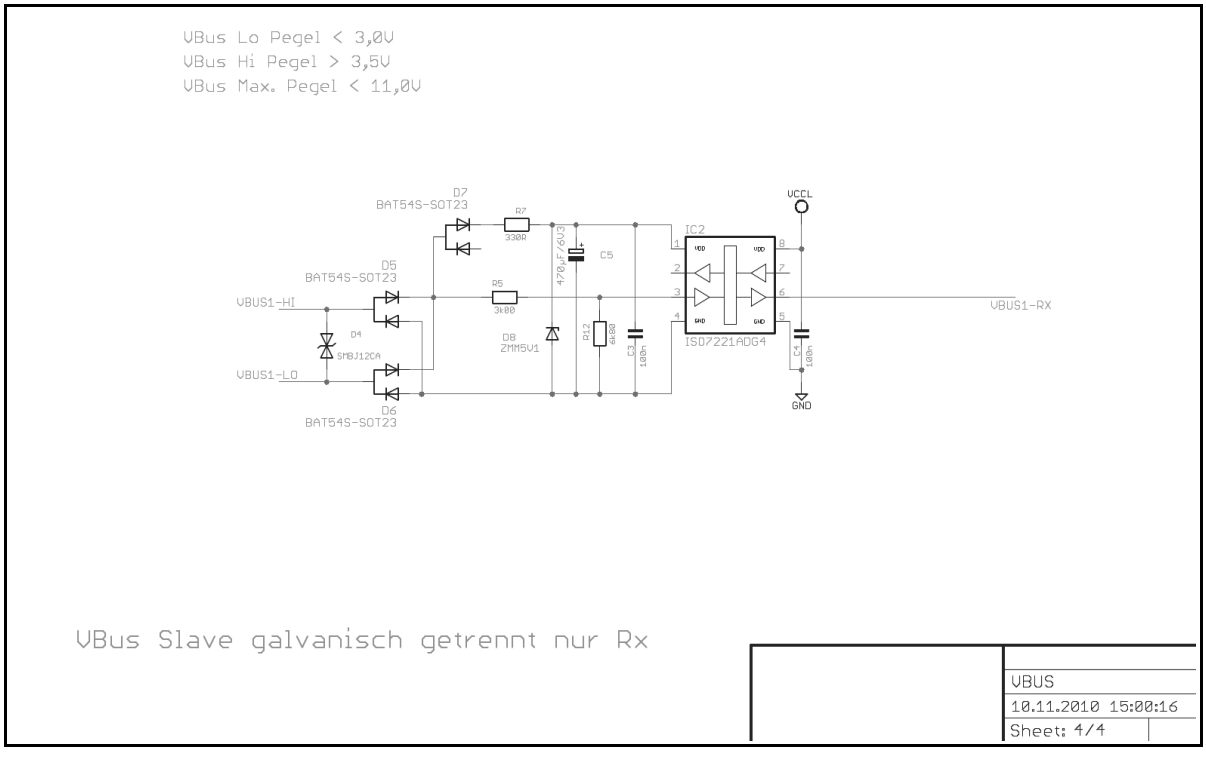

This Schemetic is designed for use with a supply volDaye of VCCL = 3.3 V. To use a supply volDaye of VCCL = 5.0 V the following resistor values have to be adjusted:

	R205	R207
3,3 V	820 Ω	1600 Ω
5,0 V	2200 Ω	1600 Ω

C. VBus Data Protocol

For data transmission and reception a UART is used in half-duplex mode with 9600 bits per second, 1 start bit, 8 data bits and one stop bits. Neither parity nor handshakes are used.

Since the VBus is a single-master-system the communication timing is controlled by the master. The master pauses for short moments during the transmission to ensure that all bus-powered slaves have enough time to recharge. In addition to that slaves are only allowed to send data after they have been requested to do so by the master. After a master's request an appropriate time frame is reserved for the answer.

1. SYNC-Byte

Every VBus data stream starts with a synchronisation byte (SYNC-Byte):

0xAA or 170 decimal

The reception of a SYNC-Byte starts a new data stream. If the current reception was incomplete it will be cancelled and discarded. This happens as well whenever a byte is received that has its MSB (Most Significant Bit) set (its value is greater than 0x7F or 127 decimal). All received bytes up to the next SYNC-Byte are ignored.

Reception is complete if the data stream reaches its announced length without MSB or checksum errors. The data stream is then processed and reception starts with next SYNC-Byte.

2. Checksums

To detect communication errors the data stream is protected by one or more checksums. The data stream's length and amount of checksums are depending on several factors:

- protocol version
- announced amount of payload

Checksums can be calculated using the following C function:

```
unsigned char VBus_CalcCrc(const unsigned char *Buffer, int Offset, int Length)
{
    unsigned char Crc;
    int i;

    Crc = 0x7F;
    for (i = 0; i < Length; i++) {
        Crc = (Crc - Buffer [Offset + i]) & 0x7F;
    }
    return Crc;
}
```

3. Septet-Bytes

During transmission of payload data care must be taken that no byte is transmitted with its MSB set. To ensure this the MSBs of up to seven payload bytes are extracted for the duration of the transmission into an addition MSB collection byte (called „Septet-Byte“) and transmitted separately. The extraction and re-injection are handled by the following C functions:

```
void VBus_ExtractSeptett(unsigned char *Buffer, int Offset, int Length)
{
    unsigned char Septett;
    int i;

    Septett = 0;
    for (i = 0; i < Length; i++) {
        if (Buffer [Offset + i] & 0x80) {
            Buffer [Offset + i] &= 0x7F;
            Septett |= (1 << i);
        }
    }
    Buffer [Offset + Length] = Septett;
}

void VBus_InjectSeptett(unsigned char *Buffer, int Offset, int Length)
```

```
{
    unsigned char Septett;
    int i;

    Septett = Buffer [Offset + Length];
    for (i = 0; i < Length; i++) {
        if (Septett & (1 << i)) {
            Buffer [Offset + i] |= 0x80;
        }
    }
}
```

A payload data block of four bytes would be transformed like this:

Before	After	Description
0xE8	0x68	First payload byte, MSB (=1) is extracted to Septet-Bit 0
0x03	0x03	Second payload byte, MSB (=0) is extracted to Septet-Bit 1
0xF4	0x74	Third payload byte, MSB (=1) is extracted to Septet-Bit 2
0x01	0x01	Fourth payload byte, MSB (=0) is extracted to Septet-Bit 3
	0x05	Septet-Byte

4. Head of a VBus data stream

The first 6 bytes of a VBus data stream (starting with the SYNC-Byte) share the same structure for all protocol versions:

Offset	Description
0	SYNC-Byte (0xAA or 170 decimal)
1	Destination address
2	Destination address
3	Source address
4	Source address
5	Protocol version

Addresses are assigned by RESOL. Every module on the VBus has at least one address. Modules that have an adjustable sub-address use the four least significant bits for that. See chapter G.Known Addresses on page 18 for a list of known addresses.

The remaing data stream structure differs depending on the „Protocol version“ byte. The following values are valid:

Value	Description
0x10 or 16 decimal	Protocol version 1.0
0x20 or 32 decimal	Protocol version 2.0
0x30 or 48 decimal	Protocol version 3.0

D. Protocol version 1.0

VBus data streams of protocol version 1.0 (called „packets“) are used for continous data exchange of measurement, control and balance values between a master and its slaves. Packets start with a 10 byte header that can announce a variable amount of additional payload.

Offset	Description
0	SYNC-Byte (0xAA or 170 decimal)
1	Destination address
2	Destination address
3	Source address
4	Source address
5	Protocol version
6	Command
7	Command
8	Number of payload frames
9	Checksum for offset 1-8

The payload is split into blocks of four bytes and transmitted together with its Septet-Byte and a checksum as a „frame“.

Offset	Description
i + 0	First payload byte, MSB is extracted to Septet-Bit 0
i + 1	Second payload byte, MSB is extracted to Septet-Bit 1
i + 2	Third payload byte, MSB is extracted to Septet-Bit 2
i + 3	Fourth payload byte, MSB is extracted to Septet-Bit 3
i + 4	Septet-Byte
i + 5	Checksum for offset (i + 0) to (i + 4)

The header field „Command“ can be one of the following values:

Command	Explanation
0x0100	Packet contains data for slave
0x0200	Packet contains data for slave, answer required
0x0300	Request answer of slave

The contents of the payload is is depending on three header fields:

- Source address
- Destination address
- Command

After the header was received without errors the contents of the payload is known. See chapter H.Known Packets (VBus Protocol Version 1.0) on page 21 for a list of known packets (address / command combinations).

A short packet may look like this:

Offset	Value	Explanation
0	0xAA	SYNC-Byte
1	0x11	Destination address
2	0x44	Destination address
3	0x10	Source address
4	0x66	Source address
5	0x10	Protocol version
6	0x00	Command
7	0x02	Command
8	0x01	Number of payload frames
9	0x21	Checksum for offset 1-8
10	0x07	First payload byte
11	0x04	Second payload byte
12	0x0F	Third payload byte
13	0x00	Fourth payload byte
14	0x00	Septett for offset 10-13
15	0x65	Checksum for offset 10-14

This packet is sent by module 0x6610 (RESOL Midi Pro) and is directed to module 0x4411 (RESOL HKM1) including command 0x0200 (Packet contains data for slave, answer required). These three components define the payload contents.

E. Protocol version 2.0

VBus data streams of protocol version 2.0 (called „daDayrams“) allow access to all values that can be adjusted using the module's menu system. It's primarily used for remote parameterization.

Each daDayram has a length of 16 bytes and allows to access a single data point (adjustable value). Every data point has an ID. IDs are module and version dependant. A complete list of IDs would go far beyond the scope of the document. For further reference please use the RESOL ServiceCenter software to create a new project for the controller you want to target. Each adjustable value has its ID listed in the first column of the „Parameterization“ view.

Offset	Explanation
0	SYNC-Byte (0xAA or 170 decimal)
1	Destination address
2	Destination address
3	Source address
4	Source address
5	Protocol version
6	Command
7	Command
8	ID of data point
9	ID of data point
10	Value of data point
11	Value of data point
12	Value of data point
13	Value of data point
14	Septet for offset 8-13
15	Checksum for offset 1-14

The header field „Command“ can be one of the following values:

Command	Explanation
0x0100	Answer from module with requested value
0x0200	Write value, acknowledgement required
0x0300	Read value, acknowledgement required
0x0400	Write value, acknowledgement required
0x0500	VBus clearance by master module
0x0600	VBus clearance by slave module

In regular intervals the master broadcasts daDayrams containing command 0x0500. This allows slave modules to temporarily take over the bus timing. A PC issuing a parameterization has to wait for such a clearance daDayram before starting to send daDayrams to read or write the master's data points. On completion of the parameterization the PC sends a daDayram containing command 0x0600 to return the bus timing control back to the previous master.

Destination	Source	Command	ID	Value	Description
0x0000	0x7210	0x0500	0	0	Broadcast for clearance
0x7210	0x0020	0x0300	0x1234	0	PC reads value for ID 0x1234
0x0020	0x7210	0x0100	0x1234	750	Master sends value 750 for ID 0x1234
0x7210	0x0020	0x0300	0x1235	0	PC reads value for ID 0x1235
…	…	…	…	…	…
0x0020	0x7210	0x0100	0x3456	12	Master sends value 12 for ID 0x3456
0x7210	0x0020	0x0600	0	0	PC returns bus timing to master

F. Protocol version 3.0

VBus data streams of protocol version 3.0 are used to manage and evaluate digital sensors and actors.

TO BE DOCUMENTED

G. Known Addresses

Address	Mask	Name
0x0000	0xFFFF	Broadcast
0x0010	0xFFFF	DFA
0x3011	0xFFFF	WMZ-L10
0x7731	0xFFFF	SOLTOP DeltaSol S2/S3
0x7711	0xFFFF	Multitronic [Controller]
0x7712	0xFFFF	Multitronic [WMZ]
0x6620	0xFFFF	SunGo XL
0x7F71	0xFFFF	DeltaSol FCS
0x7421	0xFFFF	DeltaSol BX
0x4252	0xFFFF	BS Solex US
0x7E11	0xFFFF	DeltaSol MX [Controller]
0x7E21	0xFFFF	DeltaSol MX [Heating circuit #]
0x7E31	0xFFFF	DeltaSol MX [WMZ #]
0x1120	0xFFFF	DeltaSol AL-E
0x7774	0xFFFF	EMZ/CME
0x7331	0xFFFF	SLR
0x7332	0xFFFF	SLR expansion module #1
0x7333	0xFFFF	SLR expansion module #2
0x7334	0xFFFF	SLR expansion module #3
0x7335	0xFFFF	SLR expansion module #4
0x6521	0xFFF0	MSR-65 #
0x3311	0xFFFF	Diemasol C
0x7751	0xFFFF	DeDietrich Diemasol C v2007
0x4311	0xFFFF	Drainback DeDietrich
0x7511	0xFFFF	SOLTEX-Controller [Part 1]
0x7512	0xFFFF	SOLTEX-Controller [Part 2]
0x7315	0xFFFF	DeltaSol M [Volume]
0x4241	0xFFFF	Huber - REGLOfresh / Felix [Controller]
0x7221	0xFFFF	DrainBloC
0x7231	0xFFFF	SC25
0x3241	0xFFFF	DT4 (B)
0x5221	0xFFFF	DT4 (MS)
0x3271	0xFFFF	ConergyDT5
0x3211	0xFFFF	EL1
0x3221	0xFFFF	DeltaSol Pro

0x3231	0xFFFF	DeltaSol B
0x3251	0xFFFF	DeltaSol BS
0x4010	0xFFF0	WMZ #
0x4221	0xFFFF	DeltaSol BS Plus
0x4420	0xFFF0	HKM1 #
0x5210	0xFFFF	DeltaSol Plus
0x5510	0xFFFF	EL2/3
0x6510	0xFFFF	HKM2
0x6520	0xFFFF	MSR65
0x6610	0xFFFF	Midi Pro
0x6650	0xFFFF	EM1
0x7311	0xFFFF	DeltaSol M [Controller]
0x7312	0xFFFF	DeltaSol M [HK1]
0x7313	0xFFFF	DeltaSol M [HK2]
0x7316	0xFFFF	DeltaSol M [WMZ1]
0x7317	0xFFFF	DeltaSol M [WMZ2]
0x7411	0xFFFF	DeltaSol ES
0x7611	0xFFFF	Friwa
0x7621	0xFFFF	SOLEX [Controller]
0x7622	0xFFFF	SOLEX [WMZ]
0x7721	0xFFFF	DeltaSol E [Controller]
0x7722	0xFFFF	DeltaSol E [WMZ]
0x7F61	0xFFFF	IOC-Modul [measured values]
0x7F62	0xFFFF	IOC-Modul [daily balance]
0x5111	0xFFFF	DeltaSol D
0x4278	0xFFFF	DeltaSol BS/DrainBack
0x4279	0xFFFF	DeltaSol BS/DrainBack (Fahrenheit)
0x7761	0xFFFF	DeltaSol Pool
0x7762	0xFFFF	DeltaSol Pool [WMZ]
0x4212	0xFFFF	DeltaSol C
0x4223	0xFFFF	DeltaSol BS Plus BTU
0x4321	0xFFFF	DeltaSol MiniPool
0x4111	0xFFFF	DeltaSol AL
0x7729	0xFFFF	DeltaSol E Fahrenheit [Controller]
0x772A	0xFFFF	DeltaSol E Fahrenheit [WMZ]
0x427B	0xFFFF	DeltaSol BS 2009
0x5311	0xFFFF	X-Control
0x4261	0xFFFF	DeltaSol E SorTech [Controller]
0x7210	0xFFFF	SKSR 1/2/3
0x7211	0xFFFF	SKSC3 [HK1]

0x7212	0xFFFF	SKSC3 [HK2]
0x7213	0xFFFF	SKSC3 [HK3]
0x4211	0xFFFF	SKSC1/2-Prototype
0x4231	0xFFFF	Frista
0x4251	0xFFFF	DSPlus UMSYS [Controller]
0x4265	0xFFFF	Aton DeltaSol BS
0x7321	0xFFFF	Vitosolic 200 [Controller]
0x7326	0xFFFF	Vitosolic 200 [WMZ1]
0x7327	0xFFFF	Vitosolic 200 [WMZ2]
0x7821	0xFFFF	COSMO Multi [Controller]
0x7822	0xFFFF	COSMO Multi [WMZ]

H. Known Packets (VBus Protocol Version 1.0)

1. MSR-65 (0x6521) <= Broadcast (0x0000), Command 0x0200

Offset	Size	Mask	Name	Factor	Unit
0	1		Pump speed 1 R1	1	%
1	3		Runtime 1 R1	1	s
4	1		Pump speed 2 R1	1	%
5	3		Runtime 2 R1	1	s
8	1		Pump speed 1 R2	1	%
9	3		Runtime 1 R2	1	s
12	1		Pump speed 2 R2	1	%
13	3		Runtime 2 R2	1	s
16	1		Pump speed 1 R3	1	%
17	3		Runtime 1 R3	1	s
20	1		Pump speed 2 R3	1	%
21	3		Runtime 2 R3	1	s
24	1		Pump speed 1 R4	1	%
25	3		Runtime 1 R4	1	s
28	1		Pump speed 2 R4	1	%
29	3		Runtime 2 R4	1	s
32	1		Pump speed 1 R5	1	%
33	3		Runtime 1 R5	1	s
36	1		Pump speed 2 R5	1	%
37	3		Runtime 2 R5	1	s
40	1		Offset Sensor 1	0.1	K
41	1		Offset Sensor 2	0.1	K
42	1		Offset Sensor 3	0.1	K
43	1		Offset Sensor 4	0.1	K
44	1		Offset Sensor 5	0.1	K
45	1		Offset Sensor 6	0.1	K
46	1		Sensor mask	1	
47	1		Relay mask	1	

2. Broadcast (0x0000) <= MSR-65 (0x6521), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C

3. DFA (0x0010) <= EL1 (0x3211), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed R1	1	%
7	1		Error code	1	
8	2		Pump runtime R1	1	h
10	1		Loading status	1	
11	1		Flags	1	

4. DFA (0x0010) <= DeltaSol Pro (0x3221), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Pump speed relay 2	1	%
8	2		Control flags	1	
10	1		Error mask	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h

5. DFA (0x0010) <= DeltaSol Plus (0x5210), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	1		Pump speed relay 1	1	%
11	1		Pump speed relay 2	1	%
12	2		Flow rate	1	l/h
14	1		Antifreeze ratio	1	%
15	1		Antifreeze type	1	
16	2		Heat	1	Wh
18	2		Heat	1000	Wh
20	2		Heat	1000000	Wh
22	1		Hardware	1	
23	1		Software	1	
24	1		Error mask	1	
25	1		Error info 1	1	
26	1		Error info 2	1	
27	1		Relay mask	1	
28	2		System time	1	

6. DFA (0x0010) <= EL2/3 (0x5510), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Operating hours	1	h
10	1		Pump speed relay 1	1	%
11	1		Control status	1	
12	1		Error mask	1	

7. DFA (0x0010) <= Midi Pro (0x6610), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	1	1	Relay status 1	1	
12	1	2	Relay status 2	1	
12	1	4	Relay status 3	1	
12	1	8	Relay status 4	1	
12	1	16	Relay status 5	1	
12	1	32	Relay status 6	1	
13	1		Pump speed 1	1	%
15	1		Error number	1	
16	2		Error mask	1	
18	1		Error info 1	1	
19	1		Error info 2	1	
20	1		Error info 3	1	
21	1		Error info 4	1	
22	2		Arrangement options 1	1	
24	1		System	1	
25	2		Version	1	
27	1		Module status	1	
28	2		System time	1	
30	1		Pump speed 2	1	%
31	1		Pump speed 3	1	%
32	1		Arrangement options 2	1	
33	2		Irradiation	1	W/m²
35	1		Operating hours flag	1	

8. Broadcast (0x0000) <= WMZ (0x4010), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Heat	1000	Wh
2	2		Heat	1	Wh
4	2		Flow rate	0.01	qm/h
6	1		Power	10	W
8	2		Flow temperature	0.1	°C
10	2		Return temperature	0.1	°C
12	2		Heat	1000000	Wh
14	1		Power	2560	W
15	1		Glycol	1	
16	1		Pressure	0.0	bar

9. DFA (0x0010) <= DeltaSol BS Plus (0x4221), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed pump 1	1	%
9	1		Pump speed pump 2	1	%
10	1		Relay mask	1	
11	1		Error mask	1	
12	2		System time	1	
14	1		Scheme	1	
15	1	1	Option collector max.	1	
15	1	2	Option collector min.	1	
15	1	4	Option collector frost	1	
15	1	8	Option tube collector	1	
15	1	16	Option recooling	1	
15	1	32	Option HQM	1	
16	2		Operating hours relay 1	1	
18	2		Operating hours relay 2	1	
20	2		Heat quantity	1	Wh
22	2		Heat quantity	1000	Wh
24	2		Heat quantity	1000000	Wh
26	2		Version	0.01	

10. HKM1 #%d (0x4420) <= Broadcast (0x0000), Command 0x0200

Offset	Size	Mask	Name	Factor	Unit
8	1		Maximum flow temperature	1	°C
9	1		HC characteristic curve	0.1	
10	1		Night correction	1	K
11	1		Day correction	1	K
12	1		Mixer runtime	1	s
13	1		Summer operation	1	°C
14	1		Timer info	1	

11. Broadcast (0x0000) <= HKM1 (0x4420), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	1		Error status	1	
1	2		Module status	1	
3	1		Relay status	1	
4	2		Error info	1	
8	2		Flow temperature	0.1	°C
10	2		Remote control	0.1	°C
12	2		Outdoor temperature	0.1	°C
16	2		Flow set temperature	0.1	°C
18	2		Module version	1	

12. DFA (0x0010) <= DeltaSol M [Controller] (0x7311), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Temperature sensor 11	0.1	°C
22	2		Temperature sensor 12	0.1	°C
24	2		Irradiation	1	W/m²
28	4		Impulse input 1	1	
32	4		Impulse input 2	1	
36	2		Sensor line break mask	1	
38	2		Sensor short-circuit mask	1	
40	2		Sensor usage mask	1	
44	1		Pump speed relay 1	1	%
45	1		Pump speed relay 2	1	%
46	1		Pump speed relay 3	1	%
47	1		Pump speed relay 4	1	%
48	1		Pump speed relay 5	1	%
49	1		Pump speed relay 6	1	%
50	1		Pump speed relay 7	1	%
51	1		Pump speed relay 8	1	%
52	1		Pump speed relay 9	1	%
58	2		Relay usage mask	1	
60	2		Error mask	1	
62	2		Warning mask	1	
64	2		Controller version	1	
66	2		System time	1	

13. DFA (0x0010) <= DeltaSol M [HK1] (0x7312), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Remote control	0.1	K
4	2		Outdoor temperature	0.1	°C
6	2		Store temperature	0.1	°C
8	2		Flow set temperature	0.1	°C
10	1		Relay mask	1	

14. DFA (0x0010) <= DeltaSol M [WMZ1] (0x7316), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate	1	l/h
6	2		Heat	1	Wh
8	2		Heat	1000	Wh
10	2		Heat	1000000	Wh

15. DFA (0x0010) <= DeltaSol ES (0x7411), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Flow rate	0.01	qm/h
18	2		Irradiation	1	W/m²
20	1	8	Relay 4	1	
20	1	16	Relay 5	1	
20	1	32	Relay 6	1	
21	1		Pump speed 1	1	%
22	1		Pump speed 2	1	%
23	1		Pump speed 3	1	%
24	2		System time	1	
26	2		Scheme	1	
27	1	1	Option: collector cooling	1	
27	1	2	Option: collector minimum limitation	1	
27	1	4	Option: Frost protection function	1	
27	1	8	Option: tube collector function	1	
27	1	16	Option: recooling	1	
27	1	32	Opt.: heat quantity measurement	1	
28	2		Operating hours 1	1	h
30	2		Operating hours 2	1	h
32	2		Operating hours 3	1	h
34	2		Operating hours 4	1	h
36	2		Operating hours 5	1	h
38	2		Operating hours 6	1	h
40	2		Heat quantity	1	Wh
42	2		Heat quantity	1000	Wh
44	2		Heat quantity	1000000	Wh

16. HKM2 (0x6510) <= Broadcast (0x0000), Command 0x0200

Offset	Size	Mask	Name	Factor	Unit
0	2		Control register	1	
8	1		Maximum flow temperature	1	°C
9	1		HC characteristic curve	0.1	
10	1		Night correction	1	K
11	1		Day correction	1	K
12	1		Mixer runtime	1	s
13	1		Summer operation	1	°C
14	1		Timer info	1	
15	1		Option afterheating	1	
16	2		Store temperature 1 (Bus)	0.1	°C
18	2		Outdoor temperature Bus	0.1	°C
20	2		dT AH on	0.1	K
22	2		dT AH off	0.1	K
24	1		Minimum store temperature	1	°C
25	1		Store cooling temperature	1	°C
26	1		Store demand temperature (on)	1	°C
27	1		Store demand temperature (off)	1	°C
28	1		DHW demand temperature (on)	1	°C
29	1		DHW demand temperature (off)	1	°C
30	2		Store temperature 2 (Bus)	0.1	°C

17. Broadcast (0x0000) <= HKM2 (0x6510), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	1		Error status	1	
1	2		Module status	1	
3	1	1	Relay 1	1	
3	1	2	Relay 2	1	
3	1	4	Relay 3	1	
3	1	8	Relay 4	1	
3	1	16	Relay 5	1	
3	1	32	Relay 6	1	
4	2		Error info	1	
8	2		Flow temperature	0.1	°C
10	2		Remote control	0.1	°C
12	2		Outdoor temperature	0.1	°C
14	2		Store temperature 1	0.1	°C
16	2		Flow set temperature	0.1	°C
18	2		Module version	1	
20	2		Store temperature 2	0.1	°C
23	2		Temperature sensor 6	0.1	°C

18. DFA (0x0010) <= DeltaSol B (0x3231), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Error mask	1	
8	2		Operating hours relay 1	1	h
10	1		Realy Mask	1	
10	1	1	Relay status relay 1	1	
10	1	2	Relay status relay 2	1	

19. DFA (0x0010) <= DeltaSol BS (0x3251), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Error mask	1	
8	2		Operating hours relay 1	1	h

20. DFA (0x0010) <= Friwa (0x7611), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		System time	1	
20	1		Pump speed relay 1	1	%
21	1		Pump speed relay 2	1	%
22	1	4	Status relay 3	1	
22	1	8	Status relay 4	1	
23	1		Sensor defect mask	1	
24	1		DHW set temperature	1	°C
25	1		Options	1	
26	1		Status	1	
28	2		Heat quantity	1	Wh
30	2		Heat quantity	1000	Wh
32	2		Heat quantity	1000000	Wh
34	1		Version	1	
35	1		Version	0.01	

21. DFA (0x0010) <= SOLEX [Controller] (0x7621), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Flow rate sensor 8	1	l/h
16	2		Irradiation Sensor 9	1	W/m²
18	2		System time	1	
20	1		Pump speed relay 1	1	%
21	1		Pump speed relay 2	1	%
22	1		Pump speed relay 3	1	%
23	1		Pump speed relay 4	1	%
24	1		Pump speed relay 5	1	%
25	2		Error mask	1	
28	2		Messages	1	
30	1		Version	1	
31	1		Version	0.01	

22. DFA (0x0010) <= SOLEX [WMZ] (0x7622), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate sensor 8	1	l/h
6	2		Heat quantity	1	Wh
8	2		Heat quantity	1000	Wh
10	2		Heat quantity	1000000	Wh

23. DFA (0x0010) <= DeltaSol E [Controller] (0x7721), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Irradiation CS	1	W/m²
22	2		Impulse 1 V40	1	
24	2		Digital Input	1	
26	1		Pump speed relay 1	1	%
27	1		Pump speed relay 2	1	%
28	1		Pump speed relay 3	1	%
29	1		Pump speed relay 4	1	%
30	1		Pump speed relay 5	1	%
31	1		Pump speed relay 6	1	%
32	1		Pump speed relay 7	1	%
36	2		Error mask	1	
38	2		Messages	1	
40	1		System	1	
42	2		Scheme	1	
44	2		Flow set HC1 module sensor 18	0.1	°C
46	2		Status HC1 module	1	
48	2		Flow set HC2 module sensor 25	0.1	°C
50	2		Status HC2 module	1	
52	2		Flow set HC3 module sensor 32	0.1	°C
54	2		Status HC3 module	1	
56	2		Flow set heating circuit Sensor 11	0.1	°C
58	2		Heating circuit status	1	
60	1		Version	1	
61	1		Version	0.01	
62	2		System time	1	
64	2		Year	1	
66	1		Month	1	
67	1		Day	1	

24. DFA (0x0010) <= DeltaSol E [WMZ] (0x7722), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate sensor 8	1	l/h
6	2		Heat quantity	1	Wh
8	2		Heat quantity	1000	Wh
10	2		Heat quantity	1000000	Wh

25. DFA (0x0010) <= IOC-Modul [measured values] (0x7F61), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	4		Secondary no	1	
4	4		T-ambient	0.1	
8	4		T-flow/S1	0.1	
12	4		T-return/S2	0.1	
16	4		TSL	0.1	
20	4		Tmax-Temp./S5	0.1	
24	4		Irradiation	0.1	
28	4		Flow rate 1	1	
32	4		Flow rate 2	1	
36	4		S6	0.1	
40	4		S7	0.1	
44	4		Rated current 1	0.01	
48	4		Rated current 2	0.01	
52	4		Date measured values	1	
56	4		Heat quantity 1	0.01	
60	4		Heat quantity 2	0.01	
64	4		5 min error code	1	
68	2		Solar heat	1	
70	2		Solar heat	1000	
72	2		Solar heat	1000000	
74	2		Solar heat	1,00E+009	

26. DFA (0x0010) <= IOC-Modul [daily balance] (0x7F62), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	4		Date	1	
4	4		H-Day	0.01	kWh/(m²*d)
8	4		Q-mess	0.0010	kWh/(m²*d)
12	4		Q-est2	0.0010	kWh/(m²*d)
16	4		Q-est	0.0010	kWh/(m²*d)
20	4		Message	1	
24	4		dt-meas	0.01	h
28	4		dt_est2	0.01	h
32	4		dt-estimated	0.01	h
36	4		Qutil-m	0.01	kWh/(m²*d)
40	4		Qutil-e2	0.01	kWh/(m²*d)
44	4		Qutil-e	0.01	kWh/(m²*d)
48	4		Qtv-e2	0.0010	kWh/(m²*d)
52	4		Qtv-e	0.0010	kWh/(m²*d)
56	4		Qkv-e2	0.0010	kWh/(m²*d)
60	4		Qkv-e	0.0010	kWh/(m²*d)
64	4		Qskv-e2	0.0010	kWh/(m²*d)
68	4		Qskv-e	0.0010	kWh/(m²*d)
72	4		Tset day	0.01	°C

27. DFA (0x0010) <= DeltaSol D (0x5111), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		System pressure	0.1	bar
12	2		Flow rate	1	l/h
14	1		Pump speed relay 1	1	%
15	1		System message	1	
20	4		Heat quantity	1	Wh
24	4		Date	1	
28	2		Time	1	

28. DFA (0x0010) <= DeltaSol BS/DrainBack (0x4278), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	1	1	Sensor 1 defective	1	
10	1	2	Sensor 2 defective	1	
10	1	4	Sensor 3 defective	1	
10	1	8	Sensor 4 defective	1	
10	1	16	Emergency store temperature	1	
10	1	32	Collector emergency temperature	1	
11	1	1	R1 manual operation	1	
11	1	2	R2 manual operation	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	2		Heat quantity	1	Wh
18	2		Heat quantity	1000	Wh
20	2		Heat quantity	1000000	Wh
22	1		Status	1	
23	1		Programs	1	
24	2		Version	0.01	

29. DFA (0x0010) <= DeltaSol BS/DrainBack (Fahrenheit) (0x4279), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°F
2	2		Temperature sensor 2	0.1	°F
4	2		Temperature sensor 3	0.1	°F
6	2		Temperature sensor 4	0.1	°F
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	1	1	Sensor 1 defective	1	
10	1	2	Sensor 2 defective	1	
10	1	4	Sensor 3 defective	1	
10	1	8	Sensor 4 defective	1	
10	1	16	Emergency store temperature	1	
10	1	32	Collector emergency temperature	1	
11	1	1	R1 manual operation	1	
11	1	2	R2 manual operation	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	2		Heat quantity	1	Wh
18	2		Heat quantity	1000	Wh
20	2		Heat quantity	1000000	Wh
22	1		Status	1	
23	1		Programs	1	
24	2		Version	0.01	

30. DFA (0x0010) <= DeltaSol Pool (0x7761), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Irradiation CS	1	W/m²
22	2		Impulse 1 V40	1	
24	2		Digital Input	1	
26	1		Pump speed relay 1	1	%
27	1		Pump speed relay 2	1	%
28	1		Pump speed relay 3	1	%
29	1		Pump speed relay 4	1	%
30	1		Pump speed relay 5	1	%
31	1		Pump speed relay 6	1	%
32	1		Pump speed relay 7	1	%
33	2		Error mask	1	
36	1	1	Solar dTon	1	
36	1	2	CS on	1	
36	1	4	Solar min on	1	
36	1	8	Solar min off	1	
36	1	16	Pool max.	1	
36	1	32	Minimum filter runtime	1	
36	1	64	Afterheating	1	
36	1	128	Solar afterheating	1	
37	1	1	dT solar afterheating	1	
37	1	2	Circulation	1	
37	1	4	Collector shutdown	1	
37	1	8	Collector minimum	1	
37	1	16	dT pool cooling function off	1	
37	1	32	Flow limitation	1	

37	1	64	Extra filter runtime	1	
37	1	128	External controller release	1	
38	1	1	Error relay	1	
38	1	2		1	
38	1	4	T pool cooling function	1	
38	1	8	Solar circuit on	1	
38	1	16	Filter active	1	
38	1	32	Afterheating normal	1	
38	1	64	Solar circuit active	1	
38	1	128	Operating relay active	1	
39	1	1	Pump check	1	
39	1	2	Solar dToff	1	
40	2		Filter runtime	1	min
44	1		Version / Solar phase	1	
45	1		Version	0.01	
46	2		System time	1	
48	2		Year	1	
50	1		Month	1	
51	1		Day	1	
52	4		Circulation time counter	1	s
56	4		Extra filter time	1	s
60	4		Pump monitoring	1	s
64	4		Solar min. on/off	1	s
68	4		Sim5	1	
72	4		Duration controlling period	1	ms

31. DFA (0x0010) <= DeltaSol Pool [WMZ] (0x7762), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate sensor 8	1	l/h
6	2		Heat quantity	1	Wh
8	2		Heat quantity	1000	Wh
10	2		Heat quantity	1000000	Wh

32. DFA (0x0010) <= DeltaSol C (0x4212), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature S1	0.1	°C
2	2		Temperature S2	0.1	°C
4	2		Temperature S3	0.1	°C
6	2		Temperature S4	0.1	°C
8	1		Pump speed R1	1	%
9	1		Pump speed R2	1	%
10	1		Error mask	1	
11	1		Variant	1	
12	2		Operating hours R1	1	h
14	2		Operating hours R2	1	h
16	2		Heat quantity	1	Wh
18	2		Heat quantity	1000	Wh
20	2		Heat quantity	1000000	Wh
22	2		System time	1	

33. DFA (0x0010) <= DeltaSol BS Plus BTU (0x4223), Command 0x0100

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°F
2	2		Temperature sensor 2	0.1	°F
4	2		Temperature sensor 3	0.1	°F
6	2		Temperature sensor 4	0.1	°F
8	1		Pump speed pump 1	1	%
9	1		Pump speed pump 2	1	%
10	1		Relay mask	1	
11	1		Error mask	1	
12	2		System time	1	
14	1		Scheme	1	
15	1	1	Option collector max.	1	
15	1	2	Option collector min.	1	
15	1	4	Option collector frost	1	
15	1	8	Option tube collector	1	
15	1	16	Option recooling	1	
15	1	32	Option HQM	1	
16	2		Operating hours relay 1	1	
18	2		Operating hours relay 2	1	
20	2		Heat quantity	1	BTU
22	2		Heat quantity	1000	BTU
24	2		Heat quantity	1000000	BTU
26	2		Version	0.01	

34. DFA (0x0010) <= DeltaSol AL (0x4111)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed relay 1	1	%
10	2		Status display	1	
12	2		Operating hours relay 1	1	h
16	4		Heat quantity	1	Wh

35. DFA (0x0010) <= SKSC1/2 (0x4211)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature S1	0.1	°C
2	2		Temperature S2	0.1	°C
4	2		Temperature S3	0.1	°C
6	2		Temperature S4	0.1	°C
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	1		Error mask	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	2		Heat quantity	1	Wh
18	2		Heat quantity	1000	Wh
20	2		Heat quantity	1000000	Wh

36. DFA (0x0010) <= Frista (0x4231)

Offset	Size	Mask	Name	Factor	Unit
0	2		DHW temperature	0.1	°C
2	2		Cold water temperature	0.1	°C
4	2		Circulation temperature	0.1	°C
6	2		Flow rate	0.1	l/min
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	2		System time	1	
12	1		Options	1	
13	1		Status	1	
14	1		Relay status	1	
15	1		Sensor defective	1	
16	1		DHW set temperature	1	°C
17	1		Source temperature	1	°C
19	1		Remaining draw-off		Min
20	4		Operating cycles		
24	2		Heat quantity	1	Wh
26	2		Heat quantity	1000	Wh
28	2		Heat quantity	1000000	Wh
30	1		Version	1	
31	1		Version	0.01	
32	2		Max. cold water temperature	0.1	°C
34	2		Min. cold water temperature	0.1	°C
36	2		Max. flow rate	1	l/h
38	2		Draw-off quantity	0.1	m³

37. DFA (0x0010) <= DeltaSol BS 2009 (0x427B)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed relay 1	1	%
12	1		Pump speed relay 2	1	%
10	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	1		Unit type	1	
17	1		System	1	
20	2		Error mask	1	
20	1	1	Sensor 1 defective	1	
20	1	2	Sensor 2 defective	1	
20	1	4	Sensor 3 defective	1	
20	1	8	Sensor 4 defective	1	
22	2		System time	1	
24	4		Status mask	1	
28	4		Heat quantity	1	Wh
32	2		SV Version	0.01	
34	2		Variant	1	

38. Broadcast (0x0000) <= EM1 (0x6650)

Offset	Size	Mask	Name	Factor	Unit
0	4		Resistor 1	1	
4	4		Resistor 2	1	
8	4		Resistor 3	1	
12	4		Resistor 4	1	
16	4		Resistor 5	1	
20	4		Resistor 6	1	

39. DFA (0x0010) <= SKSC3 [HK1] (0x7211)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow set temperature	0.1	°C
2	1		Mixer runtime	1	s
3	1		Mixer break time	1	s
4	2		HC status	1	

40. DFA (0x0010) <= SKSC3 [HK2] (0x7212)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow set temperature	0.1	°C
2	1		Mixer runtime	1	s
3	1		Mixer break time	1	s
4	2		HC status	1	

41. DFA (0x0010) <= SKSC3 [HK3] (0x7213)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow set temperature	0.1	°C
2	1		Mixer runtime	1	s
3	1		Mixer break time	1	s
4	2		HC status	1	

42. DFA (0x0010) <= DeltaSol M [Volume] (0x7315)

Offset	Size	Mask	Name	Factor	Unit
0	4		Operating seconds R1	1	s
4	4		Operating seconds R2	1	s
8	4		Operating seconds R3	1	s
12	4		Operating seconds R4	1	s
16	4		Operating seconds R5	1	s
20	4		Operating seconds R6	1	s
24	4		Operating seconds R7	1	s
28	4		Operating seconds R8	1	s
32	4		Operating seconds R9	1	s
36	4		Volume 1	0.1	l
40	4		Volume 2	0.1	l

43. DFA (0x0010) <= Vitosolic 200 [Controller] (0x7321)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Temperature sensor 11	0.1	°C
22	2		Temperature sensor 12	0.1	°C
24	2		Irradiation	1	W/m²
28	4		Impulse input 1	1	
32	4		Impulse input 2	1	
36	2		Sensor line break mask	1	
38	2		Sensor short-circuit mask	1	
40	2		Sensor usage mask	1	
44	1		Pump speed relay 1	1	%
45	1		Pump speed relay 2	1	%
46	1		Pump speed relay 3	1	%
47	1		Pump speed relay 4	1	%
48	1		Pump speed relay 5	1	%
49	1		Pump speed relay 6	1	%
50	1		Pump speed relay 7	1	%
51	1		Pump speed relay 8	1	%
52	1		Pump speed relay 9	1	%
58	2		Relay usage mask	1	
60	2		Error mask	1	
62	2		Warning mask	1	
64	2		Controller version	1	
66	2		System time	1	

44. DFA (0x0010) <= Vitosolic 200 [WMZ1] (0x7326)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate	1	l/h
6	2		Heat	1	Wh
8	2		Heat	1000	Wh
10	2		Heat	1000000	Wh

45. DFA (0x0010) <= DeltaSol BX (0x7421)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature RPS	0.1	°C
12	2		Pressure RPS	0.1	Bar
14	2		Temperature VFS	0.1	°C
16	2		Flow rate VFS	1	l/h
18	2		Flow rate V40	1	l/h
20	1		Unit	1	
22	1		PWM 1	1	%
23	1		PWM 2	1	%
24	1		Pump speed relay 1	1	%
25	1		Pump speed relay 2	1	%
26	1		Pump speed relay 3	1	%
27	1		Pump speed relay 4	1	%
28	4		Operating seconds relay 1	1	s
32	4		Operating seconds relay 2	1	s
36	4		Operating seconds relay 3	1	s
40	4		Operating seconds relay 4	1	s
44	2		Error	1	
44	1	1	Error S1	1	
44	1	2	Error S2	1	
44	1	4	Error S3	1	
44	1	8	Error S4	1	
44	1	16	Error S5	1	
44	1	32	Error S6	1	
44	1	64	Error S7	1	
44	1	128	Error S8	1	
45	1	1	Error S9	1	
45	1	2	Error V40	1	
45	1	4	Leakage	1	
45	1	8	Overpressure	1	
45	1	16	Flow rate error	1	
46	2		Status	1	

46	1	1	Blocking protection 1	1	
46	1	2	Blocking protection 2	1	
46	1	4	Blocking protection 3	1	
46	1	8	Blocking protection 4	1	
46	1	16	Initialisation	1	
46	1	32	Fill	1	
46	1	64	Stabilisation	1	
46	1	128	Pump delay	1	
47	1	1	Heat dump	1	
47	1	2	Overrun	1	
47	1	4	Thermal disinfection	1	
47	1	8	System cooling	1	
47	1	16	Store cooling	1	
47	1	32	Spreaded loading	1	
47	1	64	Frost protection	1	
47	1	128	Collector cooling	1	
48	4		Heat quantity	1	Wh
52	2		Version	0.01	
54	2		System time	1	
56	4		Date	1	

46. DFA (0x0010) <= DeltaSol E Fahrenheit [Controller] (0x7729)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°F
2	2		Temperature sensor 2	0.1	°F
4	2		Temperature sensor 3	0.1	°F
6	2		Temperature sensor 4	0.1	°F
8	2		Temperature sensor 5	0.1	°F
10	2		Temperature sensor 6	0.1	°F
12	2		Temperature sensor 7	0.1	°F
14	2		Temperature sensor 8	0.1	°F
16	2		Temperature sensor 9	0.1	°F
18	2		Temperature sensor 10	0.1	°F
20	2		Irradiation CS	1	W/m²
22	2		Impulse 1 V40	1	
24	2		Digital Input	1	
26	1		Pump speed relay 1	1	%
27	1		Pump speed relay 2	1	%
28	1		Pump speed relay 3	1	%
29	1		Pump speed relay 4	1	%
30	1		Pump speed relay 5	1	%
31	1		Pump speed relay 6	1	%
32	1		Pump speed relay 7	1	%
36	2		Error mask	1	
38	2		Messages	1	
40	1		System	1	
42	2		Scheme	1	
44	2		Flow set HC1 module sensor 18	0.1	°F
46	2		Status HC1 module	1	
48	2		Flow set HC2 module sensor 25	0.1	°F
50	2		Status HC2 module	1	
52	2		Flow set HC3 module sensor 32	0.1	°F
54	2		Status HC3 module	1	
56	2		Flow set heating circuit Sensor 11	0.1	°F
58	2		Heating circuit status	1	
60	1		Version	1	
61	1		Version	0.01	
62	2		System time	1	
64	2		Year	1	
66	1		Month	1	
67	1		Day	1	

47. DFA (0x0010) <= DeltaSol E Fahrenheit [WMZ] (0x772A)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°F
2	2		Return temperature	0.1	°F
4	2		Flow rate sensor 8	1	l/h
6	2		Heat quantity	1	Wh
8	2		Heat quantity	1000	Wh
10	2		Heat quantity	1000000	Wh

48. DFA (0x0010) <= COSMO Multi [Controller] (0x7821)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Irradiation CS	1	W/m²
22	2		Impulse 1 V40	1	
24	2		Digital Input	1	
26	1		Pump speed relay 1	1	%
27	1		Pump speed relay 2	1	%
28	1		Pump speed relay 3	1	%
29	1		Pump speed relay 4	1	%
30	1		Pump speed relay 5	1	%
31	1		Pump speed relay 6	1	%
32	1		Pump speed relay 7	1	%
36	2		Error mask	1	
38	2		Messages	1	
40	1		System	1	
42	2		Scheme	1	
44	2		Flow set HC1 module sensor 18	0.1	°C
46	2		Status HC1 module	1	
48	2		Flow set HC2 module sensor 25	0.1	°C
50	2		Status HC2 module	1	
52	2		Flow set HC3 module sensor 32	0.1	°C
54	2		Status HC3 module	1	
56	2		Flow set heating circuit Sensor 11	0.1	°C
58	2		Heating circuit status	1	
60	1		Version	1	
61	1		Version	0.01	
62	2		System time	1	
64	2		Year	1	
66	1		Month	1	
67	1		Day	1	

49. DFA (0x0010) <= COSMO Multi [WMZ] (0x7822)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate sensor 8	1	l/h
6	2		Heat quantity	1	Wh
8	2		Heat quantity	1000	Wh
10	2		Heat quantity	1000000	Wh

50. DFA (0x0010) <= DeltaSol MX [Controller] (0x7E11)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Temperature sensor 11	0.1	°C
22	2		Temperature sensor 12	0.1	°C
24	2		Temperature sensor 13	0.1	°C
26	2		Temperature sensor 14	0.1	°C
28	2		Temperature sensor 15	0.1	°C
30	2		Irridiation sensor 16	1	W/m²
32	2		Temperature sensor 17	0.1	°C
34	2		Temperature sensor 18	0.1	°C
36	2		Temperature sensor 19	0.1	°C
38	2		Temperature sensor 20	0.1	°C
40	4		Volume flow rate sensor 13	1	l/h
44	4		Volume flow rate sensor 14	1	l/h
48	4		Volume flow rate sensor 15	1	l/h
52	4		Volume flow rate sensor 17	1	l/h
56	4		Volume flow rate sensor 18	1	l/h
60	4		Volume flow rate sensor 19	1	l/h
64	4		Volume flow rate sensor 20	1	l/h
68	2		Pressure sensor 17	0.01	bar
70	2		Pressure sensor 18	0.01	bar
72	2		Pressure sensor 19	0.01	bar
74	2		Pressure sensor 20	0.01	bar
76	1		Pump speed relay 1	1	%
77	1		Pump speed relay 2	1	%
78	1		Pump speed relay 3	1	%
79	1		Pump speed relay 4	1	%
80	1		Pump speed relay 5	1	%

81	1	Pump speed relay 6	1	%
82	1	Pump speed relay 7	1	%
83	1	Pump speed relay 8	1	%
84	1	Pump speed relay 9	1	%
85	1	Pump speed relay 10	1	%
86	1	Pump speed relay 11	1	%
87	1	Pump speed relay 12	1	%
88	1	Pump speed relay 13	1	%
89	1	Pump speed relay 14	1	%
92	4	System date	1	
96	4	Error mask	1	

51. DFA (0x0010) <= DeltaSol MX [heating circuit #] (0x7E21)

Offset	Size	Mask	Name	Factor	Unit
0	2		Set flow temperature	0.1	°C
2	1		Operating status	1	

52. DFA (0x0010) <= DeltaSol MX [WMZ #] (0x7E31)

Offset	Size	Mask	Name	Factor	Unit
0	4		Heat quantity	1	Wh

53. EM1 (0x6650) <= Broadcast (0x0000)

Offset	Size	Mask	Name	Factor	Unit
0	1		Pump speed relay 1.1	1	
1	3		Timer 1.1	1	
4	1		Pump speed relay 1.2	1	
5	3		Timer 1.2	1	
8	1		Pump speed relay 2.1	1	
9	3		Timer 2.1	1	
12	1		Pump speed relay 2.2	1	
13	3		Timer 2.2	1	
16	1		Pump speed relay 3.1	1	
17	3		Timer 3.1	1	
20	1		Pump speed relay 3.2	1	
21	3		Timer 3.2	1	
24	1		Pump speed relay 4.1	1	
25	3		Timer 4.1	1	
28	1		Pump speed relay 4.2	1	
29	3		Timer 4.2	1	
32	1		Pump speed relay 5.1	1	
33	3		Timer 5.1	1	
36	1		Pump speed relay 5.2	1	
37	3		Timer 5.2	1	
40	1		SensorOutputType 1	1	
41	1		SensorOutputType 2	1	
42	1		SensorOutputType 3	1	
43	1		SensorOutputType 4	1	
44	1		SensorOutputType 5	1	
45	1		SensorOutputType 6	1	

54. DFA (0x0010) <= DeltaSol AL-E (0x1120)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Pump speed relay 2	1	%
8	2		Status display	1	
10	2		Time	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	4		Heat quantity	1	Wh

55. DFA (0x0010) <= ConergyDT5 (0x3271)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed pump 1	1	
9	1		Pump speed pump 2	1	
10	1		Relay mask	1	
11	1		Error mask	1	
12	2		System time	1	
14	1		Scheme	1	
15	1	1	Option PostPulse	1	
15	1	2	Option thermostat	1	
15	1	4	Option HQM	1	
16	2		Operating hours relay 1	1	
18	2		Operating hours relay 2	1	
20	2		Heat quantity	1	Wh
22	2		Heat quantity	1000	Wh
24	2		Heat quantity	1000000	Wh
26	2		Version	0.01	

56. DFA (0x0010) <= BS Solex US (0x4252)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Unit	1	
10	1		Pump speed relay 1	1	%
11	1		Pump speed relay 2	1	%
12	4		Operating seconds relay 1	1	s
16	4		Operating seconds relay 2	1	s
20	1	1	Sensor 1 defective	1	
20	1	2	Sensor 2 defective	1	
20	1	4	Sensor 3 defective	1	
20	1	8	Sensor 4 defective	1	
22	1	1	Collector emergency temp.	1	
22	1	2	Minimum collector temperature	1	
22	1	4	Emergency heat exchanger temp.	1	
22	1	8	Emergency store temperature	1	
22	1	16	Store empty	1	
22	1	32	Maximum store temperature	1	
22	1	64	Collector frost protection	1	
22	1	128	Heat exchanger frost protection	1	
23	1	1	Tube collector	1	
23	1	2	Loading	1	
23	1	4	R1 manual operation	1	
23	1	8	R2 manual operation	1	
24	4		Heat quantity	1	Wh
28	2		Time	1	
30	2		Version	1	

57. DFA (0x0010) <= DeltaSol E SorTech [Controller] (0x4261)

Offset	Size	Mask	Name	Factor	Unit
0	2		T LT OUT	0.1	°C
2	2		T MT OUT	0.1	°C
4	2		T A1 OUT	0.1	°C
6	2		T A2 OUT	0.1	°C
8	2		T HT Ext	0.1	°C
10	2		T LT Ext	0.1	°C
12	2		T LT IN v	0.1	°C
14	1	1	Arrangement	1	
14	1	2	Heating mode	1	
14	1	4	Flow switch LTcircuit	1	
14	1	8	HV_A1_IN	1	
14	1	16	HV_A2_IN	1	
14	1	32	HV_OUT	1	
14	1	64	Message relay	1	
15	1		RCS %	1	%
16	1		Pump relay	1	%
17	1		SPR relay	1	%
18	1		Phase	1	
19	1		Systemcode	1	
22	2		W Soll	1	Hz
24	2		T LTS OUT AVG	0.1	°C
26	2		T MT OUT AVG	0.1	°C
30	2		T LT IN AVG	0.1	°C
32	4		Number of cycles	1	
36	4		Summed-on spraying time	1	
40	2		System time	1	
42	2		Year	1	
44	1		Month	1	
45	1		Day	1	
46	1		Core	1	
47	1		Core	0.01	
48	2		T LT IN AVG	0.1	°C
50	2		T LT IN Cycle	0.1	°C
52	2		T LT OUT Cycle	0.1	°C
54	2		T MT OUT Cycle	0.1	°C
56	2		dQ LT Cycle	0.1	kW
58	2		dV LT	1	l/h

58. DFA (0x0010) <= Drainback DeDietrich (0x4311)

Offset	Size	Mask	Name	Factor	Unit
0	2		TC	0.1	°C
2	2		CD	0.1	°C
4	2		CU	0.1	°C
6	1		P1	1	%
7	1		P2	1	%
10	2		LS	0.1	
12	1		Ph	1	
13	1		P1S	1	
16	4		KWH	0.1	kWh

59. DFA (0x0010) <= DeltaSol MiniPool (0x4321)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	2		System time	1	
12	1		Status info 1	1	
13	1		Status info 2	1	
14	2		Remaining status runtime	1	
16	3		Filter runtime today	1	s
19	1		Control status	1	
24	4		Heat quantity	1	Wh

60. DFA (0x0010) <= SLR (0x7331)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Temperature sensor 11	0.1	°C
22	2		Temperature sensor 12	0.1	°C
24	2		Temperature sensor 13	0.1	°C
26	2		Temperature sensor 14	0.1	°C
28	2		Temperature sensor 15	0.1	°C
30	2		Temperature sensor 16	0.1	°C
32	2		Temperature sensor 17	0.1	°C
34	2		Temperature sensor 18	0.1	°C
36	2		Temperature sensor 19	0.1	°C
38	2		Temperature sensor 20	0.1	°C
40	2		Temperature sensor 21	0.1	°C
42	2		Temperature sensor 22	0.1	°C
44	1		Pump speed R1	1	%
45	1		Pump speed R2	1	%
46	1		Pump speed R3	1	%
47	1		Pump speed R4	1	%
48	1		Pump speed R5	1	%
49	1		Pump speed R6	1	%
50	1		Pump speed R7	1	%
51	1		Pump speed R8	1	%
52	1		Pump speed R9	1	%
53	1		Pump speed R10	1	%
54	1		Pump speed R11	1	%
55	1		Pump speed R12	1	%
56	1		Pump speed R13	1	%
57	1		Pump speed R14	1	%

58	1	Pump speed R15	1	%
59	1	Pump speed R16	1	%
60	1	Pump speed R17	1	%
61	1	Pump speed R18	1	%
64	4	Sensor usage mask 1	1	
68	4	Sensor usage mask 2	1	
72	2	Error mask	1	
74	2	Warning mask	1	
76	2	Version	1	
78	2	System time	1	
80	1	Variant	1	

61. DFA (0x0010) <= SLR-expansion-module #1 (0x7332)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 17	0.1	°C
2	2		Temperature sensor 18	0.1	°C
4	2		Temperature sensor 19	0.1	°C
6	2		Temperature sensor 20	0.1	°C
8	2		Temperature sensor 21	0.1	°C
10	2		Temperature sensor 22	0.1	°C
12	1		Pump speed R14	1	%
13	1		Pump speed R15	1	%
14	1		Pump speed R16	1	%
15	1		Pump speed R17	1	%
16	1		Pump speed R18	1	%

62. DFA (0x0010) <= SLR-expansion-module #2 (0x7333)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 23	0.1	°C
2	2		Temperature sensor 24	0.1	°C
4	2		Temperature sensor 25	0.1	°C
6	2		Temperature sensor 26	0.1	°C
8	2		Temperature sensor 27	0.1	°C
10	2		Temperature sensor 28	0.1	°C
12	1		Pump speed R19	1	%
13	1		Pump speed R20	1	%
14	1		Pump speed R21	1	%
15	1		Pump speed R22	1	%
16	1		Pump speed R23	1	%

63. DFA (0x0010) <= SLR-expansion-module #3 (0x7334)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 29	0.1	°C
2	2		Temperature sensor 30	0.1	°C
4	2		Temperature sensor 31	0.1	°C
6	2		Temperature sensor 32	0.1	°C
8	2		Temperature sensor 33	0.1	°C
10	2		Temperature sensor 34	0.1	°C
12	1		Pump speed R24	1	%
13	1		Pump speed R25	1	%
14	1		Pump speed R26	1	%
15	1		Pump speed R27	1	%
16	1		Pump speed R28	1	%

64. DFA (0x0010) <= SLR-expansion-module #4 (0x7335)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 35	0.1	°C
2	2		Temperature sensor 36	0.1	°C
4	2		Temperature sensor 37	0.1	°C
6	2		Temperature sensor 38	0.1	°C
8	2		Temperature sensor 39	0.1	°C
10	2		Temperature sensor 40	0.1	°C
12	1		Pump speed R29	1	%
13	1		Pump speed R30	1	%
14	1		Pump speed R31	1	%
15	1		Pump speed R32	1	%
16	1		Pump speed R33	1	%

65. DFA (0x0010) <= SOLTEX-Controller [Part 1] (0x7511)

Offset	Size	Mask	Name	Factor	Unit
0	2		Collector temperature	0.1	°C
2	2		Temperature S,p	0.1	°C
4	2		Temperature S,s	0.1	°C
6	2		HP flow temperature	0.1	°C
8	2		HP return temperature	0.1	°C
10	2		Evap. temperature	0.1	°C
12	2		Soil temperature	0.1	°C
14	2		Flow rate collector	0.1	l/min
16	1	4	Relay P,H	1	
16	1	8	Relay WP	1	
16	1	16	Valve WP	1	
16	1	32	Valve SW	1	
16	1	64	Valve Ko	1	
16	1	128	Valve So	1	
17	1	1	Valve SP	1	
18	1		Power P,Ko	1	%
19	1		Power P,S	1	%
20	4		Error mask	1	
25	1		P,Ko nominal power	1	&
26	2		T_Wabs	0.1	°C
28	4		Heat quantity S,p	0.1	kWh
32	4		Heat quantity S,s 36	0.1	kWh
36	2		Diff. Toutd/24h	0.1	K
38	2		Diff. TSs/8h	0.1	K
40	2		Diff. TSs/1h	0.1	K
42	2		Operating sec. heat pump	1	s
44	4		Time period HP / 24h	1	s
48	4		Heat pump runtime / 24 h	1	s
56	2		Temperature T,H	0.1	°C
58	2		System time	1	

66. DFA (0x0010) <= SOLTEX-Controller [Part 2] (0x7512)

Offset	Size	Mask	Name	Factor	Unit
0	4		t-Sp	1	s
4	4		t-Ss	1	s
8	4		Heat pump runtime	1	s
12	4		Number of HP starts	1	
16	4		t-WP-Ss	1	s
20	4		t-Ps	1	s
24	2		Temperature T-x	0.1	°C
26	2		Temperature T-xx	0.1	°C
28	2		C1	0.01	
30	2		Version	0.01	

67. DFA (0x0010) <= SOLTOP DeltaSol S2/S3 (0x7731)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	1		Pump speed R1	1	%
17	1		Pump speed R2	1	%
18	1		Pump speed R3	1	%
19	1		Relay byte	1	
20	2		Heat	1	Wh
22	2		Heat	1000	Wh
24	2		Heat	1000000	Wh
26	1		Scheme	1	

68. DFA (0x0010) <= WMZ-L10 (0x3011)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow speed	0.01	m/s
6	2		Operating days	1	
10	2		Air duct diameter	0.01	m²
12	4		Air duct volume	1	m³/h
16	4		Air duct mass	1	kg/h
20	2		Air density	1.0E-4	kg/m³
24	2		Air pressure	1	hPa
22	2		Power	0.1	kW
28	2		Heat quantity kWh	1	kWh
30	2		Heat quantity MWh	1	kWh

69. DFA (0x0010) <= DT4 (B) (0x3241)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Error mask	1	
10	1		Relay mask	1	

70. DFA (0x0010) <= Diemasol C (0x3311)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4 (>= 1.02)	0.1	°C
8	2		Pump speed relay 1 (<= v1.01)	0.1	%
10	2		Pump speed relay 2 (<= v1.01)	0.1	%
8	1		Pump speed relay 1 (>= v1.02)	1	%
9	1		Pump speed relay 2 (>= v1.02)	1	%
10	1		Error mask (>= v1.02)	1	
11	1		Relay mask (>= v1.02)	1	
6	2		Heat quantity (<= v1.01)	1	kWh
12	2		Heat quantity (>= v1.02)	1	kWh

71. DFA (0x0010) <= Huber - REGLOfresh / Felix [Controller] (0x4241)

Offset	Size	Mask	Name	Factor	Unit
0	2		DHW temperature (Display)	0.1	°C
2	2		Cold water temperature	0.1	°C
4	2		Buffer temperature	0.1	°C
6	2		Flow rate	0.01	l/h
8	1		Speed 1	1	%
9	1		Speed 2	1	%
10	2		System time	1	
12	1	1	Option circulation active	1	
12	1	2	Opt. emergency operation active	1	
13	1	1	Draw-off active	1	
13	1	2	DHW production active	1	
13	1	4	Manual operation active	1	
13	1	8	Emergency operation active	1	
13	1	16	Blocking protection active	1	
13	1	32	Circulation active	1	
13	1	64	Overheating active	1	
13	1	128	Draw-off impulse active	1	
14	1	1	Relay 1	1	
14	1	2	Relay 2	1	
15	1	1	Sensor 1 defective	1	
15	1	2	Sensor 2 defective	1	
15	1	4	Sensor 3 defective	1	
15	1	8	Sensor 4 defective	1	
16	1		DHW set temperature	1	°C
17	1		Mixing valve temperature	1	°C
18	1		dT buffer	0.1	K
19	1		Remaining circulation time	1	min
20	4		Number of operating cycles	1	
24	2		Heat quantity	1	Wh
26	2		Heat quantity	1000	Wh
28	2		Heat quantity	1000000	Wh
30	1		Software version major	1	
31	1		Software version minor	1	
32	2		Max. cold water temperature	0.1	°C
34	2		Min. cold water temperature	0.1	°C
36	2		Flow rate max.	1	l/h

38	2	Maximum draw-off quantity	1	m³
40	2	DHW temperature (Control)	0.1	°C
42	2	Source temperature (Control)	0.1	°C
44	1	Internal value	1	
45	1	Internal value	1	
46	1	Internal value	1	
47	1	Internal value	1	
48	2	Internal value	1	
50	2	Internal value	1	

72. DFA (0x0010) <= DSPlus UMSYS [Controller] (0x4251)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature absorber (S1)	0.1	°C
2	2		Temp.ehind heat pump (S2)	0.1	°C
4	2		Temp. behind underground tank (S3)	0.1	°C
6	2		Estim. Temp. underground tank	0.1	°C
8	2		Temperature behind pump 1 (S4)	0.1	°C
10	2		System time	1	
12	2		Switch-on temperature difference	0.1	K
14	2		Switch-off temperature difference	0.1	K
16	2		dT heat pump active	0.1	K
18	2		dT heat pump inactive	0.1	K
20	2		Underground tank maximum temp.	0.1	°C
22	1	1	S1 defective	1	
22	1	2	S2 defective	1	
22	1	4	S3 defective	1	
22	1	8	S4 defective	1	
22	1	16	dT sufficient	1	
22	1	32	Heat pump active	1	
22	1	64	Underground tank full	1	
22	1	128	Relay 1 active	1	
22	1	256	Relay 2 active	1	
24	2		Version	0.01	

73. DFA (0x0010) <= Aton DeltaSol BS (0x4265)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	1		Pump speed relay 1	1	%
9	1		Pump speed relay 2	1	%
10	1	1	Sensor 1 defective	1	
10	1	2	Sensor 2 defective	1	
10	1	4	Sensor 3 defective	1	
10	1	8	Sensor 4 defective	1	
12	2		Operating hours relay 1	1	h
14	2		Operating hours relay 2	1	h
16	2		Heat quantity	1	Wh
18	2		Heat quantity	1000	Wh
20	2		Heat quantity	1000000	Wh
24	2		Version	0.01	

74. DFA (0x0010) <= DT4 (MS) (0x5221)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	1		Pump speed relay 1	1	%
7	1		Error mask	1	
10	1		Relay mask	1	
12	2		Temperature sensor 4	0.1	°C
14	2		Temperature sensor 5	0.1	°C
16	2		Flow rate	0.1	l/min
18	2		Heat quantity	1	Wh
20	2		Heat quantity	1000	Wh
22	2		Heat quantity	1000000	Wh

75. DFA (0x0010) <= X-Control (0x5311)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Irradiation sensor 5	1	W/m²
10	1		Pump speed R1	1	%
11	1		Pump speed R2	1	%
12	1		Pump speed R3	1	%
13	1		Relay bit mask	1	
14	2		Heat quantity	1	Wh
16	2		Heat quantity	1000	Wh
18	2		Heat quantity	1000000	Wh
21	1		System	1	
22	1	1	Options: frost protection	1	
22	1	4	Options: tube collector	1	
22	1	8	Options: recooling	1	
22	1	16	Options: collector cooling	1	
22	1	32	Options: external HX	1	
22	1	64	Options: afterheating	1	
22	1	128	Options: return preheating	1	
22	1	256	Options: valve	1	
22	1	512	Options: minimal	1	
22	1	1024	Options: HQM	1	
22	1	2048	Options: boiler loading	1	
22	1	4096	Options: solar cell	1	
22	1	8192	Options: 2. collector valve	1	
24	1		Error mask	1	
25	1		Sensor line break mask	1	
26	1		Sensor short-circuit mask	1	
28	2		System time	1	

76. DFA (0x0010) <= SunGo XI (0x6620)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	1	1	Relay status 1	1	
12	1	2	Relay status 2	1	
12	1	4	Relay status 3	1	
12	1	8	Relay status 4	1	
12	1	16	Relay status 5	1	
12	1	32	Relay status 6	1	
13	1		Pump speed 1	1	%
30	1		Pump speed 2	1	%
31	1		Pump speed 3	1	%
15	1		Error number	1	
16	2		Error mask	1	
18	1		Error info 1	1	
19	1		Error info 2	1	
20	1		Error info 3	1	
21	1		Error info 4	1	
22	2		Arrangement options 1	1	
24	1		System	1	
25	2		Version	1	
27	1		Module status	1	
28	2		System time	1	

77. DFA (0x0010) <= DrainBloC (0x7221)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Flow rate	1	l/h
12	2		System pressure	0.1	bar
14	1		Control 1	1	%
15	1		Control 2	1	%
16	1		Pump speed relay 1	1	%
17	1		PWM 1	1	%
18	1		Pump speed relay 2	1	%
19	1		PWM 2	1	%
20	4		Heat quantity	1	Wh
36	1		Version	0.01	
38	2		Time	1	
40	4		Date	1	

78. DFA (0x0010) <= SC25 (0x7231)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Flow rate	1	l/h
12	2		System pressure	0.1	bar
14	2		Temperature sensor 8	0.1	°C
16	1		Control 1	1	%
17	1		Control 2	1	%
18	1		Pump speed relay 1	1	%
19	1		PWM 1	1	%
20	1		Pump speed relay 2	1	%
21	1		PWM 2	1	%
22	1	1	Manual operation 1	1	
22	1	2	Manual operation 2	1	
24	4		Heat quantity	1	Wh
28	1	1	ΔT collector-store	1	
28	1	2	ΔT flow-return	1	
28	1	4	Loading break	1	
28	1	8	Collector cooling	1	
28	1	16	Recooling	1	
28	1	32	Frost protection	1	
28	1	64	Tube collector	1	
28	1	128	ΔT3	1	
29	1	1	Thermostat 1	1	
29	1	2	Blocking protection 1	1	
29	1	4	Blocking protection 2	1	
29	1	8	Stabilisation	1	
32	1	1	Overpressure	1	
32	1	2	Thermosiphoning	1	
32	1	4	ΔT too high	1	
36	1	1	S1 defective	1	
36	1	2	S2 defective	1	
36	1	4	S3 defective	1	
36	1	8	S-flow defective	1	

36	1	16	S-return defective	1
36	1	32	Pressure (S6) defective	1
36	1	64	Volume flow rate (S7) defect	1
36	1	128	Flow rate	1
37	1	1	Leakage	1
40	2		Version	0.01
42	2		Time	1
44	4		Date	1

79. DFA (0x0010) <= Multitronic [Controller] (0x7711)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Irradiation	1	W/m²
22	2		Impulse input 1	1	
24	2		Impulse input 2	1	
26	1		Pump speed relay 1	1	%
27	1		Pump speed relay 2	1	%
28	1		Pump speed relay 3	1	%
29	1		Pump speed relay 4	1	%
30	1		Pump speed relay 5	1	%
31	1		Pump speed relay 6	1	%
32	1		Pump speed relay 7	1	%
34	2		System time	1	
36	2		Error mask	1	
38	2		Warning mask	1	
40	2		Controller version	1	
42	1		System	1	
43	1		Scheme	1	
44	2		HC1 flow set	0.1	°C
46	1		HC1 operation status	1	
47	1		HC1 status	1	
48	2		HC2 flow set	0.1	°C
50	1		HC2 operation status	1	
51	1		HC2 status	1	
52	2		HC3 flow set	0.1	°C
54	1		HC3 operation status	1	
55	1		HC3 status	1	
56	4		Sensor usage mask	1	
60	4		Relay usage mask	1	

80. DFA (0x0010) <= Multitronic [WMZ] (0x7712)

Offset	Size	Mask	Name	Factor	Unit
0	2		Flow temperature	0.1	°C
2	2		Return temperature	0.1	°C
4	2		Flow rate	1	l/h
6	2		Heat	1	Wh
8	2		Heat	1000	Wh
10	2		Heat	1000000	Wh

81. DFA (0x0010) <= EMZ/CME (0x7774)

Offset	Size	Mask	Name	Factor	Unit
0	4		Date	1	
4	2		Time	1	
8	2		TSS	0.1	°C
10	2		TEF	0.1	°C
12	2		Heat	1	Wh
14	2		Heat	1	kWh
16	2		Heat	1	MWh
18	2		Flow rate	1	l/h
20	4		Volume	0.01	m³
96	4		Impulse	1	
24	2		TSS	0.1	°C
26	2		TSA	0.1	°C
28	2		Heat 2	1	Wh
30	2		Heat 2	1	kWh
32	2		Heat 2	1	MWh
34	2		Volume flow rate 2	1	l/h
96	4		Impulse	1	
36	2		TAC	0.1	°C
38	2		TAF	0.1	°C
40	2		Heat 3	1	Wh
42	2		Heat 3	1	kWh
44	2		Heat 3	1	MWh
46	2		Volume flow rate3	1	l/h
100	4		Impulse	1	
48	2		TBC	0.1	°C
50	2		TBF	0.1	°C
52	2		Heat4	1	Wh
54	2		Heat 4	1	kWh
56	2		Heat 4	1	MWh
58	2		Volume flow rate 4	1	l/h
104	4		Impulse	1	
60	2		TSC	0.1	°C
62	2		TSF	0.1	°C
64	2		Heat 5	1	Wh
66	2		Heat 5	1	kWh
68	2		Heat 5	1	MWh

70	2	Volume flow rate 5	1	l/h
108	4	Impulse	1	
72	4	Current1	1	Wh
76	4	Current1	1	kWh
112	4	Impulse	1	
80	4	Current2	1	kWh
116	4	Impulse	1	
84	4	Gas1	0.01	m³
128	4	Impulse	1	
88	4	Thermal Energy1	1	kWh
120	4	Impulse	1	
92	4	Thermal Energy2	1	kWh
124	4	Impulse	1	
96	4	Impulse counter 1 (Volume 1/2)	1	
100	4	Impulse counter 2 (Volume 3)	1	
104	4	Impulse counter 3 (Volume 4)	1	
108	4	Impulse counter 4 (Volume 5)	1	
112	4	Impulse counter 5 (Current 1)	1	
116	4	Impulse counter 6 (Current 2)	1	
120	4	Impulse counter 7 (th. Energie 1)	1	
124	4	Impulse counter 8 (th. Energie 2)	1	
128	4	Impulse counter 9 (Gas 1)	1	

82. DFA (0x0010) <= DeltaSol FCS (0x7F71)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		System pressure	0.01	bar
12	2		Flow rate	1	l/h
14	1		Pump speed relay 1	1	%
15	1		System message	1	
16	4		Power	1	W
20	4		Heat quantity	1	Wh
24	4		Date	1	
28	2		Time	1	
30	1		Eff. minimum speed	1	%
32	4		Debug1	1	
36	4		Debug2	1	
40	4		Debug3	1	
44	4		Debug4	1	
48	4		Debug5	1	
52	2		Irradiation	1	W/m²
54	2		Cell temperature	0.1	°C

83. DFA (0x0010) <= SKSR 1/2/3 (0x7210)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Irradiation	1	W/m²
18	2		Flow rate	1	l/h
20	1		Pump speed A1	1	%
21	1		Pump speed A2	1	%
22	1		Pump speed A3	1	%
23	1		Pump speed A	1	%
24	2		Heat	1	Wh
26	2		Heat	1000	Wh
28	2		Heat	1000000	Wh
30	2		Heat	1.0E9	Wh
32	1		Error mask	1	
33	1		Sensor line break number	1	
34	1		Sensor short-circuit number	1	
42	2		System time	1	
42	2		System time2	1	

84. DFA (0x0010) <= DeDietrich Diemasol C v2007 (0x7751)

Offset	Size	Mask	Name	Factor	Unit
0	2		Temperature sensor 1	0.1	°C
2	2		Temperature sensor 2	0.1	°C
4	2		Temperature sensor 3	0.1	°C
6	2		Temperature sensor 4	0.1	°C
8	2		Temperature sensor 5	0.1	°C
10	2		Temperature sensor 6	0.1	°C
12	2		Temperature sensor 7	0.1	°C
14	2		Temperature sensor 8	0.1	°C
16	2		Temperature sensor 9	0.1	°C
18	2		Temperature sensor 10	0.1	°C
20	2		Temperature sensor 11	0.1	°C
22	2		Flow rate	0.1	l/min
24	1		Pump speed R1	1	%
25	1		Pump speed R2	1	%
26	1		Pump speed R3	1	%
27	1	1	Relay status R4	1	
27	1	2	Relay status R5	1	
27	1	4	Relay status R6	1	
27	1	8	Relay status R7	1	
27	1	16	Relay status R8	1	
27	1	32	Relay status R9	1	
28	4		Heat quantity	1	Wh
32	4		System date	1	
36	2		System time	1	
39	1		Variant	1	