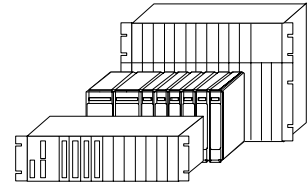


Ax 1703



Firmware Description

UMPM01

Field Bus Master according to IEC 60870-5-101

HW-Type: 2541 / FW-Type: 2506

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This document is applicable to the following product(s):

UMPM01

Rev. 00 and higher

Version	Revision	Date	Change
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1. System Overview

1.1. Short Description

The UMPM01 firmware is used for the serial coupling of two Ax 1703 components in accordance with IEC 60 870-5-101.

The functions supported by IEC 60 870-5-101 are laid down in the interoperability list of Ax 1703.

The message formats used correspond to the IEC 60 870-5-101 standard and the Ax 1703 Data Formats description.

The data communication control used for this firmware is an unbalanced primary multi-point traffic master.

The data communication control is done at a fixed baud rate of 38400 bit/s.

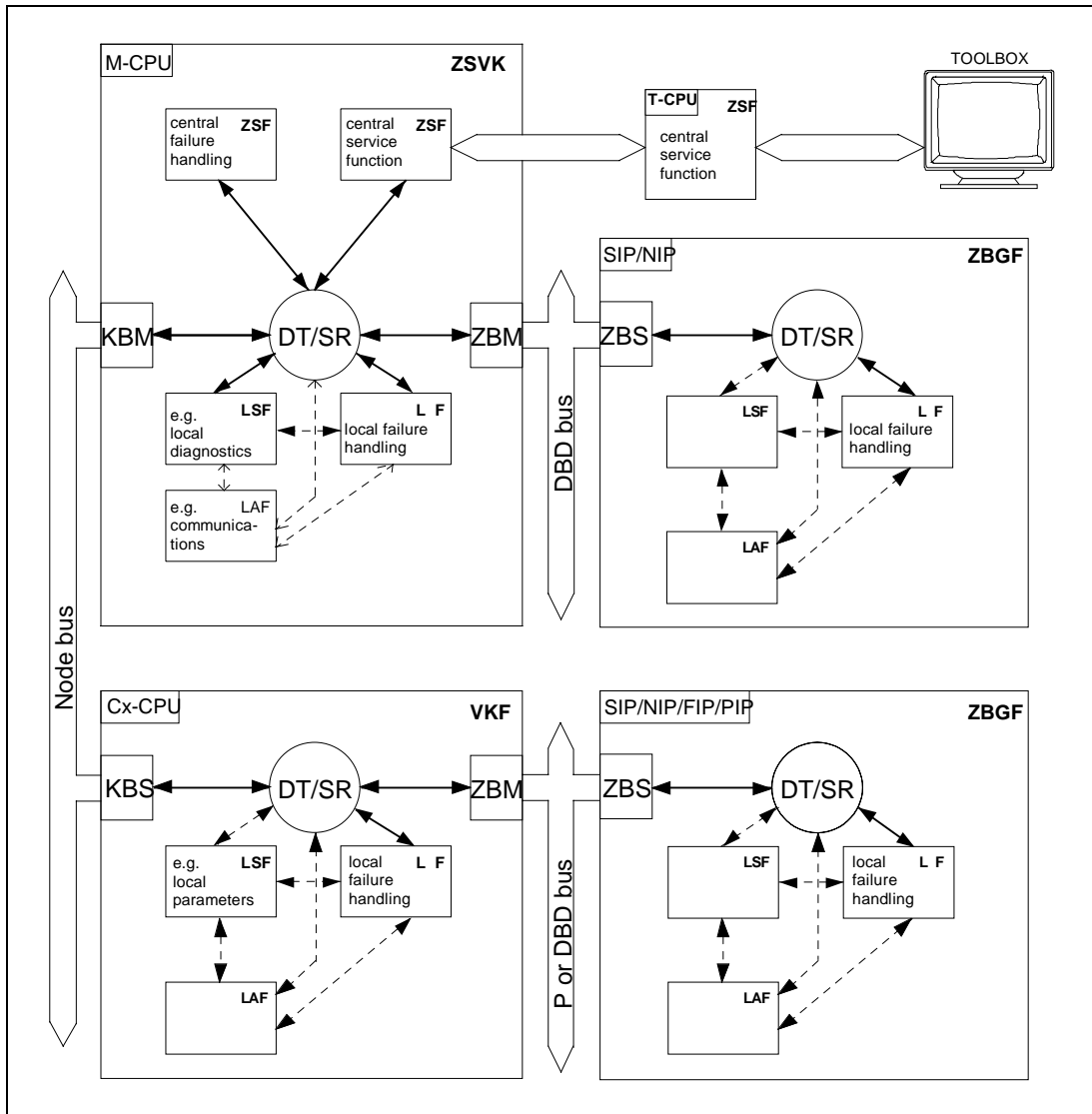
Physical interfaces:

- RS232 (V.24/V.28)
- RS422 (V.11)
- RS485 (V.11)

1.2. Interfaces

The communication to the superordinate BSE is done via messages in the Ax 1703 format.

1.3. Embedding in the Environment



2. Protocol-specific Functions

2.1. Interface Fault

After an interface fault has been detected (if parameterized) a communications fault is signalled and all further data for this station are blocked on the BSE.

2.2. Master/Standby Function

The Master/Standby function is done by the redundancy function in Ax 1703. If the firmware is in standby operation it does not send any messages. However, in contrast, all received messages are forwarded to the superordinate BSE. In order to synchronize the firmware - which is in standby operation - to the same FCB (Frame Count Bit) as the active one, the current FCB is either taken from the monitored Reset of Remote Link or from a valid long message.

2.3. Station Interrogation

The transmission of the data from the RTUs to the central station is done only by station-selective station interrogation (polling). Spontaneous transmission of the data from the RTU is, therefore, not possible. Altered data remain stored in the RTU and, on a station interrogation of this station, are transmitted to the central station.

The connected RTUs are always called by the central station starting with the lowest station address up to the highest station address. Each station is always only called once.

Data from the central station to the RTU are spontaneously transmitted after the end of the running message transmission of the interrogation cycle. Following this, the interrupted interrogation cycle is continued.

It is not automatically ensured by the station interrogation that the entire extent of the information of an RTU which is initiated for the transmission is transmitted in one interrogation cycle.

Stations which have not stored any data for the transmission are not removed from the interrogation cycle.

Faulty stations likewise continue to be interrogated in the interrogation cycle but for such stations no message repeating (retries) is carried out during the station interrogation.

2.4. Acknowledgement Behaviour

If the acknowledgement for a message which was sent out from the central station does not appear, this message is repeated n times (n = parameterizable number). After the parameterized number of message retries, the interface is marked as faulty and the interface failure is also displayed visually.

The acknowledgement expectation time is calculated for each call function code used because, on the basis of the function code, different reply message lengths are to be expected. For this reason, the idle running cycle is also accelerated in the event of faulty stations.

Call for data: Max. 255 bytes of user data
 Long acknowledgement expectation time

Other calls: Fixed reply length of 5 bytes
 Short acknowledgement expectation time

The acknowledgement expectation time is determined in units of 10ms and can be corrected by parameterization (correction factor for acknowledgement expectation time). The minimum acknowledgement expectation time is 20ms.

- Short acknowledgement expectation time = 2ms + Correction Value
- Long acknowledgement expectation time = 70ms + Correction Value

2.5. Failure Monitoring

2.5.1. Failure Monitoring in the Central Station

The failure of RTUs is detected by the central station in the normal interrogation cycle. Failed stations continue to be interrogated in the interrogation cycle but for such stations no message repeating (retries) is carried out during the station interrogation.

2.5.2. Failure Monitoring in Redundant Configurations

In redundant configurations, station-selective failure monitoring is carried out (as from Rev. 03).

The failure of the interface is detected by the STANDBY central station by monitoring for cycle message receipt (receive timeout in standby operation). On "Receive timeout" (= active central station or receive channel has failed) the interface is signalled as failed.

With station-selective failure handling, it is now possible for the passive master to detect a failure.

Guide value (period until error detection):

Error detection = 1 second * Enabled station

In the worst-case event, it can take a very long time until a failure is detected because, otherwise, the data flow would be greatly slowed down.

The station-selective failure handling is activated by entering a value on "receive timeout". If the last station fails, the global receive timeout is effective, otherwise the time is produced as described above.

Existing station-selective faults are reset in redundant STANDBY central stations if an error-free message is "heard" by these stations.

2.6. Time Synchronization

The required time precision of 1ms in the RTUs can be achieved on the one hand only by using the serial time character of a radio clock. By means of the quartz clock employed with a precision of 10^{-4} there is a maximum deviation of 360ms/h or 6ms/min. In order to guarantee a precision of 1ms the clocks in the RTUs have to be synchronized every 10 seconds. As, for cost reasons, the employment of the serial time character in all RTUs cannot be considered, the synchronization of the RTUs is done by communication. In order to achieve a time precision of 1ms in the RTUs via the local coupling, the UMPM01 master firmware sends a time synchronization message every 5 seconds (TK 103) - always at the 3rd and 8th seconds - "broadcast" to all slaves.

The slave corrects the time contained in the message by the message runtime and inserts the entry time in units of 1ms.

In addition, in the RTU the time synchronization message (FC = 156) is specially identified for the time server in the system (Bit# 5 of the migration status). Based on this identifier, the time server carries out a synchronization of the system time every 10th second.

Caution: The 1ms precision is currently only provided in the AM 1703 RTU system because only the time server in the AM 1703 supports this functionality.

2.6.1. Time Setting

After the UMPM01 firmware has been started up, the time setting is discarded until its own protocol element is time set because the firmware has to enter the current millisecond in the time synchronization message (TK 103).

It is generally the case that a time setting of the RTU is always received in the same minute in which the message was sent out from the central station.

The time setting of the RTUs is likewise done by means of an IEC time synchronization message (TK 103).

2.7. Data Block Formats Used - "PST Control Message " (Function Code 161)

For the structure, see the "Ax 1703 Data Block Formats" description.

2.7.1. PST Control Message

Description	Function no.	Possible station no.	Additional parameter 1	
START call cycle	0	125	Not defined	
STOP (disable) call cycle	1	125	Not defined	
CONTINUE (enable) call cycle	2	125	Not defined	
Continuous call Station x ON	3	0 – 99	0 – 65535	1)
Continuous call Station x OFF	4	0 – 99	Not defined	
Include station in cycle	128	0 - 99	Not defined	3)
Exclude station from cycle	129	0 - 99	0,1	2) 3)

- 1) 0..... START continuous cycle without time
1 – 65535 n * 100 ms continuous call
- 2) 0..... Remove a station fault which may exist
1..... Leave a station fault which may exist
- 3) A station can only be included or excluded if the station has been parameterized.
If the station number is not known, a "Faulty PST message" error occurs.

2.7.2. PST Status Information - Status Lines

The status lines CTS, DTR and DSR are generated in the status information.

2.7.3. PST Status Information - General

2.7.3.1. Station-selective Status Information (Station nos. 0 – 99) (only on enabling of the Repeater Operation option)

State	Status information number	Description	Signal type
Main route parameterized	0	A main route has been parameterized in the routing parameterization .	ST
Main route OK	1		ST
Main route faulty	2		ST
Main route NOK	3		ST
Standby route parameterized	8	A standby route has been parameterized in the routing parameterization.	ST
Standby route OK	9		ST
Standby route faulty	10		ST
Standby route NOK	11		ST

2.7.3.2. Cycle State Status Information (Station no. 255)

State	Status information number	Description	Signal type
Cycle IDLE	0	Cycle control is stopped. User data messages continue to be sent.	ST
Cycle NORMALMODE	1	Cycle control running in normal mode (polling of the RTUs).	ST
Continuous call	2	Continuous call is made to an RTU.	ST
Cycle stopped	3	Cycle control has been stopped via PST control message	ST
DAA running	6	A BROADCAST message is being sent now.	ST
Data message	7	A station-selective data message is being sent now.	ST

A. Appendix: Diagnose

Overview:

legend category: I ... internal
 E ... external
 C ... communication
 T ... test
 W ... warning
 B ... board/module failure
 S ... startup

category	record (rel.)	record (abs.)	meaning
I	0	0	Internal error in the operating system
	2	2	SIP parameter error
	3	3	SIP format conversion error
C	2	42	Communication error to Station no. 0 - 15
	3	43	Communication error to Station no. 16 - 31
	4	44	Communication error to Station no. 32 - 47
	5	45	Communication error to Station no. 48 - 63
	6	46	Communication error to Station no. 64 - 79
	7	47	Communication error to Station no. 80 - 95
T	0	50	Test mode of the operating and base systems

```
category:    I
record:     0
meaning:    Internal error in the operating system

Bit 00 ... RAM error
Bit 01 ... STACK error
             The defined stack range has been exceeded;
             Replace system element or notify SAT.
Bit 02 ... Firmware shut down
             Diagnosis:
             - Read out system diagnostics ring (command ID R)
               in ST emulation (possibly store to file)
Bit 03 ... Too little free space
             There is not enough free RAM memory available
             for the dynamic memory management;
             Diagnosis:
             - Change parameterization of size definitions
               (e.g. realtime rings, pool size)
             - Notify SAT.

Bit 04 ...
Bit 05 ...
Bit 06 ...
Bit 07 ...
Bit 08 ... CPU 80186 error
Bit 09 ...
Bit 10 ...
Bit 11 ...
Bit 12 ...
Bit 13 ...
Bit 14 ...
Bit 15 ...
```



```
category:    I
record:      2
meaning:     SIP parameter error
```

```
Bit 00 ... Parameter error detected by SIP
Bit 01 ... Parameter error of the LOCAL parameter block no. 06
Bit 02 ... Parameter error ZSE general
Bit 03 ... Parameter setting with invalid stationnumber.
           Diagnosis: Selected stationnumber is greater than 100 and
                   also not a broadcast-station number.

Bit 04 ... Parameter setting with invalid station number.
           Diagnosis: Same station number is used more then once.

Bit 05 ...
Bit 06 ...
Bit 07 ...
Bit 08 ...
Bit 09 ...
Bit 10 ...
Bit 11 ...
Bit 12 ...
Bit 13 ...
Bit 14 ...
Bit 15 ...
```

```
category:    I
record:      3
meaning:     SIP format conversion error

  Bit 00 ... Format conversion error in the transmit direction
  Bit 01 ...
  Bit 02 ... Format conversion error in the receive direction
  Bit 03 ...
  Bit 04 ...
  Bit 05 ...
  Bit 06 ...
  Bit 07 ...
  Bit 08 ...
  Bit 09 ...
  Bit 10 ...
  Bit 11 ...
  Bit 12 ...
  Bit 13 ...
  Bit 14 ...
  Bit 15 ...
```

```
category:    C
record:      2
meaning:     Communication error to Station no. 0 - 15
```

```
Bit 00 ... Communication error to Station no. 0
Bit 01 ... Communication error to Station no. 1
Bit 02 ... Communication error to Station no. 2
Bit 03 ... Communication error to Station no. 3
Bit 04 ... Communication error to Station no. 4
Bit 05 ... Communication error to Station no. 5
Bit 06 ... Communication error to Station no. 6
Bit 07 ... Communication error to Station no. 7
Bit 08 ... Communication error to Station no. 8
Bit 09 ... Communication error to Station no. 9
Bit 10 ... Communication error to Station no. 10
Bit 11 ... Communication error to Station no. 11
Bit 12 ... Communication error to Station no. 12
Bit 13 ... Communication error to Station no. 13
Bit 14 ... Communication error to Station no. 14
Bit 15 ... Communication error to Station no. 15
```

```
category:    C
record:      3
meaning:     Communication error to Station no. 16 - 31
```

```
Bit 00 ... Communication error to Station no. 16
Bit 01 ... Communication error to Station no. 17
Bit 02 ... Communication error to Station no. 18
Bit 03 ... Communication error to Station no. 19
Bit 04 ... Communication error to Station no. 20
Bit 05 ... Communication error to Station no. 21
Bit 06 ... Communication error to Station no. 22
Bit 07 ... Communication error to Station no. 23
Bit 08 ... Communication error to Station no. 24
Bit 09 ... Communication error to Station no. 25
Bit 10 ... Communication error to Station no. 26
Bit 11 ... Communication error to Station no. 27
Bit 12 ... Communication error to Station no. 28
Bit 13 ... Communication error to Station no. 29
Bit 14 ... Communication error to Station no. 30
Bit 15 ... Communication error to Station no. 31
```

```
category:    C
record:      4
meaning:     Communication error to Station no. 32 - 47
```

```
Bit 00 ... Communication error to Station no. 32
Bit 01 ... Communication error to Station no. 33
Bit 02 ... Communication error to Station no. 34
Bit 03 ... Communication error to Station no. 35
Bit 04 ... Communication error to Station no. 36
Bit 05 ... Communication error to Station no. 37
Bit 06 ... Communication error to Station no. 38
Bit 07 ... Communication error to Station no. 39
Bit 08 ... Communication error to Station no. 40
Bit 09 ... Communication error to Station no. 41
Bit 10 ... Communication error to Station no. 42
Bit 11 ... Communication error to Station no. 43
Bit 12 ... Communication error to Station no. 44
Bit 13 ... Communication error to Station no. 45
Bit 14 ... Communication error to Station no. 46
Bit 15 ... Communication error to Station no. 47
```

```
category:    C
record:     5
meaning:    Communication error to Station no. 48 - 63
```

```
Bit 00 ... Communication error to Station no. 48
Bit 01 ... Communication error to Station no. 49
Bit 02 ... Communication error to Station no. 50
Bit 03 ... Communication error to Station no. 51
Bit 04 ... Communication error to Station no. 52
Bit 05 ... Communication error to Station no. 53
Bit 06 ... Communication error to Station no. 54
Bit 07 ... Communication error to Station no. 55
Bit 08 ... Communication error to Station no. 56
Bit 09 ... Communication error to Station no. 57
Bit 10 ... Communication error to Station no. 58
Bit 11 ... Communication error to Station no. 59
Bit 12 ... Communication error to Station no. 60
Bit 13 ... Communication error to Station no. 61
Bit 14 ... Communication error to Station no. 62
Bit 15 ... Communication error to Station no. 63
```

```
category:    C
record:      6
meaning:     Communication error to Station no. 64 - 79
```

```
Bit 00 ... Communication error to Station no. 64
Bit 01 ... Communication error to Station no. 65
Bit 02 ... Communication error to Station no. 66
Bit 03 ... Communication error to Station no. 67
Bit 04 ... Communication error to Station no. 68
Bit 05 ... Communication error to Station no. 69
Bit 06 ... Communication error to Station no. 70
Bit 07 ... Communication error to Station no. 71
Bit 08 ... Communication error to Station no. 72
Bit 09 ... Communication error to Station no. 73
Bit 10 ... Communication error to Station no. 74
Bit 11 ... Communication error to Station no. 75
Bit 12 ... Communication error to Station no. 76
Bit 13 ... Communication error to Station no. 77
Bit 14 ... Communication error to Station no. 78
Bit 15 ... Communication error to Station no. 79
```

```
category:    C
record:      7
meaning:     Communication error to Station no. 80 - 95
```

```
Bit 00 ... Communication error to Station no. 80
Bit 01 ... Communication error to Station no. 81
Bit 02 ... Communication error to Station no. 82
Bit 03 ... Communication error to Station no. 83
Bit 04 ... Communication error to Station no. 84
Bit 05 ... Communication error to Station no. 85
Bit 06 ... Communication error to Station no. 86
Bit 07 ... Communication error to Station no. 87
Bit 08 ... Communication error to Station no. 88
Bit 09 ... Communication error to Station no. 89
Bit 10 ... Communication error to Station no. 90
Bit 11 ... Communication error to Station no. 91
Bit 12 ... Communication error to Station no. 92
Bit 13 ... Communication error to Station no. 93
Bit 14 ... Communication error to Station no. 94
Bit 15 ... Communication error to Station no. 95
```



```
category:    C
record:      8
meaning:     Communication error to Station no. 96 - 99
```

```
Bit 00 ... Communication error to Station no. 96
Bit 01 ... Communication error to Station no. 97
Bit 02 ... Communication error to Station no. 98
Bit 03 ... Communication error to Station no. 99
Bit 04 ...
Bit 05 ...
Bit 06 ...
Bit 07 ...
Bit 08 ...
Bit 09 ...
Bit 10 ...
Bit 11 ...
Bit 12 ...
Bit 13 ...
Bit 14 ...
Bit 15 ...
```

```
category:    T
record:     0
meaning:    Test mode of the operating and base systems
```

```
Bit 00 ... Memory test disabled
Bit 01 ...
Bit 02 ...
Bit 03 ...
Bit 04 ...
Bit 05 ...
Bit 06 ...
Bit 07 ...
Bit 08 ...
Bit 09 ...
Bit 10 ...
Bit 11 ...
Bit 12 ...
Bit 13 ...
Bit 14 ...
Bit 15 ...
```

B. Appendix: Bibliography

The following documents are recommended to supplement the " UMPM01 " description:

IEC 870-5-1, "Transmission Frame Formats"
(1st issue, February 1990)

DIN EN 60870-5-101 "Fernwirkeinrichtungen und Fernwirksysteme" [Telecommunications equipment and telecommunications systems]
Part 5: Transmission protocol
Main section 101: Application-related standards for basic telecommunications tasks
(IEC 870-5-101: 1995) German version EN 870-5-101: 1995

DIN EN 60870-5-5 "Fernwirkeinrichtungen und Fernwirksysteme" [Telecommunications equipment and telecommunications systems]
Part 5: Transmission protocol
Main section 5: Fundamental application functions
(IEC 870-5-5: 1995) German version EN 870-5-5: 1995

SAT Description: "Ax 1703 Data Formats"
Item number: MA0-000-x.xx

SAT Description: "IEC 60870-5-101 and 104 Interoperability"
Item number: DA0-040-x.xx

DIN 19244 "Fernwirkeinrichtungen und Fernwirksysteme" [Telecommunications equipment and telecommunications systems]
Part 10: Message Formats

DIN 19244 "Fernwirkeinrichtungen und Fernwirksysteme" [Telecommunications equipment and telecommunications systems]
Part 52: Transmission Procedures of the Connection Layer

DIN 19244 "Fernwirkeinrichtungen und Fernwirksysteme" [Telecommunications equipment and telecommunications systems]
Part 53: Transmission Protocol
Main section 3: General Structure of the Application Data

C. Appendix: Parameter Documentation

The firmware parameters are described in so-called **PD forms** (parameter documentation forms).

- The parameters described in the PD form are available for parameterization with the PSR Configuring and Service Computer of a SAT TOOLBOX
 - The PD Form describes
 - all parameters that are available for a given firmware and as of which firmware revision they are effective
 - parameter functions and their value ranges
- This appendix documents the parameters for the firmware set forth in the present document in the shape of a blank form filled with default values
- The current state of parameters of a firmware of a certain system element can be documented with the PSR Configuring and Service Computer of a SAT TOOLBOX

Parameterizing with PD forms is supported by both SAT TOOLBOX (PSR) and SAT TOOLBOX II (PSR II).

 REVISION PARAMETER DOCUMENTATION

created		last changed		released	
on	by	on	by	on	by
06-10-99	ENT-SW/FR	18-11-99	ENT-SW/FR	31-07-00	ENT-SW/FR

PHYSICAL INTERFACE (*)

Electrical interface:

 Possible: 0=RS232 (V.24/V.28)
 1=RS422 (V.11)
 2=RS485 (V.11)

Electrical interface: RS232 (V.24/V.28) CT command: SPH 002/0C (/D)

AX-1703 REDUNDANCY (*)

Behaviour when redundancy state is "PASSIVE":

 Possible: 0 = Interface "TRISTATE"
 1 = Interface "ACTIVE", Listening mode (=STANDBY)
 3 = Interface "ACTIVE", Calling mode (=OPERATION)

Behaviour: TRISTATE CT command: SPL 160/03

Delay time when switching from STANDBY->ACTIVE:

 Possible: 1-2000 [secs]; 0 = no switching delay

Delay time: 1 Seconds CT command: SPS 161 (/D)

Receive timeout in STANDBY mode:

 Possible: 0-60000 [secs]; 0 = no monitoring

Receive timeout: 0 Seconds CT command: SPS 011 (/D)

=====

c o n t i n u i n g p a r a m e t e r s

=====

MESSAGE REPETITIONS (NUMBER OF RETRIES)

The number of the maximum message repetitions (retries) which have to be carried out can be set for some types of message.
 Possible: 0-255

Retries for INIT messages (after RESET): 1 CT command: SPL 009 (/D)
 Retries for station sel. data messages: 2 CT command: SPL 008 (/D)
 Retries for data messages "unacknowledged to all": 0 CT command: SPH 008 (/D)

STATION PARAMETERIZATION

Possible:
 Station number (Station no.) 0-99; 255=not used
 Enabling (Station in the cycle) 0=no; 1=yes
 "Report" station failure..... 0=no; 1=yes
 +-----+

Station parameterization			
No.	Station no.	Enabling	"Report" failure
0	255	ys	ys
1	255	ys	ys
2	255	ys	ys
3	255	ys	ys
4	255	ys	ys
5	255	ys	ys
6	255	ys	ys
7	255	ys	ys
8	255	ys	ys
9	255	ys	ys
10	255	ys	ys
11	255	ys	ys
12	255	ys	ys
13	255	ys	ys
14	255	ys	ys
15	255	ys	ys
16	255	ys	ys
17	255	ys	ys
18	255	ys	ys
19	255	ys	ys
20	255	ys	ys
21	255	ys	ys
22	255	ys	ys
23	255	ys	ys
24	255	ys	ys
25	255	ys	ys
26	255	ys	ys
27	255	ys	ys
28	255	ys	ys
29	255	ys	ys
30	255	ys	ys
31	255	ys	ys
32	255	ys	ys
33	255	ys	ys
34	255	ys	ys
35	255	ys	ys
36	255	ys	ys
37	255	ys	ys
38	255	ys	ys
39	255	ys	ys
40	255	ys	ys
41	255	ys	ys
42	255	ys	ys
43	255	ys	ys
44	255	ys	ys
45	255	ys	ys
46	255	ys	ys
47	255	ys	ys
48	255	ys	ys
49	255	ys	ys
50	255	ys	ys
51	255	ys	ys
52	255	ys	ys
53	255	ys	ys
54	255	ys	ys
55	255	ys	ys
56	255	ys	ys
57	255	ys	ys
58	255	ys	ys
59	255	ys	ys
60	255	ys	ys
61	255	ys	ys
62	255	ys	ys
63	255	ys	ys
64	255	ys	ys

65	255	ys	ys
66	255	ys	ys
67	255	ys	ys
68	255	ys	ys
69	255	ys	ys
70	255	ys	ys
71	255	ys	ys
72	255	ys	ys
73	255	ys	ys
74	255	ys	ys
75	255	ys	ys
76	255	ys	ys
77	255	ys	ys
78	255	ys	ys
79	255	ys	ys
80	255	ys	ys
81	255	ys	ys
82	255	ys	ys
83	255	ys	ys
84	255	ys	ys
85	255	ys	ys
86	255	ys	ys
87	255	ys	ys
88	255	ys	ys
89	255	ys	ys
90	255	ys	ys
91	255	ys	ys
92	255	ys	ys
93	255	ys	ys
94	255	ys	ys
95	255	ys	ys
96	255	ys	ys
97	255	ys	ys
98	255	ys	ys
99	255	ys	ys

CALL PROCEDURE per type identifier (re-call)

After a message to a selective station, it can be continuously interrogated for a parameterizable time (=continuous calling).
 In this way, for example, the effects after a command (binary information or measured value change) are rapidly transmitted.

Possible:

Type identifier 0-255

Continuous calling time ... 1-60000 (n *100[ms]) = 0.1[secs]-100[mins];
 0=no continuous call

+-----+-----+-----+-----+-----+				
Type identifier Cont. call time [secs]				
+-----+-----+-----+-----+-----+				
No.	Current	CT command	Current	CT command
+-----+-----+-----+-----+-----+				
0	255	SPL 110 (/D)	0,0	SPS 111 (/D)
1	255	SPL 112 (/D)	0,0	SPS 113 (/D)
2	255	SPL 114 (/D)	0,0	SPS 115 (/D)
3	255	SPL 116 (/D)	0,0	SPS 117 (/D)
4	255	SPL 118 (/D)	0,0	SPS 119 (/D)
5	255	SPL 11A (/D)	0,0	SPS 11B (/D)
6	255	SPL 11C (/D)	0,0	SPS 11D (/D)
7	255	SPL 11E (/D)	0,0	SPS 11F (/D)
8	255	SPL 120 (/D)	0,0	SPS 121 (/D)
9	255	SPL 122 (/D)	0,0	SPS 123 (/D)
10	255	SPL 124 (/D)	0,0	SPS 125 (/D)
11	255	SPL 126 (/D)	0,0	SPS 127 (/D)
12	255	SPL 128 (/D)	0,0	SPS 129 (/D)
13	255	SPL 12A (/D)	0,0	SPS 12B (/D)
14	255	SPL 12C (/D)	0,0	SPS 12D (/D)


```
+-----+-----+-----+-----+-----+
```

CORRECTION FACTOR FOR EXPECTED ACKNOWLEDGEMENT TIME

The expected acknowledgement time is determined automatically
(pause/set-up/message/reset times are taken into account).
Signal running times and further delay times are to be taken
account of in the "Correction factor for expected acknowledgement time".
Possible: 0-65535 (n * 10[ms]) = 0.00[secs]-10.9[mins]

Correction factor: 0,01 secs

CT command: SPS 003 (/D)