COMMUNICATION PROTOCOL

PROFIBUS MANUAL
M4M Network analyzers

Table of Contents

1 General

M4M network analyzers offer includes versions with Profibus DP-V0 communication protocol (M4M 20 Profibus and M4M 30 Profibus).

1.1 Profibus

Profibus is the acronym of Process Field Bus. Profibus is a field bus standardized according to IEC 61158/EN 50170 with applications mainly in the industrial automation and process fields.

Profibus is a single master – multi slave communication network; it is an open, solid and powerful field bus system characterized by quick response times, completely defined by international standards and capable to allow the connection of different manufacturer's devices, if all in compliance with the same standard.

Profibus allows also the reduction of cabling between the network nodes, since it requires a single communication cable only.

Profibus communication technology is based on a master-slave architecture:

- Each Profibus system needs to have at least 1 master (e.g. PC or PLC).
- Up to 127 devices (master + slave) can be connected in a single system.
- A Profibus system can be "multi-master"; in this case the "token" architecture is used so that only one master at a time will communicate on the network.

The instrument model M4M Profibus (versions M4M 20 Profibus and M4M 30 Profibus) is a slave equipment implementing the Profibus DP-V0 protocol, that allows the cyclic input/output data reading. A DP slave is a peripheral device acquiring input information and sending data to the central master.

The Profibus DP (Decentralized Peripherals) is normally used to connect decentralized peripheral devices with quick response time, according to the IEC 61158/EN 50170 standard. This normative prescribes a bit rate range from 9.6 kbps to 12 Mbps over nodes distances up to 300 m, using standard cable and maintaining the maximum operating speed.

1.1.1   Topology

Profibus network with a PC master:
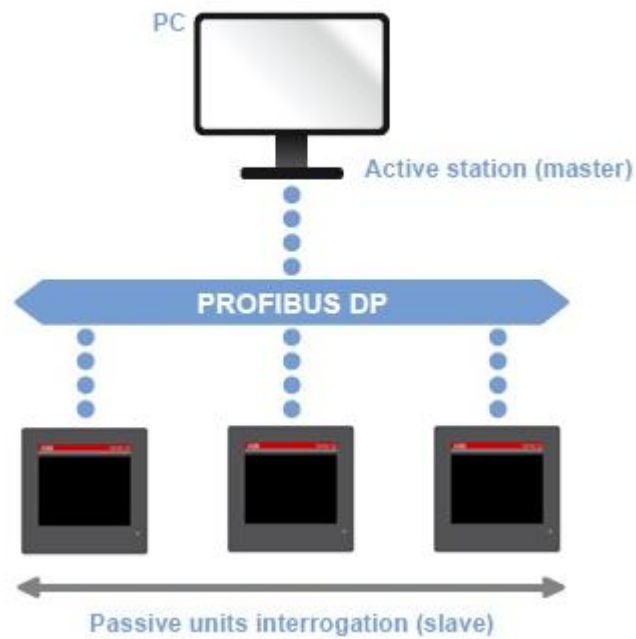
Profibus network with a PLC master:
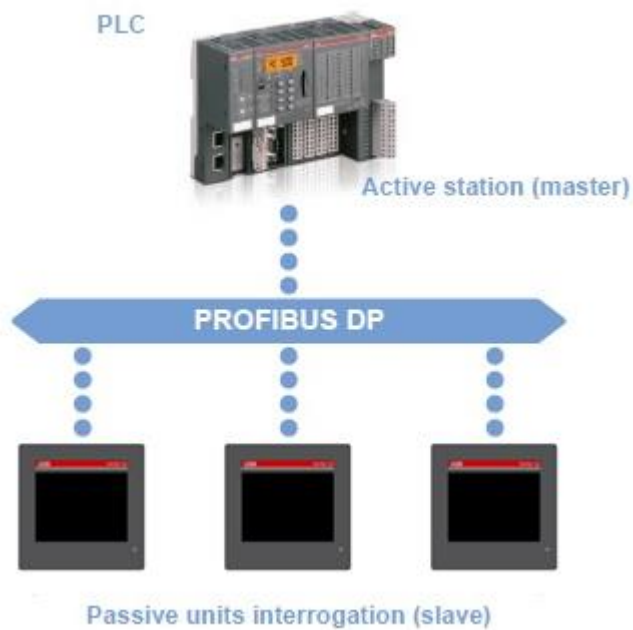
Profibus network with more than one master station:
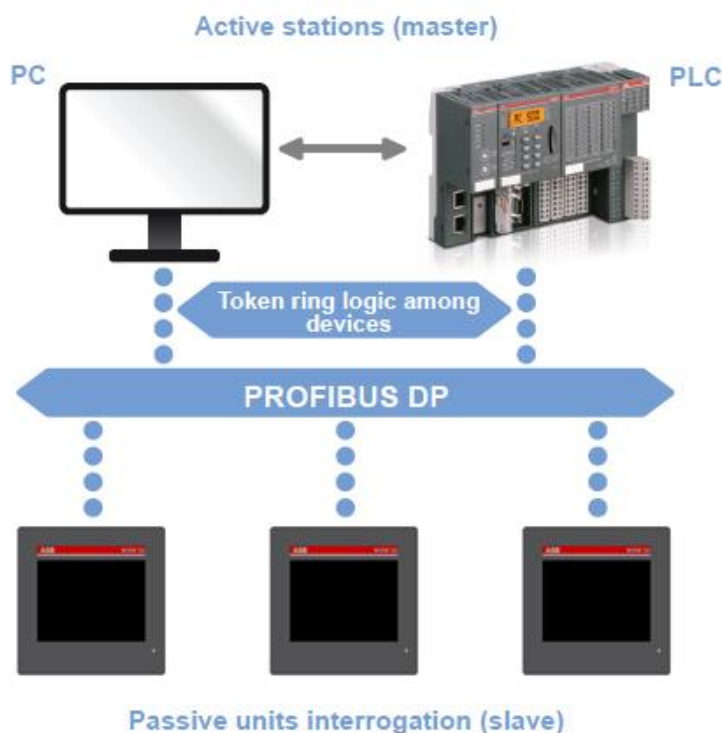
1.2 Transmission methods

The transmission method used by the Profibus DP is the RS485 interface (according to EIA) using a shielded twisted pair cable. The simple RS485 two-conductor transmission method is perfectly suited for linear/tree networks with high-speed transmission.

The Profibus bus must be always terminated at its ends by means of two terminations. Any of them must be composed by three resistors, as shown in the figure below; the termination must be fed in by 0 to 5Vdc otherwise its resistance is not equal to the characteristic impedance of the cable. Using this architecture, it becomes fixed the voltage on the bus when there are no active devices.
Termination resistors for the Profibus network:
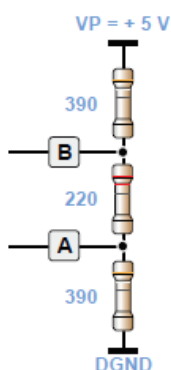
Terminators must be always present and powered since the integrity of the bus depends on the devices at its ends. If possible the so-called "Active Terminations"

should always be used. This is because usually DB9 dedicated connectors used for devices concatenation are already provided with inside ending-terminators, which may be activated if necessary.

M4M Profibus network with termination resistors:

DB9 connector of
the first device

DB9 connector of the
last device
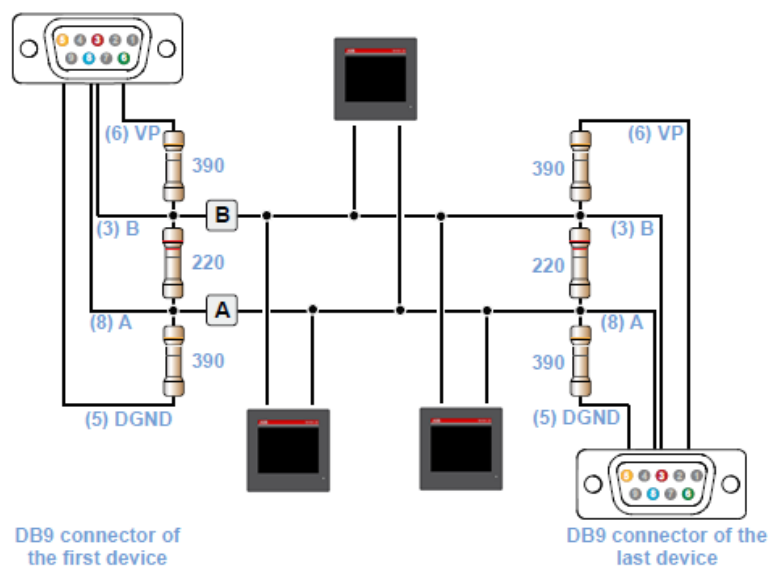
If it is desired to be protected even if the bus becomes unusable because a device is switched off at one ends, "Active Terminations" must be used. Their presence makes possible to turn on and off any device while maintaining the integrity of the bus.

M4M Profibus network with active termination:

Connector with active termination

Connector with inactive termination
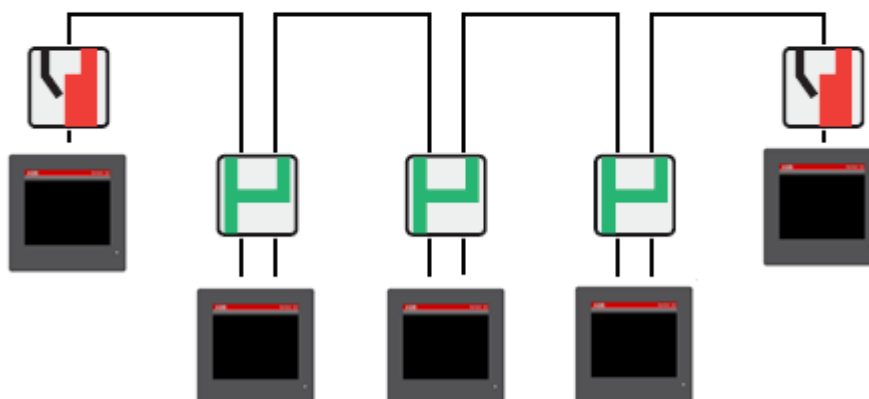
1.3   Profibus network characteristics

The extension of the Profibus network, realized by signal segmentation and re-generation, is limited to a maximum of 32 nodes/partners (master/slave) per segment; on the other hand, the entire network can have up to 126 nodes / part-ners. If it is desired to increase the length of the bus or use more than 32 stations it is necessary to use repeaters. Any repeater represents a "load" on the bus. Each new segment introduced must be terminated at its ends and can have a maximum length dependent on the baud rate; however, it is standard procedure to connect a maximum of 30 loads per segment.

M4M Profibus network with repeater:
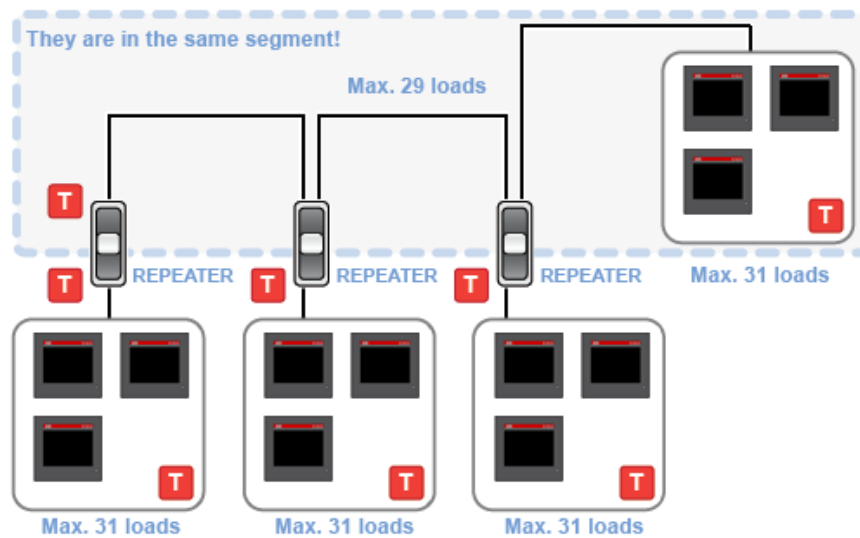
Using up to 9 repeaters, it is possible to cover distances from 1 km (at 12 Mbps) to 10 km (at 187.5 kbps), depending on the speed of transmission. Instead of the standard repeater, diagnostic repeaters can also be used. Besides the regenera-tion of the signals, they also perform an online monitoring of the bus segment connected.

1.4   Connection

The M4M Profibus interface to the Profibus bus is realized by using a 9-pin female DSUB connector (DB9F).

Pinout DB9F connector:

PIN	SIGNAL
1	-
2	-
3	LINE B
4	RTS
5	GND BUS
6	+5V BUS
7	-
8	LINE A
9	-

2   Communication telegrams

As a Profibus DP slave device, the address space is within the range 1 to 126 decimals.
There are two different variants of M4M Profibus device:

*   M4M 30 Profibus - 2CSG236791R4051
*   M4M 20 Profibus - 2CSG251131R4051

The Instruments provide 4 bytes of output data and 128 bytes of input data.
The values measured by the instrument M4M 30 Profibus are divided into 17 pages and the values measured by the instrument M4M 20 Profibus are divided into 7 pages. Each page, for both variants, is mapped into the 128 bytes of input data area. The master must first request the page of interest through the 4 bytes of output.

The Profibus telegrams to and from the M4M Profibus instrument are typically composed by 128 input bytes and 4 output bytes. The telegrams basically consist of a 4-bytes header and, in the case of inputs, additional 124 bytes of user data related to the measured values

MASTER REQUEST TELEGRAM – M4M Profibus (OUTPUT)

OUTPUT ADDRESS	MEANING	VALUE
Header byte 0 Offset = 0	Requested page number	M4M 20 [0 : 7] M4M 30 [0 : 17]
Header byte 1 Offset = 1	Reserved, not used	-
Header byte 2 Offset = 2	CONTROL byte	8 bit binary
Header byte 3 Offset = 3	Reserved, not used	-

M4M Profibus STATUS TELEGRAM – MASTER (INPUT)

OUTPUT ADDRESS	MEANING	VALUE
Header byte 0 Offset = 0	Data page number currently available	M4M 20 [0 : 7] M4M 30 [0 : 17]
Header byte 1 Offset = 1	Reserved, not used	-
Header byte 2 Offset = 2	Reserved, not used	-
Header byte 3 Offset = 3	STATUS byte	8 bit binary
Data byte 0 … 123 Offset = 4 … 127	124 bytes of data related to measured values	DWORD

CONTROL BYTE (HEADER BYTE 2 OF THYE REQUEST TELEGRAM)

BIT	MEANING
BIT 0	Internal request start/stop. **Logic value 1**: page request active. The data page number must be specified in the HEADER BYTE 0 of the request telegram. **Logic Value 0:** request page not active.
BIT [1 : 7]	Not used

STATUS BYTE (HEADER BYTE 3 OF THE STATUS TELEGRAM)

BIT	MEANING
BIT [0 : 3]	Not used
BIT 4	**Logic Value 1:** page update completed: the currently available page is the one indicated in the HEADER BYTE 0 of the status telegram and shows that the data are valid and congruent. **Logic value 0:** page update in progress (data not congruent).
BIT 5	**Logic value 1:** latest valid request. **Logic Value 0:** latest invalid request or no request received.
BIT [6 : 7]	Not used

3 Communication process and change of page

The simplified sequence to request the data from M4M Profibus can be summarized as follows:

- The master sets the page number through the HEADER BYTE 0 of the request telegram;
- The master sets equal to 1 the BIT 0 of the HEADER BYTE 2 to activate the page request, and waits for the M4M Profibus to load the new page data;
- When the HEADER BYTE 0 of the status telegram will become equal to HEADER BYTE 0 of the request telegram, and BIT 4 of STATUS BYTE will become equal to 1, then the master can read the values from the input and reset the BIT 0 in the CONTROL BYTE;
- If BIT 5 of the STATUS BYTE become equal to 0, then the number of the page you requested is not valid;
- Through 3 request telegrams for the correspondent amount of data pages, the master reads all the variables available from the meter.

Note 1: at start-up the M4M Profibus always loads the page 0.
Note 2: M4M Profibus refreshes continuously the last valid page requested.
Note 3: in case of invalid page request, the M4M Profibus continues to refresh the latest valid page requested (or eventually the default page 0).

4   Values Mapping

The memory locations not implemented in pages will be filled with the value 0xFFFFFFFF.

Data format:
- Unsigned: it is a binary number of 2 unsigned words (32 bit)
- Signed: it is a binary number of 2 words (32 bit) that, when negative, is expressed with 2's complement notation.

PAGE 0 – Realtime measurements

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total	W	0,01	Signed
8 ÷ 11	Active power L1	W	0,01	Signed
12 ÷ 15	Active power L2	W	0,01	Signed
16 ÷ 19	Active power L3	W	0,01	Signed
20 ÷ 23	Reactive power Total	var	0,01	Signed
24 ÷ 27	Reactive power L1	var	0,01	Signed
28 ÷ 31	Reactive power L2	var	0,01	Signed
32 ÷ 35	Reactive power L3	var	0,01	Signed
36 ÷ 39	Apparent power Total	VA	0,01	Signed
40 ÷ 43	Apparent power L1	VA	0,01	Signed
44 ÷ 47	Apparent power L2	VA	0,01	Signed
48 ÷ 51	Apparent power L3	VA	0,01	Signed
52 ÷ 55	Power factors Total	-	0,001	Signed
56 ÷ 59	Power factors L1	-	0,001	Signed
60 ÷ 63	Power factors L2	-	0,001	Signed
64 ÷ 67	Power factors L3	-	0,001	Signed
68 ÷ 71	Three phase system	V	0,1	Unsigned
72 ÷ 75	Voltages L1-N	V	0,1	Unsigned
76 ÷ 79	Voltages L2-N	V	0,1	Unsigned
80 ÷ 83	Voltages L3-N	V	0,1	Unsigned
84 ÷ 87	Voltage L1-L2	V	0,1	Unsigned
88 ÷ 91	Voltage L2-L3	V	0,1	Unsigned
92 ÷ 95	Voltage L1-L3	V	0,1	Unsigned
96 ÷ 99	Frequency	Hz	0,01	Unsigned
100 ÷ 103	Three phase system	A	0,01	Unsigned
104 ÷ 107	Current L1	A	0,01	Unsigned
108 ÷ 111	Current L2	A	0,01	Unsigned
112 ÷ 115	Current L3	A	0,01	Unsigned
116 ÷ 119	Current N	A	0,01	Unsigned
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 1 – Min values

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Min)	W	0,01	Signed
8 ÷ 11	Active power L1 (Min)	W	0,01	Signed
12 ÷ 15	Active power L2 (Min)	W	0,01	Signed
16 ÷ 19	Active power L3 (Min)	W	0,01	Signed
20 ÷ 23	Reactive power Total (Min)	var	0,01	Signed
24 ÷ 27	Reactive power L1 (Min)	var	0,01	Signed
28 ÷ 31	Reactive power L2 (Min)	var	0,01	Signed
32 ÷ 35	Reactive power L3 (Min)	var	0,01	Signed
36 ÷ 39	Apparent power Total (Min)	VA	0,01	Signed
40 ÷ 43	Apparent power L1 (Min)	VA	0,01	Signed
44 ÷ 47	Apparent power L2 (Min)	VA	0,01	Signed
48 ÷ 51	Apparent power L3 (Min)	VA	0,01	Signed
52 ÷ 55	Voltages L1-N (Min)	V	0,1	Unsigned
56 ÷ 59	Voltages L2-N (Min)	V	0,1	Unsigned
60 ÷ 63	Voltages L3-N (Min)	V	0,1	Unsigned
64 ÷ 67	Voltage L1-L2 (Min)	V	0,1	Unsigned
68 ÷ 71	Voltage L2-L3 (Min)	V	0,1	Unsigned
72 ÷ 75	Voltage L1-L3 (Min)	V	0,1	Unsigned
76 ÷ 79	Current L1 (Min)	A	0,01	Unsigned
80 ÷ 83	Current L2 (Min)	A	0,01	Unsigned
84 ÷ 87	Current L3 (Min)	A	0,01	Unsigned
88 ÷ 91	Current N (Min)	A	0,01	Unsigned
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 2 – Max values

INDEX	PARAMETER	DETAILS	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Max)	W	0,01	Signed
8 ÷ 11	Active power L1 (Max)	W	0,01	Signed
12 ÷ 15	Active power L2 (Max)	W	0,01	Signed
16 ÷ 19	Active power L3 (Max)	W	0,01	Signed
20 ÷ 23	Reactive power Total (Max)	var	0,01	Signed
24 ÷ 27	Reactive power L1 (Max)	var	0,01	Signed
28 ÷ 31	Reactive power L2 (Max)	var	0,01	Signed
32 ÷ 35	Reactive power L3 (Max)	var	0,01	Signed
36 ÷ 39	Apparent power Total (Max)	VA	0,01	Signed
40 ÷ 43	Apparent power L1 (Max)	VA	0,01	Signed
44 ÷ 47	Apparent power L2 (Max)	VA	0,01	Signed
48 ÷ 51	Apparent power L3 (Max)	VA	0,01	Signed
52 ÷ 55	Voltages L1-N (Max)	V	0,1	Unsigned
56 ÷ 59	Voltages L2-N (Max)	V	0,1	Unsigned
60 ÷ 63	Voltages L3-N (Max)	V	0,1	Unsigned
64 ÷ 67	Voltage L1-L2 (Max)	V	0,1	Unsigned
68 ÷ 71	Voltage L2-L3 (Max)	V	0,1	Unsigned
72 ÷ 75	Voltage L1-L3 (Max)	V	0,1	Unsigned
76 ÷ 79	Current L1 (Max)	A	0,01	Unsigned
80 ÷ 83	Current L2 (Max)	A	0,01	Unsigned
84 ÷ 87	Current L3 (Max)	A	0,01	Unsigned
88 ÷ 91	Current N (Max)	A	0,01	Unsigned
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 3 – Average values

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Average)	W	0,01	Signed
8 ÷ 11	Active power L1 (Average)	W	0,01	Signed
12 ÷ 15	Active power L2 (Average)	W	0,01	Signed
16 ÷ 19	Active power L3 (Average)	W	0,01	Signed
20 ÷ 23	Reactive power Total (Average)	var	0,01	Signed
24 ÷ 27	Reactive power L1 (Average)	var	0,01	Signed
28 ÷ 31	Reactive power L2 (Average)	var	0,01	Signed
32 ÷ 35	Reactive power L3 (Average)	var	0,01	Signed
36 ÷ 39	Apparent power Total (Average)	VA	0,01	Signed
40 ÷ 43	Apparent power L1 (Average)	VA	0,01	Signed
44 ÷ 47	Apparent power L2 (Average)	VA	0,01	Signed
48 ÷ 51	Apparent power L3 (Average)	VA	0,01	Signed
52 ÷ 55	Voltages L1-N (Average)	V	0,1	Unsigned
56 ÷ 59	Voltages L2-N (Average)	V	0,1	Unsigned
60 ÷ 63	Voltages L3-N (Average)	V	0,1	Unsigned
64 ÷ 67	Voltage L1-L2 (Average)	V	0,1	Unsigned
68 ÷ 71	Voltage L2-L3 (Average)	V	0,1	Unsigned
72 ÷ 75	Voltage L1-L3 (Average)	V	0,1	Unsigned
76 ÷ 79	Current L1 (Average)	A	0,01	Unsigned
80 ÷ 83	Current L2 (Average)	A	0,01	Unsigned
84 ÷ 87	Current L3 (Average)	A	0,01	Unsigned
88 ÷ 91	Current N (Average)	A	0,01	Unsigned
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 4 – Active energy

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active import High			
8 ÷ 11	Active import Low	kWh	0,01	Unsigned
12 ÷ 15	Active import L1 High			
16 ÷ 19	Active import L1 Low	kWh	0,01	Unsigned
20 ÷ 23	Active import L2 High			
24 ÷ 27	Active import L2 Low	kWh	0,01	Unsigned
28 ÷ 31	Active import L3 High			
32 ÷ 35	Active import L3 Low	kWh	0,01	Unsigned
36 ÷ 39	Active export High			
40 ÷ 43	Active export Low	kWh	0,01	Unsigned
44 ÷ 47	Active export L1 High			
48 ÷ 51	Active export L1 Low	kWh	0,01	Unsigned
52 ÷ 55	Active export L2 High			
56 ÷ 59	Active export L2 Low	kWh	0,01	Unsigned
60 ÷ 63	Active export L3 High			
64 ÷ 67	Active export L3 Low	kWh	0,01	Unsigned
68 ÷ 71	Active net High			
72 ÷ 75	Active net Low	kWh	0,01	Signed
76 ÷ 79	Active net L1 High			
80 ÷ 83	Active net L1 Low	kWh	0,01	Signed
84 ÷ 87	Active net L2 High			
88 ÷ 91	Active net L2 Low	kWh	0,01	Signed
92 ÷ 95	Active net L3 High			
96 ÷ 99	Active net L3 Low	kWh	0,01	Signed
100 ÷ 103	Active import (CO2) High			
104 ÷ 107	Active import (CO2) Low	Kg	0,0001	Unsigned
108 ÷ 111	Active import (Currency) High			
112 ÷ 115	Active import (Currency) Low	currency	0,0001	Unsigned
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 5 – Reactive energy

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Reactive import High			
8 ÷ 11	Reactive import Low	kvarh	0,01	Unsigned
12 ÷ 15	Reactive import L1 High			
16 ÷ 19	Reactive import L1 Low	kvarh	0,01	Unsigned
20 ÷ 23	Reactive import L2 High			
24 ÷ 27	Reactive import L2 Low	kvarh	0,01	Unsigned
28 ÷ 31	Reactive import L3 High			
32 ÷ 35	Reactive import L3 Low	kvarh	0,01	Unsigned
36 ÷ 39	Reactive export High			
40 ÷ 43	Reactive export Low	kvarh	0,01	Unsigned
44 ÷ 47	Reactive export L1 High			
48 ÷ 51	Reactive export L1 Low	kvarh	0,01	Unsigned
52 ÷ 55	Reactive export L2 High			
56 ÷ 59	Reactive export L2 Low	kvarh	0,01	Unsigned
60 ÷ 63	Reactive export L3 High			
64 ÷ 67	Reactive export L3 Low	kvarh	0,01	Unsigned
68 ÷ 71	Reactive net High			
72 ÷ 75	Reactive net Low	kvarh	0,01	Signed
76 ÷ 79	Reactive net L1 High			
80 ÷ 83	Reactive net L1 Low	kvarh	0,01	Signed
84 ÷ 87	Reactive net L2 High			
88 ÷ 91	Reactive net L2 Low	kvarh	0,01	Signed
92 ÷ 95	Reactive net L3 High			
96 ÷ 99	Reactive net L3 Low	kvarh	0,01	Signed
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 6 – Apparent energy

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Apparent import High			
8 ÷ 11	Apparent import Low	kVAh	0,01	Unsigned
12 ÷ 15	Apparent import L1 High			
16 ÷ 19	Apparent import L1 Low	KVAh	0,01	Unsigned
20 ÷ 23	Apparent import L2 High			
24 ÷ 27	Apparent import L2 Low	KVAh	0,01	Unsigned
28 ÷ 31	Apparent import L3 High			
32 ÷ 35	Apparent import L3 Low	KVAh	0,01	Unsigned
36 ÷ 39	Apparent export High			
40 ÷ 43	Apparent export Low	kVAh	0,01	Unsigned
44 ÷ 47	Apparent export L1 High			
48 ÷ 51	Apparent export L1 Low	KVAh	0,01	Unsigned
52 ÷ 55	Apparent export L2 High			
56 ÷ 59	Apparent export L2 Low	KVAh	0,01	Unsigned
60 ÷ 63	Apparent export L3 High			
64 ÷ 67	Apparent export L3 Low	KVAh	0,01	Unsigned
68 ÷ 71	Apparent net High			
72 ÷ 75	Apparent net Low	kVAh	0,01	Signed
76 ÷ 79	Apparent net L1 High			
80 ÷ 83	Apparent net L1 Low	KVAh	0,01	Signed
84 ÷ 87	Apparent net L2 High			
88 ÷ 91	Apparent net L2 Low	KVAh	0,01	Signed
92 ÷ 95	Apparent net L3 High			
96 ÷ 99	Apparent net L3 Low	KVAh	0,01	Signed
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

PAGE 7 – Configurations, Power Quality

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Serial number	-	-	ASCII
8 ÷ 11	Meter firmware version	-	-	Unsigned
12 ÷ 15	Voltage transf. ratio (Num.)	-	-	Unsigned
16 ÷ 19	Voltage transf. ratio (Den.)	-	-	Unsigned
20 ÷ 23	Current transf. ratio (Num.)	-	-	Unsigned
24 ÷ 27	Current transf. ratio (Den.)	-	-	Unsigned
28 ÷ 31	N Current transf. ratio (Num.)*	-	-	Unsigned
32 ÷ 35	N Current transf. ratio (Den.)*	-	-	Unsigned
36 ÷ 39	Wires	-	-	Unsigned
40 ÷ 43	Voltage harmonics L1-N, THD	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L2-N, THD	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L3-N, THD	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L1-L2, THD	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L2-L3, THD	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L1-L3, THD	%	0,1	Unsigned
64 ÷ 67	Current harmonics L1, THD	%	0,1	Unsigned
68 ÷ 71	Current harmonics L2, THD	%	0,1	Unsigned
72 ÷ 75	Current harmonics L3, THD	%	0,1	Unsigned
76 ÷ 79	Current harmonics N, THD	%	0,1	Unsigned
80 ÷ 83	Unbalances Phase voltage*	%	0,1	Unsigned
84 ÷ 87	Unbalances Line voltage*	%	0,1	Unsigned
88 ÷ 91	Unbalances Current*	%	0,1	Unsigned
92 ÷ 95	Input 1 Counter*	-	-	Unsigned
96 ÷ 99	Input 2 Counter*	-	-	Unsigned
100 ÷ 103	Input 3 Counter*	-	-	Unsigned
104 ÷ 107	Input 4 Counter*	-	-	Unsigned
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 8 – Voltage L1-N Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L1-N, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L1-N, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L1-N, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L1-N, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L1-N, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L1-N, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L1-N, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L1-N, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L1-N, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L1-N, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L1-N, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L1-N, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L1-N, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L1-N, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L1-N, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L1-N, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L1-N, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L1-N, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L1-N, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L1-N, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L1-N, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L1-N, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L1-N, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L1-N, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L1-N, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L1-N, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L1-N, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L1-N, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L1-N, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L1-N, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L1-N, 32°	%	0,1	Unsigned

***** Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 9 – Voltage L2-N Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L2-N, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L2-N, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L2-N, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L2-N, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L2-N, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L2-N, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L2-N, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L2-N, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L2-N, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L2-N, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L2-N, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L2-N, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L2-N, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L2-N, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L2-N, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L2-N, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L2-N, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L2-N, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L2-N, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L2-N, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L2-N, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L2-N, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L2-N, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L2-N, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L2-N, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L2-N, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L2-N, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L2-N, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L2-N, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L2-N, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L2-N, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 10 – Voltage L3-N Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L3-N, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L3-N, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L3-N, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L3-N, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L3-N, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L3-N, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L3-N, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L3-N, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L3-N, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L3-N, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L3-N, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L3-N, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L3-N, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L3-N, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L3-N, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L3-N, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L3-N, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L3-N, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L3-N, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L3-N, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L3-N, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L3-N, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L3-N, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L3-N, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L3-N, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L3-N, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L3-N, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L3-N, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L3-N, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L3-N, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L3-N, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 11 – Voltage L1-L2 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L1-L2, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L1-L2, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L1-L2, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L1-L2, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L1-L2, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L1-L2, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L1-L2, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L1-L2, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L1-L2, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L1-L2, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L1-L2, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L1-L2, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L1-L2, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L1-L2, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L1-L2, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L1-L2, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L1-L2, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L1-L2, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L1-L2, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L1-L2, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L1-L2, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L1-L2, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L1-L2, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L1-L2, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L1-L2, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L1-L2, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L1-L2, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L1-L2, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L1-L2, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L1-L2, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L1-L2, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 12 – Voltage L2-L3 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L2-L3, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L2-L3, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L2-L3, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L2-L3, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L2-L3, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L2-L3, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L2-L3, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L2-L3, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L2-L3, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L2-L3, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L2-L3, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L2-L3, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L2-L3, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L2-L3, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L2-L3, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L2-L3, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L2-L3, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L2-L3, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L2-L3, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L2-L3, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L2-L3, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L2-L3, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L2-L3, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L2-L3, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L2-L3, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L2-L3, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L2-L3, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L2-L3, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L2-L3, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L2-L3, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L2-L3, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 13 – Voltage L1-L3 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Voltage harmonics L1-L3, 2°	%	0,1	Unsigned
8 ÷ 11	Voltage harmonics L1-L3, 3°	%	0,1	Unsigned
12 ÷ 15	Voltage harmonics L1-L3, 4°	%	0,1	Unsigned
16 ÷ 19	Voltage harmonics L1-L3, 5°	%	0,1	Unsigned
20 ÷ 23	Voltage harmonics L1-L3, 6°	%	0,1	Unsigned
24 ÷ 27	Voltage harmonics L1-L3, 7°	%	0,1	Unsigned
28 ÷ 31	Voltage harmonics L1-L3, 8°	%	0,1	Unsigned
32 ÷ 35	Voltage harmonics L1-L3, 9°	%	0,1	Unsigned
36 ÷ 39	Voltage harmonics L1-L3, 10°	%	0,1	Unsigned
40 ÷ 43	Voltage harmonics L1-L3, 11°	%	0,1	Unsigned
44 ÷ 47	Voltage harmonics L1-L3, 12°	%	0,1	Unsigned
48 ÷ 51	Voltage harmonics L1-L3, 13°	%	0,1	Unsigned
52 ÷ 55	Voltage harmonics L1-L3, 14°	%	0,1	Unsigned
56 ÷ 59	Voltage harmonics L1-L3, 15°	%	0,1	Unsigned
60 ÷ 63	Voltage harmonics L1-L3, 16°	%	0,1	Unsigned
64 ÷ 67	Voltage harmonics L1-L3, 17°	%	0,1	Unsigned
68 ÷ 71	Voltage harmonics L1-L3, 18°	%	0,1	Unsigned
72 ÷ 75	Voltage harmonics L1-L3, 19°	%	0,1	Unsigned
76 ÷ 79	Voltage harmonics L1-L3, 20°	%	0,1	Unsigned
80 ÷ 83	Voltage harmonics L1-L3, 21°	%	0,1	Unsigned
84 ÷ 87	Voltage harmonics L1-L3, 22°	%	0,1	Unsigned
88 ÷ 91	Voltage harmonics L1-L3, 23°	%	0,1	Unsigned
92 ÷ 95	Voltage harmonics L1-L3, 24°	%	0,1	Unsigned
96 ÷ 99	Voltage harmonics L1-L3, 25°	%	0,1	Unsigned
100 ÷ 103	Voltage harmonics L1-L3, 26°	%	0,1	Unsigned
104 ÷ 107	Voltage harmonics L1-L3, 27°	%	0,1	Unsigned
108 ÷ 111	Voltage harmonics L1-L3, 28°	%	0,1	Unsigned
112 ÷ 115	Voltage harmonics L1-L3, 29°	%	0,1	Unsigned
116 ÷ 119	Voltage harmonics L1-L3, 30°	%	0,1	Unsigned
120 ÷ 123	Voltage harmonics L1-L3, 31°	%	0,1	Unsigned
124 ÷ 127	Voltage harmonics L1-L3, 32°	%	0,1	Unsigned

***** Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 14 – Current L1 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Current harmonics L1, 2°	%	0,1	Unsigned
8 ÷ 11	Current harmonics L1, 3°	%	0,1	Unsigned
12 ÷ 15	Current harmonics L1, 4°	%	0,1	Unsigned
16 ÷ 19	Current harmonics L1, 5°	%	0,1	Unsigned
20 ÷ 23	Current harmonics L1, 6°	%	0,1	Unsigned
24 ÷ 27	Current harmonics L1, 7°	%	0,1	Unsigned
28 ÷ 31	Current harmonics L1, 8°	%	0,1	Unsigned
32 ÷ 35	Current harmonics L1, 9°	%	0,1	Unsigned
36 ÷ 39	Current harmonics L1, 10°	%	0,1	Unsigned
40 ÷ 43	Current harmonics L1, 11°	%	0,1	Unsigned
44 ÷ 47	Current harmonics L1, 12°	%	0,1	Unsigned
48 ÷ 51	Current harmonics L1, 13°	%	0,1	Unsigned
52 ÷ 55	Current harmonics L1, 14°	%	0,1	Unsigned
56 ÷ 59	Current harmonics L1, 15°	%	0,1	Unsigned
60 ÷ 63	Current harmonics L1, 16°	%	0,1	Unsigned
64 ÷ 67	Current harmonics L1, 17°	%	0,1	Unsigned
68 ÷ 71	Current harmonics L1, 18°	%	0,1	Unsigned
72 ÷ 75	Current harmonics L1, 19°	%	0,1	Unsigned
76 ÷ 79	Current harmonics L1, 20°	%	0,1	Unsigned
80 ÷ 83	Current harmonics L1, 21°	%	0,1	Unsigned
84 ÷ 87	Current harmonics L1, 22°	%	0,1	Unsigned
88 ÷ 91	Current harmonics L1, 23°	%	0,1	Unsigned
92 ÷ 95	Current harmonics L1, 24°	%	0,1	Unsigned
96 ÷ 99	Current harmonics L1, 25°	%	0,1	Unsigned
100 ÷ 103	Current harmonics L1, 26°	%	0,1	Unsigned
104 ÷ 107	Current harmonics L1, 27°	%	0,1	Unsigned
108 ÷ 111	Current harmonics L1, 28°	%	0,1	Unsigned
112 ÷ 115	Current harmonics L1, 29°	%	0,1	Unsigned
116 ÷ 119	Current harmonics L1, 30°	%	0,1	Unsigned
120 ÷ 123	Current harmonics L1, 31°	%	0,1	Unsigned
124 ÷ 127	Current harmonics L1, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 15 – Current L2 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Current harmonics L2, 2°	%	0,1	Unsigned
8 ÷ 11	Current harmonics L2, 3°	%	0,1	Unsigned
12 ÷ 15	Current harmonics L2, 4°	%	0,1	Unsigned
16 ÷ 19	Current harmonics L2, 5°	%	0,1	Unsigned
20 ÷ 23	Current harmonics L2, 6°	%	0,1	Unsigned
24 ÷ 27	Current harmonics L2, 7°	%	0,1	Unsigned
28 ÷ 31	Current harmonics L2, 8°	%	0,1	Unsigned
32 ÷ 35	Current harmonics L2, 9°	%	0,1	Unsigned
36 ÷ 39	Current harmonics L2, 10°	%	0,1	Unsigned
40 ÷ 43	Current harmonics L2, 11°	%	0,1	Unsigned
44 ÷ 47	Current harmonics L2, 12°	%	0,1	Unsigned
48 ÷ 51	Current harmonics L2, 13°	%	0,1	Unsigned
52 ÷ 55	Current harmonics L2, 14°	%	0,1	Unsigned
56 ÷ 59	Current harmonics L2, 15°	%	0,1	Unsigned
60 ÷ 63	Current harmonics L2, 16°	%	0,1	Unsigned
64 ÷ 67	Current harmonics L2, 17°	%	0,1	Unsigned
68 ÷ 71	Current harmonics L2, 18°	%	0,1	Unsigned
72 ÷ 75	Current harmonics L2, 19°	%	0,1	Unsigned
76 ÷ 79	Current harmonics L2, 20°	%	0,1	Unsigned
80 ÷ 83	Current harmonics L2, 21°	%	0,1	Unsigned
84 ÷ 87	Current harmonics L2, 22°	%	0,1	Unsigned
88 ÷ 91	Current harmonics L2, 23°	%	0,1	Unsigned
92 ÷ 95	Current harmonics L2, 24°	%	0,1	Unsigned
96 ÷ 99	Current harmonics L2, 25°	%	0,1	Unsigned
100 ÷ 103	Current harmonics L2, 26°	%	0,1	Unsigned
104 ÷ 107	Current harmonics L2, 27°	%	0,1	Unsigned
108 ÷ 111	Current harmonics L2, 28°	%	0,1	Unsigned
112 ÷ 115	Current harmonics L2, 29°	%	0,1	Unsigned
116 ÷ 119	Current harmonics L2, 30°	%	0,1	Unsigned
120 ÷ 123	Current harmonics L2, 31°	%	0,1	Unsigned
124 ÷ 127	Current harmonics L2, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 16 – Current L3 Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Current harmonics L3, 2°	%	0,1	Unsigned
8 ÷ 11	Current harmonics L3, 3°	%	0,1	Unsigned
12 ÷ 15	Current harmonics L3, 4°	%	0,1	Unsigned
16 ÷ 19	Current harmonics L3, 5°	%	0,1	Unsigned
20 ÷ 23	Current harmonics L3, 6°	%	0,1	Unsigned
24 ÷ 27	Current harmonics L3, 7°	%	0,1	Unsigned
28 ÷ 31	Current harmonics L3, 8°	%	0,1	Unsigned
32 ÷ 35	Current harmonics L3, 9°	%	0,1	Unsigned
36 ÷ 39	Current harmonics L3, 10°	%	0,1	Unsigned
40 ÷ 43	Current harmonics L3, 11°	%	0,1	Unsigned
44 ÷ 47	Current harmonics L3, 12°	%	0,1	Unsigned
48 ÷ 51	Current harmonics L3, 13°	%	0,1	Unsigned
52 ÷ 55	Current harmonics L3, 14°	%	0,1	Unsigned
56 ÷ 59	Current harmonics L3, 15°	%	0,1	Unsigned
60 ÷ 63	Current harmonics L3, 16°	%	0,1	Unsigned
64 ÷ 67	Current harmonics L3, 17°	%	0,1	Unsigned
68 ÷ 71	Current harmonics L3, 18°	%	0,1	Unsigned
72 ÷ 75	Current harmonics L3, 19°	%	0,1	Unsigned
76 ÷ 79	Current harmonics L3, 20°	%	0,1	Unsigned
80 ÷ 83	Current harmonics L3, 21°	%	0,1	Unsigned
84 ÷ 87	Current harmonics L3, 22°	%	0,1	Unsigned
88 ÷ 91	Current harmonics L3, 23°	%	0,1	Unsigned
92 ÷ 95	Current harmonics L3, 24°	%	0,1	Unsigned
96 ÷ 99	Current harmonics L3, 25°	%	0,1	Unsigned
100 ÷ 103	Current harmonics L3, 26°	%	0,1	Unsigned
104 ÷ 107	Current harmonics L3, 27°	%	0,1	Unsigned
108 ÷ 111	Current harmonics L3, 28°	%	0,1	Unsigned
112 ÷ 115	Current harmonics L3, 29°	%	0,1	Unsigned
116 ÷ 119	Current harmonics L3, 30°	%	0,1	Unsigned
120 ÷ 123	Current harmonics L3, 31°	%	0,1	Unsigned
124 ÷ 127	Current harmonics L3, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 17 – Current N Harmonics*

INDEX	PARAMETER	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Current harmonics N, 2°	%	0,1	Unsigned
8 ÷ 11	Current harmonics N, 3°	%	0,1	Unsigned
12 ÷ 15	Current harmonics N, 4°	%	0,1	Unsigned
16 ÷ 19	Current harmonics N, 5°	%	0,1	Unsigned
20 ÷ 23	Current harmonics N, 6°	%	0,1	Unsigned
24 ÷ 27	Current harmonics N, 7°	%	0,1	Unsigned
28 ÷ 31	Current harmonics N, 8°	%	0,1	Unsigned
32 ÷ 35	Current harmonics N, 9°	%	0,1	Unsigned
36 ÷ 39	Current harmonics N, 10°	%	0,1	Unsigned
40 ÷ 43	Current harmonics N, 11°	%	0,1	Unsigned
44 ÷ 47	Current harmonics N, 12°	%	0,1	Unsigned
48 ÷ 51	Current harmonics N, 13°	%	0,1	Unsigned
52 ÷ 55	Current harmonics N, 14°	%	0,1	Unsigned
56 ÷ 59	Current harmonics N, 15°	%	0,1	Unsigned
60 ÷ 63	Current harmonics N, 16°	%	0,1	Unsigned
64 ÷ 67	Current harmonics N, 17°	%	0,1	Unsigned
68 ÷ 71	Current harmonics N, 18°	%	0,1	Unsigned
72 ÷ 75	Current harmonics N, 19°	%	0,1	Unsigned
76 ÷ 79	Current harmonics N, 20°	%	0,1	Unsigned
80 ÷ 83	Current harmonics N, 21°	%	0,1	Unsigned
84 ÷ 87	Current harmonics N, 22°	%	0,1	Unsigned
88 ÷ 91	Current harmonics N, 23°	%	0,1	Unsigned
92 ÷ 95	Current harmonics N, 24°	%	0,1	Unsigned
96 ÷ 99	Current harmonics N, 25°	%	0,1	Unsigned
100 ÷ 103	Current harmonics N, 26°	%	0,1	Unsigned
104 ÷ 107	Current harmonics N, 27°	%	0,1	Unsigned
108 ÷ 111	Current harmonics N, 28°	%	0,1	Unsigned
112 ÷ 115	Current harmonics N, 29°	%	0,1	Unsigned
116 ÷ 119	Current harmonics N, 30°	%	0,1	Unsigned
120 ÷ 123	Current harmonics N, 31°	%	0,1	Unsigned
124 ÷ 127	Current harmonics N, 32°	%	0,1	Unsigned

* Available on M4M 30 Profibus (2CSG236791R4051)

PAGE 18 – Realtime power measurements (Scaler 1)**

INDEX	QUANTITY	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total	W	1	Signed
8 ÷ 11	Active power L1	W	1	Signed
12 ÷ 15	Active power L2	W	1	Signed
16 ÷ 19	Active power L3	W	1	Signed
20 ÷ 23	Reactive power Total	var	1	Signed
24 ÷ 27	Reactive power L1	var	1	Signed
28 ÷ 31	Reactive power L2	var	1	Signed
32 ÷ 35	Reactive power L3	var	1	Signed
36 ÷ 39	Apparent power Total	VA	1	Signed
40 ÷ 43	Apparent power L1	VA	1	Signed
44 ÷ 47	Apparent power L2	VA	1	Signed
48 ÷ 51	Apparent power L3	VA	1	Signed
52 ÷ 55	-	-	-	-
56 ÷ 59	-	-	-	-
60 ÷ 63	-	-	-	-
64 ÷ 67	-	-	-	-
68 ÷ 71	-	-	-	-
72 ÷ 75	-	-	-	-
76 ÷ 79	-	-	-	-
80 ÷ 83	-	-	-	-
84 ÷ 87	-	-	-	-
88 ÷ 91	-	-	-	-
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

** Available from FW version P1.3.10.0

PAGE 19 – Min. power measurements (Scaler 1)**

INDEX	QUANTITY	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Min)	W	1	Signed
8 ÷ 11	Active power L1 (Min)	W	1	Signed
12 ÷ 15	Active power L2 (Min)	W	1	Signed
16 ÷ 19	Active power L3 (Min)	W	1	Signed
20 ÷ 23	Reactive power Total (Min)	var	1	Signed
24 ÷ 27	Reactive power L1 (Min)	var	1	Signed
28 ÷ 31	Reactive power L2 (Min)	var	1	Signed
32 ÷ 35	Reactive power L3 (Min)	var	1	Signed
36 ÷ 39	Apparent power Total (Min)	VA	1	Signed
40 ÷ 43	Apparent power L1 (Min)	VA	1	Signed
44 ÷ 47	Apparent power L2 (Min)	VA	1	Signed
48 ÷ 51	Apparent power L3 (Min)	VA	1	Signed
52 ÷ 55	-	-	-	-
56 ÷ 59	-	-	-	-
60 ÷ 63	-	-	-	-
64 ÷ 67	-	-	-	-
68 ÷ 71	-	-	-	-
72 ÷ 75	-	-	-	-
76 ÷ 79	-	-	-	-
80 ÷ 83	-	-	-	-
84 ÷ 87	-	-	-	-
88 ÷ 91	-	-	-	-
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

** Available from FW version P1.3.10.0

PAGE 20 – Max. power measurements (Scaler 1)**

INDEX	QUANTITY	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Max)	W	1	Signed
8 ÷ 11	Active power L1 (Max)	W	1	Signed
12 ÷ 15	Active power L2 (Max)	W	1	Signed
16 ÷ 19	Active power L3 (Max)	W	1	Signed
20 ÷ 23	Reactive power Total (Max)	var	1	Signed
24 ÷ 27	Reactive power L1 (Max)	var	1	Signed
28 ÷ 31	Reactive power L2 (Max)	var	1	Signed
32 ÷ 35	Reactive power L3 (Max)	var	1	Signed
36 ÷ 39	Apparent power Total (Max)	VA	1	Signed
40 ÷ 43	Apparent power L1 (Max)	VA	1	Signed
44 ÷ 47	Apparent power L2 (Max)	VA	1	Signed
48 ÷ 51	Apparent power L3 (Max)	VA	1	Signed
52 ÷ 55	-	-	-	-
56 ÷ 59	-	-	-	-
60 ÷ 63	-	-	-	-
64 ÷ 67	-	-	-	-
68 ÷ 71	-	-	-	-
72 ÷ 75	-	-	-	-
76 ÷ 79	-	-	-	-
80 ÷ 83	-	-	-	-
84 ÷ 87	-	-	-	-
88 ÷ 91	-	-	-	-
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

** Available from FW version P1.3.10.0

PAGE 21 - Avg. power measurements (Scaler 1)**

INDEX	QUANTITY	UNIT	RESOLUTION	Data type
0	Header Byte 0 (Page Number)			
1	Header Byte 1 (not used)			
2	Header Byte 2 (not used)			
3	Header Byte 3 (STATUS BYTE)			
4 ÷ 7	Active power Total (Average)	W	1	Signed
8 ÷ 11	Active power L1 (Average)	W	1	Signed
12 ÷ 15	Active power L2 (Average)	W	1	Signed
16 ÷ 19	Active power L3 (Average)	W	1	Signed
20 ÷ 23	Reactive power Total (Average)	var	1	Signed
24 ÷ 27	Reactive power L1 (Average)	var	1	Signed
28 ÷ 31	Reactive power L2 (Average)	var	1	Signed
32 ÷ 35	Reactive power L3 (Average)	var	1	Signed
36 ÷ 39	Apparent power Total (Average)	VA	1	Signed
40 ÷ 43	Apparent power L1 (Average)	VA	1	Signed
44 ÷ 47	Apparent power L2 (Average)	VA	1	Signed
48 ÷ 51	Apparent power L3 (Average)	VA	1	Signed
52 ÷ 55	-	-	-	-
56 ÷ 59	-	-	-	-
60 ÷ 63	-	-	-	-
64 ÷ 67	-	-	-	-
68 ÷ 71	-	-	-	-
72 ÷ 75	-	-	-	-
76 ÷ 79	-	-	-	-
80 ÷ 83	-	-	-	-
84 ÷ 87	-	-	-	-
88 ÷ 91	-	-	-	-
92 ÷ 95	-	-	-	-
96 ÷ 99	-	-	-	-
100 ÷ 103	-	-	-	-
104 ÷ 107	-	-	-	-
108 ÷ 111	-	-	-	-
112 ÷ 115	-	-	-	-
116 ÷ 119	-	-	-	-
120 ÷ 123	-	-	-	-
124 ÷ 127	-	-	-	-

** Available from FW version P1.3.10.0