EMM-PF-S *Communication Protocol*

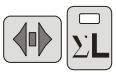
EMM MULTIMETER PROFIBUS DP-V0

This manual describes the communication protocol for the EMM-PF-S profibus interface.
This interface implement the DP-V0 slave in profibus DP network.

PROFIBUS AND EMM-PF-S

Profibus-DP is a multi-master systems. In the networks it's possible to have up to 126 devices on the same bus.
In profibus-DP networks, the interchange of data between peripheral modules and the master is made automatically by the profibus controller, which 'virtualise' the data exchange memory of the DP devices in the memory of the master.

EMM-PF-S Address Setting

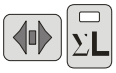
Entry to menu:  see on the display **Set Up**

Press  up to see **Id Adr**

Press  for **Increase** the address or  for **Decrease** the address

Press  for confirm address id

EMM-PF-S Version and Revision

Entry to menu:  see on the display **Set Up**

Press  up to see **Profibus.** In this page it possible to read EMM-PF-S version and revision.

See EMM User Manual for more info.

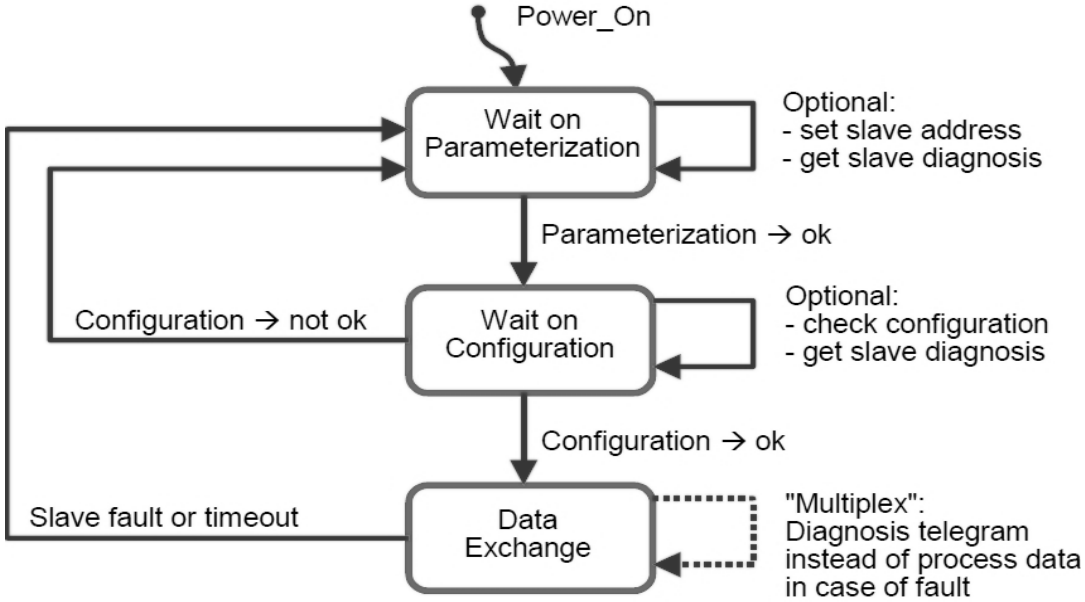
EMM-PF-S Baudrate Supported

The EMM-PF-S supported the following communication baud rate:

9,6 Kbit/s	**19.2 Kbit/s**	**45,45 Kbit/s**	**93,75 Kbit/s**	**187.5 Kbit/s**	**500 Kbit/s**	**1.5 Mbit/s**	**3 Mbit/s**

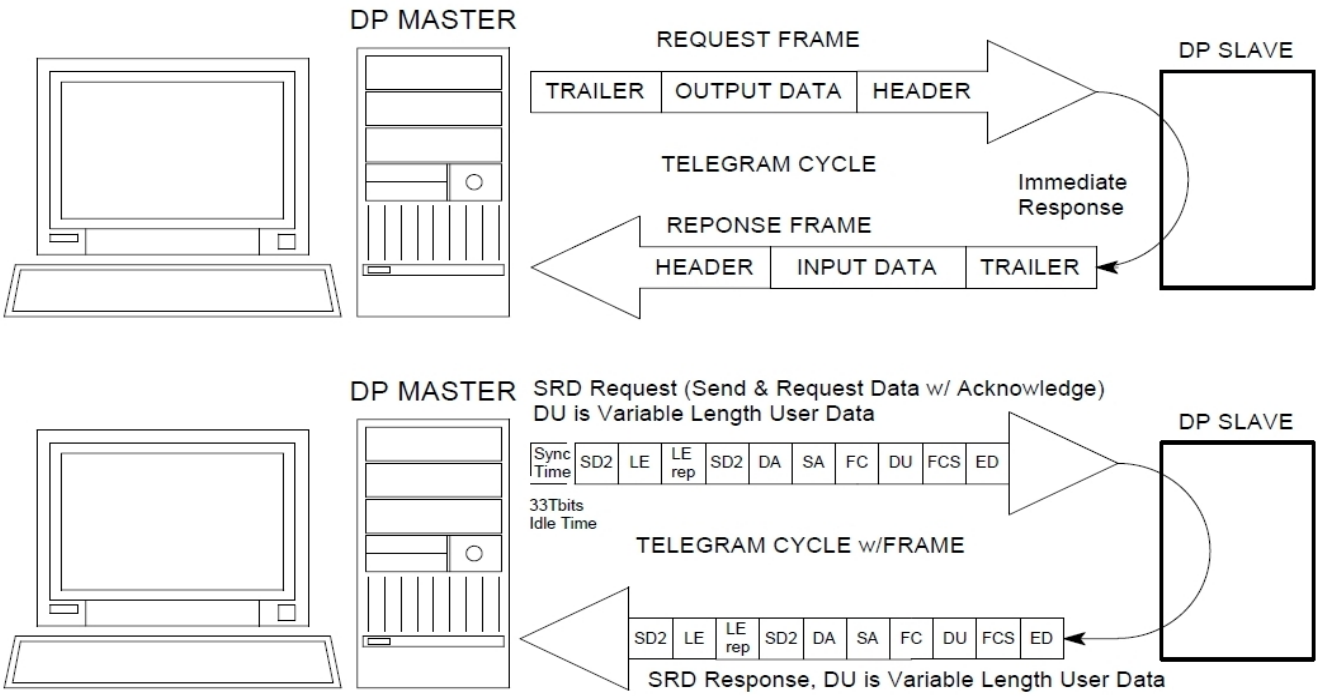
The EMM-PF-S detect the baud rate network **automatically**.

Example of Profibus Parameterization and Configuration Sequence:

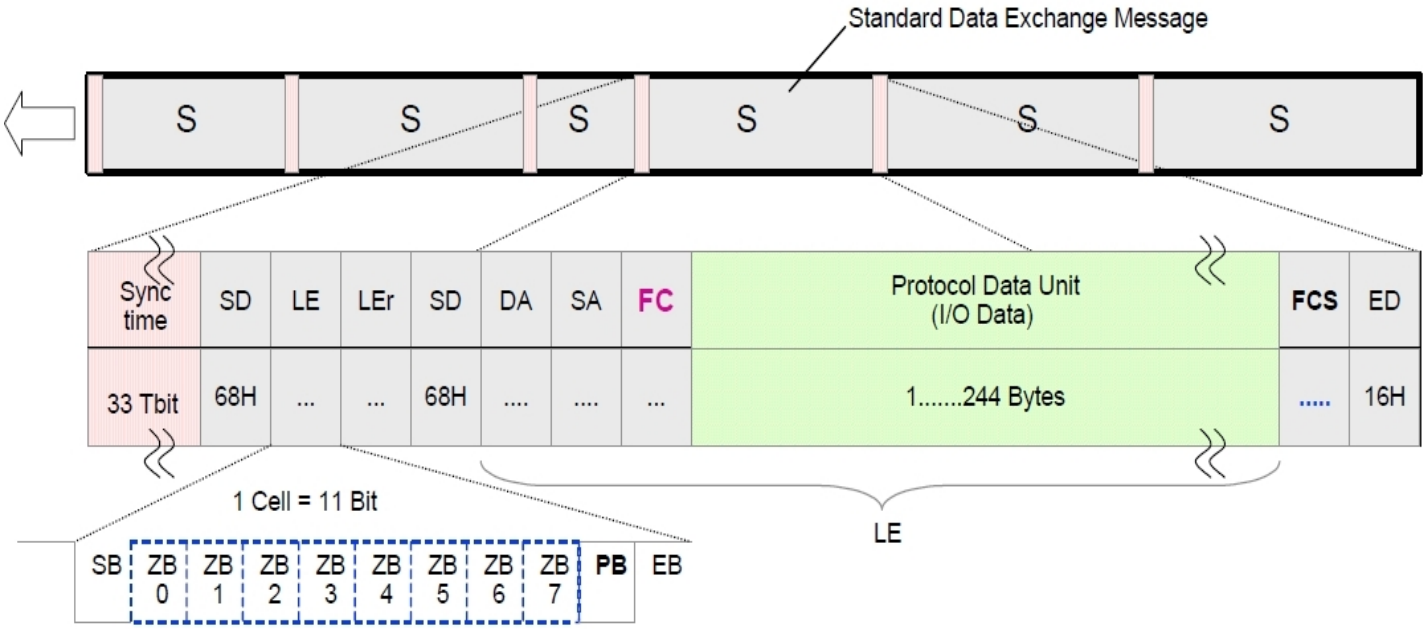


Data exchange handshake from Master to EMM-PF-S:

1) The Master place in output memory the indexes (or indexes + values)
2) Data are transferred from output memory of the master to input memory of the EMM-PF-S slave
3) EMM-PF-S read the indexes send by the master and write on its output memory area the data (measures) requested
4) Measures are transferred from output data of the EMM-PF-S to profibus master input memory area.
5) The application program, present in the master profibus, read the data from input memory and show the measures to the user



Format Message - Data Exchange

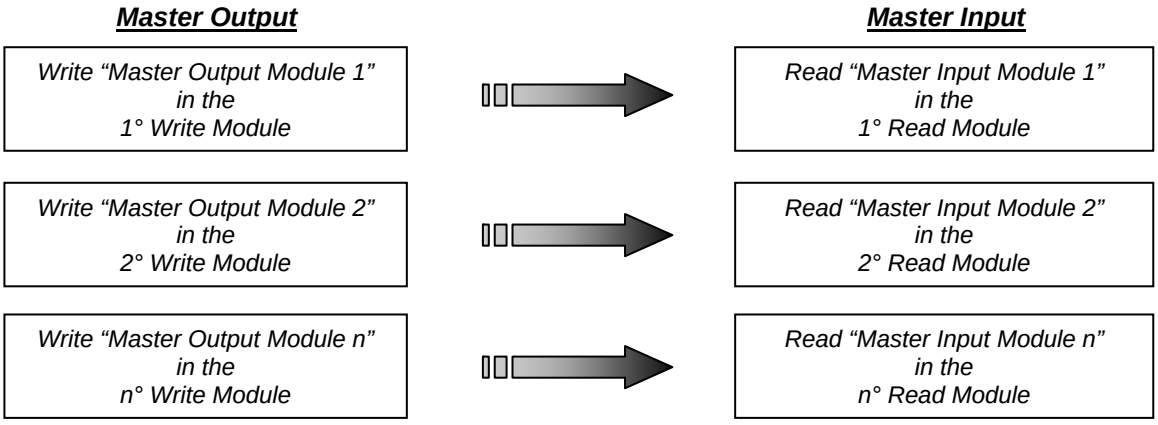


Tbit	= Clock-Bit = 1 / Baudrate
SD	= Start Delimiter (here SD2, var. data length)
LE	= Length of Process Data
LEr	= Repetition of Length; no check in FCS
DA	= Destination Address
SA	= Source Address
FC	= **Frame Control** (Message type)

Data Unit	= I/O Data, max. 244 Bytes
FCS	= Frame Checking Sequence (across data within LE)
ED	= End Delimiter
SB	= Start-Bit
ZB0...7	= Character-Bit
PB	= (even) Parity Bit
EB	= Stop-Bit

Communication Structure EMM-PF-S:

The communication with the instrument is projected "in Module". The input (master) module is 4 byte long and the output (master) module is 6 byte long. Each "write" module allow to send one index (see Read Commands Table) corresponding at the measure that it must read from master module (input). If it sent the index value in the *first master* output module the read value will be return in the *first master input module*, if it sent the index value in the *second master output module* the read value will be return in the *second master input module*, etc.



Comunication Structure Example

This structure allow to change in "real time" order and type of measure to read from EMM-PF-S instrument .
Each *Master Input Module* is formed by **4 Byte / 2 Word** (it's possible to read max 28 module at the same time) and the *Master Output Module* is format by **6 Byte / 3 Word** (it's possible to write max 28 module at the same time).

***WARNING:* Before read the measures (Master Input Module), the Master must send the indexes corresponding (Master Output Module). From Firmware V01r02 If you don't send any indexes the EMM-PF-S will be return the first 40 measures.**

***WARNING:* If it send a only wrong Index or Parameter the instrument won't return any value until all Indexes and Parameters will be corrected. The EMM-PF-S will produce a Diagnostic Message for notify the error presence.**

For example if you send:

n° Master Output Module	Index Value	Measure to Read	n° Master Input Module	Measure Value
1	0x0002	PHASE VOLTAGE L_{1-N}	1	Long Value (4 byte)
2	0x0006	LINE TO LINE VOLTAGE L_{2-3}	2	Long Value (4 byte)
3	0x0001	3-PHASE SYSTEM VOLTAGE	3	Long Value (4 byte)
4	0x0008	3-PHASE SYSTEM CURRENT	4	Long Value (4 byte)

This is the Master Outputs Structure for Read the measures:

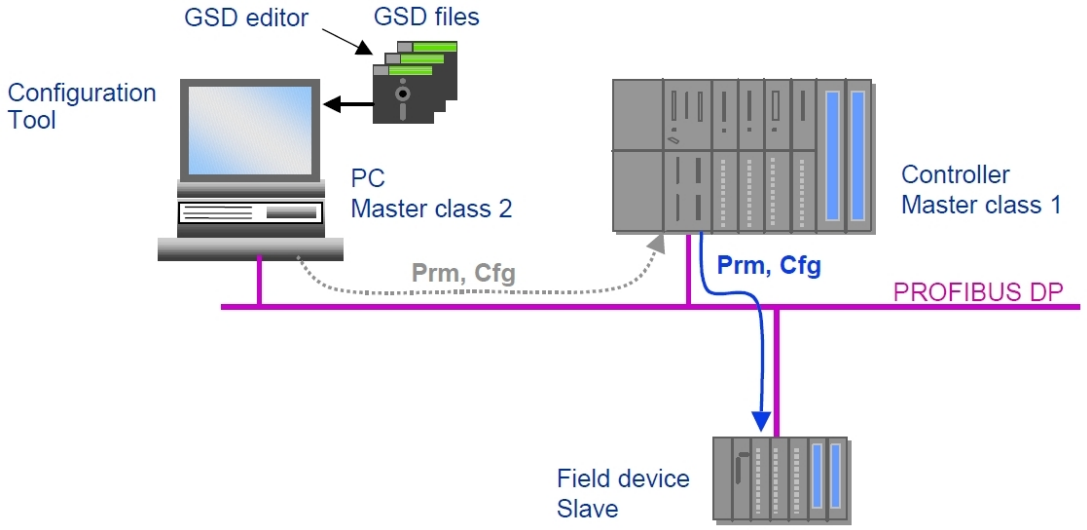
N° Master Output Module	N° Measure	Measure	Used Byte
Zero Module	None	Write 0x0000	1° - 2° Byte
Index 1	0x0002	PHASE VOLTAGE L_{1-N}	3° - 4° Byte
Parameter 1.1	xxxx	Not Necessary	5° - 6° Byte
Parameter 1.2	xxxx	Not Necessary	7° - 8° Byte
Index 2	0x0006	LINE TO LINE VOLTAGE L_{2-3}	9° - 10° Byte
Parameter 2.1	xxxx	Not Necessary	11° - 12° Byte
Parameter 2.2	xxxx	Not Necessary	13° - 14° Byte

***WARNING:* It is necessary to send at least 4 words (zero module+index1+parameter1.1+parameter1.2).**

***WARNING:* The read or write operation must be completed without interruption by other parts of the program.**

GSD File

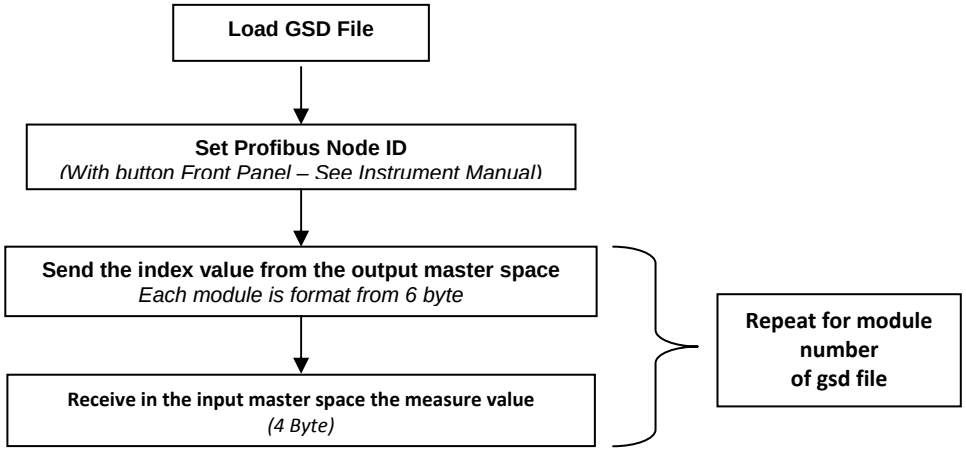
The GSD files supplied with the EMM-PF-S instrument:



GSD Name	N° Input Byte	N° Master Input Module	N° Output Byte	N Master Output Module	N° Tot Module
EMMPFS	114 Byte	28	170 Byte	28	57

The GSD file designed for improve the input/output space and speed on profibus master, because it is possible to insert from 1 to 28 module for input and from 1 to 28 module to output.

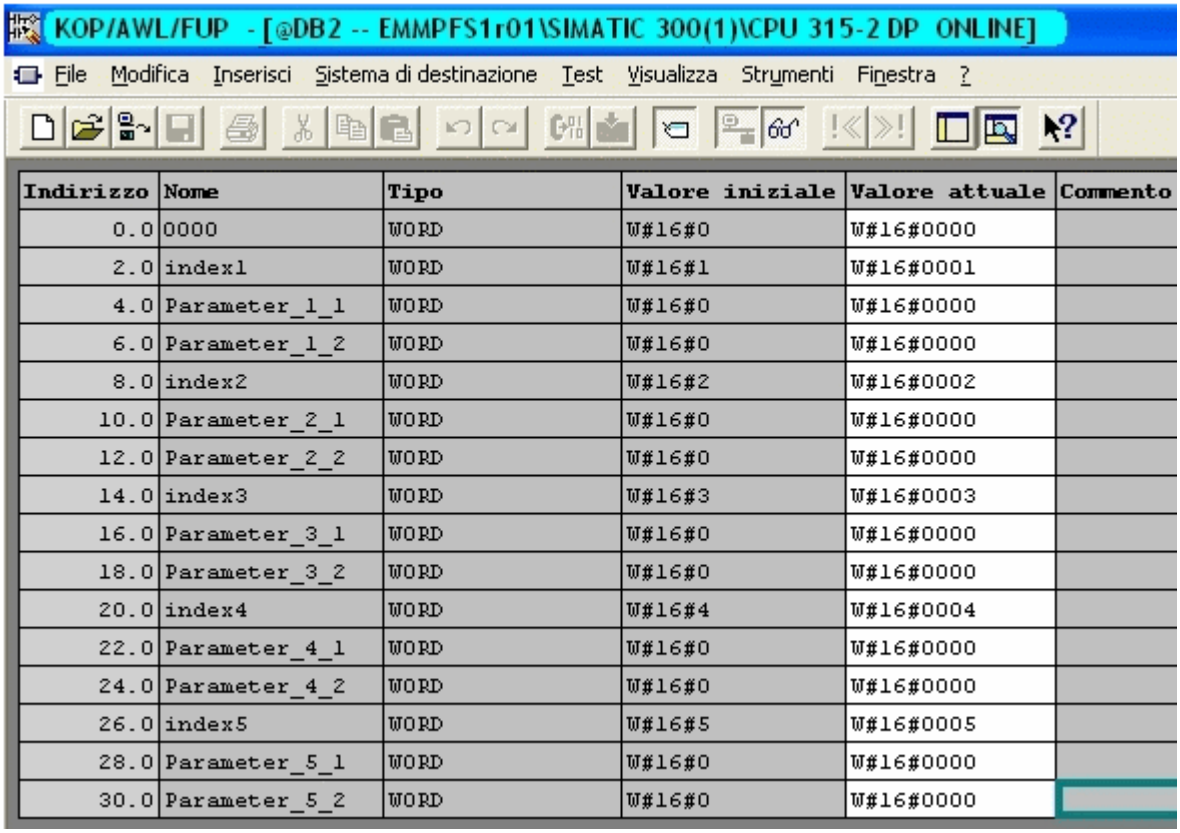
Flow Chart Configuration EMM-PF-S



In the Master Program:

1) Load GSD File.
2) Setting the EMM-PF-S Node Id in you project (Node ID on the instrument is setting with frontal panel).
3) Insert the Module that it necessary for application (if not insert automatically from program during loading gsd file).
4) Write the module index (corresponding at the measure that must read) in the master output space.
5) Receive in the master the measure value (first module if you send the first module in master output).
6) Repeat point 4 and 5 for all modules.

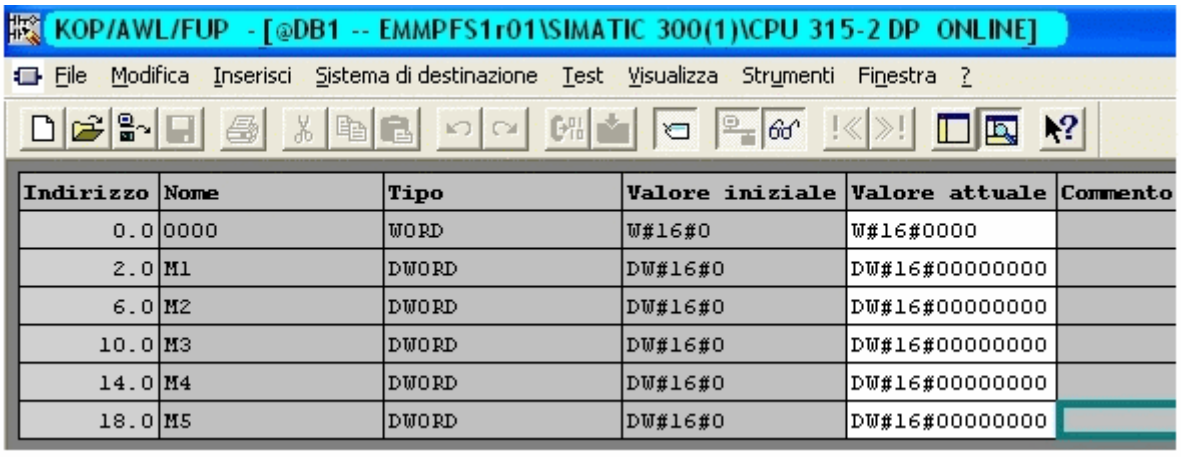
For example see the following figure (Master Output – **DB2** Step 7 File):



Indirizzo	Nome	Tipo	Valore iniziale	Valore attuale	Commento
0.0	0000	WORD	W#16#0	W#16#0000	
2.0	index1	WORD	W#16#1	W#16#0001	
4.0	Parameter_1_1	WORD	W#16#0	W#16#0000	
6.0	Parameter_1_2	WORD	W#16#0	W#16#0000	
8.0	index2	WORD	W#16#2	W#16#0002	
10.0	Parameter_2_1	WORD	W#16#0	W#16#0000	
12.0	Parameter_2_2	WORD	W#16#0	W#16#0000	
14.0	index3	WORD	W#16#3	W#16#0003	
16.0	Parameter_3_1	WORD	W#16#0	W#16#0000	
18.0	Parameter_3_2	WORD	W#16#0	W#16#0000	
20.0	index4	WORD	W#16#4	W#16#0004	
22.0	Parameter_4_1	WORD	W#16#0	W#16#0000	
24.0	Parameter_4_2	WORD	W#16#0	W#16#0000	
26.0	index5	WORD	W#16#5	W#16#0005	
28.0	Parameter_5_1	WORD	W#16#0	W#16#0000	
30.0	Parameter_5_2	WORD	W#16#0	W#16#0000	

Fig.1: File DB2 (Step7)

For each measure to read it's necessary to send the corresponding index (the first 2 bytes for each module). In this example are read the first nine measures, but it's possible to read any measure (max 28) in any order.
In this way it's possible to read the measures in the Master input space (**DB1** Step 7 File).



Indirizzo	Nome	Tipo	Valore iniziale	Valore attuale	Commento
0.0	0000	WORD	W#16#0	W#16#0000	
2.0	M1	DWORD	DW#16#0	DW#16#00000000	
6.0	M2	DWORD	DW#16#0	DW#16#00000000	
10.0	M3	DWORD	DW#16#0	DW#16#00000000	
14.0	M4	DWORD	DW#16#0	DW#16#00000000	
18.0	M5	DWORD	DW#16#0	DW#16#00000000	

Fig.2: File DB1 (Step7)

In the same way the master can write the parameter. The master must send the corresponding indexes, followed by the two parameters (Index [2 byte] + First Parameter [2 byte] + Second Parameter [2 byte]).

This is the Write Commands Structure for Write the measure.

N° Module	*N° Measure*	*Measure*	*Command Type*	*Used Byte*
Zero Module	None	Write 0x0000	None	1° - 2° Byte
Index 1	1000	KCT TRANSFORM RATIO IL1-IL2-IL3	Write	3° - 4° Byte
Parameter 1.1	xxxx	Setting Value	-	5° - 6° Byte
Parameter 1.2	xxxx	Setting Value	-	7° - 8° Byte
Index 2	1001	KVT TRANSFORM RATIO * 0.1	Write	9° - 10° Byte
Parameter 2.1	xxxx	Setting Value	-	11° - 12° Byte
Parameter 2.2	xxxx	Setting Value	-	13° - 14° Byte

Index Measures Table

EMM-PF-S Indexes corresponding at the measures:

- READ COMMANDS -

Index [Hex]	*Index [Dec]*	*Description*	*Read*	*M. U.*	*Type*
0x0001	1	3-PHASE SYSTEM VOLTAGE	Read	[V]	(Unsigned)
0x0002	2	PHASE VOLTAGE L_{1-N}	Read	[V]	(Unsigned)
0x0003	3	PHASE VOLTAGE L_{2-N}	Read	[V]	(Unsigned)
0x0004	4	PHASE VOLTAGE L_{3-N}	Read	[V]	(Unsigned)
0x0005	5	LINE TO LINE VOLTAGE L_{1-2}	Read	[V]	(Unsigned)
0x0006	6	LINE TO LINE VOLTAGE L_{2-3}	Read	[V]	(Unsigned)
0x0007	7	LINE TO LINE VOLTAGE L_{3-1}	Read	[V]	(Unsigned)
0x0008	8	3-PHASE SYSTEM CURRENT	Read	[mA]	(Unsigned)
0x0009	9	LINE CURRENT L_1	Read	[mA]	(Unsigned)
0x000A	10	LINE CURRENT L_2	Read	[mA]	(Unsigned)
0x000B	11	LINE CURRENT L_3	Read	[mA]	(Unsigned)
0x000C	12	3-PHASE SYSTEM POWER FACTOR	Read	[-]	(Signed)
0x000D	13	POWER FACTOR L_1	Read	[-]	(Signed)
0x000E	14	POWER FACTOR L_2	Read	[-]	(Signed)
0x000F	15	POWER FACTOR L_3	Read	[-]	(Signed)
0x0010	16	3-PHASE SYSTEM COS∅	Read	[-]	(Signed)
0x0011	17	PHASE $COS∅_1$	Read	[mCOS∅]	(Signed)
0x0012	18	PHASE $COS∅_2$	Read	[mCOS∅]	(Signed)
0x0013	19	PHASE $COS∅_3$	Read	[mCOS∅]	(Signed)
0x0014	20	3-PHASE SYSTEM APPARENT POWER	Read	[VA]	(Unsigned)
0x0015	21	APPARENT POWER L_1	Read	[VA]	(Unsigned)
0x0016	22	APPARENT POWER L_2	Read	[VA]	(Unsigned)
0x0017	23	APPARENT POWER L_3	Read	[VA]	(Unsigned)
0x0018	24	3-PHASE SYSTEM ACTIVE POWER	Read	[W]	(Unsigned)
0x0019	25	ACTIVE POWER L_1	Read	[W]	(Unsigned)
0x001A	26	ACTIVE POWER L_2	Read	[W]	(Unsigned)
0x001B	27	ACTIVE POWER L_3	Read	[W]	(Unsigned)
0x001C	28	3-PHASE SYSTEM REACTIVE POWER	Read	[VAR]	(Unsigned)
0x001D	29	REACTIVE POWER L_1	Read	[VAR]	(Unsigned)
0x001E	30	REACTIVE POWER L_2	Read	[VAR]	(Unsigned)
0x001F	31	REACTIVE POWER L_3	Read	[VAR]	(Unsigned)
0x0020	32	3-PHASE SYSTEM ACTIVE ENERGY T1	Read	[100*Wh]	(Unsigned)
0x0021	33	3-PHASE SYSTEM REACTIVE ENERGY T1	Read	[100*VARh]	(Unsigned)
0x0022	34	3-PHASE SYSTEM ACTIVE ENERGY T2	Read	[100*Wh]	(Unsigned)
0x0023	35	3-PHASE SYSTEM REACTIVE ENERGY T2	Read	[100*VARh]	(Unsigned)
0x0024	36	FREQUENCY	Read	[mHz]	(Unsigned)
0x0025	37	NEUTRAL CURRENT	Read	[mA]	(Unsigned)
0x0026	38	3-PHASE SYSTEM APPARENT ENERGY T1	Read	[100*VAh]	(Unsigned)
0x0027	39	3-PHASE SYSTEM APPARENT ENERGY T2	Read	[100*VAh]	(Unsigned)
0x0028	40	MAX ISTANT. CURRENT L_1	Read	[mA]	(Unsigned)
0x0029	41	MAX ISTANT. CURRENT L_2	Read	[mA]	(Unsigned)
0x002A	42	MAX ISTANT. CURRENT L_3	Read	[mA]	(Unsigned)
0x002B	43	MAX ISTANT. 3-PHASE ACTIVE POWER	Read	[W]	(Unsigned)
0x002C	44	MAX ISTANT. 3-PHASE APPARENT POWER	Read	[VA]	(Unsigned)
0x002D	45	MAX AVG (max demand) CURRENT L_1	Read	[mA]	(Unsigned)
0x002E	46	MAX AVG (max demand) CURRENT L_2	Read	[mA]	(Unsigned)
0x002F	47	MAX AVG (max demand) CURRENT L_3	Read	[mA]	(Unsigned)
0x0030	48	MAX AVG (max demand) 3-PH. ACTIVE POWER	Read	[W]	(Unsigned)
0x0031	49	MAX ISTANT. VOLTAGE L1	Read	[V]	(Unsigned)
0x0032	50	MAX ISTANT. VOLTAGE L2	Read	[V]	(Unsigned)
0x0033	51	MAX ISTANT. VOLTAGE L_3	Read	[V]	(Unsigned)
0x0034	52	MAX ISTANT. 3-PHASE REACTIVE. POWER	Read	[VAr]	(Unsigned)
0x0035	53	MAX AVG (max demand) 3-PH. REACTIVE POWER	Read	[VAr]	(Unsigned)
0x0036	54	MAX AVG (max demand) 3-PH. APPARENT POWER	Read	[VA]	(Unsigned)
0x0037	55	LAST AVERAGE 3-PHASE ACTIVE POWER	Read	[W]	(Unsigned)
0x0038	56	LAST AVERAGE 3-PHASE REACTIVE POWER	Read	[VAr]	(Unsigned)
0x0039	57	LAST AVERAGE 3-PHASE APPARENT POWER	Read	[VA]	(Unsigned)
0x003A	58	MAX ISTANT. CURRENT NEUTRAL	Read	[mA]	(Unsigned)
0x003B	59	MAX AVG (max demand) CURRENT NEUTRAL	Read	[mA]	(Unsigned)
0x003C	60	LAST AVERAGE CURRENT NEUTRAL	Read	[mA]	(Unsigned)
0x003D	61	LAST AVERAGE CURRENT L_1	Read	[mA]	(Unsigned)
0x003E	62	LAST AVERAGE CURRENT L_2	Read	[mA]	(Unsigned)
0x003F	63	LAST AVERAGE CURRENT L_3	Read	[mA]	(Unsigned)

0x0040	64	TEMPERATURE	Read	[°C]	(Unsigned)
0x0041	65	HOURS COUNTER	Read	[dh]	(Unsigned)
0x0042	66	DIGITAL OUTPUT DO1 / DO2 SETTINGS	Read	[-]	[-]
0x0043	67	DIGITAL OUTPUT DO1 & DO2 STATUS DIGITAL INPUT DI STATUS	Read	[-]	[-]
0x0044	68	SYNC MODE ENERGY MODE-NEUTRAL LINE MODE SINGLE PHASE-3PHASE MODE	Read	[-]	[-]
0x0045	69	KCT TRANSFORM RATIO IL1-IL2-IL3	Read	[-]	[-]
0x0046	70	KVT TRANSFORM RATIO * 0.1	Read	[-]	[-]
0x0047	71	kWh/kVArh PULSE WEIGHT	Read	[-]	[-]
0x0048	72	KCTN TRANSFORM RATIO I NEUTRAL	Read	[-]	[-]

- WRITE COMMANDS -

Index [Hex]	*Index [Dec]*	*Description*	*Write*	*M. U.*	*Type*
0x03E8	1000	KCT TRANSFORM RATIO IL1-IL2-IL3	Write	[-]	[-]
0x03E9	1001	KVT TRANSFORM RATIO * 0.1	Write	[-]	[-]
0x03EA	1002	kWh/kVArh PULSE WEIGHT	Write	[-]	[-]
0x03EB	1003	KCTN TRANSFORM RATIO I NEUTRAL	Write	[-]	[-]
0x03EC	1004	DIGITAL OUTPUT DO1 CONTROL REGISTER	Write	[-]	[-]
0x03ED	1005	DIGITAL OUTPUT DO2 CONTROL REGISTER	Write	[-]	[-]
0x03EE	1006	RESET ENERGY COUNTERS	Write	[-]	[-]
0x03EF	1007	RESET MAX. ISTANTANEOUS VALUES	Write	[-]	[-]
0x03F0	1008	RESET MAX AVG (max demand) VALUES	Write	[-]	[-]
0x03F1	1009	RESET ALL VALUES (MAX and counters values)	Write	[-]	[-]

STATUS READ COMMANDS

Index [Hex]	*Index [Dec]*	*Description*	*Read*	*M. U.*	*Type*
0x07D0	2000	STATUS LOW	Read	[-]	[-]
0x07D1	2001	STATUS HIGH	Read	[-]	[-]

Detail Read Command

Index [Hex]	*Index [Dec]*	*Description*	*Range*
0x0042 High Word	66 High Word	DIGITAL OUTPUT DO1 SETTINGS. MSB byte: DO1 function mode LSB byte: DO1 alarm parameter	MSB BYTE VALUE MEANING: 1 = ACTIVE ENERGY PULSE OUTPUT 2 = 3PHASE ALARM MODE **(table A)** 3 = MAX/MIN L123 ALARM MODE **(table B)** 4 = BY_REMOTE CONTROLLED
0x0042 Low Word	66 Low Word	DIGITAL OUTPUT DO2 SETTINGS MSB BYTE: DO2 function mode LSB BYTE: DO2 alarm parameter	MSB BYTE VALUE MEANING: 1 = REACTIVE ENERGY PULSE OUTPUT 2 = 3PHASE ALARM MODE **(table A)** 3 = MAX/MIN L123 ALARM MODE **(table B)** 4 = BY_REMOTE CONTROLLED

Table A - 3PHASE ALARM MODE PARAMETER

VALUE	*MEASURE DESCRIPTION FOR 3PHASE ALARM MODE*
1	3-PHASE SYSTEM LINE TO NEUTRAL VOLTAGE
2	3-PHASE SYSTEM CURRENT
3	NEUTRAL CURRENT
4	3-PHASE SYSTEM POWER FACTOR
5	3-PHASE SYSTEM ACTIVE POWER
6	3-PHASE SYSTEM REACTIVE POWER
7	3-PHASE SYSTEM APPARENT POWER
8	3-PHASE SYSTEM LINE-TO-LINE VOLTAGE
9	FREQUENCY
10	TEMPERATURE

Table B - MAX-MIN ALARM MODE PARAMETER

VALUE	*MEASURE DESCRIPTION FOR MAX-MIN ALARM MODE*
1	MAX-MIN FOR L1-N L2-N L3-N VOLTAGE
2	MAX-MIN FOR L1 L2 L3 CURRENT
3	UNUSED / INVALID
4	MAX-MIN FOR L1 L2 L3 POWER FACTOR
5	MAX-MIN FOR L1 L2 L3 ACTIVE POWER
6	MAX-MIN FOR L1 L2 L3 REACTIVE POWER
7	MAX-MIN FOR L1 L2 L3 APPARENT POWER
8	MAX-MIN FOR L1-L2 L2-L3 L3-L1 VOLTAGE
9	UNUSED / INVALID
10	UNUSED / INVALID

Index [Hex]	Index [Dec]	Description	Range
0x0043 [High Word]	67 [High Word]	DIGITAL OUTPUT DO1 & DO2 STATUS	MSB BYTE : DO1 STATUS LSB BYTE : DO2 STATUS
0x0043 [Low Word]	67 [Low Word]	DIGITAL INPUT DI STATUS	MSB BYTE : UNUSED/ALWAYS 0 LSB BYTE : DI STATUS NOTE: when LSB read value is 01 the DI input it's not powered, when 0 DI input is powered
0x0044 [High Low]	68 [High Word]	MSB BYTE: SYNC MODE LSB BYTE: ENERGY MODE	MSB BYTE VALUE MEANINGS 1 = EXTERNAL SYNC 2 = INT SYNC = 50 Hz 3 = INT SYNC = 60 Hz LSB BYTE VALUE MEANINGS 1 = TIMEBAND MODE 2 = TOTAL / PARTIAL MODE 3 = NORMAL (SINGLE COUNTER)
0x0044 [Low Word]	68 [Low Word]	MSB BYTE:NEUTRAL LINE MODE LSB BYTE:SINGLE PHASE /3PHASE MODE	MSB BYTE VALUE MEANINGS 1 = 4-WIRE (WITH NEUTRAL WIRE) 2 = 3-WIRE LSB BYTE VALUE MEANINGS 1 = 3PHASE UNBALANCED 2 = 3PHASE BALANCED 3 = SINGLE PHASE

Detail Command Write

Index [Hex]	Index [Dec]	Measure	Parameter x.1	Parameter x.2
0x03E8	1000	KCT TRANSFORM RATIO IL1-IL2-IL3	0x0000	1÷2000 dec
0x03E9	1001	KVT TRANSFORM RATIO * 0.1	0x0000	1÷4000 dec (KVT ratio is from 0.1 to 400) 1 = 0.1 … = … 4000 = 400.0
0x03EA	1002	kWh/kVArh PULSE WEIGHT	0x0000	1÷4 dec 1 = 0,01 KWh-KVArh / PULSE 2 = 0,1 KWh-KVArh / PULSE
0x03EB	1003	KCTN TRANSFORM RATIO I NEUTRAL	0x0000	1÷2000 dec

DIGITAL OUTPUTS MANAGEMENT

Index [Hex]	Index [Dec]	Measure	Parameter x.1	Parameter x.2
0x03EC	1004	DIGITAL OUTPUT DO1 CONTROL REGISTER	DO1 CONTROL: 0x0000 = OFF 0x0100 = ON	0x55AA
0x03ED	1005	DIGITAL OUTPUT DO2 CONTROL REGISTER	DO2 CONTROL: 0x0000 = OFF 0x0100 = ON	0x55AA

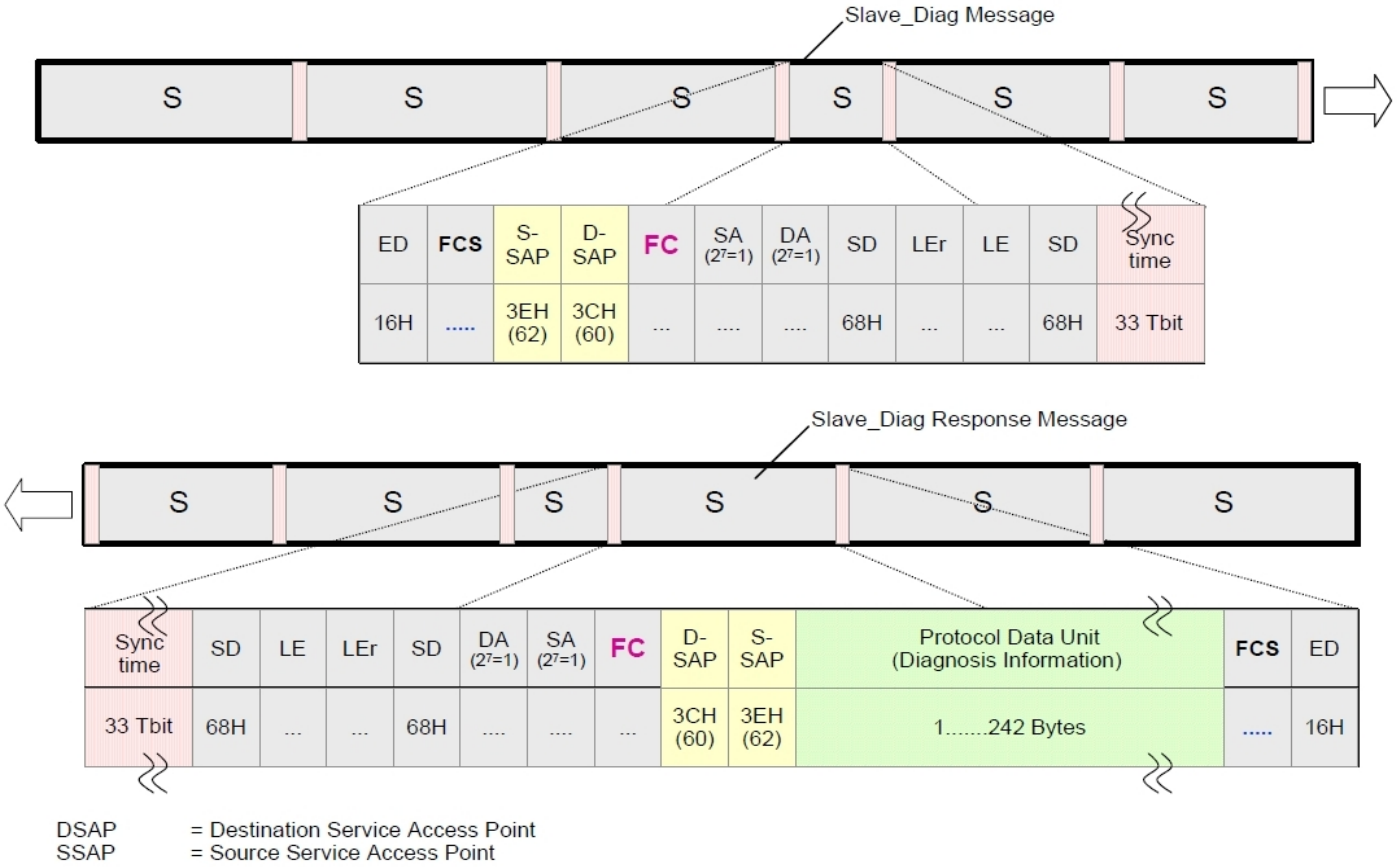
RESET

Index [Hex]	Index [Dec]	Measure	Parameter x.1	Parameter x.2
0x03EE	1006	RESET ENERGY COUNTERS	0x11B0	0x55AA
0x03EF	1007	RESET MAX. ISTANTANEOUS VALUES	0x11B2	0x55AA
0x03F0	1008	RESET MAX AVG (max demand) VALUES	0x11B4	0x55AA
0x03F1	1009	RESET ALL VALUES (MAX and counters values)	0x11B6	0x55AA

DIAGNOSTIC

The EMM-PF-S is able to generate, in case of errors, some diagnostics, automatically. These diagnostics can be send to the Master profibus through a standard mechanism expected from the profibus protocol.

Format Message – Slave Diagnosis



DSAP = Destination Service Access Point
SSAP = Source Service Access Point

Diagnostics generation mechanism

In the polling normal cycle, done by a Master station, there is not the request of the diagnostics message. It is the slave that informs the master that a diagnostics variation is occurred and that this message has to be asked.
When there is a diagnostics variation (appears or disappears), during the formatting of the answer message from a normal data request, the EMM-PF-S set the field FC (Frame Control).
The EMM-PF-S generates a diagnostic message with this format (6+12 Byte long):

Default Profibus Diagnostic Data-Unit:

1° Byte	*2° Byte*	*3° Byte*	*4° Byte*	*5° Byte*	*6° Byte*
Station Status 1	Station Status 2	Station Status 3	Diag. Master Add	Ident Number High	Ident Number Low

Specific Profibus Diagnostic:

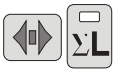
7° Byte	*8° Byte*	*9° Byte*	*10° Byte*	*11° Byte*	*12° Byte*
N° Byte Instrument Diag	Status High 31-24 bit	Status High 23-16 bit	Status High 15-8 bit	Status High 7-0 bit	Status Low 31-24 bit

13° Byte	*14° Byte*	*15° Byte*	*16° Byte*	*17° Byte*	*18° Byte*
Status Low 23-16 bit	Status Low 15-8 bit	Status Low 7-0 bit	In/out error	Module	N° Error

The Master could receive the following error:

- Internal Communication break 31° bit = 1 in Status Low
- Communication fail 30° bit = 1 in Status Low
- Illegal index 29° bit = 1 in Status Low
- Illegal data 28° bit = 1 in Status Low

EMM-PF-S Read Software Revision (on the frontal panel)

Entry to menu:  see on the display **Set Up**

Press  until see **Profibus Rev**

Wait a second and can see the version and revision of the instrument.

GSD File

```
;
;******************************** GSD-for EMM-PF-S ********************************
;* ================================================================================ *
;*                                                  *
;* Vendor:   Contrel Elettronica s.r.l                      *
;*          via S.Fereolo 9                          *
;*          26900 Lodi                              *
;*          Italy                                  *
;*          tel. : ++39-0371-30207/30761                     *
;*          fax : ++39-9132-32819                           *
;*       web site : http://www.contrel.it/                  *
;*          mail: contrel@contrel.it                        *
;*                                                  *
;* history GSD                                          *
;* ================================================================================ *
;* - 24.11.2008: V1.00                                     *
;* - 30.03.2009: V1.01                                     *
;* - 16.10.2009: V1.02  : Added Recomended BusParameters                  *
;*                                                  *
;*                                                  *
;*                                                  *
;*                                                  *
;* ================================================================================ *
#Profibus_DP
;=============================================================================
;==== General DP Keywords ====================================================
;=============================================================================
GSD_Revision = 2
Vendor_Name = "Contrel"
Model_Name = "EMM4H-PF-S"
Revision = "1.02"
Ident_Number = 0xAFFE
Protocol_Ident = 0
Station_Type = 0
FMS_supp = 0
Hardware_Release = "EMM-PF-S V1.0 r0.1"
Software_Release = "EMM-PF-S V1.0 r0.4"
Redundancy = 0
Repeater_Ctrl_Sig = 2
24V_Pins = 0
;=============================================================================
;==== Supported baudrates ====================================================
;=============================================================================
9.6_supp = 1
19.2_supp = 1
45.45_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 0
12M_supp = 0

MaxTsdr_9.6=60
MaxTsdr_19.2=60
MaxTsdr_45.45=60
MaxTsdr_93.75=60
MaxTsdr_187.5=60
MaxTsdr_500=100
MaxTsdr_1.5M=150
MaxTsdr_3M=200

Tqui_9.6=10
Tqui_19.2=10
Tqui_45.45=10
Tqui_93.75=10
Tqui_187.5=10
Tqui_500=10
Tqui_1.5M=10
Tqui_3M= 10
```

```
Tset_9.6=20
Tset_19.2=20
Tset_45.45=20
Tset_93.75=20
Tset_187.5=20
Tset_500=20
Tset_1.5M=20
Tset_3M= 20

;===============================================================================
;==== Recommended BusParameters ================================================
;===============================================================================
;----------------------
; 19k2 Baud Rate
;----------------------
; Tslot.Ini= 100
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4
;----------------------
; 93k75 Baud Rate
;----------------------
; Tslot.Ini= 100
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4
;----------------------
; 187k5 Baud Rate
;----------------------
; Tslot.Ini= 100
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4
;----------------------
; 500k Baud Rate
;----------------------
; Tslot.Ini= 200
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4
;----------------------
; 1M5 Baud Rate
;----------------------
; Tslot.Ini= 300
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4
;----------------------
; 3M Baud Rate
;----------------------
; Tslot.Ini= 300
; Min.Tsdr= 11
; Gap.Fact= 20
; Retry.N= 4

;===============================================================================
;==== Slave specific values ====================================================
;===============================================================================
Slave_Family = 3@profichip
Implementation_Type = "VPC3+"
Info_Text="EMM-PF-S - slave modular system"

Bitmap_Device = "EMMPFS"
Bitmap_SF= "EMMPFS"

Freeze_Mode_supp=1
Sync_Mode_supp=1
Fail_Safe=1
Auto_Baud_supp=1
Set_Slave_Add_supp=0

Min_Slave_Intervall=6

Modular_Station=1
Max_Module=57
Modul_Offset=1
Max_Input_Len=114
Max_Output_Len=170
Max_Data_Len=284
Max_Diag_Data_Len=18

WD_Base_1ms_supp = 1
```

```
Publisher_supp = 1
;=============================================================================
;==== User-Prm-Data ==========================================================
;=============================================================================
User_Prm_Data_Len = 12
User_Prm_Data = 0x00,0x00,0x00,0x09,0x01,0x00,0x00,0x01,0xFF,0xFF,0x00,0x00
;=============================================================================
;==== Module-Definition-List =================================================
;=============================================================================
Module="Zero Module"                    0xC1,0x01,0x01,0x01
1
EndModule

Module="Master Input Module 1"              0x42,0x03,0x00,0x02
2
EndModule

Module="Master Output Module 1"         0x82,0x05,0x00,0x03
3
EndModule

Module="Master Input Module 2"              0x42,0x03,0x00,0x04
4
EndModule

Module="Master Output Module 2"         0x82,0x05,0x00,0x05
5
EndModule

Module="Master Input Module 3"              0x42,0x03,0x00,0x06
6
EndModule

Module="Master Output Module 3"         0x82,0x05,0x00,0x07
7
EndModule

Module="Master Input Module 4"              0x42,0x03,0x00,0x08
8
EndModule

Module="Master Output Module 4"         0x82,0x05,0x00,0x09
9
EndModule

Module="Master Input Module 5"              0x42,0x03,0x00,0x0A
10
EndModule

Module="Master Output Module 5"         0x82,0x05,0x00,0x0B
11
EndModule

Module="Master Input Module 6"              0x42,0x03,0x00,0x0C
12
EndModule

Module="Master Output Module 6"         0x82,0x05,0x00,0x0D
13
EndModule

Module="Master Input Module 7"              0x42,0x03,0x00,0x0E
14
EndModule

Module="Master Output Module 7"         0x82,0x05,0x00,0x0F
15
EndModule

Module="Master Input Module 8"              0x42,0x03,0x00,0x10
16
EndModule

Module="Master Output Module 8"         0x82,0x05,0x00,0x11
17
EndModule

Module="Master Input Module 9"              0x42,0x03,0x00,0x12
18
EndModule

Module="Master Output Module 9"         0x82,0x05,0x00,0x13
19
```

```
EndModule

Module="Master Input Module 10"          0x42,0x03,0x00,0x14
20
EndModule

Module="Master Output Module 10"          0x82,0x05,0x00,0x15
21
EndModule

Module="Master Input Module 11"          0x42,0x03,0x00,0x16
22
EndModule

Module="Master Output Module 11"          0x82,0x05,0x00,0x17
23
EndModule

Module="Master Input Module 12"          0x42,0x03,0x00,0x18
24
EndModule

Module="Master Output Module 12"          0x82,0x05,0x00,0x19
25
EndModule

Module="Master Input Module 13"          0x42,0x03,0x00,0x1A
26
EndModule

Module="Master Output Module 13"          0x82,0x05,0x00,0x1B
27
EndModule

Module="Master Input Module 14"          0x42,0x03,0x00,0x1C
28
EndModule

Module="Master Output Module 14"          0x82,0x05,0x00,0x1D
29
EndModule

Module="Master Input Module 15"          0x42,0x03,0x00,0x1E
30
EndModule

Module="Master Output Module 15"          0x82,0x05,0x00,0x1F
31
EndModule

Module="Master Input Module 16"          0x42,0x03,0x00,0x20
32
EndModule

Module="Master Output Module 16"          0x82,0x05,0x00,0x21
33
EndModule

Module="Master Input Module 17"          0x42,0x03,0x00,0x22
34
EndModule

Module="Master Output Module 17"          0x82,0x05,0x00,0x23
35
EndModule

Module="Master Input Module 18"          0x42,0x03,0x00,0x24
36
EndModule

Module="Master Output Module 18"          0x82,0x05,0x00,0x25
37
EndModule

Module="Master Input Module 19"          0x42,0x03,0x00,0x26
38
EndModule

Module="Master Output Module 19"          0x82,0x05,0x00,0x27
39
EndModule

Module="Master Input Module 20"          0x42,0x03,0x00,0x28
```

```
40
EndModule

Module="Master Output Module 20"        0x82,0x05,0x00,0x29
41
EndModule

Module="Master Input Module 21"         0x42,0x03,0x00,0x2A
42
EndModule

Module="Master Output Module 21"        0x82,0x05,0x00,0x2B
43
EndModule

Module="Master Input Module 22"         0x42,0x03,0x00,0x2C
44
EndModule

Module="Master Output Module 22"        0x82,0x05,0x00,0x2D
45
EndModule

Module="Master Input Module 23"         0x42,0x03,0x00,0x2E
46
EndModule

Module="Master Output Module 23"        0x82,0x05,0x00,0x2F
47
EndModule

Module="Master Input Module 24"         0x42,0x03,0x00,0x30
48
EndModule

Module="Master Output Module 24"        0x82,0x05,0x00,0x31
49
EndModule

Module="Master Input Module 25"         0x42,0x03,0x00,0x32
50
EndModule

Module="Master Output Module 25"        0x82,0x05,0x00,0x33
51
EndModule

Module="Master Input Module 26"         0x42,0x03,0x00,0x34
52
EndModule

Module="Master Output Module 26"        0x82,0x05,0x00,0x35
53
EndModule

Module="Master Input Module 27"         0x42,0x03,0x00,0x36
54
EndModule

Module="Master Output Module 27"        0x82,0x05,0x00,0x37
55
EndModule

Module="Master Input Module 28"         0x42,0x03,0x00,0x38
56
EndModule

Module="Master Output Module 28"        0x82,0x05,0x00,0x39
57
EndModule
```

contrel elettronica srl
I-26900 Lodi - ITALY - Via S. Fereolo, 9
Tel. +39 0371 30207 / 30761 Fax +39 0371 32819
http://www.contrel.it - E-mail: contrel@contrel.it