emfis vifpe

Operation and Instruction Manual

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Ref./hpl/new emfis vifpe rs485/Rev.01

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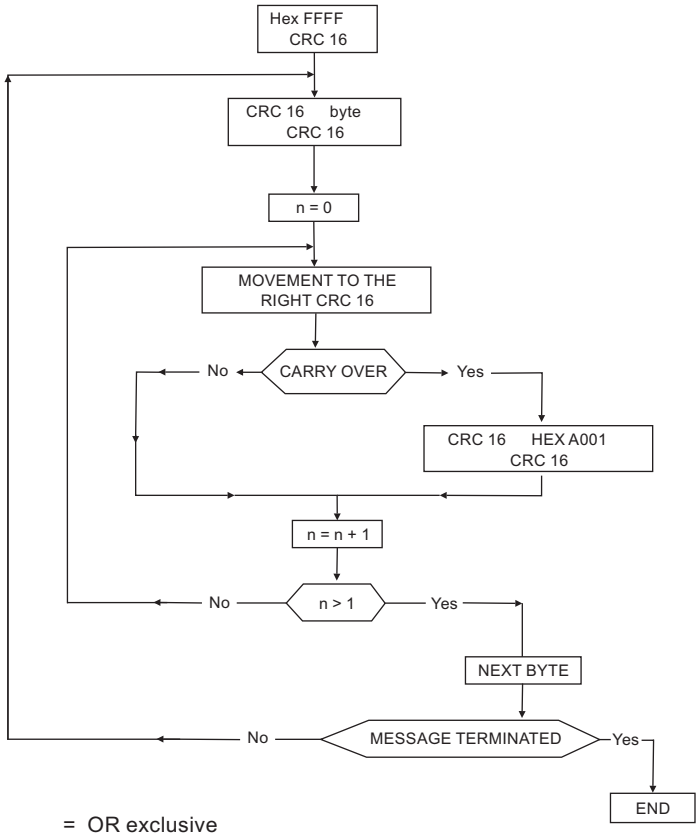
HPL ELECTRIC & POWER PVT. LTD.

In the CRC 16, the first OCTET Transmitted is LSB:

EXAMPLE : Developpement of CRC		**CRC 16**				**FLAG**
Initialisation CRC register		1111	1111	1111	1111	
of 1st character				0000	0010	
		1111	1111	1111	1101	
	Movement 1	0111	1111	1111	1110	1
Flag to 1, Polynome		1010	0000	0000	0001	
		1101	1111	1111	1111	
	Movement 2	0110	1111	1111	1111	1
Flag to 1, Polynome		1010			0001	
		1100	1111	1111	1110	
	Movement 3	0110	0111	1111	1111	0
Flag to 0	Movement 4	0011	0011	1111	1111	1
		101			1	
		1001	0011	1111	1110	
	Movement 5	0100	1001	1111	1111	0
	Movement 6	0010	0100	1111	1111	1
		101			1	
		1000	0100	1111	1110	
	Movement 7	0100	0010	0111	1111	0
	Movement 8	0010	0001	0011	1111	1
		101			1	
		1000	0001	0011	1110	
2nd character				0000	0111	
		1000	0001	0011	1001	
	Movement 1	0100	0000	1001	1100	1
		101			1	
		1110	0000	1001	1101	
	Movement 2	0111	0000	0100	1110	1
		101			1	
		1101	0000	0100	1111	
	Movement 3	0110	1000	0010	0111	1
		101			1	
		1100	1000	0010	0110	
	Movement 4	0110	0100	0001	0011	0
	Movement 5	0011	0010	0000	1001	1
		101			1	
		1001	0010	0000	1000	
	Movement 6	0100	1001	0000	0100	0
	Movement 7	0010	0100	1000	0010	0
	Movement 8	0001	0010	0100	0001	0

Guide to CRC 16 Calculation :



= OR exclusive

n = Number of information bit

Contents

1. General Information

1.1 Function:

This model of emfis vifpe with RS485 provides communication facility on RS485 MODBUS. emfis vifpe with RS485 works on a master slave configuration, where the emfis vifpe is the slave and the master can be computer / PLC etc.

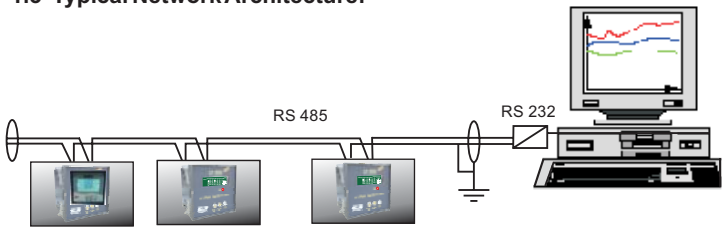
The following are also supplied with this model:

2 numbers 120Ω End-Of-Line resistance.

1.2 General Points:

For standard configuration, RS 485 serial link 2 wire is used to connect 255 emfis vifpe with one RS232 port on the master (computer/PLC etc.) over a distance of 1200 meters using MODBUS protocol.

1.3 Typical Network Architecture:



Cables and RS485/232 converter, computer are not supplied with this emfis vifpes meter.

Recommendation: Please use a shielded twisted pair cable for connection A repeater should be used if one intends to exceed the cable distance of over 1200 meters.

Range and Default Value of Programming Parameter

PARAMETER	RANGE	DEFAULT VALUE
	CT Ratio	
Primary	5-6000 in step of 5 for -/5	500
	1-1200 in step of 5 for -/1	
Secondary	-/1A or -/5A	-/5A
Slave Address	1-255	5
Baud Rate	4800 / 9600 / 19200 bps	9600 bps

Table 1.0

Example : For CT Secondary Writting.

Slave Address	Function code	Higher order address	Low order address	Number of word high	Number of word low	No. of byte	Data	CRC High	CRC low
0x0005	0x0010	0x388		0x0001		0x0002	0x0005	0x791B	

3.3 Reset Parameters (Reset to Zero):

kW & kVA MD with Date Time

Run Hour

Power On Hours

Address Table

PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	UNIT
kW MD	0x375	885	1	MW/100
RUN HOUR	0x38A	906	2	Hour/100
POWER ON HOURS(Auxiliary)	0x38C	908	2	Hour/100

Example: For Resetting the kW MD

Slave Address	Function code	Higher order address	Low order address	Number of word high	Number of word low	No. of byte	Data	CRC High	CRC low
0x0005	0x0010	0x036B		0x0001		0x0002	0x007B*	0xEF68	

***007B i.e. 1234 is the Default Programming Password**

An example has been given using WINBUS32 S/w.

Example 1: To read Second, Minute & Hour.

Slave Address	Function code	Higher order address	Low order address	Number of word high	Number of word low	No. of byte	CRC High	CRC low
0x0005	0x0003	0x0383		0x0003		0x0006	0xF5E3	

3.2 Writing Parameters:

Writing Frame

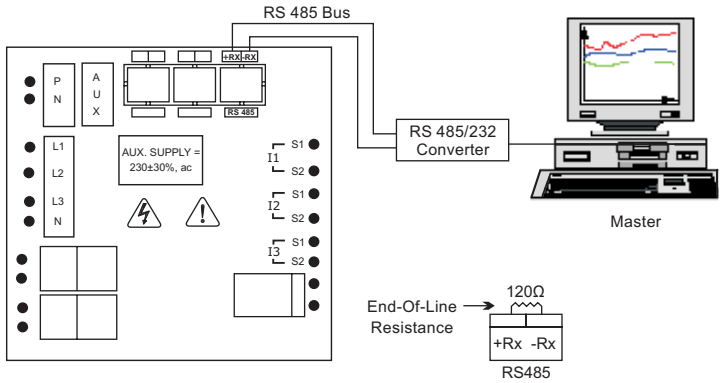
Slave Address	Function Code	Address	No. Of Word	No. of Bytes	Data	CRC 16

Function Code 16: For Writing, Maximum Word Length is 10 words.

Address Table

PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	Unit
SECOND	0x381	897	1	Sec
MINUTE	0x382	898	1	Min
HOUR	0x383	899	1	Hrs
DATE	0x384	900	1	DD
MONTH	0x385	901	1	MM
YEAR	0x386	902	1	YY
CT RATIO	0x387	903	1	
CT SECONDARY 1 : Secondary 1 5 : Secondary 5	0x388	904	1	

1.4 Connection Diagram:



Note: This serial communication requires 120Ω end-of-line resistance to be connected on first and last device in an RS485 MODBUS network.

The End Of-Line resistance supplied with emfis vifpe is to be connected between Rx- and Rx+ as shown above.

1.5 RS485 configuration :

Baud Rate : 4800 / 9600 / 19200 bps
Stop Bit : 1
Byte size : 8 Bit
Parity : None

2. Programming

To access / view the programming mode:

Keys	Instruction	Display	Comment
Prog	Press Once	PS 0---	You are now in programming mode. Password has to be Entered.

2.1 Enter the access code '1234' (default password) to access the programming mode:

Keys	Instruction	Display	Comment
Scroll up	Press Once	PS 1---	Digit increment by 1.
Scroll down	Press Once	PS 10--	Moves one digit right.
Scroll up	Press Twice	PS 12--	Digit increment by 2.
Scroll down	Press Once	PS 120-	Moves one digit right.
Scroll up	Press Thrice	PS 123-	Digit increment by 3.
Scroll down	Press Once	PS 1230	Moves one digit right.
Scroll up	Press Four Time	PS 1234	Digit increment by 4.
Prog	Press Once	PS 1234	To Configure Password.

If your password is correct '1234' (default password) you can see all setting parameters using Scroll up/Scroll down button.

2.2 Set Slave Address:

Keys	Instruction	Display	Comment
		SL 005	Default slave address.

PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	UNIT
kVA MD HOUR	0x37D	893	1	HOUR
kVA MD DATE	0x37E	894	1	DATE
kVA MD MONTH	0x37F	895	1	MONTH
kVA MD YEAR	0x380	896	1	YEAR
RTC				
SECOND	0x381	897	1	SECOND
MINUTE	0x382	898	1	MINUTE
HOUR	0x383	899	1	HOUR
DATE	0x384	900	1	DATE
MONTH	0x385	901	1	MONTH
YEAR	0x386	902	1	YEAR
CT RATIO	0x387	903	1	
CT SECONDARY	0x388	904	1	

Energy & Hours in Long				
PARAMETER	**HEX ADDRESS**	**DECIMAL ADDRESS**	**No. OF WORDS**	**UNIT**
RUN HOUR	0x389	905	2	Hour/100
POWER ON HOUR (Auxiliary)	0x38B	907	2	Hour/100
ACTIVE ENERGY	0x38D	909	2	kWh/10

PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	UNIT
MAXIMUM VALUE Σ APPARENT POWER	0x366	870	1	kVA/10
MAXIMUM VALUE Σ REACTIVE POWER	0x367	871	1	kVAR/10
FREQUENCY	0x368	872	1	Hz/100
ACTIVE ENERGY <1000.0	0x369	873	1	kWh/10
ACTIVE ENERGY >1000.0	0x36A	874	1	
RUN ON HOUR <100.00	0x371	881	1	HOUR/100
RUN ON HOUR >100.00	0x372	882	1	
POWER ON HOUR <100.00	0x373	883	1	HOUR/100
POWER ON HOUR >100.00	0x374	884	1	
MD Read or Reset				
kW MD	0x375	885	1	kW/10
kW MD MINUTE	0x376	886	1	MINUTE
kW MD HOUR	0x377	887	1	HOUR
kW MD DATE	0x378	888	1	DATE
kW MD MONTH	0x379	889	1	MONTH
kW MD YEAR	0x37A	890	1	YEAR
KVA MD	0x37B	891	1	kVA/10
KVA MD MINUTE	0x37C	892	1	MINUTE

Prog	Press Once	SL 0--	Setting a new value.
Scroll up	Press Once	SL 1--	Digit increment by 1.
Scroll down	Press Once	SL 10-	Moves 1 digit to right.
Scroll up	Press twice	SL 12-	Digit increment by 2.
Scroll down	Press Once	SL 120	Moves 1 digit to right.
Scroll up	Press thrice	SL 123	Digit increment by 3.
Prog	Press Once	donE	Slave Address setting completed successfully.

2.3 Set Baud Rate (4800/9600/19200)

Keys	Instruction	Display	Comment
Prog	Press Once	bd 9600	Default Baud Rate.
Scroll up	Press Once	bd 4800	Next.
Scroll up	Press Once	bd 9600	Next.
Scroll up	Press Once	bd 19200	Next.
Prog	Press Once	donE	Successfully set New Baud Rate (19200).

3. Communication

The MODBUS used by the emfis vifpe involves a dialogue using a Master-Slave structure. The mode of communication is the RTU (Remote Terminal Unit) using hexadecimal characters of at least 8 bit.

3.1 Reading Parameters

The Standard Reading Communication frame consists of

Device address	Function Code	Address	Data	CRC16

Function Code 3: For Reading Maximum Word length is 40 words.

Address Table

INSTANTANEOUS PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	UNIT
SERIAL NUMBER_H.	0X340	832	1	
SERIAL NUMBER_L.	0X341	833	1	
R-PHASE TO NEUTRAL VOLTAGE	0X342	834	1	Volt/10
Y-PHASE TO NEUTRAL VOLTAGE	0X343	835	1	Volt/10
B-PHASE TO NEUTRAL VOLTAGE	0x344	836	1	Volt/10
PHASE TO PHASE VOLTAGE (R-Y)	0x345	837	1	Volt/10
PHASE TO PHASE VOLTAGE (Y-B)	0x346	838	1	Volt/10
PHASE TO PHASE VOLTAGE (B-R)	0x347	839	1	Volt/10
R-PHASE CURRENT	0x348	840	1	Amp/10
Y-PHASE CURRENT	0x349	841	1	Amp/10
B-PHASE CURRENT	0x34A	842	1	Amp/10
R-PHASE AVERAGE CURRENT	0x34B	843	1	Amp/10
Y-PHASE AVERAGE CURRENT	0x34C	844	1	Amp/10
B-PHASE AVERAGE CURRENT	0x34D	845	1	Amp/10

PARAMETER	HEX ADDRESS	DECIMAL ADDRESS	No. OF WORDS	UNIT
R-PHASE MAXIMUM CURRENT	0x34E	846	1	Amp/10
Y-PHASE MAXIMUM CURRENT	0x34F	847	1	Amp/10
B-PHASE MAXIMUM CURRENT	0x350	848	1	Amp/10
TOTAL CURRENT	0x351	849	1	Amp
ACTIVE POWER (R-PHASE)	0x352	850	1	kW/10
ACTIVE POWER (Y-PHASE)	0x353	851	1	kW/10
ACTIVE POWER (B-PHASE)	0x354	852	1	kW/10
APPARENT POWER (R-PHASE)	0x355	853	1	kVA/10
APPARENT POWER (Y-PHASE)	0x356	854	1	KVA/10
APPARENT POWER (B-PHASE)	0x357	855	1	kVA/10
REACTIVE POWER (R-PHASE)	0x358	856	1	kVAR/10
REACTIVE POWER (Y-PHASE)	0x359	857	1	KVAR/10
REACTIVE POWER (B-PHASE)	0x35A	858	1	KVAR/10
POWER FACTOR (R-PHASE)	0x35B	859	1	.01
POWER FACTOR (Y-PHASE)	0x35C	860	1	.01
POWER FACTOR (B-PHASE)	0x35D	861	1	.01
SYSTEM POWER FACTOR	0x35E	862	1	.01
∑ ACTIVE POWER	0x35F	863	1	kW/10
Σ APPARENT POWER	0x360	864	1	kVA/10
Σ REACTIVE POWER	0x361	865	1	kVAR/10
AVERAGE VALUE ∑ ACTIVE POWER	0x362	866	1	kW/10
AVERAGE VALUE Σ APPARENT POWER	0x363	867	1	kVA/10
AVERAGE VALUE Σ REACTIVE POWER	0x364	868	1	kVAR/10
MAXIMUM VALUE ∑ ACTIVE POWER	0x365	869	1	kW/10