

COMMUNICATION

CONTENT

1.	MODBUS PROTOCOL	3
1.1	MODBUS communication characteristics	3
1.1.1	MODBUS network characteristics	3
1.1.2	Parameters of the MODBUS connection	3
1.1.3	Synchronisation of exchange messages	4
1.1.4	Message validity check	4
1.1.5	Address of the MiCOM relays	4
1.2	MODBUS functions of the MiCOM relays	4
1.3	Presentation of the MODBUS protocol	5
1.3.1	Frame size received by the MiCOM P220/P225 relay	5
1.3.2	Format of frames sent by the MiCOM P220/P225 relay	5
1.3.3	Messages validity check	5
1.4	MODBUS request definition used to retrieve the disturbance records	6
1.4.1	Request to know the number of available disturbance records in the Saved RAM.	6
1.4.2	Service request	7
1.4.3	Request to retrieve the data of a disturbance record channel	7
1.4.4	Request to retrieve an index frame	7
1.5	MODBUS request definition used to retrieve the event records	7
1.5.1	Request to retrieve the oldest non-acknowledge event	7
1.5.2	Request to retrieve a dedicated event	8
1.6	MODBUS request definition used to retrieve the fault records	8
1.6.1	Request to retrieve the oldest non-acknowledge fault record	8
1.6.2	Request to retrieve a dedicated fault record	8
1.7	MODBUS request definition used to retrieve both start-up current & voltage form record	9
1.7.1	Request to know the number of current values stored into the saved memory	9
1.7.2	Request to retrieve the start-up current form record data	9
1.7.3	Request to know the number of voltage values stored into the saved memory	9
1.7.4	Request to retrieve the start-up voltage form record data	9
1.8	MiCOM P220/P225 database organisation	9

1.8.1	Description of the MODBUS application mapping	9
1.8.2	Page 0: Information of product, remote signaling, remote measurements	10
1.8.3	Page 1: Remote settings for general parameters	14
1.8.4	Page 2: Remote settings for protection functions group No1	22
1.8.5	Page 3: Remote settings for protection functions group No2	26
1.8.6	Page 4: Remote controls	30
1.8.7	Pages 5 and 6: Reserved	30
1.8.8	Page 7: MiCOM P220/P225 relay status word	30
1.8.9	Page 8: Synchronisation	30
1.8.10	Page 9h to 21h: Disturbance record data (25 pages)	31
1.8.11	Page 22h: Index frame for the disturbance records	32
1.8.12	Page 23h to 33h: Start-up current form record data	32
1.8.13	Page 34h: Index frame for the start-up current form record	33
1.8.14	Page 35h: Event record data	33
1.8.15	Page 36h: Data of the oldest event	34
1.8.16	Page 37h: Fault value record data	34
1.8.17	Pages 38h à 3Ch: Selection of the disturbance record and selection of its channel	35
1.8.18	Page 3Dh: Number of available disturbance records	36
1.8.19	Page 3Eh: Data of the oldest non-acknowledged fault record	36
1.8.20	Page 3Fh: Reserved	36
1.8.21	Page 40h to 50h: Start-up voltage form record data	36
1.8.22	Page 51h: Index frame for the start-up voltage form record	37
1.9	Description of the mapping format	37

1. MODBUS PROTOCOL

The MiCOM P220/P225 relay offers MODBUS™ RTU mode communication via a rear RS485 port.

1.1 MODBUS communication characteristics

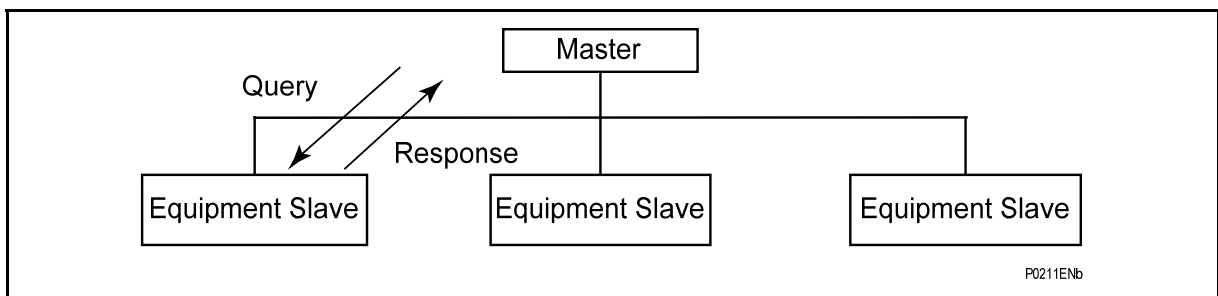
1.1.1 MODBUS network characteristics

The MODBUS protocol is based on the master-slave principle with the MiCOM P220/P225 relay as slave.

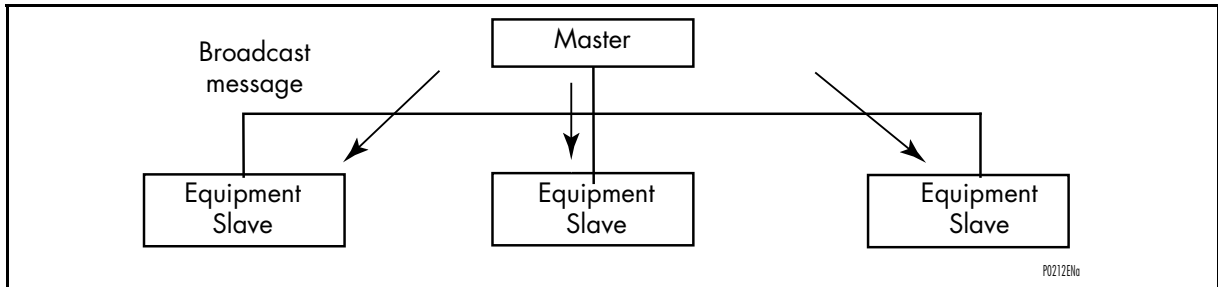
The MODBUS protocol allows the master to read and to write one or several bits, one or several words and to remote the event logging data.

The access to the network can be:

- either according to a query/response principle



- or according to a broadcast message sent from the master to all the slaves.



in that case:

- compulsory, the broadcast message is a writing order,
- the slaves return no response,
- the protocol is RTU mode. Each byte of the data frame is coded according to a hexadecimal base.
- At the end of each frame, two bytes of CRC16 validity checksum are applied on the whole of the frame content.

1.1.2 Parameters of the MODBUS connection

The different parameters of the MODBUS connection are as follows:

- Isolated two-point RS485 connection (2kV 50Hz).
- MODBUS line protocol in RTU mode.
- The baud rate can be configured by operator dialogue in the front panel of the relay:

Baud Rate
300
600
1200
2400
4800
9600
19200
38400

- Transmission mode of the configurable parameters by operator dialogue:

Transmission Mode
1 start/8 bits/1 stop: total 10 bits
1 start/8 bits/even parity/1 stop: total 11 bits
1 start/8 bits/odd parity/1 stop: total 11 bits
1 start/8 bits/2 stop: total 11 bits

1.1.3 Synchronisation of exchange messages

Any character received after a silence on the line with more or equal to a transmission time of 3 bytes is considered as a frame start.

1.1.4 Message validity check

The validation of a frame is performed with a 16-bit cyclical redundancy check (CRC). The generator polynomial is:

$$1 + x^2 + x^{15} + x^{16} = 1010\ 0000\ 0000\ 0001\ \text{binary} = A001\text{h}$$

1.1.5 Address of the MiCOM relays

The address of the MiCOM relay on a same MODBUS network is situated between 1 and 255. The address 0 is reserved for the broadcast messages.

1.2 MODBUS functions of the MiCOM relays

The MODBUS functions implemented on the MiCOM relays are:

Function 1 or 2: Reading of n bits

Function 3 or 4: Reading of n words

Function 5: Writing of 1 bit

Function 6: Writing of 1 word

Function 7: Fast reading of 8 bits

Function 8: Reading of the diagnosis counters

Function 11: Reading of the Event counter

Function 15: Writing of n bits

Function 16: Writing of n words

1.3 Presentation of the MODBUS protocol

MODBUS is a master-slave protocol whereby every exchange involves a master query and a slave response.

1.3.1 Frame size received by the MiCOM P220/P225 relay

Frame transmitted by the master (query):

Slave Number	Function Code	Information	CRC16
1 byte	1 byte	n bytes	2 bytes
0 to FFh	1 to 10h		

Slave number:

The slave number is situated between 1 and 255.

Function code:

Requested MODBUS function (1 to 16).

Information:

Contains the parameters of the selected function.

CRC16:

Value of the CRC16 calculated by the master.

Note: The MiCOM relay does not respond to globally broadcast frames sent out by the master.

1.3.2 Format of frames sent by the MiCOM P220/P225 relay

Frame sent by the MiCOM relay (response):

Slave Number	Function Code	Data	CRC16
1 byte	1 byte	n bytes	2 bytes
1 to FFh	1 to 10h		

Slave number:

The slave number is situated between 1 and 255.

Function code:

Processed MODBUS function (1 to 16).

Data:

Contains the response data to master query.

CRC16:

Value of the CRC16 calculated by the MiCOM relay.

1.3.3 Messages validity check

When the MiCOM relay receives a master query, it validates the frame:

- If the CRC is false, the frame is invalid. The MiCOM relay does not reply to the query. The master must retransmit its query. Excepting a broadcast message, this is the only case of non-reply by the MiCOM relay to a master query.
- If the CRC is correct but the MiCOM relay can not process the query, it sends to the master a exception response.

Exception frame sent by the MiCOM relay (response):

Slave Number	Function Code	Error Code	CRC16
1 byte	1 byte	1 byte	2 bytes
1 to FFh			LSB ... MSB

Slave number:

The slave number is situated between 1 and 255.

Function code:

The function code returned by the MiCOM relay in the exception frame is the code in which the most significant bit (bit7) is forced to 1.

Error code:

Among the 8 exception codes of the MODBUS protocol, the MiCOM relay manages two of them:

- code 01: Function code unauthorised or unknown.
- code 03: A value of the data field is unauthorised (incorrect code).
 - Control of pages being read.
 - Control of pages being written.
 - Control of address in pages.
 - Length of request messages.

CRC16:

The CRC16 value is calculated by the slave.

1.4 MODBUS request definition used to retrieve the disturbance records

To retrieve a disturbance record, the following requests must be done in the exact given order:

1. (optional): Send a request to know the number of disturbance records available in the saved RAM.
2. To retrieve the data of one channel:
 - 2a - (compulsory): send a service request specifying the record number and the channel number which have to be retrieved.
 - 2b - (compulsory): send requests to retrieve the data of a disturbance record channel as many time as needed.
 - 2c - (compulsory): send a request to retrieve the index frame.
3. Process the same operation (as described in the item 2) for each channel.

1.4.1 Request to know the number of available disturbance records in the Saved RAM.

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	3Dh 00	00 24h	xx.....xx

This request may be answered an error message with the error code:

EVT_NOK (0F): No record available.

Note: If there are less than 5 records available, the answer will contain zero value in the non-used words.

1.4.2 Service request

This request shall be sent before to retrieve the sample data of a disturbance record channel. It allows to specify the record number and the channel number which have to be retrieved. It allows also to know the number of samples in the channel.

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	00 13h	xx.....xx

This request may be answered an error message. Two error codes are possible :

CODE_DEF_RAM (02): Saved RAM failure.

CODE_EVT_NOK (03): No disturbance record available in the saved RAM.

1.4.3 Request to retrieve the data of a disturbance record channel

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	1 to 7Dh	xx.....xx

This request may be answered an error message. Two error codes are possible:

CODE_DEP_DATA (04): The requested sample number is superior than the number of samples in the specified channel.

CODE_SERV_NOK (05): The record number and the channel number have not been specified by a service request.

Note: This type of request can retrieve up to 125 words. A sample is coded on 1 word (16 bits).

1.4.4 Request to retrieve an index frame

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	22h 00	00 07h	xx.....xx

This event request may be answered an error message with the error code:

CODE_SERV_NOK (05): The record number and the channel number have not been specified by a service request.

1.5 MODBUS request definition used to retrieve the event records

Two ways can be followed to retrieve an event record:

- Send a request to retrieve the oldest non-acknowledge event.
- Send a request to retrieve a dedicated event.

1.5.1 Request to retrieve the oldest non-acknowledge event

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	36h 00	00 09h	xx.....xx

This event request may be answered an error message with the error code:

EVT_EN_COURS_ECRIT (5): An event is being written into the saved RAM.

Note: On event retrieval, two possibilities exist regarding the event record acknowledgement:

- a) Automatic event record acknowledgement on event retrieval.
- b) Non automatic event record acknowledgement on event retrieval.

a) Automatic event record acknowledgement on event retrieval:

The bit12 of the remote order frame (format F9 - mapping address 0400h) shall be set to 0. On event retrieval, this event record is acknowledged.

b) Non automatic event record acknowledgement on event retrieval:

The bit12 of the remote order frame (format F9 - mapping address 0400h) shall be set to 1. On event retrieval, this event record is not acknowledged.

To acknowledge this event, an other remote order shall be sent to the relay. The bit 13 of this frame (format F9 - mapping address 0400h) shall be set to 1.

1.5.2 Request to retrieve a dedicated event

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	00 09h	xx.....xx

This event request may be answered an error message with the error code:

EVT_EN_COURS_ECRIT (5): An event is being written into the saved RAM.

Note: This event retrieval does not acknowledge this event.

1.6 **MODBUS request definition used to retrieve the fault records**

Two ways can be followed to retrieve a fault record:

- Send a request to retrieve the oldest non-acknowledge fault record.
- Send a request to retrieve a dedicated fault record.

1.6.1 Request to retrieve the oldest non-acknowledge fault record

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	3Eh 00	00 10h	xx.....xx

Note: On fault retrieval, two possibilities exist regarding the fault record acknowledgement:

- a) Automatic fault record acknowledgement on event retrieval.
- b) Non automatic fault record acknowledgement on event retrieval.

a) Automatic event record acknowledgement on event retrieval:

The bit12 of the remote order frame (format F9 - mapping address 0400h) shall be set to 0. On fault retrieval, this fault record is acknowledged.

b) Automatic fault record acknowledgement on fault retrieval:

The bit12 of the remote order frame (format F9 - mapping address 0400h) shall be set to 0. On fault retrieval, this fault record is acknowledged.

c) Non automatic fault record acknowledgement on fault retrieval:

The bit12 of the remote order frame (format F9 - mapping address 0400h) shall be set to 1. On fault retrieval, this fault record is not acknowledged.

To acknowledge this fault, an other remote order shall be sent to the relay. The bit 14 of this frame (format F9 - mapping address 0400h) shall be set to 1.

1.6.2 Request to retrieve a dedicated fault record

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	00 10h	xx.....xx

Note: This fault value retrieval does not acknowledge this fault record.

1.7 MODBUS request definition used to retrieve both start-up current & voltage form record

To retrieve both start-up current & voltage form record, process as described below:

1. Send a request to know the number of values stored into the saved RAM.
2. Send a request to retrieve the start-up record data relevant to current or voltage signal form.

1.7.1 Request to know the number of current values stored into the saved memory

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	34H 00	00 03h	xx.....xx

1.7.2 Request to retrieve the start-up current form record data

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	004 to 7Ch	xx.....xx

Note: The number of requested words shall be a 2 multiple number as the value of a start-up current form record sample is coded on 4 bytes. One page of the mapping can stored up to 248 words.

1.7.3 Request to know the number of voltage values stored into the saved memory

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	51h 00	00 03h	xx.....xx

1.7.4 Request to retrieve the start-up voltage form record data

Slave Number	Function Code	Word Address	Word Number	CRC
xx	03h	Refer to mapping	04 to 7Ch	xx.....xx

Note: The number of requested words shall be a 2 multiple number as the value of a start-up voltage form record sample is coded on 4 bytes. One page of the mapping can stored up to 248 words.

1.8 MiCOM P220/P225 database organisation

1.8.1 Description of the MODBUS application mapping

The MODBUS mapping contains 60 pages.

Pages 0 to 8: Contain the MiCOM P220/P225 parameters.

Pages 9 to 51h: Contain the data of the event records, data of the fault value records, data of the disturbance records and data of both start-up current & voltage form record.

These pages are explained in the following way:

Page No	Page Content	Access
Page 0h	Information of product, remote signaling, remote measurements	Reading
Page 1h	Remote settings for general parameters	Reading & writing
Page 2h	Remote settings for protection group number 1	Reading & writing
Page 3h	Remote settings for protection group number 2	Reading & writing
Page 4h	Remote controls	Writing
Pages 5h & 6h	Reserved page	Not accessible

Page No	Page Content	Access
Page 7h	MiCOM P220/P225 relay status word	Quick reading
Page 8h	Synchronisation	Writing
Pages 9h to 21h	Disturbance record data	Reading
Page 22h	Index frame for the disturbance records	Reading
Pages 23h to 33h	Start-up current form record data	Reading
Page 34h	Index frame for the start-up current form record	Reading
Page 35h	Event record data	Reading
Page 36h	Data of the oldest event	Reading
Page 37h	Fault value record data	Reading
Pages 38h to 3Ch	Selection of the disturbance record and selection of its channel	Reading
Page 3Dh	Number of available disturbance records	Reading
Page 3Eh	Data of the oldest fault value record	Reading
Page 3Fh	Reserved page	Not accessible
Pages 40h to 50h	Start-up voltage form record data	Reading
Page 51h	Index frame for the start-up voltage form record	Reading

1.8.2 Page 0: Information of product, remote signaling, remote measurements

Access only for reading

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0000	Product Informations	Description of the relay characters 1 and 2	32 to 127	1	-	F10	
0001		Description of the relay characters 3 and 4	32 to 127	1	-	F10	P2
0002		Description of the relay characters 5 and 6	32 to 127	1	-	F10	25
0003		Factory reference characters 1 and 2	32 to 127	1	-	F10	AL
0004		Factory reference characters 3 and 4	32 to 127	1	-	F10	ST
0005		Software version	100 - xx	1	-	F21	
		Active setting group	1 to 2			F1	
0007 to 000E		<i>Reserved</i>					
000F		Status of the MiCOM relay selftest				F46	
0010	Remote-Signalings	Logic inputs	0 to 31	1	-	F12	
0011		Logic datas	0 to FFFF	1	-	F20	
0012		Internal logics	0 to FFFF	1	-	F22	
0013		Output relays	0 to 63	1	-	F13	
0014		Output information: threshold I>>	0 to FFFF	1	-	F17	
0015		Output information: threshold IO>	0 to FFFF	1	-	F16	

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0016		Output information: threshold I0>>	0 to FFFF	1	-	F16	
0017		Output information: I2 >	0 to FFFF	1	-	F16	
0018		Output information: I2 >>	0 to FFFF	1	-	F16	
0019		Output information: I<	0 to FFFF	1	-	F17	
001A		Thermal image Information	0 to FFFF	1	-	F33	
001B		Informations: EXT1, EXT2, EXT3, EXT4 timers and «AND» logical gates	0 to FFFF	1	-	F36	
001C		Informations: Excessive long start/stalled rotor	0 to FFFF	1	-	F34	
001D		Informations: RTD1 to RTD6	0 to FFFF	1	-	F4	
001E		Number of available disturbance records	0 to 5	1		F55	
001F		Informations: RTD7 to RTD10	0 to FFFF	1	-	F4'	
0020		Trip output relay status (RL1)	0 to 1	1	-	F1	
0021		Circuit breaker monitoring flag				F43	
0022		Display alarm message: t I>> PHASE				F17	
0023		Display alarm message: t I< PHASE (Mini I)				F17	
0024		Display alarm messages				F41	
0025		Display alarm messages				F41'	
0026		Display alarm messages				F41''	
0027		Display alarm messages				F41'''	
0028 to 0029		<i>Reserved</i>					
002A		Output information: threshold V<	0 to FFFF	1	-	F17	
002B		Output information: VOLTAGE DIP	0 to FFFF	1	-	F17	
002C		Output information: threshold V>	0 to FFFF	1	-	F17	
002D		Informations: CB FAIL, ABS and BUS VOLTAGE	0 to FFFF	1	-	F35	
002E		Display alarm message: tV<	0 to FFFF	1	-	F17	
002F		Display alarm message: tV>	0 to FFFF	1	-	F17	
0030	Remote-Measurements	Phase A current IA RMS	0 to 12*10 ⁶	1	A/100	F3	
0032		Phase B current IB RMS	0 to 12*10 ⁶	1	A/100	F3	
0034		Phase Current IC RMS	0 to 12*10 ⁶	1	A/100	F3	
0036		Neutral current IN RMS	0 to 3*10 ⁵	1	A/100	F3	
0038		Negative sequence I ₂ current (fundamental)	0 to 12*10 ⁶	1	A/100	F3	

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
003A		Positive sequence I ₁ current (fundamental)	0 to 12*10 ⁶	1	A/100	F3	
003C		Zero sequence current (fundamental) I ₀ (1/3 * I _N)	0 to 1*10 ⁵	1	A/100	F3	
003E		Frequency	4500 to 6500	1	1/100 Hz	F1	
003F to 0040		Phase current maximeter	0 to 12*10 ⁶	1	A/100	F1	
0041		I ₂ /I ₁ ratio			%		
0042		Line to line Voltage VAC RMS	0 to 4*10 ⁶	1	V/100	F3	
0044		Apparent power VAs	0 to 4,8*10 ⁸		KVA/100	F3	
0046		Active Power WATTS	+/- 4,8*10 ⁸		KW/100	F11	
0048		Reactive Power VARs	+/- 4,8*10 ⁸		KVAR/100	F11	
004A		Active power consumption WATT-Hours	+/- 2*10 ⁹		KWh/100	F11	
004C		Reactive power consumption VAR-Hours	+/- 2*10 ⁹		KVARh/100	F11	
004E		Power Factor	-100 to +100	1	1/100	F2	
004F		<i>Reserved</i>					
0050	Process	Load current as % I ₀ >			%	F1	
0051		Thermal status value			%	F1	
0052		<i>Reserved</i>					
0053		Time before thermal trip			Seconds	F1	
0054		RTD1 temperature value	-400 to 2000		1/10 °C	F2	
0055		RTD2 temperature value	-400 to 2000		1/10 °C	F2	
0056		RTD3 temperature value	-400 to 2000		1/10 °C	F2	
0057		RTD4 temperature value	-400 to 2000		1/10 °C	F2	
0058		RTD5 temperature value	-400 to 2000		1/10 °C	F2	
0059		RTD6 temperature value	-400 to 2000		1/10 °C	F2	
005A		Thermistor 1 value	0 to 30000	1	Ohm	F1	
005B		Thermistor 2 value	0 to 30000	1	Ohm	F1	
005C		Number of authorised start-ups			-	F1	
005D		Time before an authorised start-up			seconds	F1	
005E to 005F		Last start current value	0 to 120000	1	A	F1	
0060		Last start time value			seconds	F1	
0061		Total motor start number			-	F1	
0062		Total emergency start number			-	F1	
0063		Total motor running hours			hours	F1	
0064		RTDs status				F45	
0065		RTD7 temperature value	-400 to 2000		1/10 °C	F2	
0066		RTD8 temperature value	-400 to 2000		1/10 °C	F2	
0067		RTD9 temperature value	-400 to 2000		1/10 °C	F2	

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0068		RTD10 temperature value	-400 to 2000		1/10 °C	F2	
0069		Thermistor 3 value	0 to 30000	1	Ohm	F1	
006A		No Hottest RTD	1 to 10	1	-	F1	
006B		Information: Auto Re-Start (P225 only)	0-FFFF	1	-	F34	
006C		Display alarm message: tI>PHASE				F17	
006D		Display alarm message: tI>>>PHASE				F17	
006E		Output information: threshold I>	0-FFFF	1	-	F17	
006F		Output information: threshold I>>>	0-FFFF	1	-	F17	
0070	Trip Cause Statistics	<i>Reserved</i>					
0071		Total trip number (based on output relay No1: RL1)			-	F1	
0072		Operator trip number (logic inputs, pushbuttons or remote communication)			-	F1	
0073		Thermal trip number			-	F1	
0074		Earth fault trip number (tIo>, tIo>>>)			-	F1	
0075		Phase OC trip number (tI>, tI>>>, tI>>>>)			-	F1	
0076		Excessive long start trip number (tIstart)			-	F1	
0077		Stalled rotor trip number (whilst running - tIstall)			-	F1	
0078		Locked rotor trip number (at start)			-	F1	
0079		Loss of load trip number (tI<)			-	F1	
007A		Unbalance trip number (tI2>, tI2>>>)			-	F1	
007B		EQUATION A trip number				F1	
007C		EQUATION A trip number				F1	
007D		EQUATION A trip number				F1	
007E		EQUATION A trip number				F1	
007F		RTD1 trip number			-	F1	
0080		RTD2 trip number			-	F1	
0081		RTD3 trip number			-	F1	
0082		RTD4 trip number			-	F1	
0083		RTD5 trip number			-	F1	

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0084		RTD6 trip number			-	F1	
0085		Thermistor 1 trip number			-	F1	
0086		Thermistor 2 trip number			-	F1	
0087		Thermistor 3 trip number			-	F1	
0088		Under voltage trip number (tV<)			-	F1	
0089		Over voltage trip number (tV>)			-	F1	
008A		RTD7 trip number			-	F1	
008B		RTD8 trip number			-	F1	
008C		RTD9 trip number			-	F1	
008D		RTD10 trip number			-	F1	
008E		VOLTAGE DIP trip number			-	F1	
008F		<i>Reserved</i>			-		
0090	Fourier Magnitude	I _A magnitude			-	F1	
0091		I _B magnitude			-	F1	
0092		I _C magnitude			-	F1	
0093		3.I ₀ magnitude			-	F1	
0094	Fourier Angle	I _A angle			-	F1	
0095		I _B angle			-	F1	
0096		I _C angle			-	F1	
0097		3.I ₀ angle			-	F1	
0098 to 0099	Fourier Magnitude	I ₁ magnitude			-	F1	
009A to 009B		I ₂ magnitude			-	F1	
009C		VAC voltage magnitude			-	F1	
009D	Fourier Angle	VAC voltage angle			-	F1	
009E to 009F		<i>Reserved</i>					

1.8.3 Page 1: Remote settings for general parameters

Access for reading and writing

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0100	Remote-Settings	Address	1 to 255	1	-	F1	1
0101		Language	0 to 15	1		F1	
0102		Password: characters 1 and 2	0x41 to 0x5a	1	-	F10	AA
0103		Password: characters 3 and 4	0x41 to 0x5a	1	-	F10	AA
0104		Frequency	50 to 60	10	Hz	F1	50
0105		Default displayed value	1 to 23	1	-	F26	1
0106		Motor start-up detection criterion	0 to 1	1		F5	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0107		Analogue output type	0 to 1	1	-	F18	0
0108		Data transmitted on the analogue output n°1	0 to 22	1		F7	0
0109		Active setting group	1 to 2	1		F1	1
010A		User reference: characters 1 and 2	0x30 to 0x5a	1	-	F10	MO
010B		User reference: characters 3 and 4	0x30 to 0x5a	1	-	F10	T1
10C		Displayed fault record number	1 to 25	1		F39	25
010D		Thermistor 1 type	0 to 1	1	-	F32	0
010E		Thermistor 2 type	0 to 1	1	-	F32	0
010F		RTDs type	0 to 3	1	-	F42	0
0110		Thermistor 3 type	0 to 1	1	-	F32	0
0111		Data transmitted on the analogue output n°2	0 to 22	1		F7	0
0112		Configuration of the maximum analogue output n°1 rating	0 to 10	1	-	F47	0=10 Kilo
0113		Configuration of the maximum analogue output n°2 rating	0 to 10	1	-	F47	0=10 Kilo
0114		Configuration of the logic input active state	0 to 1	1	-	F48	1
0115		Latching of the auxiliary output relays	0 to 15	1	-	F14	0
0116		Configuration of the control voltage type for the logic inputs	0 to 1	1		F37	0
0117		Configuration of both RAM ERROR & BATTERY ERROR alarm message	0 to 1	1		F24	0
0118		Configuration of the way to switch of active setting group	0 to 1	1		F49	0 1
0119		Detect Volt Dip	0 to 1	1		F60	0 (P225) or 1 (P220)
011A		Function: Auto Re-Start (P225 only)	0 to 1	1		F24	0
011B		Treac-long (P225 only)	0 to 600	1	Sec/10	F1	20
011C		Treac-shed (P225 only)	0 to 59400	1	Sec/10	F1	0
011D		Auto Re-Start (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
0120	CT/VT Ratio	Line CT primary	1 to 3000	1	-	F1	1
0121		Line CT secondary	1 to 5	4	-	F1	1
0122		Earth/Gnd CT primary	1 to 3000	1	-	F1	1
0123		Earth/Gnd CT secondary	1 to 5	4	-	F1	1
0124		Line VT primary	1 to 20000	1	-	F1	57 or 220

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0125		Line VT secondary	57 to 130 or 220 to 480	1	-	F1	57 or 220
0126		INPUT1 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
0127		INPUT2 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
0128		INPUT3 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
0129		INPUT4 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
012A		INPUT5 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
012B		INPUT6 (AUX OUTPUT RLY)	0 to 15	1	-	F14	0
012C		Led5		2 ⁿ			
012D		Led6		2 ⁿ			
012E		Led7		2 ⁿ			
012F		Led8		2 ⁿ			
0130	Rear RS485 Communication	Data rate	0 to 7	1	-	F28	6 = 19200 bauds
0131		Parity	0 to 2	1	-	F29	0 = without
0132		<i>Reserved</i>					
0133		Stop bit	0 to 1	1	-	F31	0 =1 bit
0134		Communication available	0 to 1	1	-	F24	1 = Commu- nication available
0135 to 013C		<i>Reserved</i>					
013D	CB Supervision	CB operation number		1	-	F1	
013E		CB operating time		1	sec/100	F1	
013F		S A ⁿ I _A (phase A)		1	A ⁿ	F3	
0141		S A ⁿ I _B (phase B)		1	A ⁿ	F3	
0143		S A ⁿ I _C (phase C)		1	A ⁿ	F3	
0145		Configuration of the date format	0 to 1	1	-	F44	
0146		<i>Reserved</i>					
0147		I> (instantaneous)	0 to 15	1	-	F14	0
0148		tI> (time delayed)	0 to 15	1	-	F14	0
0149		I>>> (instantaneous)	0 to 15	1	-	F14	0
014A		tI>>> (time delayed)	0 to 15	1	-	F14	0
014B		I> (instantaneous)	0 to 15	1	-	F14	0
014C		tI> (time delayed)	0 to 15	1	-	F14	0
014D		I>>> (instantaneous)	0 to 15	1	-	F14	0
014E		tI>>> (time delayed)	0-15	1	-	F14	0
014F		Latching of the trip output relay (RL1) - (2/2)	0 to 8191	2 ⁿ	-	F8'	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0150	LED Allocation	Led 5		2 ⁿ	-	F19	0
0152		Led 6		2 ⁿ	-	F19	0
0154		Led 7		2 ⁿ	-	F19	0
0156		Led 8		2 ⁿ		F19	0
0158	Auxiliary Output Relays Allocation	t RTD10 ALARM	0 to 15	1	-	F14	0
0159		t RTD10 TRIP	0 to 15	1	-	F14	0
015A	«AND» Logical Gates Allocation	t RTD10 ALARM	0 to 15	1		F14'	0
015B		t RTD10 TRIP	0 to 15	1		F14'	0
015C		<i>Reserved</i>					
015D	Auxiliary Output Relays Allocation	GROUP 2 ACTIVE	0 to 15	1	-	F14	0
015E	Logic Inputs Allocation	Logic input L6	0 to 2 ⁿ		-	F15	0
015F		Logic input L2	0 to 2 ⁿ		-	F15	0
0160		Logic input L3	0 to 2 ⁿ		-	F15	0
0161		Logic input L4	0 to 2 ⁿ		-	F15	0
0162		Logic input L5	0 to 2 ⁿ		-	F15	0
0163	Auxiliary Output Relays Allocation	ABS	0 to 15	1	-	F14	0
0164		CB FAIL	0 to 15	1	-	F14	0
0165		TRIP CIRC. FAIL	0 to 15	1	-	F14	0
0166		t RTD7 ALARM	0 to 15	1	-	F14	0
0167		t RTD7 TRIP	0 to 15	1	-	F14	0
0168		t RTD8 ALARM	0 to 15	1	-	F14	0
0169		t RTD8 TRIP	0 to 15	1	-	F14	0
016A		t RTD9 ALARM	0 to 15	1	-	F14	0
016B		t RTD9 TRIP	0 to 15	1	-	F14	0
016C		Thermist 3	0 to 15	1	-	F14	0
016D		tV< (time delayed)	0 to 15	1	-	F14	0
016E		VOLTAGE DIP	0 to 15	1	-	F14	0
016F		tV> (time delayed)	0 to 15	1	-	F14	0
0170		Thermal overload: THERM OV.	0 to 15	1		F14	0
0171		Thermal alarm: θ ALARM	0 to 15	1	-	F14	0
0172		Thermal start inhibition θ FORBID. START	0 to 15	1	-	F14	0
0173		I0> (instantaneous)	0 to 15	1	-	F14	0
0174		tI0> (time delayed)	0 to 15	1	-	F14	0
0175		I0>>(instantaneous)	0 to 15	1	-	F14	0
0176		tI0>>(time delayed)	0 to 15	1	-	F14	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0177		l>> (instantaneous)	0 to 15	1	-	F14	0
0178		tl>> (time delayed)	0 to 15	1	-	F14	0
0179		tl2> (time delayed)	0 to 15	1	-	F14	0
017A		tl2>> (time delayed)	0 to 15	1	-	F14	0
017B		Excessive long start: EXCES LG START	0 to 15	1	-	F14	0
017C		Stalled rotor (whilst running): t lstall	0 to 15	1	-	F14	0
017D		Locked rotor (at start): LOCKED ROTOR	0 to 15	1	-	F14	0
017E		Loss of load: t l< (time delayed)	0 to 15	1	-	F14	0
017F		Start number limitation START NB LIMIT	0 to 15	1	-	F14	0
0180		Time between 2 start: T betw 2 start	0 to 15	1	-	F14	0
0181		t RTD1 ALARM	0 to 15	1	-	F14	0
0182		t RTD1 TRIP	0 to 15	1	-	F14	0
0183		t RTD2 ALARM	0 to 15	1	-	F14	0
0184		t RTD2 TRIP	0 to 15	1	-	F14	0
0185		t RTD3 ALARM	0 to 15	1	-	F14	0
0186		t RTD3 TRIP	0 to 15	1	-	F14	0
0187		t RTD4 ALARM	0 to 15	1	-	F14	0
0188		t RTD4 TRIP	0 to 15	1	-	F14	0
0189		t RTD5 ALARM	0 to 15	1	-	F14	0
018A		t RTD5 TRIP	0 to 15	1	-	F14	0
018B		t RTD6 ALARM	0 to 15	1	-	F14	0
018C		t RTD6 TRIP	0 to 15	1	-	F14	0
018D		Thermist 1	0 to 15	1	-	F14	0
018E		Thermist 2	0 to 15	1	-	F14	0
018F		EXT 1	0 to 15	1	-	F14	0
0190		EXT 2	0 to 15	1	-	F14	0
0191		CLOSE ORDER	0 to 15	1	-	F14	0
0192		TRIP ORDER	0 to 15	1	-	F14	0
0193		ORDER 1	0 to 15	1	-	F14	0
0194		ORDER 2	0 to 15	1	-	F14	0
0195		SUCCESS START	0 to 15	1	-	F14	0
0196		«AND» logical gate A: t EQU. A	0 to 15	1	-	F14	0
0197		«AND» logical gate B: t EQU. B	0 to 15	1	-	F14	0
0198		«AND» logical gate C: t EQU. C	0 to 15	1	-	F14	0
0199		«AND» logical gate D: t EQU. D	0 to 15	1	-	F14	0
019A		CB opening time : CB OPEN TIME	0 to 15	1	-	F14	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
019B		CB operation number: CB OPER NB	0 to 15	1		F14	0
019C		Σ Amps ⁿ cut by CB: S An	0 to 15	1		F14	0
019D		EXT 3	0 to 15	1	-	F14	0
019E		EXT 4	0 to 15	1	-	F14	0
019F		BUS VOLTAGE	0 to 15	1	-	F14	0
01A0	«AND» Logical Gates Allocation	Thermal overload: THERM OV.	0 to 15	1		F14'	0
01A1		Thermal alarm: θ ALARM	0 to 15	1		F14'	0
01A2		FORBIDDEN START	0 to 15	1		F14'	0
01A3		I0> (instantaneous)	0 to 15	1		F14'	0
01A4		tI0> (time delayed)	0 to 15	1		F14'	0
01A5		I0>> (instantaneous)	0 to 15	1		F14'	0
01A6		tI0>> (time delayed)	0 to 15	1		F14'	0
01A7		I>> (instantaneous)	0 to 15	1		F14'	0
01A8		tI>> (time delayed)	0 to 15	1		F14'	0
01A9		tI2> (time delayed)	0 to 15	1		F14'	0
01AA		tI2>> (time delayed)	0 to 15	1		F14'	0
01AB		Excessive long start : EXCES LG START	0 to 15	1		F14'	0
01AC		Stalled rotor (running): t I stall	0 to 15	1		F14'	0
01AD		Locked rotor (at start): LOCKED ROTOR	0 to 15	1		F14'	0
01AE		Loss of load: t I< (time delayed)	0 to 15	1		F14'	0
01AF		CB FAIL	0 to 15	1		F14'	0
01B0		TRIP CIRC. FAIL	0 to 15	1		F14'	0
01B1		t RTD1 ALARM	0 to 15	1		F14'	0
01B2		t RTD1 TRIP	0 to 15	1		F14'	0
01B3		t RTD2 ALARM	0 to 15	1		F14'	0
01B4		t RTD2 TRIP	0 to 15	1		F14'	0
01B5		t RTD3 ALARM	0 to 15	1		F14'	0
01B6		t RTD3 TRIP	0 to 15	1		F14'	0
01B7		t RTD4 ALARM	0 to 15	1		F14'	0
01B8		t RTD4 TRIP	0 to 15	1		F14'	0
01B9		t RTD5 ALARM	0 to 15	1		F14'	0
01BA		t RTD5 TRIP	0 to 15	1		F14'	0
01BB		t RTD6 ALARM	0 to 15	1		F14'	0
01BC		t RTD6 TRIP	0 to 15	1		F14'	0
01BD		Thermist 1	0 to 15	1		F14'	0
01BE		Thermist 2	0 to 15	1		F14'	0
01BF		EXT 1	0 to 15	1		F14'	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
01C0		EXT 2	0 to 15	1		F14'	0
01C1		SUCCESS START	0 to 15	1		F14'	0
01C2		EXT 3	0 to 15	1		F14'	0
01C3		EXT 4	0 to 15	1		F14'	0
01C4		t RTD7 ALARM (P225 only)	0 to 15	1		F14'	0
01C5		t RTD7 TRIP (P225 only)	0 to 15	1		F14'	0
01C6		t RTD8 ALARM (P225 only)	0 to 15	1		F14'	0
01C7		t RTD8 TRIP (P225 only)	0 to 15	1		F14'	0
01C8		t RTD9 ALARM (P225 only)	0 to 15	1		F14'	0
01C9		t RTD9 TRIP (P225 only)	0 to 15	1		F14'	0
01CA		Thermist 3 (P225 only)	0 to 15	1		F14'	0
01CB		Auto Re-Start (AND LOGIC EQUATION) (P225 only)	0 to 15	1		F14'	0
01CC		tV< (time delayed) (P225 only)	0 to 15	1		F14'	0
01CD		VOLTAGE DIP	0 to 15	1		F14'	0
01CE		tV> (time delayed) (P225 only)	0 to 15	1		F14'	0
01CF		BUS VOLTAGE (P225 only)	0 to 15	1		F14'	0
01D0	Automation Control Functions	Trip output relay assignment (RL1)	0 to 65535	2 ⁿ		F6	0
01D1		Trip output relay assignment (RL1)	0 to 8191	2 ⁿ		F6'	0
01D2		Latching of the trip output relay (RL1) - (1/2)	0 to 65535	2 ⁿ	-	F8	0
01D3		Function: Start number limitation	0 to 1	1	-	F24	0
01D4		Reference time: Treference	10 to 120	5	minute	F1	10
01D5		Hot start number	0 to 5	1	-	F1	0
01D6		Cold start number	1 to 5	1	-	F1	1
01D7		Start interdiction time: Tforbiden	1 to 120	1	minute	F1	1
01D8		Function: Time between 2 starts	0 to 1	1	-	F24	0
01D9		T betw 2 start	1 to 120	1	minute	F1	1
01DA		Function: Re-acceleration authorization	0 to 1	1	-	F24	0
01DB		Voltage dip duration: Treacc	10 to 500	1	1/100 sec	F1	20
01DC		Function: CB Opening time?	0 to 1	1	-	F24	0
01DD		CB OPENING TIME threshold	5 to 100	1	1/100 sec	F1	5

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
01DE		Function: CB Operation number?	0 to 1	1	-	F24	0
01DF		CB OPERATION NB threshold	0 to 50000	1	-	F1	0
01E0		Σ Amps ⁿ cut by CB function?: S A ⁿ	0 to 1	1	-	F24	0
01E1		SA ⁿ threshold	0 to 4000		10 ⁶ A ⁿ	F3	0
01E2		«n» exponent value	1 to 2	1	1	F1	1
01E3		TRIP T duration value (remote order)	20 to 500	5	1/100 sec	F1	20
01E4		CLOSE T duration value (remote order)	20 to 500	5	1/100 sec	F1	20
01E5	Logic Inputs	EXT1 time delay	0 to 20000	1	1/100 sec	F1	0
01E6		EXT2 time delay	0 to 20000	1	1/100 sec	F1	0
01E7	Disturbance Record	Pre-time	1 to 25	1	1/10 sec	F1	1
01E8		Post-time	1 to 25	1	1/10 sec	F1	1
01E9		Disturbance record triggering criterion: DISTUR REC TRIG	0 to 1	1		F40	0
01EA	Logic Inputs	EXT3 time delay	0 to 20000	1	1/100 sec	F1	0
01EB		EXT4 time delay	0 to 20000	1	1/100 sec	F1	0
01EC	Automation Control Functions	Voltage dip detection threshold: Detection V DIP	370 to 980 or 1430 to 3600	2	1/10 V	F1	720 or 2860
01ED		Voltage restoration detection threshold: Restoration V DIP	50 to 1300 or 200 to 4800	1	1/10 V	F1	50 or 200
01EE		Function: ABS?	0 to 1	1	-	F24	0
01EF		tABS timer	1 to 7200	1	sec	F1	1
01F0	«AND» Logical Gates Timers	«AND» logical gate A operation time delay: EQU. A Toperat	0 to 36000	1	1/10 sec	F1	0
01F1		«AND» logical gate A reset time delay: EQU. A Treset	0 to 36000	1	1/10 sec		0
01F2		«AND» logical gate B operation time delay: EQU. B Toperat	0 to 36000	1	1/10 sec	F1	0
01F3		«AND» logical gate B reset time delay: EQU. B Treset	0 to 36000	1	1/10 sec	F1	0
01F4		«AND» logical gate C operation time delay: EQU. C Toperat	0 to 36000	1	1/10 sec	F1	0
01F5		«AND» logical gate C reset time delay: EQU. C Treset	0 to 36000	1	1/10 sec	F1	0
01F6		«AND» logical gate D operation time delay: EQU. D Toperat	0 to 36000	1	1/10 sec	F1	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
01F7		«AND» logical gate D reset time delay: EQU. D Treset	0 to 36000	1	1/10 sec	F1	0
01F8		Reserved					
01F9	Automation Control Functions	Function: TRIP CIRCUIT SUPERVISION?	0 to 1	1		F24	
01FA		tSUP timer	10 to 1000	1	1/100 sec	F1	10
01FB		Function: CB FAIL?	0 to 1	1		F24	
01FC		I < BF threshold	1 to 100	1	% In	F1	10
01FD		tBF timer	3 to 1000	1	1/100 sec	F1	3
01FE		Function: BUS VOLTAGE CONTROL? (P225 only)	0 to 1	1		F24	
01FF		V BUS threshold (P225 only)	50 to 1300 or 200 to 4800	1	1/10 V	F1	50 or 200

1.8.4 Page 2: Remote settings for protection functions group No1

Access for reading and writing

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0200	Protection Group 1	Thermal overload function	0 to 1	1	-	F24	0
0201		Thermal inhibition at start: θ INHIBIT	0 to 1	1	-	F24	0
0202		Thermal current threshold: I_{θ} >	20 to 150	1/100 In	-	F1	20
0203		Ke factor	0 to 10	1	-	F1	3
0204		Thermal constant time Te1	1 to 180	1	Minute	F1	1
0205		Thermal constant time Te2	1 to 360	1	Minute	F1	1
0206		Cooling constant time Tr	1 to 999	1	Minute	F1	1
0207		RTD1 influence: RTD1 INFLUENCE	0 to 1	1	-	F24	0
0208		Thermal alarm function	0 to 1	1	-	F24	0
0209		θ ALARM threshold	20 to 100	1	%	F1	20
020A		Thermal start inhibition function	0 to 1	1	-	F24	0
020B		θ FORBID START	20 to 100	1	%	F1	20
020C		$I_{>}$	0 to 1	1	-	F24	0
020D		$I_{>}$ threshold	10 to 2500	1	In/100	F1	10
020E		$I_{>}$ time delay type	0 to 2	1	-	F27	0
020F		$I_{>}$ IDMT Curve Type	0 to 10	1	-	F61	1
0216		$I_{>}$ TMS value	25 to 1500	1	1/1000	F1	25

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0217		> K value (RI curve)	100 to 10000	5	1/1000	F1	100
0218		tl> value	0 to 15000	1	1/100 s	F1	4
0213		> Reset type	0 to 1	1		F27	0
0214		> RTMS value	25 to 3200	1	1/1000	F1	25
0215		> tRESET value	0 to 60000	1	1/100 s	F1	0
0210		>>	0 to 1	1	-	F24	0
0211		>> Threshold	50 to 4000	5	ln/100	F1	50
0212		tl>> value	0 to 15000	1	1/100 s	F1	1
0219		>> time delay type	0 to 2	1	-	F27	0
021A		>> IDMT curve type	0 to 10	1	-	F61	1
021B		>> TMS value	25 to 1500	1	1/1000	F1	25
021C		K value (RI curve)	100 to 10000	5	1/1000	F1	100
021D		>> Reset Type	0 to 1	1	-	F27	0
021E		>> RTMS value	25 to 3200	1	1/1000	F1	25
021F		>> tRESET value	0 to 60000	1	1/100 s	F1	0
0220		l0> function	0 to 1	1	-	F24	0
0221		l0> threshold	2 to 1000	1	1/1000 lon	F1	2
0222		tl0> time delay	0 to 10000	1	1/100 s	F1	0
0223		l0>> function	0 to 1	1	-	F24	0
0224		l0>> threshold	2 to 1000	1	1/1000 lon	F1	2
0225		tl0>> time delay	0 to 10000	1	1/100 s	F1	0
0226 to 022A		<i>Reserved</i>					-
022B		Interlock	0 to 1	1	-	F24	0
022C		>>>	0 to 1	1	-	F24	0
022D		>>> Threshold	50 to 4000	5	ln/100	F1	50
022E		tl>>> value	0 to 15000	1	1/100 s	F1	1
022F		TMS l2>>	200 to 2000	25	1/1000	F1	1000
0230		l2> function	0 to 1	1	-	F24	0
0231		l2> threshold	40 to 800	10	1/1000 ln	F1	40
0232		tl2> time delay	0 to 20000	1	1/100 s	F1	0
0233		l2>> function	0 to 1	1	-	F24	0
0234		l2>> threshold	40 to 800	10	1/1000 ln	F1	40
0235		V< function (P225 only)	0 to 1	1	-	F24	0
0236		V< threshold (P225 only)	50 to 1300 or 200 to 4800	1	1/10V	F1	50 or 200
0237		tV< time delay (P225 only)	0 to 60000	1	1/100 sec	F1	0
0238		V< inhibition at start: INHIB V< (P225 only)	0 to 1	1	-	F24	0
0239 to 023C		<i>Reserved</i>				-	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
023D		V> function (P225 only)	0 to 1	1	-	F24	0
023E		V> threshold (P225 only)	50 to 2600 or 200 to 9600	1 ou 5	1/10V	F1	50 or 200
023F		tV> time delay (P225 only)	0 to 60000	1	1/100 sec	F1	0
0240		Excessive long start function	0 to 1	1	-	F24	0
0241		I util	50 to 500	1	1/100 In	F1	100
0242		t Istart time delay	1 to 200	1	Second	F1	1
0243		<i>Reserved</i>				-	-
0244		Blocked rotor function	0 to 1	1	-	F24	0
0245		t Istart time delay	1 to 600	1	1/10 sec	F1	1
0246		Stalled rotor function	0 to 1	1	-	F24	0
0247		Istart detection threshold	50 to 500	1	1/100 In	F1	100
0248		Locked rotor at start function	0 to 1	1	-	F24	0
0249 to 024F		<i>Reserved</i>					-
0250		I< function	0 to 1	1	-	F24	0
0251		I< threshold	10 to 100	1	1/100 In	F1	10
0252		t I< time delay	2 to 1000	1	1/10 sec	F24	2
0253		Tinhib inhibition time	5 to 30000	5	1/100 sec	F1	5
0254 to 0255		<i>Reserved</i>					-
0256		RTD10 function (P225 only)	0 to 1	1	-	F24	0
0257		RTD10 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
0258		t RTD10 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0259		RTD10 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
025A		t RTD10 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
025B		RTD9 function (P225 only)	0 to 1	1	-	F24	0
025C		RTD9 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
025D		t RTD9 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
025E		RTD9 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
025F		t RTD9 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0260		RTD1 function	0 to 1	1	-	F24	0
0261		RTD1 ALARM threshold	0 to 200	1	°C	F1	0
0262		t RTD1 ALARM time delay	0 to 1000	1	1/10 sec	F1	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0263		RTD1 TRIP threshold	0 to 200	1	°C	F1	0
0264		t RTD1 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0265		RTD2 function	0 to 1	1	-	F24	0
0266		RTD2 ALARM threshold	0 to 200	1	°C	F1	0
0267		t RTD2 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0268		RTD2 TRIP threshold	0 to 200	1	°C	F1	0
0269		t RTD2 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
026A		RTD3 function	0 to 1	1	-	F24	0
026B		RTD3 ALARM threshold	0 to 200	1	°C	F1	0
026C		t RTD3 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
026D		RTD3 TRIP threshold	0 to 200	1	°C	F1	0
026E		t RTD3 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
026F		RTD4 function	0 to 1	1	-	F24	0
0270		RTD4 ALARM threshold	0 to 200	1	°C	F1	0
0271		t RTD4 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0272		RTD4 TRIP threshold	0 to 200	1	°C	F1	0
0273		t RTD4 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0274		RTD5 function	0 to 1	1	-	F24	0
0275		RTD5 ALARM threshold	0 to 200	1	°C	F1	0
0276		t RTD5 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0277		RTD5 TRIP threshold	0 to 200	1	°C	F1	0
0278		t RTD5 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0279		RTD6 function	0 to 1	1	-	F24	0
027A		RTD6 ALARM threshold	0 to 200	1	°C	F1	0
027B		t RTD6 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
027C		RTD6 TRIP threshold	0 to 200	1	°C	F1	0
027D		t RTD6 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
027E		Thermistor 1 function	0 to 1	1	-	F24	0
027F		Thermistor 1 threshold	1 to 300	1	1/10 kΩ	F1	1
0280		Thermistor 2 function	0 to 1	1	-	F24	0
0281		Thermistor 2 threshold	1 to 300	1	1/10 kΩ	F1	1
0282		Thermistor 3 function (P225 only)	0 to 1	1	-	F24	0
0283		Thermistor 3 threshold (P225 only)	1 to 300	1	1/10 kΩ	F1	1
0284		RTD7 function (P225 only)	0 to 1	1	-	F24	0
0285		RTD7 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0286		t RTD7 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0287		RTD7 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
0288		t RTD7 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0289		RTD8 function (P225 only)	0 to 1	1	-	F24	0
028A		RTD8 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
028B		t RTD8 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
028C		RTD8 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
028D		t RTD8 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
028E to 028F		Reserved					-

1.8.5 Page 3: Remote settings for protection functions group No2

Access for reading and writing

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0300	Protection Group 2	Thermal overload function	0 to 1	1	-	F24	0
0301		Thermal inhibition at start: θ INHIBIT	0 to 1	1	-	F24	0
0302		Thermal current threshold: I_{θ} >	20 to 150	1/100 In	-	F1	20
0303		Ke factor	0 to 10	1	-	F1	3
0304		Thermal constant time Te1	1 to 180	1	Minute	F1	1
0305		Thermal constant time Te2	1 to 360	1	Minute	F1	1
0306		Cooling constant time Tr	1 to 999	1	Minute	F1	1
0307		RTD1 influence: RTD1 INFLUENCE	0 to 1	1	-	F24	0
0308		Thermal alarm function	0 to 1	1	-	F24	0
0309		θ ALARM threshold	20 to 100	1	%	F1	20
030A		Thermal start inhibition function	0 to 1	1	-	F24	0
030B		θ FORBID START	20 to 100	1	%	F1	20
030C		$I_{>}$	0 to 1	1	-	F24	0
030D		$I_{>}$ threshold	10 to 2500	1	In/100	F1	10
030E		$I_{>}$ time delay type	0 to 2	1	-	F27	0
030F		$I_{>}$ IDMT Curve Type	0 to 10	1	-	F61	1
0316		$I_{>}$ TMS value	25 to 1500	1	1/1000	F1	25

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0317		> K value (RI curve)	100 to 10000	5	1/1000	F1	100
0318		tl> value	0 to 15000	1	1/100 s	F1	4
0313		> Reset type	0 to 1	1		F27	0
0314		> RTMS value	25 to 3200	1	1/1000	F1	25
0315		> tRESET value	0 to 60000	1	1/100 s	F1	0
0310		>>	0 to 1	1	-	F24	0
0311		>> Threshold	50 to 4000	5	ln/100	F1	50
0312		tl>> value	0 to 15000	1	1/100 s	F1	1
0319		>> time delay type	0 to 2	1	-	F27	0
031A		>> IDMT curve type	0 to 10	1	-	F61	1
031B		>> TMS value	25 to 1500	1	1/1000	F1	25
031C		K value (RI curve)	100 to 10000	5	1/1000	F1	100
031D		>> Reset Type	0 to 1	1	-	F27	0
031E		>> RTMS value	25 to 3200	1	1/1000	F1	25
031F		>> tRESET value	0 to 60000	1	1/100 s	F1	0
0320		l0> function	0 to 1	1	-	F24	0
0321		l0> threshold	2 to 1000	1	1/1000 lon	F1	2
0322		tl0> time delay	0 to 10000	1	1/100 s	F1	0
0323		l0>> function	0 to 1	1	-	F24	0
0324		l0>> threshold	2 to 1000	1	1/1000 lon	F1	2
0325		tl0>> time delay	0 to 10000	1	1/100 s	F1	0
0326 to 032A		<i>Reserved</i>					-
032B		Interlock	0 to 1	1	-	F24	0
032C		>>>	0 to 1	1	-	F24	0
032D		>>> Threshold	50 to 4000	5	ln/100	F1	50
032E		tl>>> value	0 to 15000	1	1/100 s	F1	1
032F		TMS l2>>>	200 to 2000	25	1/1000	F1	1000
0330		l2> function	0 to 1	1	-	F24	0
0331		l2> threshold	40 to 800	10	1/1000 ln	F1	40
0332		tl2> time delay	0 to 20000	1	1/100 s	F1	0
0333		l2>> function	0 to 1	1	-	F24	0
0334		l2>> threshold	40 to 800	10	1/1000 ln	F1	40
0335		V< function (P225 only)	0 to 1	1	-	F24	0
0336		V< threshold (P225 only)	50 to 1300 or 200 to 4800	1	1/10V	F1	50 or 200
0337		tV< time delay (P225 only)	0 to 60000	1	1/100 sec	F1	0
0338		V< inhibition at start : INHIB V< (P225 only)	0 to 1	1	-	F24	0
0339 to 033C		<i>Reserved</i>				-	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
033D		V> function (P225 only)	0 to 1	1	-	F24	0
033E		V> threshold (P225 only)	50 to 2600 or 200 to 9600	1 ou 5	1/10V	F1	50 or 200
033F		tV> time delay (P225 only)	0 to 60000	1	1/100 sec	F1	0
0340		Excessive long start function	0 to 1	1	-	F24	0
0341		I util	50 to 500	1	1/100 In	F1	100
0342		t Istart time delay	1 to 200	1	Second	F1	1
0343		<i>Reserved</i>				-	-
0344		Blocked rotor function	0 to 1	1	-	F24	0
0345		t Istart time delay	1 to 600	1	1/10 sec	F1	1
0346		Stalled rotor function	0 to 1	1	-	F24	0
0347		Istart detection threshold	50 to 500	1	1/100 In	F1	100
0348		Locked rotor at start function	0 to 1	1	-	F24	0
0349 to 034F		<i>Reserved</i>					-
0350		I< function	0 to 1	1	-	F24	0
0351		I< threshold	10 to 100	1	1/100 In	F1	10
0352		t I< time delay	2 to 1000	1	1/10 sec	F24	2
0353		Tinhib inhibition time	5 to 30000	5	1/100 sec	F1	5
0354 to 0355		<i>Reserved</i>					-
0356		RTD10 function (P225 only)	0 to 1	1	-	F24	0
0357		RTD10 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
0358		t RTD10 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0359		RTD10 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
035A		t RTD10 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
035B		RTD9 function (P225 only)	0 to 1	1	-	F24	0
035C		RTD9 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
035D		t RTD9 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
035E		RTD9 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
035F		t RTD9 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0360		RTD1 function	0 to 1	1	-	F24	0
0361		RTD1 ALARM threshold	0 to 200	1	°C	F1	0
0362		t RTD1 ALARM time delay	0 to 1000	1	1/10 sec	F1	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0363		RTD1 TRIP threshold	0 to 200	1	°C	F1	0
0364		t RTD1 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0365		RTD2 function	0 to 1	1	-	F24	0
0366		RTD2 ALARM threshold	0 to 200	1	°C	F1	0
0367		t RTD2 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0368		RTD2 TRIP threshold	0 to 200	1	°C	F1	0
0369		t RTD2 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
036A		RTD3 function	0 to 1	1	-	F24	0
036B		RTD3 ALARM threshold	0 to 200	1	°C	F1	0
036C		t RTD3 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
036D		RTD3 TRIP threshold	0 to 200	1	°C	F1	0
036E		t RTD3 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
036F		RTD4 function	0 to 1	1	-	F24	0
0370		RTD4 ALARM threshold	0 to 200	1	°C	F1	0
0371		t RTD4 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0372		RTD4 TRIP threshold	0 to 200	1	°C	F1	0
0373		t RTD4 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0374		RTD5 function	0 to 1	1	-	F24	0
0375		RTD5 ALARM threshold	0 to 200	1	°C	F1	0
0376		t RTD5 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
0377		RTD5 TRIP threshold	0 to 200	1	°C	F1	0
0378		t RTD5 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
0379		RTD6 function	0 to 1	1	-	F24	0
037A		RTD6 ALARM threshold	0 to 200	1	°C	F1	0
037B		t RTD6 ALARM time delay	0 to 1000	1	1/10 sec	F1	0
037C		RTD6 TRIP threshold	0 to 200	1	°C	F1	0
037D		t RTD6 TRIP time delay	0 to 1000	1	1/10 sec	F1	0
037E		Thermistor 1 function	0 to 1	1	-	F24	0
037F		Thermistor 1 threshold	1 to 300	1	1/10 kΩ	F1	1
0380		Thermistor 2 function	0 to 1	1	-	F24	0
0381		Thermistor 2 threshold	1 to 300	1	1/10 kΩ	F1	1
0382		Thermistor 3 function (P225 only)	0 to 1	1	-	F24	0
0383		Thermistor 3 threshold (P225 only)	1 to 300	1	1/10 kΩ	F1	1
0384		RTD7 function (P225 only)	0 to 1	1	-	F24	0
0385		RTD7 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0386		t RTD7 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0387		RTD7 TRIP threshold (P225 only)	0 to 200	1	°C	F1	0
0388		t RTD7 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
0389		RTD8 function (P225 only)	0 to 1	1	-	F24	0
038A		RTD8 ALARM threshold (P225 only)	0 to 200	1	°C	F1	0
038B		t RTD8 ALARM time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
038C		RTD8 TRIP threshold(P225 only)	0 to 200	1	°C	F1	0
038D		t RTD8 TRIP time delay (P225 only)	0 to 1000	1	1/10 sec	F1	0
038E to 038F		Reserved					-

1.8.6 Page 4: Remote controls

Access in writing

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0400	Remote control	Remote control word 1	0 to 31	1	-	F9	0
0401 to 0402		Reserved					
0403		Remote control word 3	0 to 1	1	-	F9'	0
0404		Remote control word 2 Remote control of the output relays - under Maintenance mode only	0 to 63	1	-	F38	0

1.8.7 Pages 5 and 6: Reserved

1.8.8 Page 7: MiCOM P220/P225 relay status word

Access for quick reading

Address	Group	Description	Values Range	Step	Unit	Format	Default Value
0700	Quick reading byte	Quick reading byte		1	-	F23	0

1.8.9 Page 8: Synchronisation

Access in writing. It exists 2 possible date format configurations:

- IEC format: Inverted IEC 870-5-4 CP56Time2a
- Private format

1.8.9.1 Mapping for IEC format

The format of the clock synchronisation is coded on 8 bytes (4 words).

Words	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Value range
1	0	0	0	0	0	0	0	0	Year							00..99	
2	0	0	0	0	Month			Day of week			Day of Month			1..12 1..7 1..31			
3	Su	0	0	Hours				iv	0	Minutes					0..23 0..59		
4	Millisecond MSB							Millisecond LSB							0..59999		
	2^{15}							2^8	2^7	2^0							(s) + (ms)

su = 0 : Standard su = 1 : Summer Time
 iv = 0 : valid iv = 1 : non valid or non synchronised in system case

1.8.9.2 Mapping for PRIVATE format:

The format of the clock synchronisation is coded on 8 bytes (4 words).

Clock	@ Page	Byte Number	Value Range	Unit
Year LSB + MSB	8	2		Year
Months	8	1	1 - 12	Month
Days	8	1	1 - 31	Day
Hours	8	1	0 - 23	Hour
Minutes	8	1	0 - 59	Minute
ms LSB + MSB	8	2	0 - 59999	ms

1.8.10 Page 9h to 21h: Disturbance record data (25 pages)

Access in reading. Each page of the mapping contains 250 words.

Address	Contents	Format
0900 to 09FAh	250 words of disturbance record data	F58
0A00 to 0AFAh	250 words of disturbance record data	F58
0B00 to 0BFAh	250 words of disturbance record data	F58
0C00 to 0CFAh	250 words of disturbance record data	F58
0D00 to 0DFAh	250 words of disturbance record data	F58
0E00 to 0EFAh	250 words of disturbance record data	F58
0F00 to 0FFAh	250 words of disturbance record data	F58
1000 to 10FAh	250 words of disturbance record data	F58
1100 to 11FAh	250 words of disturbance record data	F58
1200 to 12FAh	250 words of disturbance record data	F58
1300 to 13FAh	250 words of disturbance record data	F58
1400 to 14FAh	250 words of disturbance record data	F58
1500 to 15FAh	250 words of disturbance record data	F58
1600 to 16FAh	250 words of disturbance record data	F58
1700 to 17FAh	250 words of disturbance record data	F58
1800 to 18FAh	250 words of disturbance record data	F58
1900 to 19FAh	250 words of disturbance record data	F58
1A00 to 1AFAh	250 words of disturbance record data	F58

Address	Contents	Format
1B00 to 1BFAh	250 words of disturbance record data	F58
1C00 to 1CFAh	250 words of disturbance record data	F58
1D00 to 1DFAh	250 words of disturbance record data	F58
1E00 to 1EFAh	250 words of disturbance record data	F58
1F00 to 1FFAh	250 words of disturbance record data	F58
2000 to 20FAh	250 words of disturbance record data	F58
2100 to 21FAh	250 words of disturbance record data	F58

N.B.: The above disturbance record data pages of the mapping contains the data for only one record channel.

1.8.11 Page 22h: Index frame for the disturbance records

Access in reading

Address	Contents	Format
2200h	Index frame for the disturbance records	F50

1.8.12 Page 23h to 33h: Start-up current form record data

Access in reading

Address	Contents	Format
2300 to 23F8h	124 values	
2400 to 24F8h	124 values	
2500 to 25F8h	124 values	
2600 to 26F8h	124 values	
2700 to 27F8h	124 values	
2800 to 28F8h	124 values	
2900 to 29F8h	124 values	
2A00 to 2AF8h	124 values	
2B00 to 2BF8h	124 values	
2C00 to 2CF8h	124 values	
2D00 to 2DF8h	124 values	
2E00 to 2EF8h	124 values	
2F00 to 2FF8h	124 values	
3000 to 30F8h	124 values	
3100 to 31F8h	124 values	
3200 to 32F8h	124 values	
3300 to 330Fh	16 values	

1.8.13 Page 34h: Index frame for the start-up current form record

Access in reading

Address	Contents	Format
3400h	Number of available values of the start-up current form record	F51
3401h	Number of the last page	F51
3402h	Number of available values stored in the last page	F51

1.8.14 Page 35h: Event record data

Access in reading

Address	Contents	Format	Address	Contents	Format	Address	Contents	Format
3500h	EVENT n°1	F52	3519h	EVENT n°26	F52	3532h	EVENT n°51	F52
3501h	EVENT n°2	F52	351Ah	EVENT n°27	F52	3533h	EVENT n°52	F52
3502h	EVENT n°3	F52	351Bh	EVENT n°28	F52	3534h	EVENT n°53	F52
3503h	EVENT n°4	F52	351Ch	EVENT n°29	F52	3535h	EVENT n°54	F52
3504h	EVENT n°5	F52	351Dh	EVENT n°30	F52	3536h	EVENT n°55	F52
3505h	EVENT n°6	F52	351Eh	EVENT n°31	F52	3537h	EVENT n°56	F52
3506h	EVENT n°7	F52	351Fh	EVENT n°32	F52	3538h	EVENT n°57	F52
3507h	EVENT n°8	F52	3520h	EVENT n°33	F52	3539h	EVENT n°58	F52
3508h	EVENT n°9	F52	3521h	EVENT n°34	F52	353Ah	EVENT n°59	F52
3509h	EVENT n°10	F52	3522h	EVENT n°35	F52	353Bh	EVENT n°60	F52
350Ah	EVENT n°11	F52	3523h	EVENT n°36	F52	353Ch	EVENT n°61	F52
350Bh	EVENT n°12	F52	3524h	EVENT n°37	F52	353Dh	EVENT n°62	F52
350Ch	EVENT n°13	F52	3525h	EVENT n°38	F52	353Eh	EVENT n°63	F52
350Dh	EVENT n°14	F52	3526h	EVENT n°39	F52	353Fh	EVENT n°64	F52
350Eh	EVENT n°15	F52	3527h	EVENT n°40	F52	3540h	EVENT n°65	F52
350Fh	EVENT n°16	F52	3528h	EVENT n°41	F52	3541h	EVENT n°66	F52
3510h	EVENT n°17	F52	3529h	EVENT n°42	F52	3542h	EVENT n°67	F52
3511h	EVENT n°18	F52	352Ah	EVENT n°43	F52	3543h	EVENT n°68	F52
3512h	EVENT n°19	F52	352Bh	EVENT n°44	F52	3544h	EVENT n°69	F52
3513h	EVENT n°20	F52	352Ch	EVENT n°45	F52	3545h	EVENT n°70	F52
3514h	EVENT n°21	F52	352Dh	EVENT n°46	F52	3546h	EVENT n°71	F52
3515h	EVENT n°22	F52	352Eh	EVENT n°47	F52	3547h	EVENT n°72	F52
3516h	EVENT n°23	F52	352Fh	EVENT n°48	F52	3548h	EVENT n°73	F52
3517h	EVENT n°24	F52	3530h	EVENT n°49	F52	3549h	EVENT n°74	F52
3518h	EVENT n°25	F52	3531h	EVENT n°50	F52	354Ah	EVENT n°75	F52

1.8.15 Page 36h: Data of the oldest event

Access in reading

Address	Contents	Format
3600h	Data of the oldest event	F52

1.8.16 Page 37h: Fault value record data

Access in reading

Address	Contents	Format
3700h	Data of the fault value record n°1	F53
3701h	Data of the fault value record n°2	F53
3702h	Data of the fault value record n°3	F53
3703h	Data of the fault value record n°4	F53
3704h	Data of the fault value record n°5	F53
3705h	Data of the fault value record n°6	F53
3706h	Data of the fault value record n°7	F53
3707h	Data of the fault value record n°8	F53
3708h	Data of the fault value record n°9	F53
3709h	Data of the fault value record n°10	F53
370Ah	Data of the fault value record n°11	F53
370Bh	Data of the fault value record n°12	F53
370Ch	Data of the fault value record n°13	F53
370Dh	Data of the fault value record n°14	F53
370Eh	Data of the fault value record n°15	F53
370Fh	Data of the fault value record n°16	F53
3710h	Data of the fault value record n°17	F53
3711h	Data of the fault value record n°18	F53
3712h	Data of the fault value record n°19	F53
3713h	Data of the fault value record n°20	F53
3714h	Data of the fault value record n°21	F53
3715h	Data of the fault value record n°22	F53
3716h	Data of the fault value record n°23	F53
3717h	Data of the fault value record n°24	F53
3718h	Data of the fault value record n°25	F53

1.8.17 Pages 38h à 3Ch: Selection of the disturbance record and selection of its channel

Access in reading

Address	Disturbance Record Number	Channel	Format
3800h	1	I A (phase A current)	F54
3801h	1	I B (phase B current)	F54
3802h	1	I C (phase C current)	F54
3803h	1	I N (neutral current)	F54
3804h	1	Frequency	F54
3805h	1	Logic inputs and logic outputs	F54
3806h	1	V AC (phase A–phase C voltage) (P225 only)	F54
3900h	2	I A (phase A current)	F54
3901h	2	I B (phase B current)	F54
3902h	2	I C (phase C current)	F54
3903h	2	I N (neutral current)	F54
3904h	2	Frequency	F54
3905h	2	Logic inputs and logic outputs	F54
3906h	2	V AC (phase A–phase C voltage) (P225 only)	F54
3A00h	3	I A (phase A current)	F54
3A01h	3	I B (phase B current)	F54
3A02h	3	I C (phase C current)	F54
3A03h	3	I N (neutral current)	F54
3A04h	3	Frequency	F54
3A05h	3	Logic inputs and logic outputs	F54
3A06h	3	V AC (phase A–phase C voltage) (P225 only)	F54
3B00h	4	I A (phase A current)	F54
3B01h	4	I B (phase B current)	F54
3B02h	4	I C (phase C current)	F54
3B03h	4	I N (neutral current)	F54
3B04h	4	Frequency	F54
3B05h	4	Logic inputs and logic outputs	F54
3B06h	4	V AC (phase A–phase C voltage) (P225 only)	F54
3C00h	5	I A (phase A current)	F54
3C01h	5	I B (phase B current)	F54
3C02h	5	I C (phase C current)	F54
3C03h	5	I N (neutral current)	F54
3C04h	5	Frequency	F54
3C05h	5	Logic inputs and logic outputs	F54

Address	Disturbance Record Number	Channel	Format
3C06h	5	V AC (phase A–phase C voltage) (P225 only)	F54

1.8.18 Page 3Dh: Number of available disturbance records

Access in reading

Address	Contents	Format
3D00h	Number of available disturbance records	F55

1.8.19 Page 3Eh: Data of the oldest non-acknowledged fault record

Access in reading

Address	Contents	Format
3E00h	Data of the oldest fault value record	F53

1.8.20 Page 3Fh: Reserved

1.8.21 Page 40h to 50h: Start-up voltage form record data

Access in reading

Address	Contents	Format
4000 to 40F8h	124 values	
4100 to 41F8h	124 values	
4200 to 42F8h	124 values	
4300 to 43F8h	124 values	
4400 to 44F8h	124 values	
4500 to 45F8h	124 values	
4600 to 46F8h	124 values	
4700 to 47F8h	124 values	
4800 to 48F8h	124 values	
4900 to 49F8h	124 values	
4A00 to 4AF8h	124 values	
4B00 to 4BF8h	124 values	
4C00 to 4CF8h	124 values	
4D00 to 4DF8h	124 values	
4E00 to 4EF8h	124 values	
4F00 to 4FF8h	124 values	
5000 to 500Fh	16 values	

1.8.22 Page 51h: Index frame for the start-up voltage form record

Access in reading

Address	Contents	Format
5100h	Number of available values of the start-up voltage form record	F51
5101h	Number of the last page	F51
5102h	Number of available values stored in the last page	F51

1.9 Description of the mapping format

CODE	DESCRIPTION
F1	Unsigned integer - numerical data 1-65535
F2	Signed integer - numerical data -32768 to +32767
F3	Unsigned long integer - numerical data 0 to 4294967925
F4	Unsigned integer - RTD/thermistor monitoring function status - RTD1 to RTD6 (P225 only) Bit 0 : t RTD1 ALARM signal or Thermist1 signal Bit 1 : t RTD1 TRIP signal or Thermist2 signal Bit 2 : t RTD2 ALARM signal or Thermist3 signal Bit 3 : t RTD2 TRIP signal Bit 4 : t RTD3 ALARM signal Bit 5 : t RTD3 TRIP signal Bit 6 : t RTD4 ALARM signal Bit 7 : t RTD4 TRIP signal Bit 8 : t RTD5 ALARM signal Bit 9 : t RTD5 TRIP signal Bit 10 : t RTD6 ALARM signal Bit 11 : t RTD6 TRIP signal Bits 13 to 15 : reserved
F4'	Unsigned integer - RTD/thermistor monitoring function status - RTD7 to RTD10 Bit 0 : t RTD7 ALARM signal Bit 1 : t RTD7 TRIP signal Bit 2 : t RTD8 ALARM signal Bit 3 : t RTD8 TRIP signal Bit 4 : t RTD9 ALARM signal Bit 5 : t RTD9 TRIP signal Bit 6 : t RTD10 ALARM signal Bit 7 : t RTD10 TRIP signal Bits 8 to 15 : reserved
F5	Unsigned integer : Motor start-up detection criterion Bit 0 : Closing of the CB (52A) Bit 1 : Closing of the CB and overshoot of the I_{util} current threshold ($52A + I_{util}$)

CODE	DESCRIPTION
F6	Unsigned long : Trip output relay assignment (RL1) Bit 0 : tI>> Bit 1 : tI0> Bit 2 : tI0>> Bit 3 : tI2> Bit 4 : tI< (loss of load) Bit 5 : THERM OVERLOAD (Thermal overload) Bit 6 : EXCES LONG START (Excessive long start) Bit 7 : tIstall (Stalled rotor whilst running) Bit 8 : LOCKED ROTOR (locked rotor at start) Bit 9 : tRTD1 TRIP or Thermist1 Bit 10 : tRTD2 TRIP or Thermist2 Bit 11 : tRTD3 TRIP or Thermist3 Bit 12 : tRTD4 TRIP Bit 13 : tRTD5 TRIP Bit 14 : tRTD6 TRIP Bit 15 : tRTD 10 TRIP (P225 only)
F6'	Bit 0 : tI2>> Bit 1 : EXT 1 Bit 2 : EXT 2 Bit 3 : Equation A (« AND » logical gate A) Bit 4 : Equation B (« AND » logical gate B) Bit 5 : Equation C (« AND » logical gate C) Bit 6 : Equation D (« AND » logical gate D) Bit 7 : tRTD7 TRIP (P225 only) Bit 8 : tRTD8 TRIP (P225 only) Bit 9 : tRTD9 TRIP (P225 only) Bit 10 : tV< (P225 only) Bit 11 : VOLTAGE DIP Bit 12 : tV> (P225 only) Bit 13 : tI> Bit 14 : tI>>> Bit 15 : reserved
F7	Unsigned integer : Data transmitted on the analogue outputs 0 : IA RMS 1 : IB RMS 2 : IC RMS 3 : IN RMS 4 : THERM ST (thermal state) 5 : % I LOAD (load in % of full load current) 6 : Tbef START (time before a permitted start) 7 : Tbef TRIP (time before a thermal trip) 8 : V AC RMS (phase A-phase C voltage) (P225 only) 9 : POWER FACT 10 : WATTS 11 : VARs 12 : T°C RTD1 13 : T°C RTD2

CODE	DESCRIPTION
	14 : T°C RTD3 15 : T°C RTD4 16 : T°C RTD5 17 : T°C RTD6 18 : T°C RTD7 (P225 only) 19 : T°C RTD8 (P225 only) 20 : T°C RTD9 (P225 only) 21 : T°C RTD10 (P225 only) 22 : No Hottest RTD
F8	Unsigned integer : Latching of the trip output relay (RL1) Bit 0 : tI>> Bit 1 : tI0> Bit 2 : tI0>> Bit 3 : tI2> Bit 4 : tI< Bit 5 : THERM OVERLOAD (Thermal overload) Bit 6 : EXCES LONG START (Excessive long start) Bit 7 : tIstall (Stalled rotor whilst running) Bit 8 : LOCKED ROTOR (locked rotor at start) Bit 9 : tRTD1 TRIP or Thermist1 Bit 10 : tRTD2 TRIP or Thermist2 Bit 11 : tRTD3 TRIP or Thermist3 (P225 only) Bit 12 : tRTD4 TRIP Bit 13 : tRTD5 TRIP Bit 14 : tRTD6 TRIP Bit 15 : tRTD 10 TRIP (P225 only)
F8'	Bit 0 : tI2>> Bit 1 : EXT 1 Bit 2 : EXT 2 Bit 3 : Equation A (« AND » logical gate A) Bit 4 : Equation B (« AND » logical gate B) Bit 5 : Equation C (« AND » logical gate C) Bit 6 : Equation D (« AND » logical gate D) Bit 7 : tRTD7 TRIP (P225 only) Bit 8 : tRTD8 TRIP (P225 only) Bit 9 : tRTD9 TRIP (P225 only) Bit 10 : tV< (P225 only) Bit 11 : VOLTAGE DIP Bit 12 : tV> (P225 only) Bit 13 : tI> Bit 14 : tI>>> Bit 15 : reserved
F9	Unsigned integer : Remote control word 1 Bit 0 : Remote delocking of the trip output relay (RL1) Bit 1 : Remote alarm acknowledgement Bit 2 : Remote TRIP ORDER Bit 3 : Remote CLOSE ORDER Bit 4 : Remote EMERGENCY START

CODE	DESCRIPTION
	Bit 5 : Remote order to change of active setting group Bit 6 : Remote ORDER 1 Bit 7 : Remote ORDER 2 Bit 8 : Remote triggering of disturbance record Bit 9 : Remote maintenance mode enabling order Bit 10 : Remote maintenance mode disabling order Bit 11 : Remote thermal state value reset Bit 12 : Non automatic event/fault record acknowledgement on record retrieval Bit 13 : Remote acknowledgement of the oldest non-acknowledged event record Bit 14 : Remote acknowledgement of the oldest non-acknowledged fault record Bit 15 : Remote acknowledgement of the « RAM memory error » alarm
F9'	Unsigned integer : Remote control word 3 Bit 0 to 1 : Reserved Bit 2 : Remote acknowledgement of the oldest non-acknowledged disturbance record
F10	ASCII characters 32 - 127 = ASCII character 1 32 - 127 = ASCII character 2
F11	Longer integer : numerical data - 2 147 483 648 to + 2 147 483 647
F12	Unsigned integer : Logic inputs status Bit 0 : Logic input 1 (CB/contactator status : 52a) Bit 1 : Logic input 2 Bit 2 : Logic input 3 Bit 3 : Logic input 4 Bit 4 : Logic input 5 Bit 5 : Logic input 6
F13	Unsigned integer : Output relays status Bit 0 : Output relay 1 (trip output relay) Bit 1 : Output relay 2 Bit 2 : Output relay 3 Bit 3 : Output relay 4 Bit 4 : Output relay 5 Bit 5 : Watchdog relay
F14	Unsigned integer : Auxiliary output relays allocation Bit 0 : Allocation to relay 2 Bit 1 : Allocation to relay 3 Bit 2 : Allocation to relay 4 Bit 3 : Allocation to relay 5 <i>Bits 4 to 15 : reserved</i>
F14'	Unsigned integer : « AND » logical gates allocation Bit 0 : Allocation to equation A Bit 1 : Allocation to equation B Bit 2 : Allocation to equation C Bit 3 : Allocation to equation D <i>Bits 4 to 15 : reserved</i>

CODE	DESCRIPTION
F15	Unsigned integer : Logic inputs allocation. Bit 0 : EMERG ST (emergency start) Bit 1 : SET GROUP (change from one protection setting group to another) Bit 2 : SPEED SW (speed switch - locked rotor detection at start-up) Bit 3 : DIST TRIG (trigging of a disturbance recording) Bit 4 : EXT RESET (external reset) Bit 5 : EXT 1 (auxiliary 1 timer) Bit 6 : EXT 2 (auxiliary 2 timer) Bit 7 : EXT 3 (auxiliary 3 timer) Bit 8 : EXT 4 (auxiliary 4 timer) Bit 9 : θ RESET (thermal state value reset) Bit 10 : TRIP CIRC (trip circuit wiring supervision) Bit 11 : VOLTAGE DIP <i>Bits 12 to 15 : reserved</i>
F16	Unsigned integer : Earth fault and unbalance protection information <i>Bits 0 to 4 : reserved</i> Bit 5 : Instantaneous signal ($I_{0>}$ or $I_{0>>}$) bit 6 : Time delayed signal ($tI_{0>}$ or $tI_{0>>}$ or $tI_{2>}$ or $tI_{2>>}$) <i>Bits 7 to 15 : reserved</i>
F17	Unsigned integer : Phase OC and loss of load protection information Bit 0 : Any phase, overshoot of the $I_{>}$, $I_{>>}$, $I_{>>>}$ threshold signal or VOLTAGE DIP signal Bit 1 : Phase A signal , overshoot of the $I_{>}$, $I_{>>}$, $I_{>>>}$ threshold Bit 2 : Phase B signal, overshoot of the $I_{>}$, $I_{>>}$, $I_{>>>}$ threshold Bit 3 : Phase C signal, overshoot of the $I_{>}$, $I_{>>}$, $I_{>>>}$ threshold <i>Bit 4 : reserved</i> Bit 5 : Instantaneous signal $I_{>}$, $I_{>>}$, $I_{>>>}$ or $V_{<}$ or $V_{>}$ Bit 6 : Time delayed signal $tI_{>}$, $tI_{>>}$, $tI_{>>>}$ or $tI_{<}$ or $tV_{<}$ or $tV_{>}$ <i>Bits 7 to 15 : reserved</i>
F18	Unsigned integer : Analogue output type 0 : 4-20 mA 1 : 0-20 mA
F19	Unsigned long : LED allocation Bit 0 : θ ALARM (thermal alarm) Bit 1 : THERM OVERLOAD (thermal overload) Bit 2 : $tI_{0>}$ Bit 3 : $tI_{0>>}$ Bit 4 : $tI_{>>>}$ Bit 5 : $tI_{2>}$ Bit 6 : $tI_{2>>}$ Bit 7 : $tI_{<}$ Bit 8 : EXCES LONG START Bit 9 : tI_{stall} (stalled rotor whilst running) Bit 10 : LOCKED ROTOR (at start) Bit 11 : EMERG RESTART (emergency restart) Bit 12 : FORBIDDEN START Bit 13 : $tRTD_{1,2,3}$ ALARM Bit 14 : $tRTD_{1,2,3}$ TRIP or Thermist 1, 2, 3

CODE	DESCRIPTION
	Bit 15 : t RTD 4, 5, 6 ALARM Bit 16 : t RTD 4, 5, 6 TRIP Bit 17 : TRIP CIRCUIT FAIL (trip circuit wiring in failure) Bit 18 : EXT 1 Bit 19 : EXT 2 Bit 20 : MOTOR STOPPED Bit 21 : MOTOR RUNNING Bit 22 : SUCCESSFUL START Bit 23 : tI> Bit: 24 : tI>>> Bit 25 : t RTD 7, 8, 9, 10 ALARM (P225 only) Bit 26 : t RTD 7, 8, 9, 10 TRIP (P225 only) Bit 27 : tV< (P225 only) Bit 28 : VOLTAGE DIP (load shedding further a voltage dip) Bit 29 : tV> (P225 only) Bit 30 : BUS VOLTAGE (bus voltage too low to enable a start) (P225 only) Bit 31 : CB FAIL (CB failure)
F19`	Unsigned integer : LED allocation Bit 0 : INPUT 1 Bit 1 : INPUT 2 Bit 2 : INPUT 3 Bit 3 : INPUT 4 Bit 4 : INPUT 5 Bit 5 : INPUT 6 Bit 6 : AUTO RE-START (P225 only)
F20	Unsigned integer : Status of the information assigned to the logic inputs Bit 0 : Emergency start Bit 1 : Change from one protection setting group to another Bit 2 : Voltage Dip Bit 3 : CB/Contactor status (52a interlock): open = 0, close = 1 Bit 4 : Triggng of a disturbance recording Bit 5 : Speed switch signal Bit 6 : External reset Bit 7 : Auxiliary timer EXT 1 Bit 8 : Auxiliary timer EXT 2 Bit 9 : Auxiliary timer EXT 3 Bit 10 : Auxiliary timer EXT 4 <i>Bit 11 : reserved</i> Bit 12 : Thermal state value reset <i>Bits 13 to 14 : reserved</i> Bit 15 : Trip circuit supervision
F21	Unsigned integer : Software version Most significant digit : software version number Lost significant digit : software version letter 100 : 10.A version 101 : 10.B version 110 : 11.A version 122 : 12.C version

CODE	DESCRIPTION
F22	Unsigned integer : Internal logic status Bit 0 : Trip output relay latched (RL1) <i>Bit 1 : reserved</i>
F23	Unsigned integer : Quick reading byte Bit 0 : General MiCOM relay status Bit 1 : Minor relay failure Bit 2 : Presence of a non-acknowledged event record Bit 3 : Clock synchronisation status Bit 4 : Presence of a non-acknowledged disturbance record Bit 5 : Presence of a non-acknowledged fault record <i>Bits 6 to 15 : reserved</i>
F24	0 : Function out of service 1 : Function in service
F25	2 : ASCII characters
F26	Default displayed value 1 : IA RMS 2 : IB RMS 3 : IC RMS 4 : IN RMS 5 : THERM ST (Thermal state) 6 : % I LOAD (load in % of full load current) 7 : Tbef START (time before a permitted start) 8 : Tbef TRIP (time before a thermal trip) 9 : V AC RMS (phase A–phase C voltage) 10 : POWER FACT 11 : WATTs 12 : VARs 13 : T°C RTD1 14 : T°C RTD2 15 : T°C RTD3 16 : T°C RTD4 17 : T°C RTD5 18 : T°C RTD6 19 : T°C RTD7 (P225 only) 20 : T°C RTD8 (P225 only) 21 : T°C RTD9 (P225 only) 22 : T°C RTD10 (P225 only) 23 : No Hottest RTD
F27	<i>Reserved</i>
F28	Unsigned integer : Baudrate 0 : 300 1 : 600 2 : 1200 3 : 2400 4 : 4800 5 : 9600 6 : 19200 7 : 38400

CODE	DESCRIPTION
F29	Unsigned integer : parity 0 : Without 1 : Even 2 : Odd
F30	<i>Reserved</i>
F31	Unsigned integer : Stop bit 0 : 1 stop bit 1 : 2 stop bits
F32	Unsigned integer : Thermistor type 0 : PTC 1 : NTC
F33	Unsigned integer : Thermal image information Bit 0 : θ ALARM signal (thermal alarm) Bit 1 : THERM OV. signal (thermal overload) Bit 2 : θ FORBID START signal (prohibited start due to thermal criteria) <i>Bits 3 to 15 : reserved</i>
F34	Unsigned integer : Start sequence and stalled/locked rotor information Bit 0 : Start sequence in progress signal Bit 1 : Successful start signal Bit 2 : Excessive long start signal Bit 3 : Stalled rotor whilst running signal Bit 4 : Locked rotor at start signal Bit 5 : Overshoot of the permitted hot starts number signal Bit 6 : Overshoot of the permitted cold starts number signal Bit 7 : Limitation of the starts number signal Bit 8 : Minimum time between two starts signal Bit 9 : Prohibiting start signal <i>Bit 10 : reserved</i> Bit 11 : Re-acceleration phase in progress signal <i>Bit 12 : reserved</i> Bit 13 : Overshoot of the I _{stall} threshold signal Bit 14 : Motor running signal <i>Bit 15 : Detection V DIP threshold signal</i>
F34'	Unsigned integer : information of Auto Re-Start (P225 only) Bit 0 : Start in progress(Treac-shed not time out) (P225 only) Bit 1 : Start failed(Treac-shed timed out and no re-start) (P225 only) Bit 2 : Auto Re-Start (P225 only) Bit 3 : Treac-long not timed out (P225 only) <i>Bit 4 : Flag of "AUTO RE-START" on LCD ALARM (P225 only)</i>
F35	Unsigned integer : CB Fail, Busbars Voltage Control, ABS functions information Bit 0 : ABS signal Bit 1 : CB FAIL signal Bit 2 : Phase A open Pole signal Bit 3 : Phase B open Pole signal Bit 4 : Phase C open Pole signal Bit 5 : BUS VOLTAGE signal (P225 only) <i>Bits 6 to 15 : reserved</i>

CODE	DESCRIPTION
F36	Unsigned integer : EXT1...EXT4 timers and « AND » logical gates information Bit 0 : EXT1 timer signal Bit 1 : EXT2 timer signal Bit 2 : Equation A signal Bit 3 : Equation B signal Bit 4 : Equation C signal Bit 5 : Equation D signal <i>Bit 6 : reserved</i> Bit 7 : EXT3 timer signal Bit 8 : EXT4 timer signal <i>Bits 9 to 15 : reserved</i>
F37	Control voltage type necessary to power on the logic inputs 0 : Direct voltage (DC) 1 : Alternating voltage (AC)
F38	Unsigned integer : Remote control word 2 - Remote control of the output relays - under Maintenance mode only Bit 0 : Output relay 1 (trip output relay) Bit 1 : Output relay 2 Bit 2 : Output relay 3 Bit 3 : Output relay 4 Bit 4 : Output relay 5 Bit 5 : Watchdog relay
F39	Unsigned integer : Displayed fault record number <i>0 : reserved</i> 1 : Fault record n°1 2 : Fault record n°2 3 : Fault record n°3 4 : Fault record n°4 5 : Fault record n°5 6 : Fault record n°6 7 : Fault record n°7 8 : Fault record n°8 9 : Fault record n°9 10 : Fault record n°10 11 : Fault record n°11 12 : Fault record n°12 13 : Fault record n°13 14 : Fault record n°14 15 : Fault record n°15 16 : Fault record n°16 17 : Fault record n°17 18 : Fault record n°18 19 : Fault record n°19 20 : Fault record n°20 21 : Fault record n°21 22 : Fault record n°22 23 : Fault record n°23 24 : Fault record n°24

CODE	DESCRIPTION
	25 : Fault record n°25
F40	Disturbance record triggering criterion 0 : ON INST : Overshoot of a current or voltage threshold (I>, I>>, I>>, I0>, I0>>, V< or V>) 1 : ON TRIP : Relay n°1 operation (trip output relay operation : RL1)
F41	Display alarm messages Bit 0 a : TH OVERLOAD (thermal overload) Bit 1 a : t lo> Bit 2 a : t lo>> Bit 3 a : t I2> Bit 4 a : t I2>> Bit 5 a : LONG START tIstart Bit 6 a : MECHAN JAM tIstall (whilst running) Bit 7 a : LOCKED ROTOR (at start) Bit 8 a : t RTD 1 TRIP Bit 9 a : t RTD 2 TRIP Bit 10 a : t RTD 3 TRIP Bit 11 a : t RTD 4 TRIP Bit 12 a : t RTD 5 TRIP Bit 13 a : t RTD 6 TRIP Bit 14 a : Thermist 1 Bit 15 a : Thermist 2
F41'	Bit 0 b : EXT 1 Bit 1 b : EXT 2 Bit 2 b : EQUATION A Bit 3 b : EQUATION B Bit 4 b : EQUATION C Bit 5 b : EQUATION D Bit 6 b : θ ALARM (thermal alarm) Bit 7 b : t RTD 1 ALAR Bit 8 b : t RTD 2 ALAR Bit 9 b : t RTD 3 ALAR Bit 10 b : t RTD 4 ALAR Bit 11 b : t RTD 5 ALAR Bit 12 b : t RTD 6 ALAR Bit 13 b : θ FORBIDDEN START Bit 14 b : START NB LIMIT Bit 15 b : T between 2 start
F41''	Bit 0 c : RE-ACCELER AUTHOR (re-acceleration in progress) Bit 1 c : CB OPENING TIME (CB opening time) Bit 2 c : CB OPERTION NB (CB operation number) Bit 3 c : SA2n (Σ Amps ⁿ cut by CB) Bit 4 c : Thermist 3 (P225 only) Bit 5 c : t RTD 7 TRIP (P225 only) Bit 6 c : t RTD 8 TRIP (P225 only) Bit 7 c : t RTD 9 TRIP (P225 only) Bit 8 c : t RTD 7 ALAR (P225 only) Bit 9 c : t RTD 8 ALAR (P225 only) Bit 10 c : t RTD 9 ALAR (P225 only)

CODE	DESCRIPTION
	Bit 11 c : CB FAIL Bit 12 c : TRIP CIRC. FAIL Bit 13 c : VOLTAGE DIP Bit 14 c : BUS VOLTAGE (P225 only) Bit 15 c : ANTI BACK SPIN
F41'''	Bit 0 d : t RTD 10 ALAR (P225 only) Bit 1 d : t RTD 10 TRIP (P225 only)
F42	RTD type 0 : Pt100 type 1 : Ni 120 type 2 : Ni 100 type 3 : Cu 10 type
F43	Circuit breaker monitoring flag Bit 0 : CB opening time signal Bit 1 : CB operation number signal Bit 2 : Σ Amps ⁿ cut by CB signal
F44	Datation format 0 : Private format 1 : IEC format
F45	RTD status Bit 0 : RTD 1 failure or thermistance 1 failure Bit 1 : RTD 2 failure or thermistance 2 failure Bit 2 : RTD 3 failure or thermistance 3 failure Bit 3 : RTD 4 failure Bit 4 : RTD 5 failure Bit 5 : RTD 6 failure Bit 6 : RTD board error Bit 7 : RTD 7 failure (P225 only) Bit 8 : RTD 8 failure (P225 only) Bit 9 : RTD 9 failure (P225 only) Bit 10 : RTD 10 failure (P225 only)
F46	Unsigned integer : Status of the MiCOM relay self-test Bit 0 : ANALOG OUTPUT ERROR (Analogue output error) Bit 1 : COMM. ERROR (Communication error) Bit 2 : EEPROM ERROR DATA (EEPROM memory error) Bit 3 : CT/VT ERROR (Analogue signals acquisition error) Bit 4 : CLOCK ERROR (Internal clock error) Bit 5 : EEPROM ERROR CALIBR. (EEPROM calibration error) Bit 6 : RAM ERROR (RAM memory error) Bit 7 : RTD/Therm ERROR (short-wiring or open circuit) <i>Bits 8 to 15 : reserved</i>
F47	Unsigned integer : Maximum analogue output rating for power data: 0 : 10K 1 : 50K 2 : 100K 3 : 200K 4 : 500K 5 : 1M

CODE	DESCRIPTION
	6 : 10M 7 : 100M 8 : 500M 9 : 1G 10 :4G
F48	Unsigned integer : Configuration of the logic input active state 0 : inactive state when control voltage is applied on. 1 : active state when control voltage is applied on. Bit 0 : Logic input 1 Bit 1 : Logic input 2 Bit 2 : Logic input 3 Bit 3 : Logic input 4 Bit 4 : Logic input 5 Bit 5 : Logic input 6
F49	Configuration of the way to switch of active setting group 0 : PICK-UP 1 : LEVEL
F50	1 st word : Disturbance record number 2 nd word : Disturbance recording end time (sec) : number of seconds since the 01/01/1994.....lsb (low significant bit) 3 rd word : Disturbance recording end time (sec) : number of seconds since the 01/01/1994.....msb (most significant bit) 4 th word : Disturbance recording end time (ms).....lsb (low significant bit) 5 th word : Disturbance recording end time (ms).....msb (most significant bit) 6 th word : Cause of the disturbance record triggering 1 : Relay n°1 operation 2 : Overshoot of a current threshold (I>>, Io>, Io>>, V< or V>) 3 : Remote trig 4 : Trig order received through a logic input 7 th word : Frequency
F51	1 st word : Number of available values in the start-up current & voltage form record 2 nd word : Address of the last page containing significant record data 3 rd word : Word number contained in the last page (containing significant record data)
F52	1 st word : event type : Refer to format F56 2 nd word : associated value type : Refer to format F56 3 rd word : mapping address of the associated value 4 th word : reserved 5 th word : event occurrence date (second) : number of seconds since the 01/01/1994...lsb 6 th word : event occurrence date (second) : number of seconds since the 01/01/1994...msb 7 th word : event occurrence date (ms)lsb (low significant bit) 8 th word : event occurrence date (ms)msb (most significant bit) 9 th word : acknowledgement : (0 = non acknowledged event ; 1 = acknowledged event)
F53	1 st word : Fault record number 2 nd word : Fault date (sec) : second number since 04/05/2010.lsb (low significant bit) 3 rd word : Fault date (sec) : second number since 04/05/2010.msb (most significant bit) 4 th word : Fault date (ms)lsb (low significant bit) 5 th word : Fault date (ms)msb (most significant bit)

CODE	DESCRIPTION
	<p>6th word : Fault date (season) : (0 = winter, 1 = summer, 2 = non defined)</p> <p>7th word : Active setting group while the fault occurrence : (1 or 2)</p> <p>8th word : Faulty phase : (0 =none, 1 = phase A, 2 = phase B, 3 = phase C, 4 = phases A-B, 5 = phases AC, 6 = phases B-C, 7 = phases A-B-C, 8 = earth, 9 = V A-C voltage)</p> <p>9th word : Cause of the fault record : Refer to format F57</p> <p>10th word : Fault value magnitude (fundamental value) : Refer to format F59</p> <p>11th word : Phase A current magnitude (True RMS value) : Refer to format F59</p> <p>12th word : Phase B current magnitude (True RMS value) : Refer to format F59</p> <p>13th word : Phase C current magnitude (True RMS value) : Refer to format F59</p> <p>14th word : Earth current magnitude (True RMS value) : Refer to format F59</p> <p>15th word : Phase A-Phase C voltage magnitude (True RMS value) : Refer to format F59</p> <p>16th word : Acknowledgement : (0 = non acknowledged fault record; 1 = acknowledged fault record)</p>
F54	<p>1st word : Samples number containing in the mapping</p> <p>2nd word : Pre-time sample number</p> <p>3rd word : Post-time sample number</p> <p>4th word : Primary line CT value</p> <p>5th word : Secondary line CT value</p> <p>6th word : Primary earth CT value</p> <p>7th word : Secondary earth CT value</p> <p>8th word : Ratio of the internal phase CT</p> <p>9th word : Ratio of the internal earth CT</p> <p>10th word : Primary line VT valuelsb (low significant bit)</p> <p>11th word : Primary line VT valuemsb (most significant bit)</p> <p>12th word : Secondary line CT value</p> <p>13th to 15th words : reserved</p> <p>16th word : Ratio of the internal voltage numerator (100)</p> <p>17th word : Ratio of the internal voltage denominator (12600 or 3400) - 16 bits ADC</p> <p>18th word : Address of the last page containing samples</p> <p>19th word : Word number contained in the last page (containing samples)</p>
F55	<p>1st word : Number of disturbance record available</p> <p>2nd word : Oldest disturbance record number</p> <p>3rd word : Oldest disturbance record date (sec) : number of seconds since the 04/05/2010lsb (low significant bit)</p> <p>4th word : Oldest disturbance record date (sec) : number of seconds since the 04/05/2010: number of seconds since the 04/05/2010msb (most significant bit)</p> <p>5th word : Oldest disturbance record date (ms)lsb (low significant bit)</p> <p>6th word : Oldest disturbance record date (ms)msb (most significant bit)</p> <p>7th word : Cause of the oldest disturbance record :</p> <ul style="list-style-type: none"> 1 : Relay n°1 operation 2 : Overshoot of a current or voltage threshold (I>>, Io>, Io>>, V< or V>) 3 : Remote trig 4 : Trig order received through a logic input

CODE	DESCRIPTION
	<p>8th word : Acknowledgement</p> <p>9th word : Previous disturbance record number</p> <p>10th word : Previous disturbance record date (sec) : number of seconds since the 04/05/2010lsb (low significant bit)</p> <p>11th word : Previous disturbance record date (sec) : number of seconds since the 04/05/2010msb (most significant bit)</p> <p>12th word : Previous disturbance record date (ms)lsb (low significant bit)</p> <p>13th word : Previous disturbance record date (ms)msb (most significant bit)</p> <p>14th word : Cause of the previous disturbance record:</p> <ul style="list-style-type: none"> 1 : Relay n°1 operation 2 : Overshoot of a current or voltage threshold (I>>, Io> or Io>>, V< or V>) 3 : Remote trig 4 : Trig order received through a logic input <p>15th word : Acknowledgement and so on regarding the other disturbance records.</p>

	Code	Event Type	Associated Value Type
F56	00	"No EVENT"	-
	01	"REMOTE CLOSING"	F9
	02	"REMOTE TRIPPING"	F9
	03	«DISTURBANCE RECORD TRIGGERING»	F60
	04	«SETTING CHANGE»	MODBUS address of the modified value
	05	"I >>" (instantaneous signal)	F17 ↑↓
	06	"I0 >" (instantaneous signal)	F16 ↑↓
	07	"I0 >>" (instantaneous signal)	F16 ↑↓
	08	"I2 >" (instantaneous signal)	F16 ↑↓
	09	"I2 >>" (instantaneous signal)	F16 ↑↓
	10	"I <" (instantaneous signal)	F17 ↑↓
	11	"THERMAL ALARM"	F33 ↑↓
	12	"t RTD1 ALARM"	F4 ↑↓
	13	"t RTD2 ALARM"	F4 ↑↓
	14	"t RTD3 ALARM"	F4 ↑↓
	15	"t RTD4 ALARM"	F4 ↑↓
	16	"t RTD5 ALARM"	F4 ↑↓
	17	"t RTD6 ALARM"	F4 ↑↓
	18	"THERMAL OVERLOAD"	F33 ↑↓
	19	"THERMAL FORBIDDEN START"	F33 ↑↓
	20	"t I >>" (time delayed signal)	F17 ↑↓
	21	"t I0 >" (time delayed signal)	F16 ↑↓
	22	"t I0 >>" (time delayed signal)	F16 ↑↓
	23	"t I2 >" (time delayed signal)	F16 ↑↓
	24	"t I2 >>" (time delayed signal)	F16 ↑↓
	25	"t I <" (time delayed signal)	F17 ↑↓
	26	"REACCELERATION IN PROGRESS"	F34 ↑↓
	27	"EMERGENCY START"	F34
	28	"START-UP DETECTION"	F34
	29	"MOTOR HALTED"	F34
	30	"EXCESSIVE START TIME"	F34 ↑↓
	31	"STALLED ROTOR WHILST RUNNING"	F34 ↑↓
	32	"LOCKED ROTOR AT START"	F34 ↑↓
	33	"START NUMBER LIMITATION"	F34 ↑↓
	34	"MINIMUM TIME BETWEEN 2 STARTS"	F34 ↑↓
	35	"EXT 1"	F34 ↑↓
	36	"EXT 2"	F36 ↑↓
	37	"EQUATION A"	F36 ↑↓
	38	"EQUATION B"	F36 ↑↓
	39	"EQUATION C"	F36 ↑↓
40	"EQUATION D"	F36 ↑↓	

	Code	Event Type	Associated Value Type
56	41	"t RTD1 TRIP"	F4 ↑↓
	42	"t RTD2 TRIP"	F4 ↑↓
	43	"t RTD3 TRIP"	F4 ↑↓
	44	"t RTD4 TRIP"	F4 ↑↓
	45	"t RTD5 TRIP"	F4 ↑↓
	46	"t RTD6 TRIP"	F4 ↑↓
	47	"THERMISTOR 1"	F4 ↑↓
	48	"THERMISTOR 2"	F4 ↑↓
	49	"CB OPENING TIME ALARM"	F43 ↑↓
	50	"CB OPERATION NUMBER ALARM"	F43 ↑↓
	51	"CB SAn ALARM"	F43 ↑↓
	52	"TRIPPING : THERMAL OVERLOAD"	F33
	53	"TRIPPING : t I >>" (time delayed signal)	F17
	54	"TRIPPING : t I0 >" (time delayed signal)	F16
	55	"TRIPPING : t I0 >>" (time delayed signal)	F16
	56	"TRIPPING : t I2 >" (time delayed signal)	F16
	57	"TRIPPING : t I2 >>" (time delayed signal)	F16
	58	"TRIPPING : t I <" (time delayed signal)	F17
	59	"TRIPPING : EXCESSIVE START TIME"	F34
	60	" TRIPPING : STALLED ROTOR WHILST RUNNING"	F34
	61	"TRIPPING : LOCKED ROTOR AT START"	F34
	62	"TRIPPING : EXT 1"	F36
	63	"TRIPPING : EXT 2"	F36
	64	"TRIPPING : EQUATION A"	F36
	65	"TRIPPING : EQUATION B"	F36
	66	"TRIPPING : EQUATION C"	F36
	67	"TRIPPING : EQUATION D"	F36
	68	"TRIPPING : t RTD1 TRIP"	F4
	69	"TRIPPING : t RTD2 TRIP"	F4
	70	"TRIPPING : t RTD3 TRIP"	F4
	71	"TRIPPING : t RTD4 TRIP"	F4
	72	"TRIPPING : t RTD5 TRIP"	F4
	73	"TRIPPING : t RTD6 TRIP"	F4
	74	"TRIPPING : THERMISTOR 1"	F4
	75	"TRIPPING : THERMISTOR 2"	F4
	76	"ACKNOWLEDGEMENT OF ONE ALARM USING KEYPAD"	-
	77	"ACKNOWLEDGEMENT OF ALL ALARMS USING KEYPAD"	-
	78	"REMOTE ACKNOWLEDGEMENT OF ONE ALARM"	-
	79	"REMOTE ACKNOWLEDGEMENT OF ALL ALARMS"	-
	80	"CHANGE OF THE LOGIC INPUTS STATUS"	F12 ↑↓
	81	"MAJOR RELAY FAILURE»"	F46 ↑↓
	82	"MINOR RELAY FAILURE"	F46 ↑↓

	Code	Event Type	Associated Value Type
F56	83	"CHANGE OF THE LOGIC OUTPUTS STATUS"	F13 ↑↓
	84	"EXT 3"	F36 ↑↓
	85	"EXT 4"	F36 ↑↓
	86	<i>Reserved</i>	-
	87	"V <" (instantaneous signal) (P225 only)	F17 ↑↓
	88	<i>Reserved</i>	-
	89	"V >" (instantaneous signal)	F17 ↑↓
	90	"t RTD7 ALARM" (P225 only)	F4' ↑↓
	91	"t RTD8 ALARM" (P225 only)	F4' ↑↓
	92	"t RTD9 ALARM" (P225 only)	F4' ↑↓
	93	"t RTD10 ALARM" (P225 only)	F4' ↑↓
	94	"t RTD7 TRIP" (P225 only)	F4' ↑↓
	95	"t RTD8 TRIP" (P225 only)	F4' ↑↓
	96	"t RTD9 TRIP" (P225 only)	F4' ↑↓
	97	"t RTD10 TRIP" (P225 only)	F4' ↑↓
	98	"THERMISTOR 3" (P225 only)	F4' ↑↓
	99	"t V <" (time delayed signal) (P225 only)	F4 ↑↓
	100	<i>Reserved</i>	F17 ↑↓
	101	"t V >" (time delayed signal) (P225 only)	-
	102	«ACTIVE SETTING GROUP CHANGE»	F17 ↑↓
	103	"BUS VOLTAGE" (P225 only)	-
	104	"ANTI BACK SPIN"	F17 ↑↓
	105	"CB. FAIL"	F35 ↑↓
	106	"VOLTAGE DIP"	F35 ↑↓
	107	"TRIP CIRC. FAIL"	F35 ↑↓
	108	"TRIPPING : t RTD7 TRIP" (P225 only)	F43
	109	"TRIPPING : t RTD8 TRIP" (P225 only)	F4'
	110	"TRIPPING : t RTD9 TRIP" (P225 only)	F4'
	111	"TRIPPING : t RTD10 TRIP" (P225 only)	F4'
	112	"TRIPPING : THERMISTOR 3" (P225 only)	F4'
	113	"TRIPPING : t V<" (time delayed signal) (P225 only)	F4
	114	"TRIPPING : t V>" (time delayed signal) (P225 only)	F17
	115	"LATCHING OF THE OUTPUT RELAYS"	F17
	116	"MAINTENANCE MODE ACTIVE"	-
117	"OUTPUT RELAY REMOTE CONTROL - UNDER MAINTENANCE MODE"	F9 F38	

- Note:
- The double arrow ↑↓ means the event is generated on event occurrence and another is generated on event disappearance.
 - On event occurrence, the corresponding bit of the associated format is set to « 1 ».
 - On event disappearance, the corresponding bit of the associated format is set to « 0 ».

	Code	Fault origin
F57	00	"NO FAULT"
	01	"REMOTE TRIPPING"
	02	"TRIPPING : t I >>" (time delayed signal)
	03	"TRIPPING : t I0 >" (time delayed signal)
	04	"TRIPPING : t I0 >>" (time delayed signal)
	05	"TRIPPING : t I2 >" (time delayed signal)
	06	"TRIPPING : t I2 >>" (time delayed signal)
	07	"TRIPPING : t I <" (time delayed signal)
	08	"TRIPPING : EXCESSIVE LONG START"
	09	"TRIPPING : STALLED ROTOR WHILST RUNNING"
	10	"TRIPPING : LOCKED ROTOR AT START"
	11	"TRIPPING : THERMAL OVERLOAD"
	12	"TRIPPING : EXT 1"
	13	"TRIPPING : EXT 2"
	14	"TRIPPING : EQUATION A"
	15	"TRIPPING : EQUATION B"
	16	"TRIPPING : EQUATION C"
	17	"TRIPPING : EQUATION D"
	18	"TRIPPING : t RTD1 TRIP"
	19	"TRIPPING : t RTD2 TRIP"
	20	"TRIPPING : t RTD3 TRIP"
	21	"TRIPPING : t RTD4 TRIP"
	22	"TRIPPING : t RTD5 TRIP"
	23	"TRIPPING : t RTD6 TRIP"
	24	"TRIPPING : THERMISTOR 1"
	25	"TRIPPING : THERMISTOR 2"
	26	"TRIPPING : THERMISTOR 3" (P225 only)
	27	"TRIPPING : t RTD7 TRIP" (P225 only)
	28	"TRIPPING : t RTD8 TRIP" (P225 only)
	29	"TRIPPING : t RTD9 TRIP" (P225 only)
	30	"TRIPPING : t RTD10 TRIP" (P225 only)
	31	"TRIPPING : t V <" (time delayed signal) (P225 only)
	32	"TRIPPING : VOLTAGE DIP"
33	"TRIPPING : t V >" (time delayed signal) (P225 only)	

	Conversion rules for the current values of the disturbance record
F58	<p>* In order to obtain the phase current value at phase CT primary, apply the following formula: «Primary phase current value (in Amps)» = «Remote value» x «Primary phase CT value» x $\sqrt{2}/800$</p> <p>* In order to obtain the earth current value at the earth CT primary, apply the following formula: «Primary earth current value (in Amps)» = «Remote value» x «Primary earth CT value» x $\sqrt{2}/32700$</p> <p>* In order to obtain the phase-phase voltage value at the line VT primary, apply the following formula: «Primary voltage value (in Amps)» = «Remote value» x «Primary VT/Secondary VT ratio» x $\sqrt{2}$ x (100/internal voltage denominator ratio)</p> <p>With : internal voltage denominator ratio = 12600 for 57-130 V voltage input range internal voltage denominator ratio = 3400 for 220-480 V voltage input range</p>

Conversion rules for the current values of the fault data record	
F59	<p>* In order to obtain the phase current value at phase CT primary, apply the following formula: « Primary phase current value (in Amps) » = « Remote value » x « Primary phase CT value »/800</p> <p>* In order to obtain the negative sequence component value of the current at phase CT primary, apply the following formula: « Primary negative current value (in Amps) » = « Remote value » x « Primary phase CT value »/800</p> <p>* In order to obtain the earth current value at the earth CT primary, apply the following formula: « Primary earth current value (in Amps) » = « Remote value » x « Primary earth CT value »/32700</p> <p>* In order to obtain the phase-phase voltage value at the line VT primary, apply the following formula: - For 57-130 V voltage input range «Primary voltage value (in Amps)» = «Remote value» x «Primary VT value»/127576 - For 220-480 V voltage input range «Primary voltage value (in Amps)» = «Remote value» x «Primary VT value»/3406</p>

CODE	DESCRIPTION
F60	Detect Volt Dip
CODE	DESCRIPTION
F61	Unsigned integer : Curve type Bit 0 : STI (IEC) Bit 1 : SI (IEC) Bit 2 : VI (IEC) Bit 3 : EI (IEC) Bit 4 : LTI (IEC) Bit 5 : STI (CO2) Bit 6 : MI (ANSI) Bit 7 : LTI (CO8) Bit 8 : VI (ANSI) Bit 9 : EI (ANSI) Bit 10 : RC (IEC) Rectifier curve

