

MV Electrical network management

Easergy Range

FLITE116 – G200

Wireless Communicating indicator

IEC 870-5-101 communication

Appendix to the User's manual



Contents

CONTENTS 2
INTEROPERABILITY 3
INFORMATION OBJECT ADDRESSES 9

Interoperability

8.1 Network configuration

(network-specific parameter)

- Point-to-point
- Multiple point-to-point
- Multipoint-party line
- Multipoint-star

8.2 Physical layer

(network-specific parameter)

Transmission speed (control direction)

- | | | | |
|---|---|---|---------------------------------------|
| Unbalanced
interchange
circuit
V.24/V.28
Standard | Unbalanced
interchange
circuit
V.24/V.28
Recommended
if > 1200 bit/s | Balanced
interchange
circuit
X.24/X.27 | |
| <input type="checkbox"/> 100 bit/s | <input checked="" type="checkbox"/> 2,400 bit/s | <input type="checkbox"/> 2,400 bit/s | <input type="checkbox"/> 56,000 bit/s |
| <input checked="" type="checkbox"/> 200 bit/s | <input checked="" type="checkbox"/> 4,800 bit/s | <input type="checkbox"/> 4,800 bit/s | <input type="checkbox"/> 64,000 bit/s |
| <input checked="" type="checkbox"/> 300 bit/s | <input checked="" type="checkbox"/> 9,600 bit/s | <input type="checkbox"/> 9,600 bit/s | |
| <input checked="" type="checkbox"/> 600 bit/s | | <input type="checkbox"/> 19,200 bit/s | |
| <input checked="" type="checkbox"/> 1,200 bit/s | | | |

Transmission speed (monitor direction)

- | | | | |
|---|---|---|---------------------------------------|
| Unbalanced
interchange
circuit
V.24/V.28
Standard | Unbalanced
interchange
circuit
V.24/V.28
Recommended
if > 1200 bit/s | Balanced
interchange
circuit
X.24/X.27 | |
| <input type="checkbox"/> 100 bit/s | <input checked="" type="checkbox"/> 2,400 bit/s | <input type="checkbox"/> 2,400 bit/s | <input type="checkbox"/> 56,000 bit/s |
| <input checked="" type="checkbox"/> 200 bit/s | <input checked="" type="checkbox"/> 4,800 bit/s | <input type="checkbox"/> 4,800 bit/s | <input type="checkbox"/> 64,000 bit/s |
| <input checked="" type="checkbox"/> 300 bit/s | <input checked="" type="checkbox"/> 9,600 bit/s | <input type="checkbox"/> 9,600 bit/s | |
| <input checked="" type="checkbox"/> 600 bit/s | | <input type="checkbox"/> 19,200 bit/s | |
| <input checked="" type="checkbox"/> 1,200 bit/s | | | |

Transmission speed must be the same in the control and monitor directions.

8.3 Link layer

(network-specific parameter)

Frame format FT1.2, single character 1 and the fixed timeout interval are used exclusively in this companion standard.

Link transmission procedure

- Balanced transmission
- Unbalanced transmission

Frame length

255

Maximum length L (number of octets)

Address field of the link

- Not present (balanced transmission only)
- One octet
- Two octets
- Structured
- Unstructured

8.4 Application layer

Transmission mode for application data

Mode 1 (Least significant octet first), as defined in clause 4.10 of IEC 870-5-4, is used exclusively in this companion standard.

Common address of ASDU

(system-specific parameter)

- One octet
- Two octets

Information object address

(system-specific parameter)

- One octet
- Two octets
- Three octets
- structured
- unstructured

Cause of transmission

(system-specific parameter)

- One octet
- Two octets (with originator address)

Selection of standard ASDUs

Process information in monitor direction

(station-specific parameter)

- <1> := Single-point information M_SP_NA_1
- <2> := Single-point information with time tag M_SP_TA_1
- <3> := Double-point information M_DP_NA_1
- <4> := Double-point information with time tag M_DP_TA_1
- <5> := Step position information M_ST_NA_1
- <6> := Step position information with time tag M_ST_TA_1
- <7> := 32-bit string M_BO_NA_1
- <8> := 32-bit string with time tag M_BO_TA_1
- <9> := Measured value, normalised value M_ME_NA_1
- <10> := Measured value, normalised value with time tag M_ME_TA_1
- <11> := Measured value, scaled value M_ME_NB_1
- <12> := Measured value, scaled value with time tag M_ME_TB_1
- <13> := Measured value, short floating point value M_ME_NC_1
- <14> := Measured value, short floating point value with time tag M_ME_TC_1
- <15> := Integrated totals M_IT_NA_1
- <16> := Integrated totals with time tag M_IT_TA_1
- <17> := Protection equipment event with time tag M_EP_TA_1
- <18> := Packed start protection equipment events with time tag M_EP_TB_1
- <19> := Packed output circuit information of protection equipment with time tag M_EP_TC_1
- <20> := Packed single-point information with status change detection M_PS_NA_1
- <21> := Measured value, normalised value without quality descriptor M_ME_ND_1

Extension

■ <30>	:= Single-point information with time tag CP56Time2a	M_SP_TB_1
□ <31>	:= Double-point information with time tag CP56Time2a	M_DP_TB_1
□ <32>	:= Step position information with time tag CP56Time2a	M_ST_TB_1
□ <33>	:= 32-bit string with time tag CP56Time2a	M_BO_TB_1
□ <34>	:= Measured value, normalised value with time tag CP56Time2a	M_ME_TD_1
■ <35>	:= Measured value, scaled value with time tag CP56Time2a	M_ME_TE_1
□ <36>	:= Measured value, short floating point value with time tag CP56Time2a	M_ME_TF_1
□ <37>	:= Integrated totals with time tag CP56Time2a	M_IT_TB_1
□ <38>	:= Protection equipment event with time tag CP56Time2a	M_EP_TD_1
□ <39>	:= Packed start events of protection equipment with time tag CP56Time2a	M_EP_TE_1
□ <40>	:= Packed output circuit information of protection equipment with time tag CP56Time2a	M_EP_TF_1

Process information in control direction

(station-specific parameter)

■ <45>	:= Single command	C_SC_NA_1
□ <46>	:= Double command	C_DC_NA_1
□ <47>	:= Regulating step command	C_RC_NA_1
□ <48>	:= Set point command, normalised value	C_SE_NA_1
□ <49>	:= Set point command, scaled value	C_SE_NB_1
□ <50>	:= Set point command, short floating point value	C_SE_NC_1
■ <51>	:= 32-bit string	C_BO_NA_1

System information in monitor direction

(station-specific parameter)

■ <70>	:= End of initialisation	M_EI_NA_1
--------	--------------------------	-----------

System information in control direction

(station-specific parameter)

■ <100>	:= Interrogation command	C_IC_NA_1
□ <101>	:= Counter interrogation command	C_CI_NA_1
□ <102>	:= Read command	C_RD_NA_1
■ <103>	:= Clock synchronisation command	C_CS_NA_1
□ <104>	:= Test command	C_TS_NB_1
■ <105>	:= Reset process command	C_RP_NC_1
■ <106>	:= Delay acquisition command	C_CD_NA_1

Parameter in control direction

(station-specific parameter)

<input type="checkbox"/> <110>	:= Parameter of measured value, normalised value	P_ME_NA_1
<input checked="" type="checkbox"/> <111>	:= Parameter of measured value, scaled value	P_ME_NB_1
<input type="checkbox"/> <112>	:= Parameter of measured value, short floating point value	P_ME_NC_1
<input type="checkbox"/> <113>	:= Parameter activation	P_AC_NA_1

File transfer

(station-specific parameter)

<input type="checkbox"/> <120>	:= File ready	F_FR_NA_1
<input type="checkbox"/> <121>	:= Section ready	F_SR_NA_1
<input type="checkbox"/> <122>	:= Call directory, select file, call file, call section	F_SC_NA_1
<input type="checkbox"/> <123>	:= Last section, last segment	F_LS_NA_1
<input type="checkbox"/> <124>	:= Ack file, ack section	F_AF_NA_1
<input type="checkbox"/> <125>	:= Segment	F_SG_NA_1
<input type="checkbox"/> <126>	:= Directory	F_DR_TA_1

8.5 Basic application functions

Station initialisation

(station-specific parameter)

- Remote initialisation

General interrogation

(system- or station-specific parameter)

- global
 - group 1 group 7 group 13
 - group 2 group 8 group 14
 - group 3 group 9 group 15
 - group 4 group 10 group 16
 - group 5 group 11
 - group 6 group 12

Addresses must be defined by group

Clock synchronisation

(station-specific parameter)

- Clock synchronisation

Transmission command

(object-specific parameter)

- Direct command
- Direct set-point transmission command
- Select and execute command
- Select and execute a set-point transmission command
- C_SE_ACTTERM used
- No additional definition
- Short pulse (duration set by a satellite station system parameter)
- Long pulse (duration set by a satellite station system parameter)
- Continuous output

Transmission of integrated totals

(station or object-specific parameter)

- Counter request
- Counter freezes without reset
- Counter freezes with reset
- Counter reset
- General counter request
- Group 1 counter request
- Group 2 counter request
- Group 3 counter request
- Group 4 counter request

Addresses must be defined by group

Parameter loading

(object-specific parameter)

- Threshold value
- Smoothing factor
- Low measured value transmission limit
- High measured value transmission limit

Activation parameter

(object-specific parameter)

- Addressed object cyclic or periodic transmission activation/deactivation

File transfer

(station-specific parameter)

- File transfer in the monitoring direction
- File transfer in the control direction

Information object addresses

G200 - Standard addressing

Single command (Control direction)					
Description	Name	Relative adress		Default adress	
SC1	instantaneous current values	0	0	1	1

Single-Point information (monitor direction)					
Description	Name	Relative address		Default address	
SP 1	Equipment start	0	0	10	A
SP 2	Configuration.	1	1	11	B
SP 3	Stack 80%	2	2	12	C
SP 4	Reserved	3	3	13	D
SP 5	Reserved	4	4	14	E
SP 6	Reserved	5	5	15	F
SP 7	Reserved	6	6	16	10
SP 8	Reserved	7	7	17	11
SP 9	Digital Input 1	8	8	18	12
SP 10	Digital Input 2	9	9	19	13
SP 11	Digital Input 3	10	A	20	14
SP 12	Digital Input 4	11	B	21	15
SP 13	Digital Input 5	12	C	22	16
SP 14	Digital Input 6	13	D	23	17
SP 15	Reserved	14	E	24	18
SP 16	Reserved	15	F	25	19
SP 17	DI/DT fault - Ind. 1	16	10	26	1A
SP 18	IMAX fault - Ind. 1	17	11	27	1B
SP 19	Battery fault - Ind. 1	18	12	28	1C
SP 20	Volt presence – Ind. 1	19	13	29	1D
SP 21	Comm fault - Ind. 1	20	14	30	1E
SP 22	Flite presence – Ind. 1	21	15	31	1F
SP 23	Conf in progres - Ind.1	22	16	32	20
SP 24	Config fault – Ind. 1	23	17	33	21
SP 25	DI/DT fault - Ind. 2	24	18	34	22
SP 26	IMAX fault - Ind. 2	25	19	35	23
SP 27	Battery fault - Ind. 2	26	1A	36	24
SP 28	Volt presence – Ind. 2	27	1B	37	25
SP 29	Comm fault - Ind. 2	28	1C	38	26
SP 30	Flite presence – Ind. 2	29	1D	39	27
SP 31	Conf in progres- Ind.2	30	1E	40	28
SP 32	Config fault – Ind. 2	31	1F	41	29
SP 33	DI/DT fault - Ind. 3	32	20	42	2A
SP 34	IMAX fault - Ind. 3	33	21	43	2B
SP 35	Battery fault - Ind. 3	34	22	44	2C
SP 36	Volt presence – Ind. 3	35	23	45	2D
SP 37	Comm fault - Ind. 3	36	24	46	2E
SP 38	Flite presence – Ind. 3	37	25	47	2F
SP 39	Conf in progres- Ind.3	38	26	48	30
SP 40	Config fault – Ind. 3	39	27	49	31
SP 41	DI/DT fault - Ind. 4	40	28	50	32
SP 42	IMAX fault - Ind. 4	41	29	51	33
SP 43	Battery fault - Ind. 4	42	2A	52	34
SP 44	Volt presence – Ind. 4	43	2B	53	35
SP 45	Comm fault - Ind. 4	44	2C	54	36
SP 46	Flite presence – Ind. 4	45	2D	55	37
SP 47	Conf in progres- Ind.4	46	2E	56	38
SP 48	Config fault – Ind. 4	47	2F	57	39

IEC 870-5-101 Communication

SP 49	DI/DT fault - Ind. 5	48	30	58	3A
SP 50	IMAX fault - Ind. 5	49	31	59	3B
SP 51	Battery fault - Ind. 5	50	32	60	3C
SP 52	Volt presence – Ind. 5	51	33	61	3D
SP 53	Comm fault - Ind. 5	52	34	62	3E
SP 54	Flite presence – Ind. 5	53	35	63	3F
SP 55	Conf in progres- Ind.5	54	36	64	40
SP 56	Config fault – Ind. 5	55	37	65	41
SP 57	DI/DT fault - Ind. 6	56	38	66	42
SP 58	IMAX fault - Ind. 6	57	39	67	43
SP 59	Battery fault - Ind. 6	58	3A	68	44
SP 60	Volt presence – Ind. 6	59	3B	69	45
SP 61	Comm fault - Ind. 6	60	3C	70	46
SP 62	Flite presence – Ind. 6	61	3D	71	47
SP 63	Conf in progres- Ind.6	62	3E	72	48
SP 64	Config fault – Ind. 6	63	3F	73	49
SP 65	DI/DT fault - Ind. 7	64	40	74	4A
SP 66	IMAX fault - Ind. 7	65	41	75	4B
SP 67	Battery fault - Ind. 7	66	42	76	4C
SP 68	Volt presence – Ind. 7	67	43	77	4D
SP 69	Comm fault - Ind. 7	68	44	78	4E
SP 70	Flite presence – Ind. 7	69	45	79	4F
SP 71	Conf in progres- Ind.7	70	46	80	50
SP 72	Config fault – Ind. 7	71	47	81	51
SP 73	DI/DT fault - Ind. 8	72	48	82	52
SP 74	IMAX fault - Ind. 8	73	49	83	53
SP 75	Battery fault - Ind. 8	74	4A	84	54
SP 76	Volt presence – Ind. 8	75	4B	85	55
SP 77	Comm fault - Ind. 8	76	4C	86	56
SP 78	Flite presence – Ind. 8	77	4D	87	57
SP 79	Conf in progres- Ind.8	78	4E	88	58
SP 80	Config fault – Ind. 8	79	4F	89	59
SP 81	DI/DT fault - Ind. 9	80	50	90	5A
SP 82	IMAX fault - Ind. 9	81	51	91	5B
SP 83	Battery fault - Ind. 9	82	52	92	5C
SP 84	Volt fresence – Ind. 9	83	53	93	5D
SP 85	Comm fault - Ind. 9	84	54	94	5E
SP 86	Flite fresence - Ind. 9	85	55	95	5F
SP 87	Conf in progres- Ind.9	86	56	96	60
SP 88	Config fault – Ind. 9	87	57	97	61

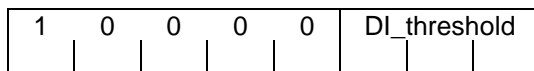
Measured value (monitor direction)					
Description	Name	Default adress		Relative adress	
ME 1	I_mean - Ind. 1	0	0	100	64
ME 2	I_min - Ind. 1	1	1	101	65
ME 3	I_max - Ind. 1	2	2	102	66
ME 4	Voltage pres. - Ind. 1	3	3	103	67
ME 5	Comms count. - Ind. 1	4	4	104	68
ME 6	I_inst - Ind. 1	5	5	105	69
ME 7	I_mean - Ind. 2	6	6	106	6A
ME 8	I_min - Ind. 2	7	7	107	6B
ME 9	I_max - Ind. 2	8	8	108	6C
ME 10	Voltage pres. - Ind. 2	9	9	109	6D
ME 11	Comms count. - Ind. 2	10	A	110	6E
ME 12	I_inst - Ind. 2	11	B	111	6F
ME 13	I_mean - Ind. 3	12	C	112	70
ME 14	I_min - Ind. 3	13	D	113	71
ME 15	I_max - Ind. 3	14	E	114	72
ME 16	Voltage pres. - Ind. 3	15	F	115	73
ME 17	Comms count. - Ind. 3	16	10	116	74
ME 18	I_inst - Ind. 3	17	11	117	75
ME 19	I_mean - Ind. 4	18	12	118	76
ME 20	I_min - Ind. 4	19	13	119	77
ME 21	I_max - Ind. 4	20	14	120	78
ME 22	Voltage pres. - Ind. 4	21	15	121	79
ME 23	Comms count. - Ind. 4	22	16	122	7A
ME 24	I_inst - Ind. 4	23	17	123	7B
ME 25	I_mean - Ind. 5	24	18	124	7C
ME 26	I_min - Ind. 5	25	19	125	7D
ME 27	I_max - Ind. 5	26	1A	126	7E
ME 28	Voltage pres. - Ind. 5	27	1B	127	7F
ME 29	Comms count. - Ind. 5	28	1C	128	80
ME 30	I_inst - Ind. 5	29	1D	129	81
ME 31	I_mean - Ind. 6	30	1E	130	82
ME 32	I_min - Ind. 6	31	1F	131	83
ME 33	I_max - Ind. 6	32	20	132	84
ME 34	Voltage pres. - Ind. 6	33	21	133	85
ME 35	Comms count. - Ind. 6	34	22	134	86
ME 36	I_inst - Ind. 6	35	23	135	87
ME 37	I_mean - Ind. 7	36	24	136	88
ME 38	I_min - Ind. 7	37	25	137	89
ME 39	I_max - Ind. 7	38	26	138	8A
ME 40	Voltage pres. - Ind. 7	39	27	139	8B
ME 41	Comms count. - Ind. 7	40	28	140	8C
ME 42	I_inst - Ind. 7	41	29	141	8D
ME 43	I_mean - Ind. 8	42	2A	142	8E
ME 44	I_min - Ind. 8	43	2B	143	8F
ME 45	I_max - Ind. 8	44	2C	144	90
ME 46	Voltage pres. - Ind. 8	45	2D	145	91
ME 47	Comms count. - Ind. 8	46	2E	146	92
ME 48	I_inst - Ind. 8	47	2F	147	93
ME 49	I_mean - Ind. 9	48	30	148	94

IEC 870-5-101 Communication

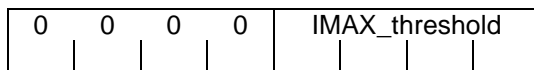
ME 50	I_min - Ind. 9	49	31	149	95
ME 51	I_max - Ind. 9	50	32	150	96
ME 52	Voltage pres. - Ind. 9	51	33	151	97
ME 53	Comms count. - Ind. 9	52	34	152	98
ME 54	I_inst - Ind. 9	53	35	153	99

32 Bits Strings parameters (Control direction)					
Description	Name	Relative Address		Default Address	
BO 1	Parameters - Ind. 1	0	0	160	A0
BO 2	Parameters - Ind. 2	1	1	161	A1
BO 3	Parameters - Ind. 3	2	2	162	A2
BO 4	Parameters - Ind. 4	3	3	163	A3
BO 5	Parameters - Ind. 5	4	4	164	A4
BO 6	Parameters - Ind. 6	5	5	165	A5
BO 7	Parameters - Ind. 7	6	6	166	A6
BO 8	Parameters - Ind. 8	7	7	167	A7
BO 9	Parameters - Ind. 9	8	8	168	A8

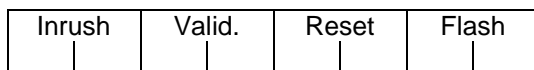
Indicator parameters: they are transmitted as 32-bit analog output.



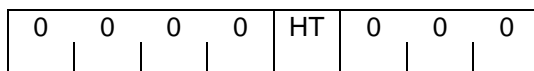
byte 1



byte 2



byte 3 = Ctl



byte 4 = HT

DI_threshold	User-selected di/dt threshold value
IMAX_threshold	User-selected IMAX threshold value
Ctl	This control Word is used to configure following parameters : inrush time-out, fault confirmation per voltage absence, automatic voltage reset and flash time-out
HT	Electrical field threshold above which the MV voltage is detected.

Recommended values are in bold

di_threshold	di/dt value (for 50Hz networks)	IMAX_Threshold	IMAX value	Ctl	Description	HT	voltage presence
1xxx0000	6 A / 30 ms	XXXX0000	800 A	00XXXXXX	No Inrush	XXXX0XXX	> 9 kV/m
1xx0001	12 A / 30 ms	XXXX0001	100 A	01XXXXXX	Inrush : 3s	XXXX1XXX	> 18 kV/m
1xxx0010	24 A / 30 ms	XXXX0010	150 A	10XXXXXX	Inrush : 30 s		
1xxx0011	30 A / 30 ms	XXXX0011	200 A	11XXXXXX	Inrush : 60 s		
1xxx0100	40 A / 30 ms	XXXX0100	250 A	XX00XXXX	No validation		
1xx0101	60 A / 30 ms	XXXX0101	300 A	XX01XXXX	Validation		
1xxx0110	80 A / 30 ms	XXXX0110	400 A	XX10XXXX	Not used		
1xxx0111	OFF	XXXX0111	500 A	XX11XXXX	Not used		
		XXXX1000	600 A	XXXX00XX	No auto. Reset		
				XXXX01XX	auto. reset 3s		
				XXXX10XX	auto. reset 30s		
				XXXX11XX	auto. reset 60s		
				XXXXXX00	2 h flash time		
				XXXXXX01	4 h flash time		
				XXXXXX10	8 h flash time		
				XXXXXX11	16 h flash time		

Note: for 60 Hz networks, dt becomes 25ms

Parameter of measured values, scaled value (Control direction)					
Description	Name	Relative adress		Default adress	
P_ME1	Current deadband(%)	0	0	170	AA
P_ME2	Min current variation	1	1	171	AB
P_ME3	Voltage deadband	2	2	172	AC
P_ME4	Communication fault counter threshold	3	3	173	AD
P_ME5	Measurement period	4	4	174	AE

Load current deadband (I_{mean} , I_{min} , I_{max}) - P_ME1

Definition:

Load current variation (expressed in %) above which the measured current value can be stored in the IEC stack.

Possible values: 0 to 100

Minimum current variation deadband (I_{mean} , I_{min} , I_{max}) - P_ME2

Definition:

Minimum load current variation (expressed in A) above which the measured current value can be stored in the IEC stack.

Possible values: 0 to 250

NB: To be stored, a current must be above the load current variation and above the minimum current variation.

DeadBand voltage availability - P_ME3

Definition:

Minimum voltage presence percentage variation above which the measured voltage value is stored in stack.

Possible values: 0 to 20

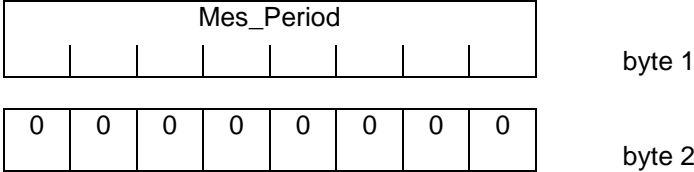
Communication fault counter threshold - P_ME4

Definition:

Successive number of missing hourly measurements above which an event is stored in stack.

Possible values: 1 to 4

Measurement period - P_ME5



Definition:
Period of time for current measurement recording

Possible values:
0002h= test (every 2 minutes)
003Ch= standard(every 1 hour)

Note: it is mandatory to use 1 hour for normal operation

Schneider Electric Industries SAS

Schneider Electric Telecontrol
839 chemin des Batterses
Z.I. Ouest
01700 St Maurice de Beynost
Tel : +33 (0)4 78 55 13 13
Fax : +33 (0)4 78 55 50 00

<http://www.schneider-electric.com>
E-mail : telecontrol@schneider-electric.com

*As standards, specifications and designs change from time to time,
please ask for confirmation of the information given in this
publication.*