

MV Electrical network management

Easergy Range

FLITE116 – G200

Wireless Communicating indicator

DNP 3.0 communication

Appendix to the User's manual



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Functionality

Monitoring

- Network faults (di/dt or IMAX)
- Voltage losses/ returns
- Flite Low battery and communication failures

Measurements

- Phase currents(I_min, I_max, I_mean and I_inst)
- MV presence statistics

Remote control

- Flite parameters
- G200 parameters
- Long range Communication
- Storage and alarms information

Characteristics

Type of transmission	asynchronous serial
Protocol	DNP 3.0
Data format	1 start bit, 8 data bits, no parity, 1 stop bit
Speed	200, 300, 600, 1200, 2400, 4800 or 9600 bauds
Electrical interface	RS232, GSM or GPRS
Type of connector	9 pin SUB-D, male

LINK LAYER

Idle line delay:

- Minimum idle line time-out between two consecutive frames.
- Value ranges from 10 to 100 ms.
- Default is <10 ms>.

Requires Data Link Layer Confirmation:

- When set to <yes>, the Link Layer sends User Data using a "SEND-CONFIRM EXPECTED" frame type
- When set to <no>, the Link Layer sends User Data using a "SEND-NO REPLY EXPECTED" frame type
- Default is <no> (**caution: <no> is mandatory for GPRS**)

Note: when "SEND – NO REPLY expected" frame type is used, G200 will never send "RESET of remote link" frames. It shall strictly operate as a slave.

Maximum Data Link re-tries:

- Number of retries the Link Layer shall try to send its User Data when G200 doesn't receive any CONFIRM frame (ACK or NACK) to a message using SEND-CONFIRM EXPECTED frames
- When the Maximum Data Link re-tries is reached without confirmation, Link Layer will perform "RESET OF REMOTE LINK" to re-initialize the link.
- Value ranges from 0 to 10
- Default is <3>.

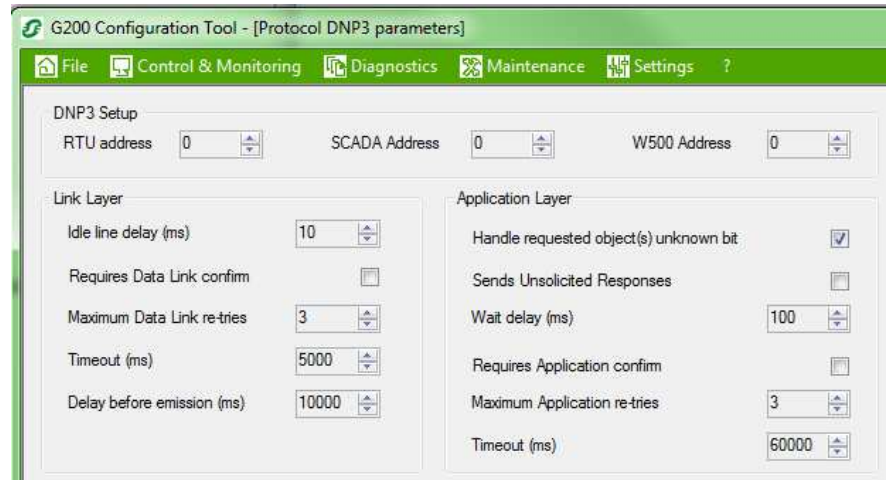
Timeout:

- delay that Link Layer will wait for a "CONFIRM" frame after sending a "SEND – CONFIRM expected" frame.
- Value ranges from 1 to 10 s.
- Default is <5 s>.

Delay before emission:

- To avoid collision when spontaneously emitting on a half-duplex link, G200 will wait a T delay after seeing the link is no more busy (using CD).
- If at this moment, CD is still not present, G200 will send the message.
- If present, it will wait another T delay.
- T delay is the sum of "Delay before emission" and a random value.
- Value ranges from 0 to 10 s.
- Default is <10 s>.

Protocol parameters



APPLICATION LAYER

Handle requested object(s) unknown bit:

- If checked, the G200 will use a specific bit to indicate to the SCADA that the object required is unknown. If the Scada doesn't support this function, uncheck this option.

Sends Unsolicited Responses:

- When set to <yes>, unsolicited responses are enabled
- When set to <no>, unsolicited responses are disabled
- Default is <yes>

Wait delay:

- Minimum delay between two consecutive unsolicited responses.
- Value ranges from 0 to 5 s (select <0 s> when you don't want to use this feature)
- Default is <100 ms>.

Requires Application confirm:

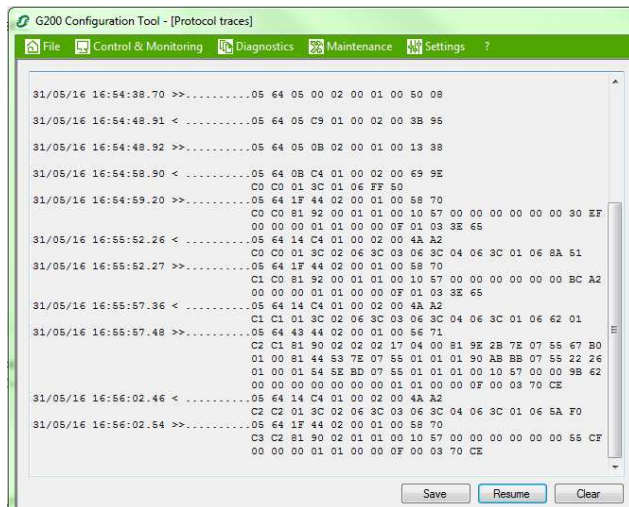
- When set to <yes>, application frames sent by the RTU are confirmed by the master.
- When set to <no>, there are not confirmed.
- Default is <no>.

Maximum Application re-tries:

- Number of re-tries from the application Layer when the RTU does not receive any "CONFIRM" frame.
- Value ranges from 0 to 10
- Default is <3>.

Timeout:

- Delay that Application Layer shall wait to receive a "CONFIRM" frame after having sent an application frame.
- Value ranges from 1s to 5 min.
- Default is <1 min>



Protocol Traces

This analyzer displays recognized protocol frames with some additional information such as:

- the direction of the frame
 - >> for host to G200 communications
 - << for G200 to host communications,
- if possible, the error that has been detected:
 - character framing error,
 - overflow,
 - checksum error,
 - bad length,
 - bad control character.

Note: in case of multiple errors, only the first one is indicated.

Each correct frame is displayed one block per line:

- 10 bytes for the first line,
- 18 bytes for next ones,
- the last line may be shorter.

<h1>DNP V3.00</h1> <h2>DEVICE PROFILE DOCUMENT</h2>	
Vendor Name :	SCHNEIDER ELECTRIC
Device Name :	G200 X DNP3 V1.10 and V2.00 (X: GPRS, MODEM Hayes or RS232)
Highest DNP Level Supported : For Requests : L1 For Responses : L1	Device Function : <input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave
Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table) : <ul style="list-style-type: none"> • Binary input - All Variations : Read all points • Analog input - All Variations : Read all points • Analog output -All Variations: Read all points 	
Maximum Data Link Frame Size (octets) : Transmitted : 292 Received : (must be 292)	Maximum Application Fragment Size (octets) : Transmitted : 1532 ⁽¹⁾ Received : 498
Maximum Data Link Re-tries : <input type="checkbox"/> None <input type="checkbox"/> Fixed at _____ <input checked="" type="checkbox"/> Configurable, range 1 to 10 ⁽²⁾	Maximum Application Layer Re-tries : <input type="checkbox"/> None <input type="checkbox"/> Fixed at _____ <input checked="" type="checkbox"/> Configurable, range 1 to 10 ⁽²⁾

⁽¹⁾ Enables an application fragment to contain all class 0 data (including expansion, future use and reserved points) and 100 event objects (corresponding to event buffer capacity).

⁽²⁾ Local configuration with a PC.

Requires Data Link Layer Confirmation :

Never
 Always
 Sometimes
 Configurable⁽³⁾

Requires Application Layer Confirmation :

Never
 Always (not recommended)
 When reporting Event Data (Slave devices only)
 When sending multi-fragment responses (Slave devices only)

Sometimes If 'Sometimes', when? _____
 Configurable⁽³⁾

Timeouts while waiting for :

Data Link Confirm	<input type="checkbox"/> None	<input type="checkbox"/> Fixed at _____	<input type="checkbox"/> Variable	<input checked="" type="checkbox"/> Configurable ⁽³⁾
Complete Appl. Fragment	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Fixed at _____	<input type="checkbox"/> Variable	<input type="checkbox"/> Configurable
Application Confirm	<input type="checkbox"/> None	<input type="checkbox"/> Fixed at _____	<input type="checkbox"/> Variable	<input checked="" type="checkbox"/> Configurable ⁽³⁾
Complete Appl. Response	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Fixed at _____	<input type="checkbox"/> Variable	<input type="checkbox"/> Configurable

Others _____

Sends/Executes Control Operations :

WRITE Binary Outputs	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
SELECT/OPERATE	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always ⁽⁴⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
DIRECT OPERATE	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always ⁽⁵⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
DIRECT OPERATE – NO ACK	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always ⁽⁵⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Count > 1	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always ⁽⁵⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse On	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always ⁽⁶⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse Off	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always ⁽⁶⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch On	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always ⁽⁶⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch Off	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always ⁽⁶⁾	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Queue	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Clear Queue	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable

⁽³⁾ Local configuration with a PC.
⁽⁴⁾ Executes as it has been received.
⁽⁵⁾ Always executes a "Pulse On" with "on-time" = 3 s.

Device Profile document

<p>Reports Binary Input Change Events when no specific variation requested :</p> <ul style="list-style-type: none"> <input type="checkbox"/> Never <input checked="" type="checkbox"/> Only time-tagged <input type="checkbox"/> Only non-time-tagged <input type="checkbox"/> Configurable to send both, one or the other (attach explanation) 	<p>Reports time-tagged Binary Input Change Events when no specific variation requested :</p> <ul style="list-style-type: none"> <input type="checkbox"/> Never <input checked="" type="checkbox"/> Binary Input Change With Time <input type="checkbox"/> Binary Input Change With Relative Time <input type="checkbox"/> Configurable (attach explanation)
<p>Sends Unsolicited Responses :</p> <ul style="list-style-type: none"> <input type="checkbox"/> Never <input checked="" type="checkbox"/> Configurable (attach explanation) <input type="checkbox"/> Only certain objects <input type="checkbox"/> Sometimes (attach explanation) <input type="checkbox"/> ENABLE/DISABLE UNSOLICITED Function codes supported 	<p>Sends Static Data in Unsolicited Responses :</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Never <input type="checkbox"/> When Device Restarts <input type="checkbox"/> When Status Flags Change <p>No other options permitted.</p>
<p>Default Counter Object/Variation :</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No Counters Reported <input type="checkbox"/> Configurable (attach explanation) <input type="checkbox"/> Default Object _____ Default Variation _____ <input type="checkbox"/> Point-by-point list attached 	<p>Counters Roll Over at :</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No Counters Reported <input type="checkbox"/> Configurable (attach explanation) <input type="checkbox"/> 16 Bits <input type="checkbox"/> 32 Bits <input type="checkbox"/> Other Value _____ <input type="checkbox"/> Point-by-point list attached
<p>Sends Multi-Fragment Responses : <input checked="" type="checkbox"/> Yes No <input type="checkbox"/></p>	

Implementation Table

OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)		Notes
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)	
1	0	Binary Input – All Variations	1	06			
1	1	Binary Input			129	00	
1	2	Binary Input with Status			129	00	
2	2	Binary Input Change with Time			129	17	
12	1	Control Relay Ouput Block	5,6	17,28	129	Echo of request	
30	0	Analog Input – All Variations	1	06			
30	2	16-Bit Analog Input			129	00	
32	4	16-Bit Analog Change Event with Time			129	17	
40	0	Analog Output Status – All Variations	1	06			
41	2	16-Bit Analog Output Block	5,6	17,28			
41	1	32-Bit Analog Output Block	5,6	17,28			
50	1	Time and Date	2 (see 4.14)	07 where quantity=1			
60	1	Class 0 Data	1	06			
60	2	Class 1 Data	1	06,07,08			
60	3	Class 2 Data	1	06,07,08			(7)
60	4	Class 3 Data	1	06,07,08			(7)
80	1	Internal Indications	2	00 index=7			
		No object	13				
		No object	23 (see 4.14)				

 Addition to Highest DNP Levels Supported

(7) : RESPONSE TO THIS REQUEST IS OBJECT UNKNOWN

Point list

Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Binary Input	0 / 0	1	1	No Status	2	2	1	With Time	Equipment start
Binary Input	1 / 1	1	1	No Status	2	2	1	With Time	Configuration.
Binary Input	2 / 2	1	1	No Status	2	2	1	With Time	Stack 80%
Binary Input	3 / 3	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	4 / 4	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	5 / 5	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	6 / 6	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	7 / 7	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	8 / 8	1	1	No Status	2	2	1	With Time	Digital Input 1
Binary Input	9 / 9	1	1	No Status	2	2	1	With Time	Digital Input 2
Binary Input	A / 10	1	1	No Status	2	2	1	With Time	Digital Input 3
Binary Input	B / 11	1	1	No Status	2	2	1	With Time	Digital Input 4
Binary Input	C / 12	1	1	No Status	2	2	1	With Time	Digital Input 5
Binary Input	D / 13	1	1	No Status	2	2	1	With Time	Digital Input 6
Binary Input	E / 14	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	F / 15	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	10 / 16	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 1
Binary Input	11 / 17	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 1
Binary Input	12 / 18	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 1
Binary Input	13 / 19	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 1
Binary Input	14 / 20	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 1
Binary Input	15 / 21	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 1
Binary Input	16 / 22	1	1	No Status	2	2	1	With Time	Conf in progres - Ind.1
Binary Input	17 / 23	1	1	No Status	2	2	1	With Time	Config fault – Ind. 1
Binary Input	18 / 24	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 2
Binary Input	19 / 25	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 2
Binary Input	1A / 26	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 2
Binary Input	1B / 27	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 2
Binary Input	1C / 28	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 2
Binary Input	1D / 29	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 2
Binary Input	1E / 30	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.2
Binary Input	1F / 31	1	1	No Status	2	2	1	With Time	Config fault – Ind. 2
Binary Input	20 / 32	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 3
Binary Input	21 / 33	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 3
Binary Input	22 / 34	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 3
Binary Input	23 / 35	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 3
Binary Input	24 / 36	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 3
Binary Input	25 / 37	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 3
Binary Input	26 / 38	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.3
Binary Input	27 / 39	1	1	No Status	2	2	1	With Time	Config fault – Ind. 3
Binary Input	28 / 40	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 4
Binary Input	29 / 41	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 4
Binary Input	2A / 42	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 4
Binary Input	2B / 43	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 4
Binary Input	2C / 44	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 4
Binary Input	2D / 45	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 4
Binary Input	2E / 46	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.4
Binary Input	2F / 47	1	1	No Status	2	2	1	With Time	Config fault – Ind. 4
Binary Input	30 / 48	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 5
Binary Input	31 / 49	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 5

Point list

Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Control Relay Output Block	0/0	12	1						refresh instantaneous current values (I_inst)
Binary Input	32 / 50	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 5
Binary Input	33 / 51	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 5
Binary Input	34 / 52	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 5
Binary Input	35 / 53	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 5
Binary Input	36 / 54	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.5
Binary Input	37 / 55	1	1	No Status	2	2	1	With Time	Config fault – Ind. 5
Binary Input	38 / 56	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 6
Binary Input	39 / 57	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 6
Binary Input	3A / 58	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 6
Binary Input	3B / 59	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 6
Binary Input	3C / 60	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 6
Binary Input	3D / 61	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 6
Binary Input	3E / 62	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.6
Binary Input	3F / 63	1	1	No Status	2	2	1	With Time	Config fault – Ind. 6
Binary Input	40 / 64	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 7
Binary Input	41 / 65	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 7
Binary Input	42 / 66	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 7
Binary Input	43 / 67	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 7
Binary Input	44 / 68	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 7
Binary Input	45 / 69	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 7
Binary Input	46 / 70	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.7
Binary Input	47 / 71	1	1	No Status	2	2	1	With Time	Config fault – Ind. 7
Binary Input	48 / 72	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 8
Binary Input	49 / 73	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 8
Binary Input	4A / 74	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 8
Binary Input	4B / 75	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 8
Binary Input	4C / 76	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 8
Binary Input	4D / 77	1	1	No Status	2	2	1	With Time	Flite presence – Ind. 8
Binary Input	4E / 78	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.8
Binary Input	4F / 79	1	1	No Status	2	2	1	With Time	Config fault – Ind. 8
Binary Input	50 / 80	1	1	No Status	2	2	1	With Time	DI/DT fault - Ind. 9
Binary Input	51 / 81	1	1	No Status	2	2	1	With Time	IMAX fault - Ind. 9
Binary Input	52 / 82	1	1	No Status	2	2	1	With Time	Battery fault - Ind. 9
Binary Input	53 / 83	1	1	No Status	2	2	1	With Time	Volt presence – Ind. 9
Binary Input	54 / 84	1	1	No Status	2	2	1	With Time	Comm fault - Ind. 9
Binary Input	55 / 85	1	1	No Status	2	2	1	With Time	Flite presence - Ind. 9
Binary Input	56 / 86	1	1	No Status	2	2	1	With Time	Conf in progres- Ind.9
Binary Input	57 / 87	1	1	No Status	2	2	1	With Time	Config fault – Ind. 9

Point list

Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Input	0 / 0	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 1
Analog Input	1 / 1	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 1
Analog Input	2 / 2	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 1
Analog Input	3 / 3	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 1
Analog Input	4 / 4	30	2	16-Bit					Comms count. - Ind. 1
Analog Input	5 / 5	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 1
Analog Input	6 / 6	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 2
Analog Input	7 / 7	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 2
Analog Input	8 / 8	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 2
Analog Input	9 / 9	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 2
Analog Input	A / 10	30	2	16-Bit					Comms count. - Ind. 2
Analog Input	B / 11	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 2
Analog Input	C / 12	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 3
Analog Input	D / 13	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 3
Analog Input	E / 14	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 3
Analog Input	F / 15	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 3
Analog Input	10 / 16	30	2	16-Bit					Comms count. - Ind. 3
Analog Input	11 / 17	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 3
Analog Input	12 / 18	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 4
Analog Input	13 / 19	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 4
Analog Input	14 / 20	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 4
Analog Input	15 / 21	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 4
Analog Input	16 / 22	30	2	16-Bit					Comms count. - Ind. 4
Analog Input	17 / 23	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 4
Analog Input	18 / 24	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 5
Analog Input	19 / 25	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 5
Analog Input	1A / 26	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 5

Point list

Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Input	1B / 27	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 5
Analog Input	1C / 28	30	2	16-Bit					Comms count. - Ind. 5
Analog Input	1D / 29	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 5
Analog Input	1E / 30	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 6
Analog Input	1F / 31	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 6
Analog Input	20 / 32	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 6
Analog Input	21 / 33	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 6
Analog Input	22 / 34	30	2	16-Bit					Comms count. - Ind. 6
Analog Input	23 / 35	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 6
Analog Input	24 / 36	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 7
Analog Input	25 / 37	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 7
Analog Input	26 / 38	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 7
Analog Input	27 / 39	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 7
Analog Input	28 / 40	30	2	16-Bit					Comms count. - Ind. 7
Analog Input	29 / 41	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 7
Analog Input	2A / 42	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 8
Analog Input	2B / 43	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 8
Analog Input	2C / 44	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 8
Analog Input	2D / 45	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 8
Analog Input	2E / 46	30	2	16-Bit					Comms count. - Ind. 8
Analog Input	2F / 47	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 8
Analog Input	30 / 48	30	2	16-Bit	32	4	1	16-Bit With Time	I_mean - Ind. 9
Analog Input	31 / 49	30	2	16-Bit	32	4	1	16-Bit With Time	I_min - Ind. 9
Analog Input	32 / 50	30	2	16-Bit	32	4	1	16-Bit With Time	I_max - Ind. 9
Analog Input	33 / 51	30	2	16-Bit	32	4	1	16-Bit With Time	Voltage pres. - Ind. 9
Analog Input	34 / 52	30	2	16-Bit					Comms count. - Ind. 9
Analog Input	35 / 53	30	2	16-Bit	32	4	1	16-Bit With Time	I_inst - Ind. 9

Point list

Description	Index (hex/dec)	WRITE			READ				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Output	0 / 0	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 1
Analog Output	1 / 1	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 2
Analog Output	2 / 2	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 3
Analog Output	3 / 3	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 4
Analog Output	4 / 4	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 5
Analog Output	5 / 5	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 6
Analog Output	6 / 6	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 7
Analog Output	7 / 7	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 8
Analog Output	8 / 8	41	1	32-Bit	40	1	1	32-Bit Without Time	Parameters - Ind. 9
Analog Output	9 / 9	41	1	32-Bit	40	1	1	32-Bit Without Time	Reserved
Analog Output	A / 10	41	1	32-Bit	40	1	1	32-Bit Without Time	Reserved
Analog Output	B / 11	41	1	32-Bit	40	1	1	32-Bit Without Time	Reserved
Analog Output	C / 12	41	1	32-Bit	40	1	1	32-Bit Without Time	Storage Information
Analog Output	D / 13	41	1	32-Bit	40	1	1	32-Bit Without Time	Alarm Information for G200 and Flites
Analog Output	E / 14	41	1	32-Bit	40	1	1	32-Bit Without Time	Automatic call
Analog Output	F / 15	41	1	32-Bit	40	1	1	32-Bit Without Time	Main SCADA phone number (Low)
Analog Output	10 / 16	41	1	32-Bit	40	1	1	32-Bit Without Time	Main SCADA phone number (High)

Point list

Description	Index (hex/dec)	WRITE			READ				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Output	11 / 17	41	1	32-Bit	40	1	1	32-Bit Without Time	Stdby SCADA phone number (Low)
Analog Output	12 / 18	41	1	32-Bit	40	1	1	32-Bit Without Time	Stdby SCADA phone number (High)
Analog Output	13 / 19	41	1	32-Bit	40	1	1	32-Bit Without Time	SMS service center phone number (Low)
Analog Output	14 / 20	41	1	32-Bit	40	1	1	32-Bit Without Time	SMS service center phone number (High)
Analog Output	15 / 21	41	1	32-Bit	40	1	1	32-Bit Without Time	SMS user phone Number (Low)
Analog Output	16 / 22	41	1	32-Bit	40	1	1	32-Bit Without Time	SMS user phone Number (High)
Analog Output	17 / 23	41	1	32-Bit	40	1	1	32-Bit Without Time	G200 IP address
Analog Output	18 / 24	41	1	32-Bit	40	1	1	32-Bit Without Time	SCADA IP address

Point list

Description	Index (hex/dec)	WRITE			READ				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Output	19 / 25	41	2	16-Bit	40	2	1	16-Bit Without Time	Current deadband(%)
Analog Output	1A / 26	41	2	16-Bit	40	2	1	16-Bit Without Time	Minimum current variation
Analog Output	1B / 27	41	2	16-Bit	40	2	1	16-Bit Without Time	Reserved
Analog Output	1C / 28	41	2	16-Bit	40	2	1	16-Bit Without Time	Voltage deadband
Analog Output	1D / 29	41	2	16-Bit	40	2	1	16-Bit Without Time	Voltage indicator threshold
Analog Output	1E / 30	41	2	16-Bit	40	2	1	16-Bit Without Time	Communication fault counter threshold
Analog Output	1F / 31	41	2	16-Bit	40	2	1	16-Bit Without Time	Digital Inputs Alarms information
Analog Output	20 / 32	41	2	16-Bit	40	2	1	16-Bit Without Time	Measurement period
Analog Output	21 / 33	41	2	16-Bit	40	2	1	16-Bit Without Time	G200 parameters
Analog Output	22 / 34	41	2	16-Bit	40	2	1	16-Bit Without Time	G200 local port
Analog Output	23 / 35	41	2	16-Bit	40	2	1	16-Bit Without Time	SCADA remote port

Internal Indications

SCADA time synchronization

Bit 4 of first IIN byte is set when G200 starts up. This bit is cleared when the SCADA sends its first clock synchronization message.

Then G200 sets it again regularly (every hour) to ensure the SCADA is answering it on a regular basis.

This clock synchronization is required to ensure a proper accuracy of time-stamping process. Should G200 not receive a new synchronization message from the master within an hour after the last one, the IIN bit is set.

Information Objects Addresses

Addresses are written on 8-bits :



- For a **binary input** (Obj 1 Var 1 or Obj 2 Var 2)

- For the **G200**

n = 0	Equipment Start
n = 1	Configuration
n = 2	Stack 80%
n = 8	Digital Input 1
n = 9	Digital Input 2
n = 10	Digital Input 3
n = 11	Digital Input 4
n = 11	Digital Input 5
n = 13	Digital Input 6

- For each **Flite**

m = 16 + (0 à 11)	Flite (indicator) number
n = 1 + (8 * m)	di/dt Fault
n = 2 + (8 * m)	IMAX Fault
n = 3 + (8 * m)	Battery check
n = 4 + (8 * m)	Voltage Presence
n = 5 + (8 * m)	Comm. Fault
n = 6 + (8 * m)	Flite Presence
n = 7 + (8 * m)	Configuration in progress
n = 8 + (8 * m)	Configuration fault

- For a **Control Relay Output Block** (Obj 12 Var 1)

n = 0	refresh instantaneous current values of all Flite indicators
-------	---

Information Objects Addresses

- For a **32-bit analog output** (Obj 40 Var 1 and Obj 41 Var 1)
 - n = 0 à 8 **Flite (indicator) parameters**
 - n = 12 **Storage Information**
 - n = 13 **G200 and FLITE Alarms Information**
 - n = 14 **Cyclic dial-up**

 - for GSM mode only:**
 - n = 15, 16 **SCADA phone number**
 - n = 17, 18 **Standby SCADA phone number**
 - n = 19, 20 **SMS service center phone**
 - n = 21, 22 **SMS user phone**

 - for GPRS mode only:**
 - n = 23 **G200 IP address**
 - n = 24 **SCADA IP address**

- For a **16-bit analog output** (Obj 40 Var 2 and Obj 41 Var 2)
 - n = 25 **Load current deadband (%)**
 - n = 26 **Minimum current variation (A)**
 - n = 27 **Reserved**
 - n = 28 **Voltage deadband**
 - n = 29 **Voltage indicator threshold**
 - n = 30 **Communication fault counter threshold**
 - n = 31 **Digital Input alarms Information**
 - n = 32 **Measurement period**
 - n = 33 **G200 parameters**

 - for GPRS mode only:**
 - n = 34 **G200 local port**
 - n = 35 **SCADA remote port**

- For a **16-bit analog input** (Obj 30 Var 2 and Obj 32 Var 4)
 - m = 0 à 11 **Flite (indicator) number**
 - n = 0 + (6* m) **I_mean**
 - n = 1 + (6* m) **I_min**
 - n = 2 + (6* m) **I_max**
 - n = 3 + (6*m) **Voltage presence indicator**
 - n = 4 + (6*m) **Comms count. (communications counter)**
 - n = 5 + (6*m) **I_inst**

G200 “Equipment Start” binary input:

The “Equipment Start” bit is set to <1> when the equipment starts.
It is set to <0> when a Class 0 is requested by the master.

G200 “Configuration” binary input:

The “Configuration” bit is set to <0> when the configuration has been made locally.
It is set to <1> when the configuration has been made remotely from the SCADA.

Control Relay Output Block:

Only the control code 3 (latch on) can be used for all the CROB:
- <1>: refresh instantaneous current measurement values

Once the command is executed, the CROB is automatically set to <0>.

Special information Objects

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

1	0	0	0	0	di_threshold	byte 1		
0	0	0	0	IMAX_threshold	byte 2			
Inrush	Valid.	Reset	Flash	byte 3 = Ctl				
0	0	0	0	HT	0	0	0	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
1xx0000	6 A / 30 ms	XXXX0000	800 A	00XXXXXX	No Inrush	XXXX0XXX	> 9 kVm
1xx0001	12 A / 30 ms	XXXX0001	100 A	01XXXXXX	Inrush : 3s	XXXX1XXX	> 18 kVm
1xx0010	24 A / 30 ms	XXXX0010	150 A	10XXXXXX	Inrush : 30 s		
1xx0011	30 A / 30 ms	XXXX0011	200 A	11XXXXXX	Inrush : 60 s		
1xx0100	40 A / 30 ms	XXXX0100	250 A	XX00XXXX	No validation		
1xx0101	60 A / 30 ms	XXXX0101	300 A	XX01XXXX	Validation		
1xx0110	80 A / 30 ms	XXXX0110	400 A	XX10XXXX	Not used		
1xx0111	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

Special information Objects

Stored information

DC	CC	FP	C	VP	B	I	D	
0	0	0	0	OF	P	C	D	byte 1
0	0	DI6	DI5	DI4	DI3	DI2	DI1	byte 2
0	0	0	0	VAV	IMA	IMI	IAV	byte 3
								byte 4

This enables the user to choose whether a change of state is added to the DNP3 Stack or not, for each type of information:

D	bit for di/dt Fault
I	bit for IMAX Fault
B	bit for Battery check
VP	bit for Voltage Presence
C	bit for Comm. Fault
FP	bit for Flite Presence
CC	bit for Configuration in progress
DC	bit for Configuration fault

D	bit for Equipment Start
C	bit for Configuration
P	bit for DNP3 Stack 80%

DI1	bit for Digital Input 1
DI2	bit for Digital Input 2
DI3	bit for Digital Input 3
DI4	bit for Digital Input 4
DI5	bit for Digital Input 5
DI5	bit for Digital Input 6

Measurement storage

IAV	bit for I_{average} (also referred to as I _{mean})
IMI	bit for I_{min}
IMA	bit for I_{max}
VAV	bit for Voltage Presence indicator

When the bit is set to <0>, the change is not added in the DNP3 stack. When set to <1>, it is added.

Alarms information: G200 and FLITE

32-bit analog output (0x0D / 13) :

VP	B	I	D	byte 1
DC	CC	FP	C	byte 2
0	P	CG	D	byte 3
V	0	0	0	byte 4

Analog output 16 bits (0x1F / 31):

DI4	DI3	DI2	DI1	byte 1
		DI6	DI5	byte 2

This enables the user to choose whether a change of state creates an alarm or not, for each type of information:

D	bits for di/dt fault
I	bits for IMAX fault
B	bits for Battery check
VP	bits for Voltage presence
C	bits for Comm. fault
FP	bits for Flite presence
CC	bits for Configuration in progress
DC	bits for Configuration fault
D	bits for Equipment Start
CG	bits for Configuration
P	bits for DNP3 Stack 80%
V	bits for Deadband
DI1	bits for Digital input 1
DI2	bits for Digital input 2
DI3	bits for Digital input 3
DI4	bits for Digital input 4
DI5	bits for Digital input 5
DI6	bits for Digital input 6

When bits are set to **00**, the information is not alarmed. When set to **01**, it is alarmed on bit set. When set to **10**, it is alarmed on bit reset. When set to **11**, it is alarmed on both bit set and bit reset.

NB: The "deadband" alarm is restricted to **00** and **01** values.

Special information Objects

Cyclic dial-up

	Set	byte 1
	Hours	byte 2
	Minutes	byte 3
	Period	byte 4

With:

Set = 0: cyclic dial-up **OFF**

Set = 1: cyclic dial-up **ON**

Hours (from 0 to 23) and Minutes (from 0 to 59): start times

Period (from 0 to 255): cycle period in hours

Telephone number (for GSM only)

Definition:

- **Main SCADA phone number** : host computer main telephone number, to which alarms are sent first.
- **Stdby SCADA phone number**: host computer back-up telephone number, to which alarms are sent when the communication fails with the host computer main telephone number.
- **SMS service center phone**: telephone number of the SMS (short message services) service center.
- **SMS user phone**: telephone number of the user cell phone that is planned to receive SMS messages issued from the G200

Possible values:

A telephone number comprises 15 digits maximum.

Only the following characters are accepted: <0 to 9>, '+'=<A>, '='=, '?'=<F>
When a zone is initialized with <F...F>, G200 does not send alarms.

For instance, +330476606599 is converted as follows :

A3	byte 1
30	byte 2
47	byte 3
66	byte 4
06	byte 5
59	byte 6
9F	byte 7
FF	byte 8

IP address (for GPRS only)

Definition:

- **G200 IP address:** IP address of the G200 (must be 0.0.0.0 if dynamic allocation is used)
- **SCADA IP address:** IP address of the SCADA

Possible values:

Each byte can be : 0 <byte < 255

For instance, 193.251.9.68 is converted as follows :

68 / 0x44	byte 1
9 / 0x09	byte 2
251 / 0xFB	byte 3
193 / 0xC1	byte 4

Special information Objects

Load current deadband (I_mean, I_min, I_max)

Definition:

Load current variation (expressed in %) above which the measured current value is stored in the DNP3 stack.

Possible values: 0 to 100

Minimum current variation for deadband (I_mean, I_min, I_max)

Definition:

Minimum load current variation (expressed in A) above which the measured current value is stored in the DNP3 stack.

Possible values: 0 to 250

Caution: to be stored, a current measurement must overtake **both** the load current variation **and** the minimum current variation.

DeadBand voltage availability

Definition:

Minimum voltage presence percentage variation above which the voltage availability is stored in the DNP3 stack.

Possible values: 0 to 20

Voltage Threshold (only for FLITE 116)

Definition:

Voltage threshold (expressed in %) above/ below which an alarm is sent.

Possible values: 0 to 100

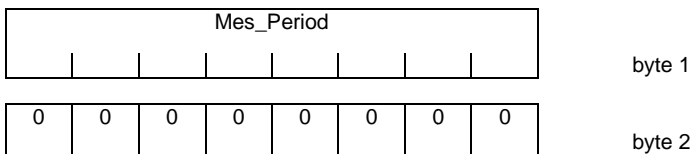
Communication fault counter threshold

Definition:

Successive number of missing hourly measurements above which an alarm is sent.

Possible values: 1 to 4

Measurement period



Definition:

Period of time for current measurement recording

Possible values:

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

Caution: it is mandatory to use 1 hour measurement period for normal operation

Special information Objects

G200 parameters

Definition:

TA	SE	AE	WS	SS	LM	DM		
0	0	0	0	0	0	0	0	0

byte 1

byte 2

This enables the user to set G200 communication parameters:

DM	00 : SCADA only 01: W500 only 10: W500 and SCADA
AE	bit used for enabled alarm
SE	bit used for enabled SMS
TA	bit used to test the alarm mechanism

For GPRS mode:

LM	bits for <i>listen mode</i> : 0 (no listen port are opened), 1 (the local port is opened)
SS	bits for <i>SCADA socket type</i> : 0 (TCP), 1 (UDP - not yet implemented)
WS	bits for <i>W500 socket type</i> : 0 (TCP), 1 (UDP - not yet implemented)

G200 and SCADA port (for GPRS only)

Definition:

- G200 port : local port on which G200 is listening to incoming connections (only if listen mode is <ON>)
- SCADA port : remote port on which the SCADA is listening to incoming connections from G200

Possible values: 1 to 65535

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