

# MV Network management MV/LV substations remote monitoring

Merlin Gerin **Easergy** Range  
**Easergy FLAIR 200C**

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**DNP 3.0 Communication**  
**User's Manual**





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## General

### Local configuration

Configuration and diagnosis of the Flair 200C is performed by connecting a laptop PC.

This software can be used to :

- Change the Flair 200C configuration (communication parameters, alarms, etc.)
- Read the equipment state of the Flair 200C
- Read the recordings made by the Flair 200C
- Reset the time of the Flair 200C

### Requisite equipment

The equipment is configured using a PC provided with MS-DOS and :

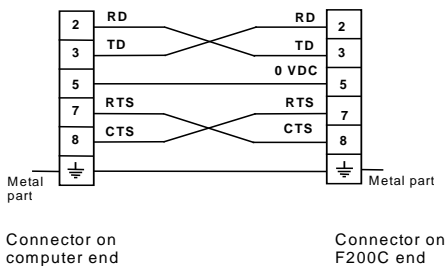
- "Flair 200 Configuration and diagnostic" software,
- Connection cable

### Running the configuration program

- Connect the cable to serial port 1 (COM1) of the computer and to the serial connector of FLAIR 200C.
- Start the PC under Windows and insert the "Easergy" CD-Rom. The configuration program is run. Select the start menu. The main menu appears.

### Comments concerning use of the software :

- Following modifications, the configuration data are only acknowledged by the equipment after validation in the "**OK**" zone.
- During modifications and before the validation operation, the equipment runs with the previous data, which are therefore at least partially different from the data momentarily displayed on the screen.
- Action in the "**Cancel**" zone displays the old parameters again.
- The zone in which the cursor is positioned is highlighted.
- To move between zones (data input fields or function title), the "**arrow keys**" or "**tabulation**" key are used.
- To select a highlighted zone, the "**Enter**" or "**Space**" keys are used.



- Parameter values are modified using:
  - the "+" or "**Space**" keys to increase the value,
  - the "-" key to reduce the value.

When a parameter value is at its maximum, pressing the "+" or "**Space**" key changes the value to its minimum. Pressing the "-" key changes it back to the maximum.

- To exit a sub-menu, the user presses the "**Escape**" key.
- To exit the main menu, the user presses the "**Alt**" and "**F4**" keys simultaneously.

### Specific messages :

When the configuration software is started up, several types of message may appear on the screen:

- "**Unidentified Equipment connected**": the serial link between the configuration computer and the equipment to be configured is not valid: check the connection cord, and the connection location at the computer end.
- "**Fault messages**": related to a configuration loss or internal problem.

### Software configuration :

Pressing the F10 key accesses the software configuration menu. The menu is used to modify:

- display colors,
- the serial port used.

## Main menu

### RTU address :

- May take every value between 0 and 65534.
- Default value is 0.

### SCADA address :

- May take every value between 0 and 65534.
- Default value is 0.

### DNP3 Parameters :

Displays the configuration screen of protocol dedicated parameters.

### Modem type

- Defines the communication medium. Possible values : Direct RS232 , Hayes, GSM, GPRS.
- In this exemple, default value is : Direct RS232.

### Communication Parameters (RS232, Hayes and GSM only) :

Displays the communication medium parameters setup screen according to the medium selected.

### GPRS modem version :

### GPRS Parameters (GPRS only) :

Displays the configuration screen of GPRS dedicated parameters.

### TCP/IP Parameters (GPRS only) :

Displays the configuration screen of TCP/IP dedicated parameters

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                    Easergy Flair 200C DNP3
                    PROM v1.00, PIC v2.08, Type: A

PARAMETERS SETUP
Equipment name: f200c                               Measurement and fault detection
                                                    Alarm Parameters
DNP3 Setup:                                          Setup Time
RTU address   : 0                                    Energy Preset
SCADA address : 0
DNP3 Parameters

Modem Type: Direct RS 232
Communication Parameters

SAVE CONFIGURATION :
OK
Cancel

DIAGNOSIS
Display events           Erase events
Display analog          DNP3 Analyser
Equipment states
    
```

### Alarm Parameters :

Displays the alarm configuration screen.

### DNP3 Analyser :

Displays the trace of exchanges between the equipment and the control station.

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                    Easergy Flair 200C DNP3
                    PROM v1.00, PIC v0.00, Type: A

PARAMETERS SETUP
Equipment name: f200c                               Measurement and fault detection
                                                    Alarm Parameters
DNP3 Setup:                                          Setup Time
RTU address   : 0                                    Energy Preset
SCADA address : 0
DNP3 Parameters

Modem Type: GPRS
GPRS Parameters
TCP/IP parameters

SAVE CONFIGURATION :
OK                               Default Config.
Cancel

DIAGNOSIS
Display events           Erase events
Display analog          DNP3 Analyser
Equipment state
    
```

## Alarm Parameters

### Digital Input :

- For each Digital Input, the "yes" option causes sending of an alarm on each change of state of the input.
- Default value is no.

### Alarm on ... :

- The "yes" option causes sending of an alarm upon occurrence of the fault.
- Default value is no.

### Alarm message enabled :

- The yes option activates alarm transmission.
- Default value is no.

Note : Alarm call to the control station and SMS sending can be enabled at the same time. The SMS message is sent first.

### Dial-up test:

- The "yes" option allows a test to be performed on alarm transmission to the control station. The Flair 200C is calling the supervisor after recording of the configuration.
- Default value is no.

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                          Alarm Parameters

Digital input 1 :      no           Alarm message enabled : no
Digital input 2 :      no           Dial up test :          no
Digital input 3 :      no
Digital input 4 :      no           Cyclic dial up :       no
Digital input 5 :      no           Starting time (min) :   0
Digital input 6 :      no           (hour) :                0
Flair 200C fault :      no           Period (hours) :       24

Alarm on AC supply off detection : no
Alarm on phase fault detection :   no
Alarm on earth fault detection :   no

Escape=Exit
    
```

### Cyclic dial-up :

- The yes option causes cyclic dial-up to the control station.
- Default value is no.

### Starting time (min & hour) :

- Starting time (in the following 24 hours) of the cyclic dial-up.
- Default value is midnight.

### Period :

- Time interval between two consecutive cyclic dial-ups, from 0 to 255h.
- Default value is 24 hours

## Communication Parameters

(RS232, Hayes or GSM modem type)

### Direct RS 232

#### Host baud rate:

- This is the transmission speed between the SCADA and the RTU. The available values are 200, 300, 600, 1200, 2400, 4800 and 9600 bauds
- The default value is set to 9600 bauds.

#### Handle DSR:

- Select "yes" if you want F200C to detect connection, using DSR.
- Default value is "no".

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                          Communication Parameters

Modem : Direct RS 232

Host baud rate : 9600  bauds

Handle DSR : no
Handle DCD : no

Handle CTS : no
CTS delay : 20ms
RTS (or CTS) to message delay : 20ms
Message to RTS delay : 20ms

Escape=Exit
    
```

### Handle DCD:

- Select "yes" if you want F200C to control reception with DCD.
- Default value is "no".

### Handle CTS:

- Select "yes" if you want F200C to wait for CTS after asserting RTS before sending the message.
- Default value is "no".

### CTS Delay:

- It's the delay F200C will wait for CTS if handled. Value is from 20 to 500 ms.
- Default value is 20 ms.

### RTS (or CTS) to message delay:

- It's the delay F200C will wait after RTS (or CTS if handled) before sending the message. Value is from 0 to 500 ms.
- Default value is 20 ms.

### Message to RTS delay:

- It's the delay F200C will wait after the end of the message before asserting RTS low. Value is from 0 to 500 ms.
- Default value is 20 ms.

## Hayes

### Host baud rate :

- This is the transmission speed between the SCADA and the RTU. The available values are 200, 300, 600, 1200, 2400, 4800 and 9600 bauds
- The default value is set to 9600 bauds.

### Dialing type :

- Tone, pulse or none.
- The default value is tone.

### Host tel number (main) :

- Phone number of the control station (maximum 15 digits).
- This field is empty in default settings

### Host tel number (standby) :

- Standby number of the control station if the main number is unavailable station (maximum 15 digits).
- This field is empty in default settings

### Dial up delay time :

Time lag between the occurrence of an alarm and the call to the SCADA.

#### 1<sup>st</sup> attempt :

- Configurable from 0 to 60 s in increments of 1 s.
- Default value : 1s.

The value 0 corresponds to a random time lag between 1 and 60 s to avoid all the equipment calling the SCADA at the same time.

#### 2<sup>nd</sup> attempt :

In the event that the first call fails, time lag before the second call to the SCADA.

- Configurable from 0 to 5 min in increments of 1 min.
- Default value : 1mn.

The value 0 corresponds to a random delay between 1 and 5 min.

#### 3<sup>rd</sup> attempt :

In the event that the second call fails, time lag before the third call to the SCADA.

- Configurable from 0 to 10 min in increments of 1 min.
- Default value : 2 mn.

The value 0 corresponds to a random delay between 1 and 5 min.

### Maximum transmission time:

Maximum lasting time of a call. After this time, systematic call break.

- Configurable from 1 to 30 min in increments of 1 min.
- Default value : 10 min.

### Modem init :

- Hayes modem initialization chain (AT command)
- Default settings : E0Q0V1&C1&D2S0=2.

### Factory modem init :

Restores the factory initialization chain

```
MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit
Communication Parameters

Modem : Hayes

Host baud rate : 9600 bauds
Dialing type : Tone

Host tel number (main) : 0478574532
Host tel number (standby) : 0478574532
Dial up delay time - first attempt : 1s
(0s = random value) - second attempt : 1mn
- third attempt : 2mn

Max transmission time : 10mn

Modem init : E0Q0V1&C1&D2S0=2
Factory modem init

Escape=Exit
```



### GSM

#### Host baud rate :

- This is the transmission speed between the SCADA and the RTU. The available values are 200, 300, 600, 1200, 2400, 4800 and 9600 bauds
- The default value is set to 9600 bauds.

#### PIN code:

- PIN code of the SIM card.
- Default value : 0000.

In the event of an incorrect PIN code, "PIN code error" appears in the "Equipment states" menu.

**Important: after three incorrect attempts the SIM card becomes invalid. To make it valid, a mobile phone must be used (The Flair 200C cannot do this).**

Please, consult the user guide of the SIM Card to return to an available status.

#### Alarm Parameters :

##### Host tel number (main) :

- Phone number of the control station (maximum 15 digits).
- This field is empty in default settings

##### Host tel number (standby) :

- Standby number of the control station if the main number is unavailable station (maximum 15 digits).
- This field is empty in default settings

#### Dial up delay time :

Time lag between the occurrence of an alarm and the call to the SCADA.

##### 1<sup>st</sup> attempt :

- Configurable from 0 to 60 s in increments of 1 s.
- Default value : 1s.

The value 0 corresponds to a random time lag between 1 and 60 s to avoid all the equipment calling the SCADA at the same time.

```
MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit
Communication Parameters

Modem : GSM
Host baud rate : 9600 bauds
PIN code : 0000

Alarm parameters
Host tel number (main) :
Host tel number (standby) :

Dial up delay time - first attempt : 1s
(0s = random value) - second attempt : 1mn
- third attempt : 2mn
Max transmission time : 10mn

Short Message System : SMS
Short Message System enabled : no
SMS service center phone number :
SMS user phone number :
```

##### 2<sup>nd</sup> attempt :

In the event that the first call fails, time lag before the second call to the SCADA.

- Configurable from 0 to 5 min in increments of 1 min.
- Default value : 1mn.

The value 0 corresponds to a random delay between 1 and 5 min.

##### 3<sup>rd</sup> attempt :

In the event that the second call fails, time lag before the third call to the SCADA.

- Configurable from 0 to 10 min in increments of 1 min.
- Default value : 2 mn.

The value 0 corresponds to a random delay between 1 and 5 min.

#### Maximum transmission time:

Maximum lasting time of a call. After this time, systematic call break.

- Configurable from 1 to 30 min in increments of 1 min.
- Default value : 10 min.

#### Short Message System (SMS) :

##### SMS activated :

- Yes/No, enables SMS's to be sent or not
- Default value is no.

##### SMS service center phone number :

- Phone number of the SMS server (refer to the notice with the SIM card)
- This field is empty in default settings.

##### SMS user phone number :

- Mobile phone number of the recipient of the SMS's
- This field is empty in default settings.

## GPRS Parameters

(GPRS version only)

### PIN code:

Setting of the PIN code into the SIM card (default value is 0000).

In case of wrong PIN code, "SIM card failure" appears in the screen "Equipment states".

**Important: after three incorrect attempts the SIM card becomes invalid. To make it valid, a mobile phone must be used (The Flair 200C cannot do this).**

Please, consult the user guide of the SIM Card to return to an available status.

### APN Server:

Enter the APN (Access Point Name) which you obtain from your GPRS provider

### APN Login and Password:

Enter the login and the password provided with your GPRS account.

Note: In major case, no login and password are required for GPRS access.

```
----- MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit -----
                                GPRS Parameters
SIM CARD PARAMETERS
  PIN code : 0000
GPRS COMMUNICATION PARAMETERS
  APN Server (Max 30 Digits) : internet-entreprise
  APN Login (Max 30 Digits) :
  APN Password (Max 30 Digits) :
  Time between connection attempt: 5mn
Escape=Exit
```

### Time between connection attempt :

Delay time between 2 failed connection attempts to the IP network

## TCP/IP Parameters

(GPRS version only)

### F200C Parameters

#### Host address:

The address of the F200C is currently allocated dynamically (0.0.0.0 corresponds to dynamic allocation). The allocated address is readable in Equipment State menu. This field should be writable in future use

#### Listen Mode:

Select yes, if you want F200C to listen to incoming TCP connection. When the equipment is in alarm mode, F200C stops listening to incoming connection.

#### Local Port:

Enter the port number you want F200C to listen to incoming TCP connection. Value is from 1 to 65535.

#### Max transmission time:

Maximum duration of a TCP/IP connection. On time-out expiry, the TCP/IP connection is closed.

Each time the F200C receives a request, the timer is re-armed.

```
----- MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit -----
                                TCP/IP parameters
F200C PARAMETERS
  Host address(0.0.0.0 if dynamic) : 0.0.0.0
  Listen mode : yes
  Local port(1-65535) : 20000
  Max transmission time : 10mn
  TCP connect. delay - 1st try : 1s
  (0s = random value) - 2nd try : 1mn
  - 3rd try : 2mn
SCADA PARAMETERS
  IP address : 192.168.1.13
  Socket type : TCP
  Remote port(1-65535) : 2404
Escape=Exit
```

### TCP/IP connect. delay:

Time to send an alarm configured with "delayed" option:

- **first attempt:** adjustable from **0 to 1min. per steps of 1s.** Setting it to "0" selects a random time between 0 and 1 min (this is mandatory to prevent all equipment calling the SCADA at the same time).
- **second attempt:** configurable from **0 to 5min. per steps of 1min.** Setting it to "0" selects a random time between 0 and 5 min.

- **third attempt:** configurable from **0 to 10 min, in steps of 1 min**. Setting it to "0" selects a random time between 0 and 10 min

Note: The 2nd and 3rd emissions are only used by the equipment if the preceding one did not manage to send the frame.

## DNP3 Parameters

### Idle line delay :

It's the minimum line idle interval between two consecutive frames. Values are from 10 to 100 ms.

- 10 ms is the default value.

### Requires Data Link Layer Confirm :

- Select "yes" if you want User Data to be sent using a "SEND – CONFIRM expected" frame type by the Link Layer. Selecting "no" configures Link Layer to use a "SEND – NO REPLY expected" frame type for User Data transmission.

Notice that in the case where "SEND – NO REPLY expected" frame type is used F200C will never send "RESET of remote link" frames. It will work strictly as a slave.

- Default is "yes".

### Maximum Data Link Re-tries :

- Defines the number of re-tries by the Link Layer, when the RTU doesn't receive any "CONFIRM" frame (ACK or NACK) to a frame using a "SEND – CONFIRM expected" frame type. When the Maximum Data Link Re-tries is reached without confirmation, Link Layer will perform "RESET of remote link" to re-initialise the link.
- Default value is 3.

### Time-out :

- It's the delay Link Layer will wait for a "CONFIRM" frame after sending a "SEND – CONFIRM expected" frame. Values are from 1 to 10 s.
- Default value is 5 s.

## SCADA Parameters

### Ip address :

Enter the Ip address of the SCADA

### Socket type:

Not implemented(for future use).

### Remote port:

Enter the port number the SCADA listens to incoming connection.

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                                DNP3 Parameters
=====
LINK LAYER
Idle line delay                  : 10ms
Requires Data Link Confirm      : no
Maximum Data Link Re-tries      : 3
Time-out                        : 5s
Delay before emission           : 10s

APPLICATION LAYER
Handle requested object(s) unknown bit : yes
Sends Unsolicited Responses        : no
Wait delay                          : 100ms
Requires Application Confirm        : no
Maximum Application Re-tries        : 3
Time-out                             : 1mn
Transmission of currents on changes : yes
Deadband value                      : 10

Escape=Exit
=====
    
```

### Delay before emission :

- To avoid collision when spontaneously emitting on a half-duplex link, F200C will wait a T delay after seeing the link is no more busy (using CD). If at this moment, CD is still not present, F200C 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. Configured values are from 0 to 10 s.
- Default value is 0 s.

### Transmission of currents on changes :

- You can permit or inhibit transmission of currents measurements on changes by selecting respectively "yes" or "no".
- Default value is "yes".

### Deadband value

- It's the difference there must be between last reported value and current value to have a Change Event generated. Range is from 1 to 10 000 in increments of 1.
- Default value is 10

## Equipment State

The equipment states menu is used to display the information linked to the state of the F200C.

### Fault passage indicator

Faults are indicated in reverse video

### Equipment States

Current states are indicated in reverse video

### Digital Outputs

Use the “S” (select), “C” (confirm) and “A” (cAnceL) keys to control the relay outputs

### Digital Inputs

Inputs in logical state 1 are indicated in reverse video

Modem not identified: F200C was unable to communicate with the modem used.

GSM SIM card failure: F200C has detected the embedded GSM modem card, but cannot read the SIM card.

Ip address (GPRS only): Indicates the current Ip address of the F200C.

### GSM signal quality

Specific to the GSM modem, the barchart indicates the quality of the reception signal

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
                               Equipment state
Fault passage indicator:
Phase fault
Earth fault
Equipment state:
Flair 200C fault
Local conf
Remote conf
Config. fault
Alarm processing...
AC supply off
Communication state:
Modem not identified
SIM card failure
GSM signal quality:
The signal must be between 17 and 31 (0 at start, 99 is faulty)
received signal: 0
                               Digital outputs:
-----[|]-----> D01
-----[|]-----> D02
                               DO Controle: Select
                               Confirm command
                               cAnceL command
                               Digital inputs:
DI 1
DI 2
DI 3
DI 4
DI 5
DI 6
Modem state :
TCP Connected !
Ip address :
193.249.197.190
Escape=Exit
    
```

Modem state	comments
Modem Init...	G200 is configuring the modem
Entering code pin...	-
Code pin error !	Wrong code pin
Network registration...	IMSI registration
GPRS registration...	
PDP Init...	Open a PDP session
PDP Closing...	Close the PDP session
PDP Status...	Check the PDP status
PDP Connected !	Stand-bye state when listen mode is not activated.
Closing TCP listened	Close the listen port
TCP Closing...	Disconnection from the SCADA
TCP Listening...	Opening the listen port
TCP Listened !	Stand-bye state when listen mode is activated.
TCP Connecting...	Try to connect to the SCADA
TCP Connected !	Connected to the SCADA
Modem failure !	
GSM registration denied !	IMSI registration is refused by the operator (check your SIM card right with your provider)
GPRS registration denied !	GPRS registration or PDP activation is refused by the operator (check your SIM card right with your provider)

## DNP3 Analyser

This analyser shows the different frames recognised with some complementary information such as the direction of the frame (Host -> F200C or F200C -> Host), possibly the error detected (character framing error, overflow, checksum, bad length, bad control character). In case of multiple errors, it's the first one that is indicated.

Each correct frame is shown, one block per line (10 bytes for the first one, 18 bytes for next ones, last one may be shorter).

```

===== MERLIN GERIN - Configuration and Diagnostic - ALT+F4=Exit =====
31:43.16 >>..... 05 64 4F 44 00 00 00 00 03 C5
C7 C7 81 90 00 01 01 00 00 17 07 02 00 1E 02 00 16 82
00 06 01 00 00 01 00 00 01 00 00 01 00 00 01 00 F2 60
00 01 18 FC 01 86 13 1E 01 00 07 0A 01 F6 08 00 73 B9
55:52.99 < ..... 05 64 11 C4 00 00 00 00 CE 83
E0 C4 01 3C 02 06 3C 03 06 3C 04 06 95 9D
55:53.00 >>..... 05 64 0A 44 00 00 00 00 F7 93
E5 C4 81 90 02 4F 2B
55:55.09 < ..... 05 64 11 C4 00 00 00 00 CE 83
E1 C5 01 3C 02 06 3C 03 06 3C 04 06 FC 67
55:55.10 >>..... 05 64 0A 44 00 00 00 00 F7 93
E6 C5 81 90 02 AD 8C
55:57.20 < ..... 05 64 11 C4 00 00 00 00 CE 83
E2 C6 01 3C 02 06 3C 03 06 3C 04 06 3E 24
55:57.21 >>..... 05 64 0A 44 00 00 00 00 F7 93
E7 C6 81 90 02 EA A5
55:57.69 < ..... 05 64 0B C4 00 00 00 00 64 47
E3 C7 01 3C 01 06 3F DB
55:57.78 >>..... 05 64 4F 44 00 00 00 00 03 C5
E8 C7 81 90 00 01 01 00 00 17 07 02 00 1E 02 00 9A D4
00 06 01 98 04 01 88 04 01 8F 04 01 92 05 01 8F 49 2A
04 01 5E 01 01 8A 13 1E 01 00 07 0A 01 DA 08 00 C0 17
Pause...
    
```

<h1>DNP V3.00</h1> <h2>DEVICE PROFILE DOCUMENT</h2>	
Vendor Name :	SCHNEIDER ELECTRIC
Device Name :	F200 C DNP3 V1.00
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"> <li>• Binary input - All Variations : Read all points</li> <li>• Binary counter – All Variations : Read all points</li> <li>• Analog input - All Variations : Read all points</li> <li>• Analog output -All Variations: Read all points</li> </ul>	
Maximum Data Link Frame Size (octets) :  Transmitted :    292  Received :       (must be 292)	Maximum Application Fragment Size (octets) :  Transmitted :   1369 <sup>(1)</sup>  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 <sup>(2)</sup>	Maximum Application Layer Re-tries :  <input type="checkbox"/> None <input type="checkbox"/> Fixed at ____ <input checked="" type="checkbox"/> Configurable, range 1 to 10 <sup>(2)</sup>

<sup>(1)</sup> 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).

<sup>(2)</sup> Local configuration with a PC.

Requires Data Link Layer Confirmation :

Never  
 Always  
 Sometimes  
 Configurable<sup>(3)</sup>

---

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<sup>(3)</sup>

---

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 <sup>(3)</sup>
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 <sup>(3)</sup>
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 <sup>(4)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
DIRECT OPERATE	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always <sup>(5)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
DIRECT OPERATE – NO ACK	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always <sup>(5)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Count > 1	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always <sup>(5)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse On	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always <sup>(6)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse Off	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always <sup>(6)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch On	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always <sup>(6)</sup>	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch Off	<input type="checkbox"/> Never	<input checked="" type="checkbox"/> Always <sup>(6)</sup>	<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

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

<p>Reports Binary Input Change Events when no specific variation requested :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Only time-tagged</li> <li><input type="checkbox"/> Only non-time-tagged</li> <li><input type="checkbox"/> Configurable to send both, one or the other (attach explanation)</li> </ul>	<p>Reports time-tagged Binary Input Change Events when no specific variation requested :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Binary Input Change With Time</li> <li><input type="checkbox"/> Binary Input Change With Relative Time</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> </ul>
<p>Sends Unsolicited Responses :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Configurable (attach explanation)</li> <li><input type="checkbox"/> Only certain objects</li> <li><input type="checkbox"/> Sometimes (attach explanation)</li> </ul> <p><input type="checkbox"/> ENABLE/DISABLE UNSOLICITED Function codes supported</p>	<p>Sends Static Data in Unsolicited Responses :</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Never</li> <li><input type="checkbox"/> When Device Restarts</li> <li><input type="checkbox"/> When Status Flags Change</li> </ul> <p>No other options permitted.</p>
<p>Default Counter Object/Variation :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No Counters Reported</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> <li><input checked="" type="checkbox"/> Default Object <u>20</u>.</li> <li>                  Default Variation <u>01</u>.</li> <li><input type="checkbox"/> Point-by-point list attached</li> </ul>	<p>Counters Roll Over at :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No Counters Reported</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> <li><input type="checkbox"/> 16 Bits</li> <li><input checked="" type="checkbox"/> 32 Bits</li> <li><input type="checkbox"/> Other Value _____</li> <li><input type="checkbox"/> Point-by-point list attached</li> </ul>
<p>Sends Multi-Fragment Responses : <input checked="" type="checkbox"/> Yes    No <input type="checkbox"/></p>	

## F200C DNP 3.0 Communication 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 Output Block	5,6	17,28	129	Echo of request	
20	0	Binary Counter – All Variations	1	06			
20	1	32-Bit Binary Counter			129	00	
30	0	Analog Input – All Variations	1	06			
30	1	32-Bit Analog Input			129	00	
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**



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						Digital Output 1
Control Relay Output Block	1/1	12	1						Digital Output 2
Control Relay Output Block	2/2	12	1						Preset energy
Control Relay Output Block	3/3	12	1						Reset of Fault Passage Indicator

**Control relay output block :**

**0 and 1** : Command of digital output 1 and 2.

**2** : Loading of the meter Energy with the preset energy value (32 bits) on closing order.

**3** : Fault passage indicator reset on closing order.

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	Digital Input 1
Binary Input	1 / 1	1	1	No Status	2	2	1	With Time	Digital Input 2
Binary Input	2 / 2	1	1	No Status	2	2	1	With Time	Digital Input 3
Binary Input	3 / 3	1	1	No Status	2	2	1	With Time	Digital Input 4
Binary Input	4 / 4	1	1	No Status	2	2	1	With Time	Digital Input 5
Binary Input	5 / 5	1	1	No Status	2	2	1	With Time	Digital Input 6
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	Flair 200C fault
Binary Input	9 / 9	1	1	No Status	2	2	1	With Time	Local configuration
Binary Input	A / 10	1	1	No Status	2	2	1	With Time	Remote configuration
Binary Input	B / 11	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	C / 12	1	1	No Status	2	2	1	With Time	Configuration fault
Binary Input	D / 13	1	1	No Status	2	2	1	With Time	Stack 80%
Binary Input	E / 14	1	1	No Status	2	2	1	With Time	Event loss
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	Earth fault
Binary Input	11 / 17	1	1	No Status	2	2	1	With Time	Fugitive. earth fault
Binary Input	12 / 18	1	1	No Status	2	2	1	With Time	AC supply off phase 1
Binary Input	13 / 19	1	1	No Status	2	2	1	With Time	Phase fault
Binary Input	14 / 20	1	1	No Status	2	2	1	With Time	Fast phase fault
Binary Input	15 / 21	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	16 / 22	1	1	No Status	2	2	1	With Time	Reserved
Binary Input	17 / 23	1	1	No Status	2	2	1	With Time	Reserved

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	Phase current I1
Analog Input	1 / 1	30	2	16-Bit	32	4	1	16-Bit With Time	Phase current I2
Analog Input	2 / 2	30	2	16-Bit	32	4	1	16-Bit With Time	Phase current I3
Analog Input	3 / 3	30	2	16-Bit	32	4	1	16-Bit With Time	Homopolar current I0
Analog Input	4 / 4	30	2	16-Bit	32	4	1	16-Bit With Time	Average current Imean
Analog Input	5 / 5	30	2	16-Bit					Power factory
Analog Input	6 / 6	30	2	16-Bit					Frequency

Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Input	7 / 7	30	1	32-Bit					Voltage phase 1
Analog Input	8 / 8	30	1	32-Bit					Active power
Analog Input	9 / 9	30	1	32-Bit					Reactive power
Analog Input	A / 10	30	1	32-Bit					Apparent power

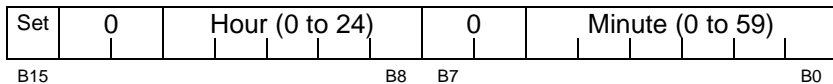
Description	Index (hex/dec)	Default Static Variation			Default Event Variation				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Binary counter	0 / 0	20	1	32-Bit					Energy

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	Cyclic dial up period
Analog Output	1 / 1	41	1	32-Bit	40	1	1	32-Bit Without Time	Energy preset value
Analog Output	2 / 2	41	1	32-bit	40	1	1	32-Bit Without Time	F200C IP address (GPRS version only) (read only for future use)
Analog Output	3 / 3	41	1	32-bit	40	1	1	32-Bit Without Time	SCADA IP address (GPRS version only)

**Analog output 0 : Cyclic dial period**

The Flair 200C may periodically dial up. This function can be used to check if the equipment is still running and to download measurements. The parameters of the cyclic dial up are coded as follows :

Most significant byte :

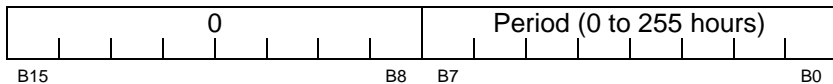


Set = 1 : Cyclic dial up process is on (only if alarms are activated).

Set = 0 : Cyclic dial up process is off.

Hour and Minute stand for the starting time of the process in the current day.

Least significant byte :



Period stands for the number of hours between two automatic calls.

**Analog output 2 and 3 : IP addresses (for GPRS only)**

F200C IP address: IP address of the F200C (must be 0.0.0.0 if dynamic allocation is used)

SCADA IP address: IP address of the SCADA

Each byte can be : 0 <byte < 255

For instance, 193.251.9.68 is coded as :

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

Description	Index (hex/dec)	WRITE			READ				Point Name
		Obj	Var	Desc	Obj	Var	Class	Desc	
Analog Output	4 / 4	41	2	16-Bit	40	2	1	16-Bit Without Time	Alarms on TSS
Analog Output	5 / 5	41	2	16-Bit	40	2	1	16-Bit Without Time	Power off threshold
Analog Output	6 / 6	41	2	16-Bit	40	2	1	16-Bit Without Time	Power on threshold
Analog Output	7 / 7	41	2	16-Bit	40	2	1	16-Bit Without Time	Imax threshold
Analog Output	8 / 8	41	2	16-Bit	40	2	1	16-Bit Without Time	I0 threshold
Analog Output	9 / 9	41	2	16-Bit	40	2	1	16-Bit Without Time	Reset fault time
Analog Output	A / 10	41	2	16-Bit	40	2	1	16-Bit Without Time	Imax fault ack. time
Analog Output	B / 11	41	2	16-Bit	40	1	1	16-Bit Without Time	I0 fault ack. time
Analog Output	C / 12	41	2	16-Bit	40	1	1	16-Bit Without Time	Flair 200C port (GPRS only)
Analog Output	D / 13	41	2	16-Bit	40	1	1	16-Bit Without Time	SCADA port (GPRS only)

**Analog output 4 : Alarms on TSS**

1 = Alarm is ON if the TSS is ON

0 = Alarm is not used

Analog output 4 : alarms on TSS		
Alarme	Désignation	Bit
1	Digital input 1	0
2	Digital input 2	1
3	Digital input 3	2
4	Digital input 4	3
5	Digital input 5	4
6	Digital input 6	5
7	Flair 200C fault	6
8	Test alarm	7
9	Short message system enabled	8
10	Reserved	9
11	AC supply off	10
12	Phase fault	11
13	Earth fault	12
14	Alarm message set up	13
15	Reserved	14
16	Reserved	15

**Analog output 5 to 11 :**

Parameter of measurements range					
Analog Output index (decimal value)	Parameter	min	max	Incremental value	unit
5	Power off threshold	5	95	1	%
6	Power on threshold	70	120	1	%
7	Imax threshold	40	750	1	A
8	I0 threshold	20	160	1	A
9	Reset fault time	1	12	1	h
10	Imax fault ack. time	40	800	1	ms
11	I0 fault ack time	20	800	1	ms

**Analog output 12 and 13 : F200C and SCADA ports (for GPRS only)**

F200C port : local port on which F200C is listening to incoming connections (only if local parameter listen mode is <ON>)

SCADA port : remote port on which the SCADA is listening to incoming connections from F200C

Possible values: 1 to 65535

## **Internal INdications**

### **Control center time synchronization**

Bit 4 of first IIN byte is set when F200C starts up. This bit is cleared when the SCADA sends its first clock synchronization message.

Then F200C 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 F200C not receive a new synchronization message from the master within an hour after the last one, the IIN bit is set.

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