



## MULTI-LINE 2



### Option N

- Modbus TCP/IP
- SMS/e-mail alarms
- NTP time synchronisation



DEIF A/S · Frisenborgvej 33 · DK-7800 Skive

Tel.: +45 9614 9614 · Fax: +45 9614 9615

info@deif.com · www.deif.com

Document no.: 4189340701E

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# 1. Delimitation

## 1.1 Scope of option N

This description of options covers the following products:

|                                |                                                                                                       |
|--------------------------------|-------------------------------------------------------------------------------------------------------|
| AGC-3                          | SW version 3.31.x or later<br>(The SMS or e-mail transfer function is not supported for this product) |
| AGC-4                          | SW version 4.68.x or later                                                                            |
| ASC-4                          | SW version 4.00.0 or later                                                                            |
| PPM-3                          | SW version 3.08.8 or later                                                                            |
| GPC-3<br>GPU-3                 | SW version 3.04.1 or later<br>(The SMS or e-mail transfer function is not supported for this product) |
| PPU-3/GPU-3 marine version     | SW version 3.10.1 or later                                                                            |
| Multi-line 2 utility software  | SW version 3.42.0 or later                                                                            |
| Option N configurator software | SW version 1.2 (build 1.2.0.58) or later                                                              |
| Option N firmware              | SW version 2.40.1 or later                                                                            |

## 2. General information

### 2.1 Warnings, legal information and safety

#### 2.1.1 Warnings and notes

Throughout this document, a number of warnings and notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted as follows in order to separate them from the general text.

##### Warnings



##### **DANGER!**

Warnings indicate a potentially dangerous situation, which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

##### Notes



##### **INFO**

Notes provide general information, which will be helpful for the reader to bear in mind.

#### 2.1.2 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.



##### **INFO**

The Multi-line 2 unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

##### Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

#### 2.1.3 Safety issues

Installing and operating the Multi-line 2 unit may imply work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.



##### **DANGER!**

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

#### 2.1.4 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

### **2.1.5 Factory settings**

The Multi-line 2 unit is delivered from factory with certain factory settings. These are based on average values and are not necessarily the correct settings for matching the engine/generator set in question. Precautions must be taken to check the settings before running the engine/generator set.

## **2.2 Open source software**

This product contains open source software licensed under, for example, GNU General Public License (GNU GPL) and GNU Lesser Public License (GNU LGPL). The source code for this software can be obtained by contacting DEIF A/S at [support@deif.com](mailto:support@deif.com). DEIF A/S reserves the right to charge for the cost of the service.

## 3. Description of option

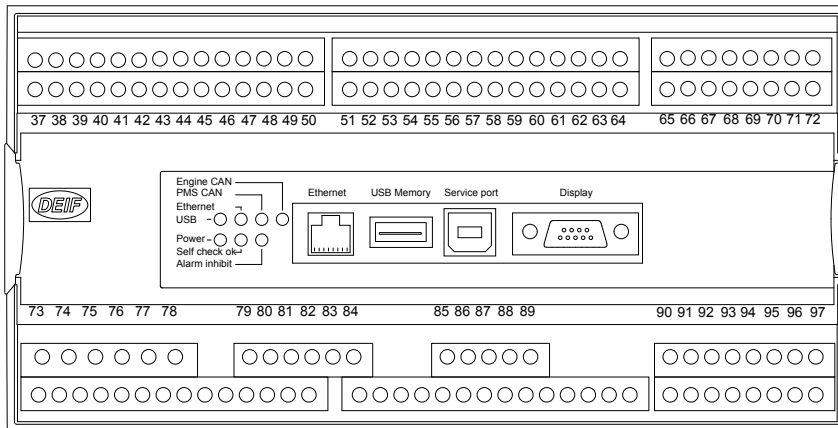
### 3.1 Hardware

The option N is an Ethernet hardware option offering a number of features; hereafter called option N. The hardware needed for option N replaces the default interface board placed under the service port (see figure below).

The option N board has four connectors:

1. Display port (9-pole SUB-D)
2. Service port (USB A-B)
3. USB Memory (currently not used)
4. Ethernet (RJ-45 for CAT 5 cable)

There are currently three different option N hardware cards which are almost identical in features, but they are different in hardware. You can tell which card type you have from the version of the software embedded in option N. This information can be retrieved from the jump menu 9000 on the display unit. Either it is version 1.xx.x (type 1), or it is version 2.xx.x (type 2 or 3). For type 2 or 3, if the MAC address of the unit is 00:D0:C8:02:xx:xx or higher, it is the last hardware type, type 3. Otherwise, it is type 2. This document focuses on the most recent version, but it also describes the differences compared to a setup using the older option N hardware.

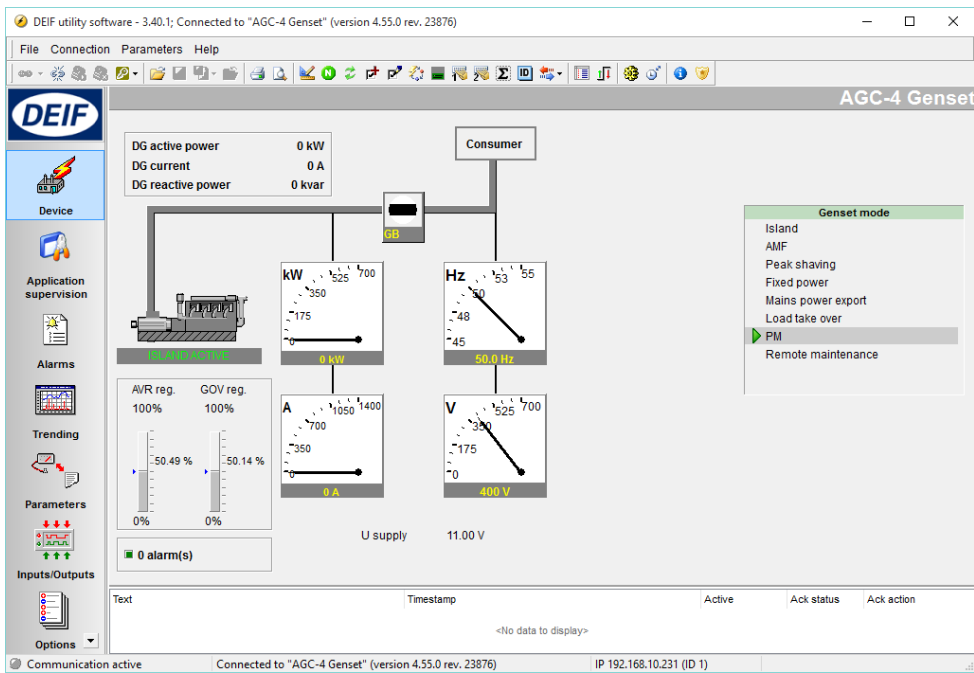


**Multi-line 2 device mounted with the option N interface board.**

### 3.2 Option N configuration software

The features that option N offers can only be configured using the free PC tool:

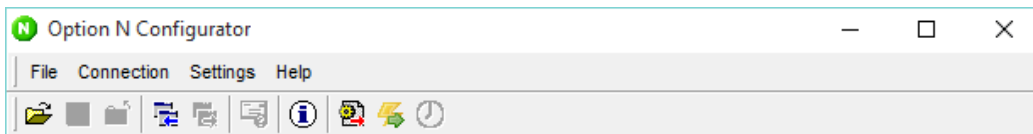
DEIF Multi-line 2 utility software v.3.x (USW).



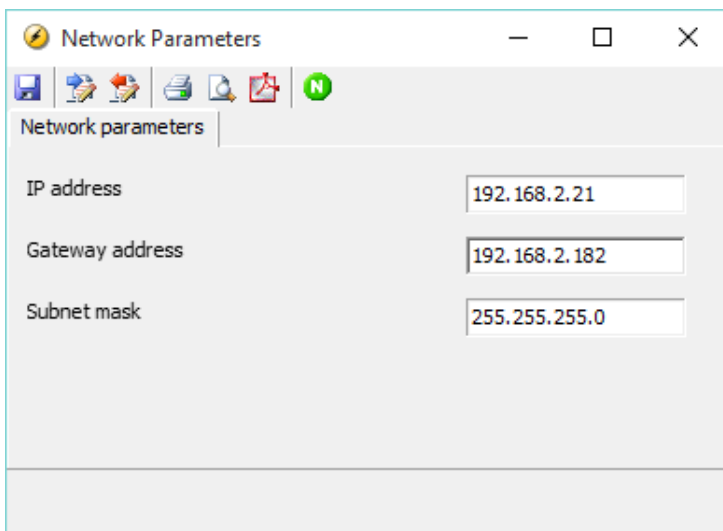
The USW-3 can be downloaded from: [www.deif.com](http://www.deif.com).

To open the option N configurator, the utility software has to be opened. Click the icon  at the top of the utility software to open the option N configurator.

The layout of the option N configuration tool can have two different looks, dependent on the image version of option N in the controller. The image version in the controller can be checked by pressing JUMP on the display and then going to parameter 9003. If the controller has image version 2.1x or earlier, the option N configurator will look like this:

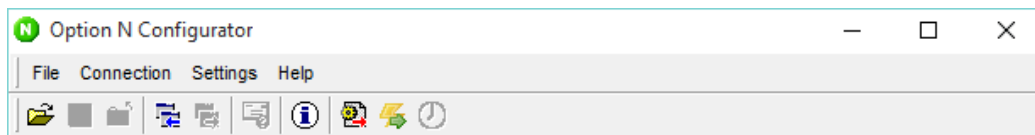


If the image version of option N in the controller is 2.2x or later, the first window to pop up will look like this:



To open the option N configurator, click the option N configurator button inside the pop-up window.

When selected, the option N configurator will show:



## 4. Network configuration of the option N board

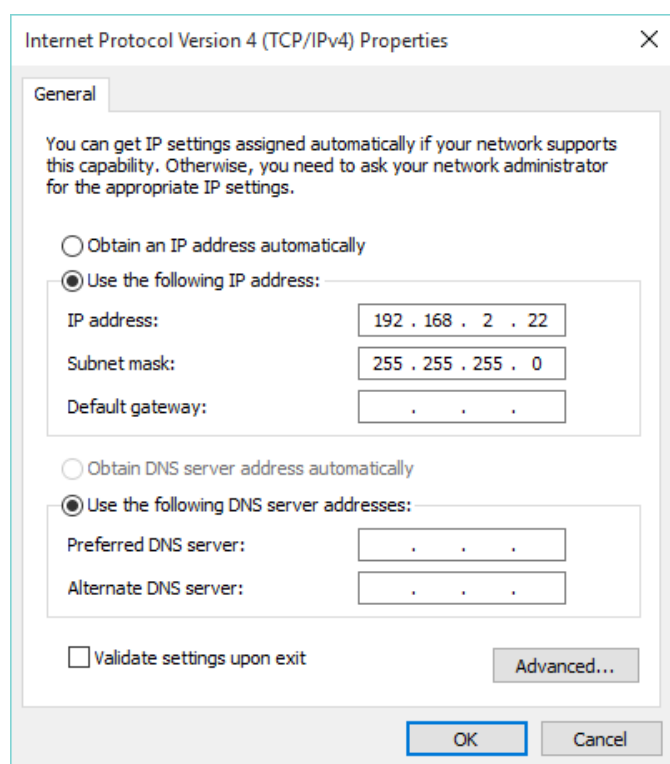
### 4.1 Network settings

The Ethernet port of the Multi-line 2 option N board is delivered pre-configured with these network settings:

|             | Factory setting |
|-------------|-----------------|
| IP address  | 192.168.2.21    |
| Subnet mask | 255.255.255.0   |

The network parameters can be set by the utility software. To start up, it is important that the PC has a static IP address, and also that there is direct connection between the controller and the PC by means of an Ethernet cable.

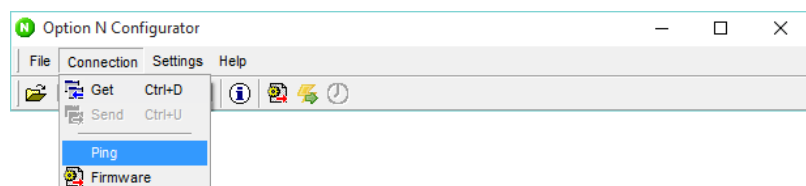
The static IP address can be set up by entering the properties for TCP/IPv4 (TCP/IPv4 can be found in "Control panel" and "Network and Internet settings" on your PC). Change the settings of the static IP to the ones shown below.



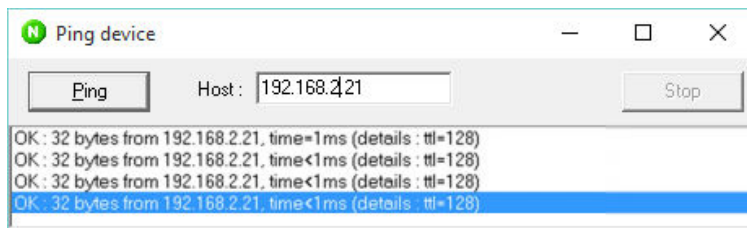
### 4.2 Option N board setup (image version 2.1x or older)

#### 4.2.1 Setup of version 2.1x or older

When your PC has been set up as described on the previous pages, and the PC is directly connected to the Ethernet socket of the option N board, you must check if you have access by means of the "Ping" menu of the option N configuration software.



Enter the IP address of the controller and click the "Ping" button (see example below).

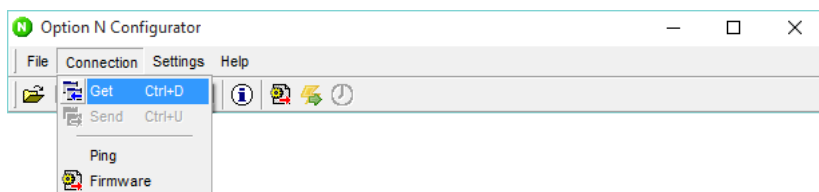


If the communication is OK, then close this window.

## 4.2.2 Modifying the network configuration from the option N configuration software

When the option N configuration software is running, it is possible to modify the option N network parameters (IP address, subnet mask, and so on).

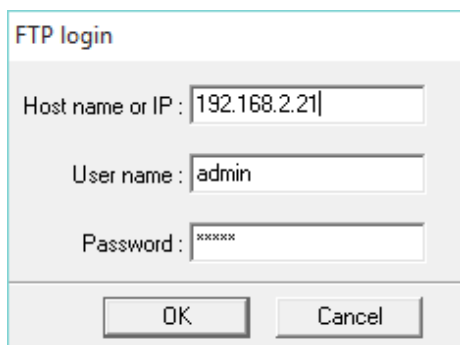
First you will have to click the "Get" button in the connection tab; see the picture below.



When this is done, a login window will show. Here you will have to type the IP address of the controller, username and password.

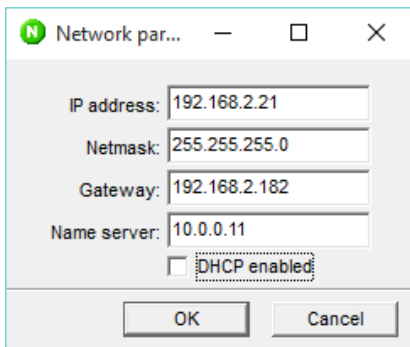
Username: admin

Password: admin



When you are logged in, it will be possible to change the network parameters. This is done by selecting the "Settings" tab, and then "Network parameters".

The parameters below are read, and they can be modified here:



DHCP is a new feature in version 2.xx.x of the option N card. When the DHCP function is enabled, the network parameters will be retrieved automatically if a DHCP server is available in the local network. If no DHCP server is available, the network parameters will fall back to factory settings.

Click the OK button to write the new configuration to the Multi-line 2 unit.

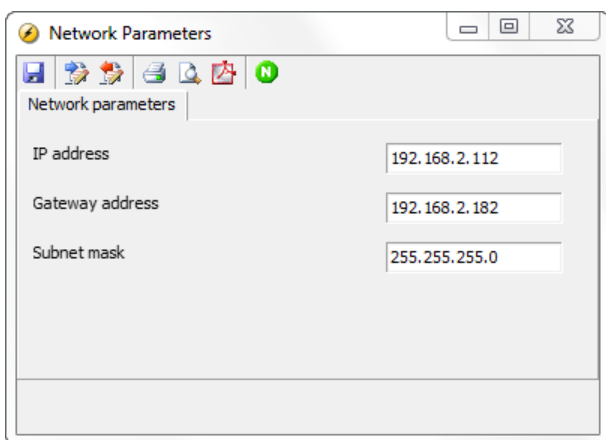
After clicking OK, option N reboots automatically. It will take 90 seconds before the unit is fully operational again.

You can save all these network parameters in a file (file extension: .OptionN) by using the save function.

## 4.3 Option N board setup (image version 2.2x or later)

### 4.3.1 Setup of version 2.2x or later

The IP address can be set up by means of the utility software or the display. To set the IP address by means of the utility software, it is only required to click the option N configurator icon. Then the network parameters will pop up as the first.



Note that the above window will not pop up if the utility software was not already connected to the Multi-line 2 unit. In this case, the option N configuration software will be displayed instead. In this window, it is possible to change the network parameters. When

changes have been made, it is required to write them to the device. This is done by clicking the icon with the red arrow in it .

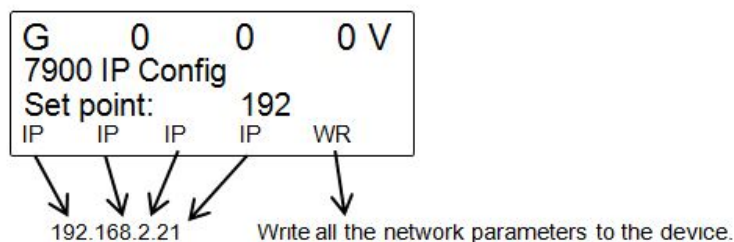
Alternatively, the network parameters can be set by means of the display, but only if the image version is 2.2x or later. This is possible with all the units listed below:

- The **AGC-4** unit from software version 4.55.0
- The **ASC-4** unit from software version 4.00.0
- The **GPU-3** and the **PPU-3** marine version units from software version 3.10.0

In the display, the parameters can be found in menu numbers 7900, 7910 and 7920.

The IP address can be changed in menu 7900, the gateway address in menu 7910, and subnet mask in menu 7920. When changes have been made, they must be written to the device. This is done in parameter 7905, which is also shown furthest to the right, in the IP address config. menu (7900).

The IP window looks like this:

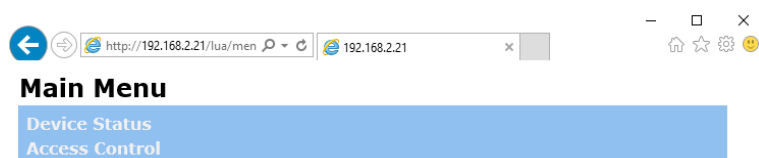


- INFO**  
When parameters 7900, 7910 and 7920 are accessed, the numbers shown are not necessarily the actual network parameters. If network parameters have been changed from the utility software, the displayed numbers will be wrong.
- INFO**  
When you click Write, both IP address, gateway and subnet mask will be sent, even if only one of them has been changed.

## 4.4 Access control setup

### 4.4.1 Access control setup

Using a web interface, the usernames and passwords of the option N card can be set. This function is to allow access for selected users only. To programme this access control, you must start your internet browser software, enter the IP address in the internet address field and click Enter.



Click the bottom link, "Access Control", to change the access control parameters of the option N card (username = admin, password = admin).

← → http://192.168.2.21/luas/setting 192.168.2.21

## Access Control

### Passwords

| Page                | Old password | New password | Retype new |
|---------------------|--------------|--------------|------------|
| Admin page (this) : |              |              |            |
| Applications :      |              |              |            |
| FTP/Telnet/admin :  |              |              |            |
| FTP/Telnet/root :   |              |              |            |

Set

### WWW IP Filtering

☐ Use same (Admin page) filter for everything

Admin page (this) : \*

Applications : \*

Modbus/TCP/IP :

Update

#### About Filter Rules

An IP filter consists of a list of one or more patterns, each of which specifies a valid or excluded address. A pattern is an IP address, possibly with "\*" replacing part of the end of the address. If the pattern starts with "!" the address is excluded instead of included. Patterns are separated with commas and/or whitespace. The list of patterns are evaluated from left to right, and evaluation continues until the IP address in question is either rejected or accepted.

The filter rule examples to the right show 1) Access granted to one host only, 2) Access granted to the hosts on one class C network only, 3) Access denied for one host, granted to all others. 4) Access granted to all.

```
192.168.1.1
192.168.1.*
!192.168.1.2 , *
=
```

Notice: Changes in filter settings will not take effect until the unit is restarted.  
You may use the restart button below to do so.

Restart

[Back to main menu](#)

## "Passwords"

Is used to modify the passwords of each web page type (admin, application or FTP).

## "WWW IP Filtering"

Is used to select one or several IP addresses that will be allowed to access the option N card for each option N application type. If these fields are left blank, no IP address filter is applied, and the option N card is accessible by all IP addresses without any restrictions.

## 5. TCP/IP Modbus communication

TCP/IP Modbus is identical with the classical serial Modbus communication, except for the fact that the media used for this communication is a TCP/IP communication. So the basic Modbus functionalities will not be explained here, but more information can be found in the Multi-line 2 option H2 (Modbus option) documentation, which can be downloaded free of charge from the DEIF website, [www.deif.com](http://www.deif.com).

The useful parameters required from the software you use for communicating with the option N card by means of TCP/IP Modbus communication are:

- The **IP address** of the option N card to talk to
- The **port number** to be used

The previous chapters explain how to set up the IP address parameter of the option N card. The port number to be used is: **502**.

## 6. SMS or e-mail alarms transfer

### 6.1 SMS or e-mail alarms transfer

When the option N card has access to the Internet, it can be configured to send SMS and e-mail alarm messages. These functions require third party service providers (often a priced service), a DNS server and eventually an SMTP server.

The SMS function has been designed and tested to work with the Clickatell service provider,

[www.clickatel.com](http://www.clickatel.com).

The e-mail function requires an available e-mail server that supports SMTP. Most popular e-mail servers support SMTP. Contact your system administrator for details.

This alarm application supervises a number of Modbus flags. Should one or more of these alarm flags get set, the configured SMS and/or e-mail messages will be sent.

Each of the supervised alarm flags holds the state of a "fail class", which is one of the following:

| Controller type      | Fail class                                                                     |
|----------------------|--------------------------------------------------------------------------------|
| AGC-4 DG or standard | Block, Warning, Trip GB, Trip+stop, Shutdown, Trip MB, Safety stop, Trip MB/GB |
| AGC-4 Mains          | Block, Warning, Trip TB, Trip MB, Trip MB/TB                                   |
| AGC-4 BTB            | Block, Warning, Trip BTB                                                       |
| ASC-4                | Warning, Shutdown                                                              |
| PPM-3 DG             | DG unit: Block, Warning, Trip GB, Trip+stop, Shutdown, Safety stop             |
| PPM-3 BTB            | Block, Warning, Trip BTB                                                       |
| PPM-3 SG             | Block, Warning, Trip SGB, Safety stop                                          |
| PPM-3 SC             | Block, Warning, Trip SCB, Safety stop                                          |
| PPM-3 EDG            | Block, Warning, Trip of GB, Trip and stop, Shutdown, Trip of TB                |

Note that the above list can be modified in the future and that it is exhaustive only at the time that this documentation is written.

Nine e-mail receivers and nine SMS receivers can be defined. For each recipient, the fail classes to receive notifications about can be defined. For e-mails, it can furthermore be specified if the user should receive the mails as a "to" receiver or a "cc" receiver.

The alarm flags are scanned every second and for each unit (from lowest to highest CAN ID number), each fail class (from highest to lowest priority) is evaluated, and e-mail/SMS messages are sent accordingly.

There is one special case, where an alarm is suppressed: when a warning alarm is detected at the same time as some higher priority alarm, the warning alarm will not be sent.

### 6.2 SMS or e-mail alarms configuration

You must use the "Get" function (  ) to be able to access this alarm function. Then go to the "Settings" menu and select the "Email and SMS" menu, or click the "Email and SMS settings" icon (  ).

**Email and SMS**

Remember to activate the "SMS and Email" function if not already

**Email general:**

Address of SMTP server:

Sender address:

User name for mail server:

Password for mail server:

User text in email:

**SMS general:**

SMS gateway:

User name for SMS gateway:

Password for SMS gateway:

SMS gateway ID (optional):

Pattern for mail subject line:

Pattern for mail body:

Pattern for http GET request:

Http proxy:

User text in SMS:

**Alarms**

**Email**

| Recipients Email | Alarm list |
|------------------|------------|
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |

**SMS**

| Recipients tif | Alarm list |
|----------------|------------|
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |

Read from device Send to device OK Cancel

Send to device >>> Write the above configuration to the option N card.

Read from device >>> Read the configuration present in the option N card.

**Email general**

Address of SMTP server:

Sender address:

User name for mail server:

Password for mail server:

User text in email:

## Email general

This field gathers all the useful parameters for exporting the alarms by means of e-mail messages. This section is then connected to the e-mail section containing the "Recipients e-mail" (right upper section of this window). If you do not require exporting the alarms by means of e-mail messages, do not fill in these fields.

### Address of SMTP server

Must contain the IP address (or the URL address) of the SMTP server you want to use for exporting alarms by means of e-mail messages and eventually the port number that must be used. The standard port of the standard SMTP service is port number 25.

To add security to some existing protocols (for example IMAP, POP, and so on), it was decided to add encryption as a layer underneath the existing protocol. However, to determine that the software should talk the encrypted version of the protocol rather than the plain text one, a different port number is used for each protocol.

Adding the port number 465 to the SMTP server address will automatically use SSL/TLS encryption. It is this encryption type that is typically used by Google mail or gmail. In this case, here we could enter **smtp.gmail.com:465** as address of the SMTP server.

The port number 587 can also be used for STARTTLS encryption. It is this encryption type that is typically used by Microsoft hotmail. In this case, here we can enter **smtp.live.com:587** as address of the SMTP server, and this encryption type will automatically be used here too.

Remember to open the used port number on your network if the SNMP server is not directly placed on your local network (LAN), or ask the network administrator if special local network rules or rights are blocking the communication to the SNMP server locally.

### Sender address

Must contain the sender's e-mail address.

### Username for mail server

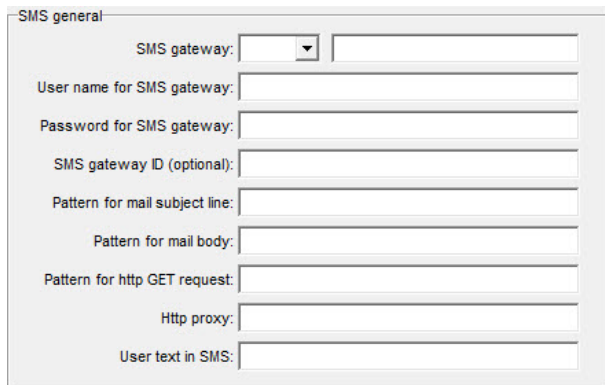
If required by the used SMTP server, you can type a username here.

### Password for mail server

If required by the used SMTP server, you can type a password here.

### User text in e-mail

The text you enter here will be placed in the subject line of the sent e-mail messages.



### SMS general

This field gathers all the useful parameters for exporting the alarms by means of SMS messages. This section is then connected to the section containing the 'Recipients tlf' (right lower section of this window).

### SMS gateway

Two different services can be used to export alarms by means of SMS messages when using the services from an SMS gateway provider (for example: Clickatell [www.clickatell.com](http://www.clickatell.com)):

- http to SMS (see the Clickatell http post specification document [\\_SMS Gateway](#)).
- mail to SMS (see the Clickatell SMTP post specification document [\\_SMS Gateway](#)).

Visit their website to get all the details regarding these two different services.

The first field is for selection of the service type for alarms by means of SMS messages. Select "http" or "mail". The contents of the next field (to the right) depend on the SMS gateway type ("http" or "email"):

- http: The heading of the http command line (ex: <http://api.clickatell.com>).
- email: The e-mail address given by your SMS gateway provider (example from Clickatell: [sms@messaging.clickatell.com](mailto:sms@messaging.clickatell.com)).



#### INFO

Remember to select a valuable name server IP address inside the network parameters of option N. If this DNS server is unavailable, you cannot use URL text addresses (example: [www.clickatell.com](http://www.clickatell.com)), but IP addresses instead.

### Username for SMS gateway

Type the username ID given by your SMS gateway provider.

### **Password for SMS gateway**

Type the password ID given by your SMS gateway provider.

### **SMS gateway ID (optional)**

Type the application ID given by your SMS gateway provider if this is necessary to use your provider services.

### **Pattern for mail subject line**

You must fill in this field if "mail" is selected in the SMS gateway field (see above). In this case, the text line you enter here will be the subject line of the e-mails that will be sent for exporting alarms by means of SMS messages.

### **Pattern for mail body**

You must fill in this field if you select "mail" in the SMS gateway field (see above). In this case, the text line you enter here will be the body text of the e-mails that will be sent for exporting alarms by means of SMS messages.

### **Pattern for http GET request**

You must fill in this field if you select "http" in the SMS gateway field (see above). In this case, the text line you enter here will be the http line of the http message that will be used for exporting alarms by means of SMS messages.

The symbols below must be used to incorporate all the useful data from the other fields into this http GET request. The line to enter here can then be as follows:

```
/http/sendmsg?api_id=%I&user=%U&password=%P&to=%N&text=%M
```

In these patterns, the substitution parameters to use in the above http command line are:

%U is replaced by the "User name for SMS gateway" field content.

%P is replaced by the "Password for SMS gateway" field content.

%I is replaced by the "SMS gateway ID" field content.

%N is replaced by the "Recipients tlf" field content.

%M is replaced by the "User text in SMS" field content.

The final http command line that will be sent to the SMS gateway provider will then be:

```
'content of the field situated at the right side of the SMS gateway field'/http/sendmsg?api_id='SMS gateway ID'  
field content.  
'&user='user name for SMS gateway field content'&password='password for SMS gateway field  
content'&to='Recipients tlf field content'&text='user text in SMS field content'.
```

### **Http proxy**

Must contain the proxy server IP address (and the port number) that is required to reach the WEB (World Wide Web) from the Multi-line 2 unit option N card TCP/IP port. For example 192.168.1.1:8080. A semicolon must be used as separator between the proxy server IP address (192.168.1.1) and the port number (8080).

### **User text in SMS**

The text line you enter here will be used as SMS text when exporting alarms by means of SMS messages.

| Email            |            |
|------------------|------------|
| Recipients Email | Alarm list |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |

The above table has to be filled in if you want to export the alarms by means of e-mail messages.

### Recipients Email

Must contain the e-mail addresses of the persons to contact by e-mail messages when an alarm is detected from the Multi-line 2 unit.

### Alarm list

This field informs about the fail class alarms which are of interest to the corresponding e-mail address (from the left side). If all alarm types must be transmitted to one particular e-mail address, type "all" in the alarm list, like this:

| Email            |            |
|------------------|------------|
| Recipients Email | Alarm list |
| abcdef@deif.com  | all        |

If only a few alarms must be transmitted to one particular e-mail address, sorted by fail class, type them in the alarm list, separated by a comma (,) without space, like this:

| Email            |                     |
|------------------|---------------------|
| Recipients Email | Alarm list          |
| abcdef@deif.com  | "Warning","Trip GB" |
| abcdef@deif.com  | "Block","Shutdown"  |
| abcdef@deif.com  | "Safe stop"         |



### INFO

It is important here to write exactly the right fail class text. Example: "warning" is wrong, "Warning" is correct, "Trip + Stop" is wrong, "Trip+stop" is correct. The maximum number of characters on each alarm list is 30.

More examples below:

| Email            |                        |
|------------------|------------------------|
| Recipients Email | Alarm list             |
| r.one@deif.com   | "Trip GB", to          |
| r.one@deif.com   | "Block","Shutdown", to |
| r.two@deif.com   | "Trip GB", cc          |
| r.two@deif.com   | "Block","Shutdown", cc |
| r.three@deif.com | all                    |
| r.four@deif.com  | "Warning"              |

| SMS            |            |
|----------------|------------|
| Recipients tlf | Alarm list |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |
|                |            |

The above table must be filled in if you want to export the alarms by means of SMS messages.

### Recipients tlf

Must contain the GSM phone number of the persons to contact by SMS messages when an alarm is detected from the Multi-line 2 unit.

### Alarm list

This field informs which fail class alarm is interesting for the corresponding GSM phone number (from the left side). If all alarm types must be transmitted to one particular e-mail address, type "all" in the alarm list, like this:

| SMS            |            |
|----------------|------------|
| Recipients tlf | Alarm list |
| 4540404041     | all        |

If only a few alarms must be transmitted to one particular GSM phone number, sorted by fail class, type them in the alarm list, separated by a comma (,) without space, like this:

| SMS            |                    |
|----------------|--------------------|
| Recipients tlf | Alarm list         |
| 4540404041     | "Block","Shutdown" |
| 4540404041     | "Trip GB"          |
| 4540404042     | "Warning"          |



### INFO

It is important here to write exactly the right fail class text. Example: "warning" is wrong, "Warning" is correct, "Trip + Stop" is wrong, "Trip+stop" is correct. The maximum number of characters on each alarm list is 30.

| SMS            |                    |
|----------------|--------------------|
| Recipients tlf | Alarm list         |
| 4540404041     | "Block","Shutdown" |
| 4540404041     | "Trip GB"          |
| 4540404042     | "Block","Shutdown" |
| 4540404042     | "Trip GB"          |
| 4540404043     | all                |
| 4540404044     | "Warning"          |

More examples below:

Example 1: Exporting the Multi-line 2 alarms by e-mails.

By adding "to" or "cc" at the end of each alarm list item, the concerned IP address will be used as "to" or "cc" field in the e-mail that will send the alarm.



**Email and SMS**

Remember to activate the "SMS and Email" function if not already

**Email general**

Address of SMTP server:

Sender address:

User name for mail server:

Password for mail server:

User text in email:

**SMS general**

SMS gateway:

User name for SMS gateway:

Password for SMS gateway:

SMS gateway ID (optional):

Pattern for mail subject line:

Pattern for mail body:

Pattern for http GET request:

Http proxy:

User text in SMS:

**Alarms**

**Email**

| Recipients Email | Alarm list |
|------------------|------------|
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |

**SMS**

| Recipients tlf | Alarm list             |
|----------------|------------------------|
| 4540404041     | "Warning", "Trip+stop" |
| 4540404041     | "Shutdown"             |
| 4540404042     | all                    |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |

Read from device    Send to device    OK    Cancel

Pattern for http GET request:

http/sendmsg?api\_id=%I&user=%U&password=%P&to=%N&text=%M.

%I: Will insert what is already typed inside the "SMS gateway ID" field (api\_id).

%U: Will insert what is already typed inside the "User name for SMS gateway" field (username).

%P: Will insert what is already typed inside the "Password for SMS gateway" field (password).

%N: Will insert what is already typed inside the "Recipients tlf" field (mobile phone numbers).

%M: Will insert what is already typed inside the "User text in SMS" field (user-selectable text).

Example 3: Exporting the Multi-line 2 alarms by SMS (SMS gateway service type: mail).

**Email and SMS**

Remember to activate the "SMS and Email" function if not already

**Email general**

Address of SMTP server: 195.41.46.251

Sender address: noreply@deif.com

User name for mail server: smtp\_user name

Password for mail server: \*\*\*\*\*

User text in email: User defined text in email

**SMS general**

SMS gateway: mail sms@messaging.clickatell.com

User name for SMS gateway: user name

Password for SMS gateway: \*\*\*\*\*

SMS gateway ID (optional): 123456

Pattern for mail subject line:

Pattern for mail body: pi\_id:%I&user:%U&password:%P&to:%N&text:%M

Pattern for http GET request:

Http proxy: 192.168.5.1:8080

User text in SMS: User defined text in SMS

**Alarms**

**Email**

| Recipients Email | Alarm list |
|------------------|------------|
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |
|                  |            |

**SMS**

| Recipients tlf | Alarm list             |
|----------------|------------------------|
| 4540404041     | "Warning", "Trip+stop" |
| 4540404041     | "Shutdown"             |
| 4540404042     | all                    |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |
|                |                        |

Read from device Send to device OK Cancel

Pattern for mail body: api\_id:%I&user:%U&password:%P&to:%N&text:%M.

%I: Will insert what is already typed inside the "SMS gateway ID" field (api\_id).

%U: Will insert what is already typed inside the "User name for SMS gateway" field (username).

%P: Will insert what is already typed inside the "Password for SMS gateway" field (password).

%N: Will insert what is already typed inside the "Recipients tlf" field (mobile phone numbers).

%M: Will insert what is already typed inside the "User text in SMS" field (user-selectable text).

6.3 Received message format

The content of the message sent is defined as:

"MsgNo.\_n1\_IDNo.\_n2\_t1\_t2\_t3"

The variables in the message are as follows:

n1: Unique number of the alarm, incremented at each new alarm detection.

n2: CAN ID of the unit giving the alarm:

t1: User-defined text.

t2: Name of the fail class.

t3: Specific alarm text:

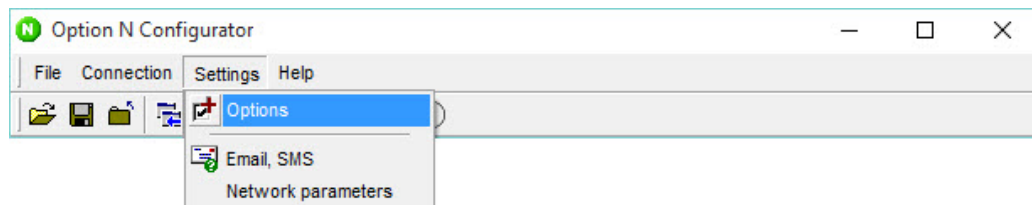
The alarm texts for the individual alarms will be used.

An example of a message could be:

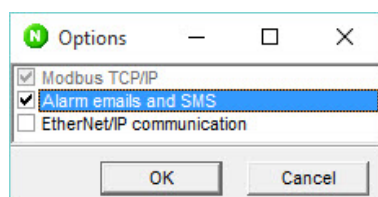
"MsgNo.\_1\_IDNo.\_3\_User defined text\_WARNING\_Dig. input 23"

### 6.3.1 Alarm transfer function selection from the option N configuration software

The alarm transfer is a user-selectable option. Open the "Settings" menu of the option N configuration SW to enable or disable this option.

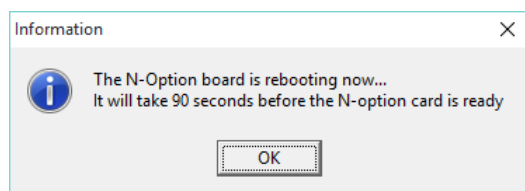
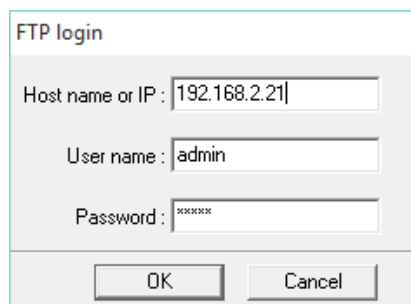


Select the required option here:



The Modbus TCP/IP option is marked with grey because it is not a user-selectable option. This option is always selected as standard.

Check that the IP address is right, correct it if necessary and click "OK".



## 7. Option N clock synchronisation

### 7.1 Network Time Protocol (NTP)

NTP is a TCP/IP protocol for synchronising time over a network. Basically, a client requests the current time from a server and uses it to set its own clock. NTP is intended to synchronise all participating computers to within a few milliseconds of Coordinated Universal Time (UTC).

NTP can usually maintain time to within tens of milliseconds over the public internet, and it can achieve better than one millisecond accuracy in local area networks under ideal conditions. Asymmetric routes and network congestion can cause errors of 100 ms or more. Implementations send and receive timestamps using the User Datagram Protocol (UDP) on port number 123.

Option N includes a function that can be used for synchronising the Multi-line 2 unit clock periodically through an NTP server. This function is available from the image software version 2.40.1 and with the below Multi-line 2 unit types:

- The AGC-4 unit from software version 4.50.0.

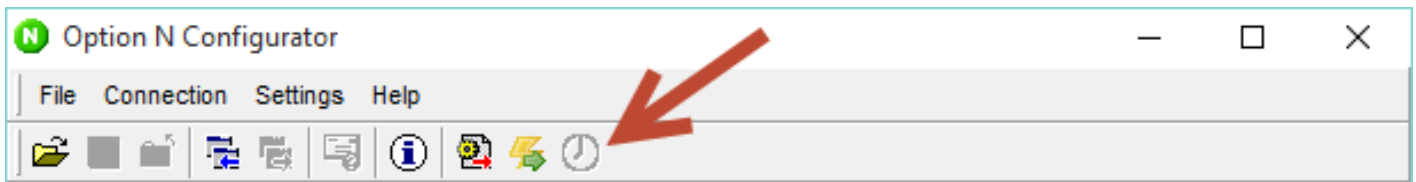
NTP server examples from <http://tf.nist.gov/tf-cgi/servers.cgi>

| Name                          | IP address             | Location                        |
|-------------------------------|------------------------|---------------------------------|
| nist1-nj2.ustiming.org        | 165.193.126.229        | Weehawken, NJ                   |
| nist1-pa.ustiming.org         | 206.246.122.250        | Hatfield, PA                    |
| time-c.nist.gov               | 129.6.15.30            | NIST, Gaithersburg, Maryland    |
| time-d.nist.gov               | 2610:20:6F15:15::27    | NIST, Gaithersburg, Maryland    |
| nist1-macon.macon.ga.us       | 98.175.203.200         | Macon, Georgia                  |
| wolfnisttime.com              | 207.223.123.18         | Birmingham, Alabama             |
| nist.time.nosc.us             | 96.226.242.9           | Carrollton, Texas               |
| nist.netservicesgroup.com     | 64.113.32.5            | Southfield, Michigan            |
| nisttime.carsoncity.k12.mi.us | 66.219.116.140         | Carson City, Michigan           |
| nist1-lnk.binary.net          | 216.229.0.179          | Lincoln, Nebraska               |
| www.nist.gov *                | 24.56.178.140          | WWV, Fort Collins, Colorado     |
| time.nist.gov                 | Global for all servers | Multiple locations              |
| utcnist.colorado.edu          | 128.138.140.44         | University of Colorado, Boulder |
| utcnist2.colorado.edu         | 128.138.141.172        | University of Colorado, Boulder |
| ntp-nist.ldsbc.edu            | 198.60.73.8            | LDSBC, Salt Lake City, Utah     |
| nist1-lv.ustiming.org         | 64.250.229.100         | Las Vegas, Nevada               |
| nist-time-server.eoni.com     | 216.228.192.69         | La Grande, Oregon               |

\* The server named www.nist.gov in the table above is used as example in this documentation.

### 7.2 Configuration of the option N NTP server function

The “Date and Time” icon shown below is the one to use for configuring the NTP server function:



Note that this icon is available only after using the “Get from device (Ctrl + D)” function, and if option N is supporting this function inside.

By clicking the “Date and time” icon, the window below will pop up:

**NTP server(s)**

Enter the address of the NTP server(s) to use. Up to 10 server addresses can be entered, separated by a space character. This address can be a host name or an IP address. Empty this field and press the OK button for disabling the option N TNP server function.

**Time zone**

Enter the time zone corresponding to the location of the Multi-line 2 unit. Note that this function is not supporting the winter/summer time auto adjustment. Example for the city of Paris which is located at the standard UTC time zone of UTC+01:00: Select GMT +2:00 for winter time and GMT +3:00 for summer time. The list of cities shown here is then corresponding to the European winter time. For the European summer time, you add one hour.

Below an example of a possible configuration:

## 8. Option N firmware upgrade

### 8.1 Firmware upgrade

The jump menu no. 9000 of the Multi-line 2 unit display shows the option N firmware version, also called image software (see the example below).

|                     |     |    |     |
|---------------------|-----|----|-----|
| G                   | 0   | 0  | 0 V |
| GW: 192.168.001.001 |     |    |     |
| Image Ver. 2.00.0   |     |    |     |
| APPL                | REV | W1 | W2  |

In the example, the image software version is 2.00.0.

This chapter will explain how to update the image software.

#### 8.1.1 Obtain the option N firmware from DEIF

The USW is normally obtained from DEIF via the internet. Visit [www.deif.com](http://www.deif.com) and select "Software" in the top menu.

English ▾

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DE

**Maximise your business**

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Green at heart Social Responsibility Global partner Quality

Scroll down to the "Software downloads" list and select "N-options firmware".

|  <div>Land Power   Marine &amp; Offshore   Wind Power </div> |         |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|
| Multi-line 300 GPU 300 ver. 1.x.x.                                                                                                                                                                                               | 1.0.1.0 | 30-09-2016 |
| Multi-line 300 PICUS ver. 1.x.x.                                                                                                                                                                                                 | 1.0.4.0 | 15-08-2017 |
| Multi-line 300 PPM 300 ver. 1.x.x.                                                                                                                                                                                               | 1.0.6.0 | 16-08-2017 |
| Multi-line 300 PPU 300 ver. 1.x.x.                                                                                                                                                                                               | 1.0.1.0 | 25-08-2017 |
|  N-options firmware                                                                                                                              | 2.40.1  | 04-06-2015 |
| Proface design template                                                                                                                                                                                                          | 1.00.0  | 06-09-2006 |
| SD Datalog Software                                                                                                                                                                                                              | 1.00.0  | 30-03-2011 |
| TAS-3x1-DG Configuration Software                                                                                                                                                                                                | 1.22    | 19-12-2006 |

Contact DEIF Support if you need an older version of the firmware, for software version 1.xx.x.

The current software version can be retrieved from the jump menu 9000 of the Multi-line 2 unit.

## 8.1.2 How to write the option N firmware

Follow the steps described in this chapter to write a new firmware on the option N card, also called image software.

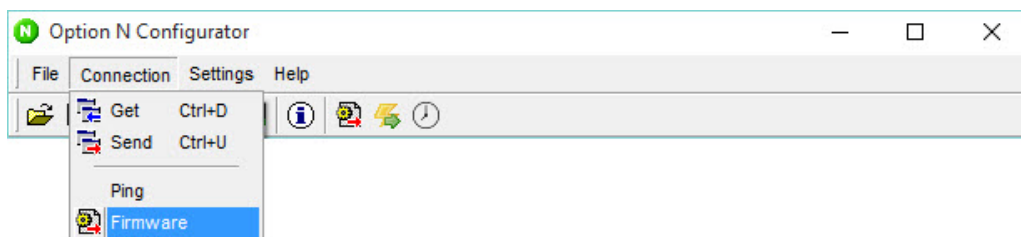
Click the "Option N" icon in the USW to open the option N configuration software.



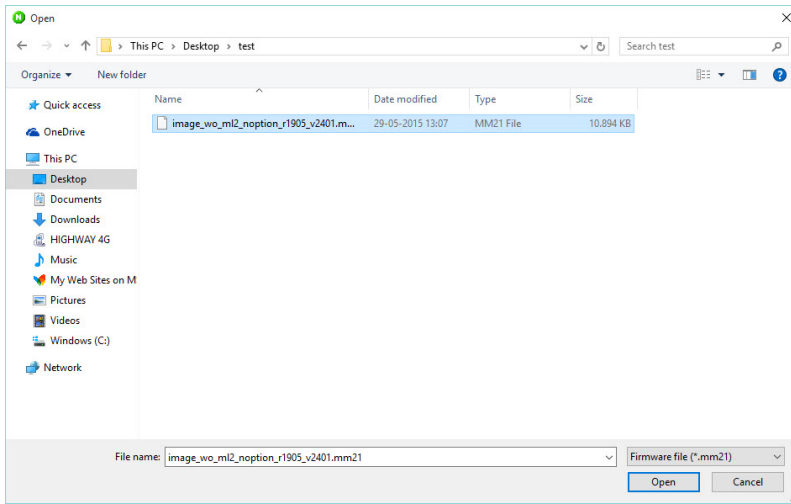
Click the "Send firmware to device" icon,



- or use the "Connection" menu and the "Firmware" submenu.



Open the new image file "xxx.mm21" to be written to the unit if it is for a version 2.xx.x software type,



- or open the new image file "xxx.bin" to be written to the unit if it is for a version 1.xx.x software type.

Enter IP address, username and password (the factory settings are: username = admin and password = admin).

The screenshot shows an 'FTP login' dialog box. It has three input fields: 'Host name or IP' with the value '192.168.2.21', 'User name' with the value 'admin', and 'Password' with masked characters 'xxxxxx'. At the bottom are 'OK' and 'Cancel' buttons.



#### INFO

Remember to check the jump menu 9000 to see the IP address of the unit.

Upgrade of the firmware is in progress.

The screenshot shows a 'Firmware' upgrade window. It has three checked options: 'Restart the device in u-boot mode', 'Delete the current image', and 'Send the firmware to the device'. Below these is a progress bar showing 'Data transfer : 4,5 MB of 8,0 MB downloaded (at 416,0 KB/Sec)' and 'Time left : 00:00:08'. At the bottom are two unchecked radio buttons: 'Running the image' and 'Reboot of the device', and a 'Close' button.

Download of the new image software is now completed.

Firmware

Restart the device in u-boot mode

Delete the current image

Send the firmware to the device

Data transfer : 8,0 MB of 8,0 MB downloaded (at 407,7 KB/Sec)

Time left : 00:00:00

...loading the image...

Running the image

Reboot of the device

Close

## 9. Data logging

Menu 9250

It is possible to log the configurable Modbus area (up to 500 registers) to the WebARM.

The logged registers begins from 000 and amounts to what is configured in parameter 9251. Logging is active when this parameter is different from 0.

Logging sample rate are configurable in the interval 2-3600sec.

The logs are saved on root of the WebARM in folder /mnt/misc/log. A FTP-client is needed to access the files. Up to 7 files with a maximum size of 1MB stores the log after a FIFO-principle. Logged values are hexadecimal.

## 10. Parameters

### 10.1 Further information

Option N relates to parameter 9000.

For further information, see the separate parameter list for the Multi-line unit in question:

|                            |                            |
|----------------------------|----------------------------|
| AGC-3                      | Document number 4189340705 |
| AGC-4                      | Document number 4189340688 |
| ASC-4                      | Document number 4189341077 |
| PPM-3                      | Document number 4189340672 |
| GPC-3/GPU-3                | Document number 4189340580 |
| GPU-3/PPU-3 marine version | Document number 4189340581 |