



-power in control



MULTI-LINE 2 DESCRIPTION OF OPTIONS



Option N

- Modbus TCP/IP



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Document no.: 4189340612D

This description of options covers the following products:

AGC 200 series	SW version 3.53.1 or later
APU 200 series	SW version 3.53.x or later
Utility Software	SW version 3.20.0 or later

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1. Warnings and legal information

This chapter includes important information about general legal issues relevant in the handling of DEIF products. Furthermore, some overall safety precautions will be introduced and recommended. Finally, the highlighted notes, which will be used throughout this document, are presented.

Legal information and responsibility

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.

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

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.

Safety issues

Installing 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.

Programming

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

Notes

Throughout this document a number of notes will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.



The notes provide general information which will be helpful for the reader to bear in mind.

2. Description of option

Hardware

The option N is an Ethernet hardware option offering a number of features (hereafter referred to as the option N). The hardware needed for the option N is placed with an RJ45 connector on the left side of the unit, seen from the rear.

The option N is delivered through the Ethernet port, and we recommend using a twisted pair category 5 cable (CAT5 as defined in ANSI/TIA/EIA-568-A) for connection of the option N to the network.

The option N port automatically detects the cable type, so both twisted and straight cables can be used.

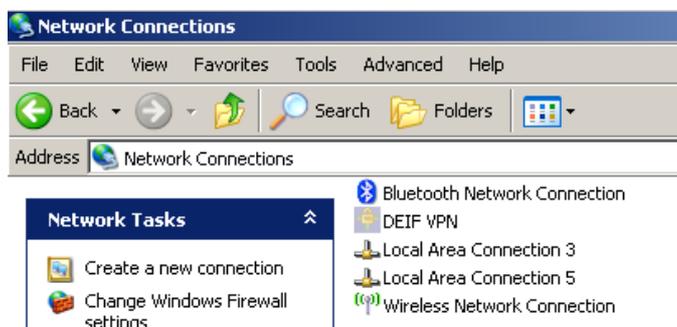
3. Network configuration of the option N

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

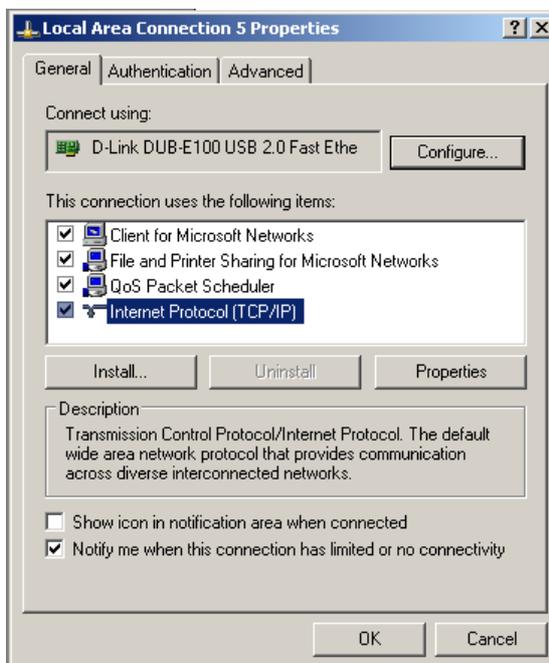
	Factory setting
IP address	192.168.20.11
Gateway address	192.168.20.200
Subnet mask	255.255.255.0

To be able to configure and use the option N, it must be connected to a network or directly to a PC. The option J4 is for ordering a crossover Ethernet cable from DEIF. This cable can be used to connect the option N directly to a PC. For this to work, the PC must be configured to use the same network as specified above.

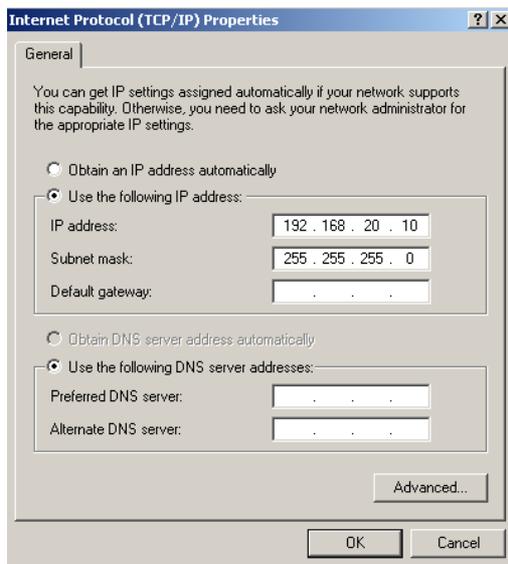
Go to the control panel via the 'Start' button on the PC screen. Select 'Network Connections'.



Select the local area connection used.



Select 'Internet Protocol (TCP/IP)' and use this setting.



Option N setup

When your PC has been set up as described on the previous pages and the PC is connected directly to the Ethernet socket of the Multi-line 2 unit option N port, you must subsequently check if you have access to the option N port from the internet connection by means of the ping utility programme from your PC.

Click 'Start' (lower left corner of the PC screen) and select 'Run...'. Type 'cmd' and press the Enter key.



Type 'ping' + the IP address of the option N (standard is 192.168.20.19) and press the Enter key (see below).

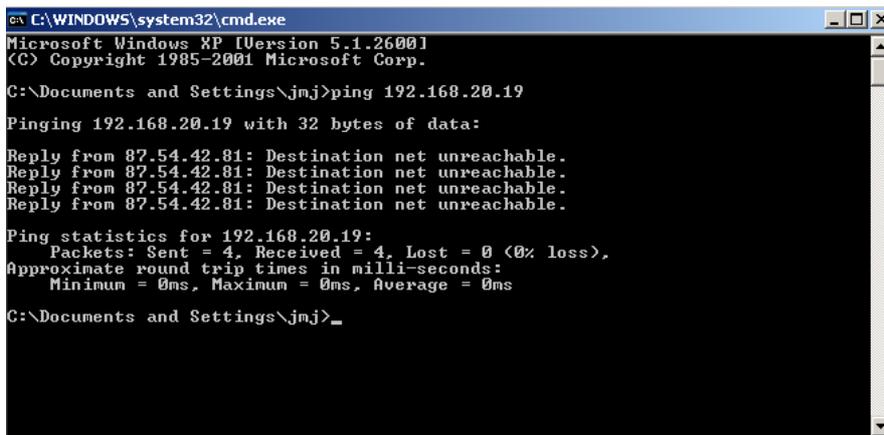
```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\jnj>ping 192.168.20.19
Pinging 192.168.20.19 with 32 bytes of data:
Reply from 192.168.20.19: bytes=32 time=4ms TTL=64
Reply from 192.168.20.19: bytes=32 time=1ms TTL=64
Reply from 192.168.20.19: bytes=32 time=1ms TTL=64
Reply from 192.168.20.19: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.20.19:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 4ms, Average = 1ms

C:\Documents and Settings\jnj>
```

The above screen dump is displayed when this connection works as it should. Otherwise, it will look like this:



Changing the AGC 200 IP address

The IP address can be changed in two different ways.

- Using the 'Tools' menu on the AGC 200 display:

Select 'Ethernet Setup' in the 'Tools' menu. This enables you to change the following:

- IP address (Factory setting 192.168.20.11)
- Subnet mask (Factory setting 255.255.255.0)
- Gateway address (Factory setting 192.168.20.200)
- MAC address (The physical address of the AGC 200. This is specific for the unit in question and cannot be changed).

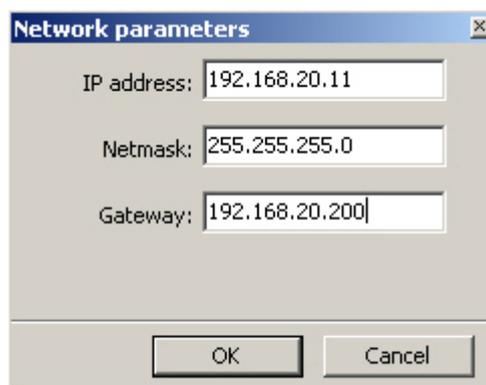
Select any of these to change the value.

- Using the option N setting in the PC utility software:

Connect to the AGC 200 using the TCP/IP link and click the option N icon when connected.

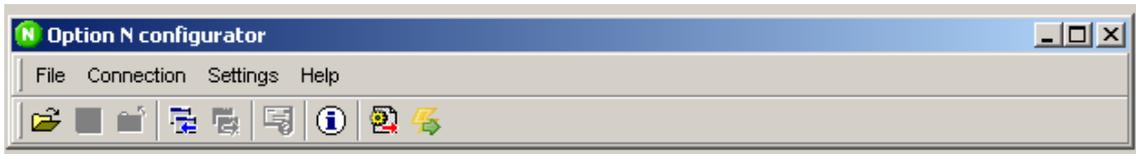


The following window appears:



The network parameters can be modified from here to match the final network configuration.

If the following window appears, you are not connected to an AGC 200:



The above window is useful when working with another product type than the AGC 200, like for example the AGC-3.



When changing the IP or gateway address, a power cycle (aux. power OFF and ON) is needed before the changes take effect. Remember to change the communication settings in the utility software (IP address) as well.

4. TCP/IP Modbus communication

TCP/IP Modbus is identical with the classical serial Modbus communication, except 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 web page www.deif.com.

Modicon, today Schneider Electric, introduced the Modbus protocol to the market in 1979. Modbus protocol is a messaging structure used to establish master-slave/client-server communication between intelligent devices. More information is available at www.modbus.org.

What is Modbus TCP/IP protocol?



TCP/IP is the common transport protocol of the internet and is actually a set of layered protocols, providing a reliable data transport mechanism between machines. Ethernet has become the de facto standard of corporate enterprise systems, so it has also, not surprisingly, become the de facto standard for factory networking. Ethernet is not a new technology. It has matured to the point that the costs of implementing this network solution has dropped to where they are commensurate with those of today's field busses.

An open Modbus TCP/IP specification was developed in 1999. The protocol specification and implementation guide are available for download (www.modbus-ida.org/specs.php).

The useful parameters required from the software you use to communicate with the option N by means of a TCP/IP Modbus communication are:

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

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

5. TCP/IP Modbus data tables

See the AGC 200 option H2 documentation to get the details of the data available by means of the TCP/IP Modbus communication (identical with the serial RS485 Modbus data).

DEIF A/S reserves the right to change any of the above.