

# ABB Drives

## User's Manual Ethernet Adapter Module NETA-01





Ethernet Adapter Module  
NETA-01

**User's Manual**

3AFE64605062 Rev G  
EN  
EFFECTIVE: 2010-02-15



# Safety instructions

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## Overview

This chapter states the general safety instructions that must be followed when installing and operating the NETA-01 Network Adapter module.

The material in this chapter must be studied before attempting any work on the unit.

In addition to the safety instructions given below, read the complete safety instructions of the specific drive you are working on.

## General safety instructions

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**WARNING!** All electrical installation and maintenance work on the drive should be carried out by qualified electricians. The drive and adjoining equipment must be properly earthed.

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Do not attempt any work on a powered drive. After switching off the mains, always allow the intermediate circuit capacitors to discharge for 5 minutes before working on the frequency converter, the motor or the motor cable. It is good practice to check (with a voltage indicating instrument) that the drive is in fact discharged before beginning work.

The motor cable terminals of the drive are at a dangerously high voltage when mains power is applied, regardless of motor operation.

There can be dangerous voltages inside the drive from external control circuits even when the drive mains power is shut off. Exercise appropriate care when working on the unit. Neglecting these instructions can cause physical injury or death.



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# Introduction to this manual

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## Overview

This chapter contains a description of the User's Manual for the NETA-01 Ethernet Adapter module.

## Intended audience

The manual is intended for the people who are responsible for installing, commissioning and using an Ethernet Adapter module with an ABB drive. The reader is expected to have a basic knowledge of electrical fundamentals, electrical wiring practices, the drive, the use of the drive control panel, internet browsers, and the Ethernet protocol.

## What this manual contains

The installation and start-up of the NETA-01 Ethernet Adapter module is introduced in this manual.

It is assumed that the drive is installed and ready to operate before starting the installation of the adapter module. For more information on the installation and start-up procedures of the drive, please refer to its user documentation.

*Safety instructions* are featured in the first few pages of this manual. Safety instructions describe the formats for various warnings and notations used within this manual. This chapter also states the safety instructions which apply to the installation and operation of the NETA-01 module.

*Introduction to this manual* contains a short description of the manual.

*Overview* contains a short description of the Ethernet protocol and the NETA-01 Ethernet Adapter module, a delivery checklist, and information on the manufacturer's warranty.

*Quick start-up guide* contains an example of NETA-01 start-up.

*Mechanical installation* contains placing and mounting instructions for the module.

*Electrical installation* contains wiring, DIP setting and earthing instructions.

*Drive configuration* explains how to program the drive before the communication through the adapter module can be started.

*The Web User Interface* gives instructions on the Java applets included in the NETA-01 module.

*Communication* contains a description of the Ethernet functions supported by the NETA-01 module.

*Fault tracing* describes how to diagnose the Ethernet connection during installation, commissioning, and normal operation.

*Appendix A: Technical data* contains information on physical dimensions, configurable settings and connectors of the module.

*Appendix B: Ambient conditions* contains a specification of the ambient conditions allowed during transportation, storage and use of the NETA-01 module.

*Appendix C: PC configuration* gives instructions on how to use PC in point-to-point connection and how to set up the Java Virtual Machine.

*Appendix D: Using predefined e-mail* contains information on the configuration of the e-mail file.

*Appendix E: Server Side Includes* contains description of the SSI functions that can be used with e-mail.

*Appendix F: Taking a backup* gives instructions for taking and restoring a backup of the adapter's file system.

*Appendix G: File system* contains a description of the files in the module and file formats.

## Conventions used in this manual

### *Communication Module*

Communication Module is a name for a device (e.g. a fieldbus adapter) through which the drive is connected to an external serial communication network (e.g. a fieldbus). The communication with the communication module is activated by a drive parameter.

### *Datasets and Data Words*

Datasets are clusters of data sent through the DDCS link between the NETA-01 module and the drive. Each dataset consists of three 16-bit words, i.e. data words. The Control Word and the Status Word are types of data words; the contents of some data words are user-definable. For information, see the drive documentation.

### *MAC address*

A MAC address, short for Media Access Control address, is a unique code assigned to most forms of networking hardware. Every node on Ethernet network has unique identifier, MAC address.

### *MAC ID*

On a DDCS network, a unique node number identifies each node. This node number is between 1...254, and is called MAC ID or channel address.

### *NETA-01 Ethernet Adapter module*

The NETA-01 Adapter module is one of the optional fieldbus adapter modules available for ABB drives. The NETA-01 module is a device through which an ABB drive is connected to an Ethernet network.

### *Parameter*

A parameter is an operating instruction for the drive. Parameters can be read and programmed with the drive control panel, or through the NETA-01 module.

### *Telnet*

Telnet is a terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on a computer and connects it to a server on the network. Commands can be then entered through the Telnet program and they will be executed as if they were entered directly on the server console.

## **Product and service inquiries**

Address any inquiries about the product to your local ABB representative, quoting the type code and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to [www.abb.com/drives](http://www.abb.com/drives) and selecting *Sales, Support and Service network*.

## **Product training**

For information on ABB product training, navigate to [www.abb.com/drives](http://www.abb.com/drives) and select *Training courses*.

## **Providing feedback on ABB Drives manuals**

Your comments on our manuals are welcome. Go to [www.abb.com/drives](http://www.abb.com/drives) and select *Document Library – Manuals feedback form (LV AC drives)*.



# Overview

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## Overview

This chapter contains a short description of the NETA-01 Adapter module, a delivery checklist, and warranty information.

## The NETA-01 Ethernet Adapter module

The NETA-01 Ethernet Adapter module is an optional device for browser-based remote monitoring of ABB drives via Ethernet. Multiple drives (up to 9) can be connected to the network through the DDCS Branching Unit (NDBU-85/95) or using ring topology. Through the use of the NETA-01 Ethernet Adapter module, it is possible to

- monitor the drive
  - read and adjust drive parameter values
  - read status information and actual values from the drive
  - set up and monitor (numerically or graphically) the data logger and save its content to a file
  - read and clear the contents of the fault log and save it to a file
  - send e-mail messages (max. 9) on events
  - use e-mail for continuous monitoring of the drive
  - acquire data from the drive and the process with Modbus TCP server
- control the drive
  - give control commands (Start, Stop, Run enable, etc.) to the drive
  - feed a motor speed or torque reference to the drive
  - reset a drive fault.

The adapter module is mounted onto a standard mounting rail inside or outside the drive unit, depending on drive type and configuration. See the user's manual of the drive for module placement options.

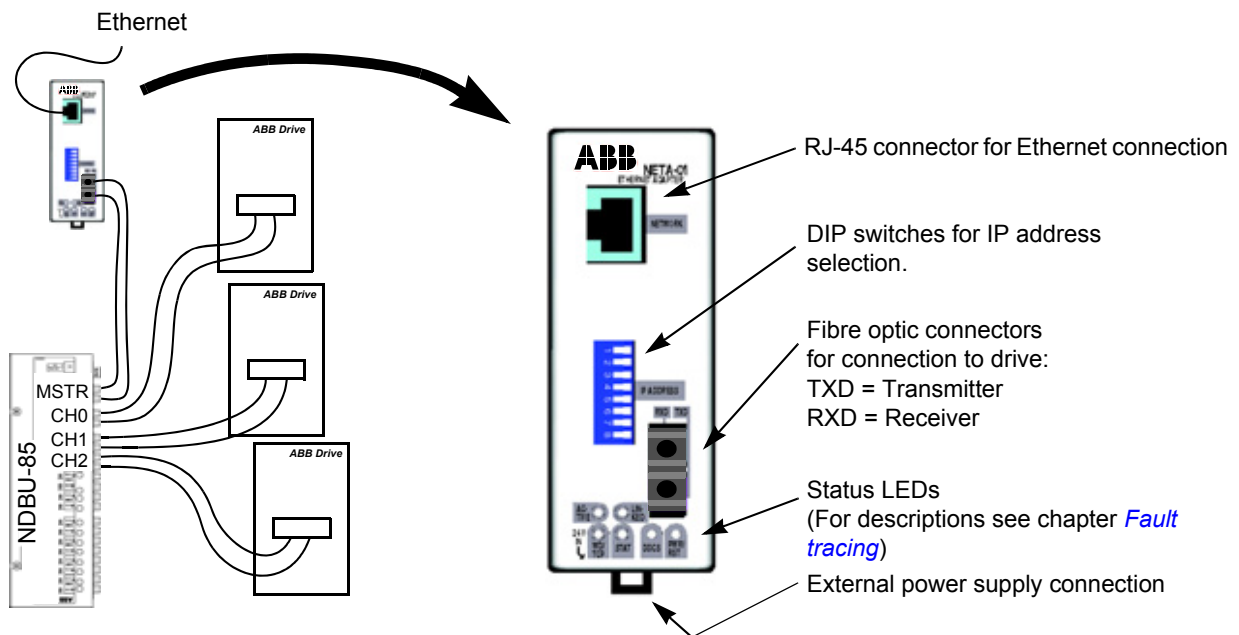


Figure 1. Star topology link with the NDBU-85/95 and the NETA-01 Adapter module

### Compatibility

The NETA-01 is compatible with:

LV AC Drives

- ACS800
- ACS 600
- ACX 400

LV DC Drives\*

- DCS 800
- DCS 600

MV AC Drives

- ACS 6000
- ACS 1000
- ACS 5000

(\* DC drives do not support the “Motor control” -applet.)



Contact your local ABB representative for information on using other drive types with the NETA-01. Some drive software applications do not support all the features of NETA-01 and those features can be deactivated from the module. By default every application support parameter access and data/fault logger operations from the module (NETA-1.3 onwards). The default setting for each drive application can be modified from a file called 'drv\_comp.cfg'. For more information see chapter [Appendix G: File system](#).

### **Delivery check**

The option package for the NETA-01 Ethernet Adapter module contains:

- Ethernet Adapter module, type NETA-01
- two pairs (four pieces) of fibre optic cables for connecting the adapter to the drive
- mounting rail
- this manual.

### **Warranty and liability information**

The manufacturer warrants the equipment supplied against defects in design, materials and workmanship for a period of twelve (12) months after installation or twenty-four (24) months from date of manufacturing, whichever first occurs. The local ABB office or distributor may grant a warranty period different to the above and refer to local terms of liability as defined in the supply contract.

The manufacturer is not responsible for

- any costs resulting from a failure if the installation, commissioning, repair, alternation, or ambient conditions of the drive do not fulfil the requirements specified in the documentation delivered with the unit and other relevant documentation.
- units subjected to misuse, negligence or accident
- units comprised of materials provided or designs stipulated by the purchaser.

In no event shall the manufacturer, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, losses or penalties.

If you have any questions concerning your ABB drive, please contact the local distributor or ABB office. The technical data, information and specifications are valid at the time of printing. The manufacturer reserves the right to modifications without prior notice.



# Quick start-up guide

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## Overview

This chapter describes the start-up procedure of NETA-01 Ethernet adapter.

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**Note:** ACS800 Standard drive will be used in the example. The configuration procedure of other drives and application might differ from this one. See drive-specific user manual for more information.

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## PC requirements

NETA-01 module can be configured and used with a normal PC that has:

- An Ethernet network adapter
- Windows 98/ME/2000/XP, Linux
- A World Wide Web browser, such as Microsoft Internet Explorer 5.5 or higher, or Netscape 6.2 or higher
- Microsoft VM or Java Virtual Machine installed for the browser in use (see [Appendix C: PC configuration](#))
- Telnet and FTP clients for module configuration (if needed).

This section provides a quick example on how to get the module up and running after the PC is configured. The example provides an easy way to configure the network settings.

## Mechanical installation

Fasten the module according to chapter [Mechanical installation](#).

## Electrical installation

### Connecting the module to your network

Make sure that the module power is switched off. Connect the Ethernet network cable to the RJ-45 connector of the module. Use a ferrite core on the cable at the PC end to ensure proper functioning of the connection.

### Connecting the module to the drive

Multiple drives can be connected to the NETA-01 by using the NDBU-85/95 DDCCS Branching Unit or a ring topology. In this example, the NETA-01 is connected to only one drive without the branching unit (ring topology).

The NETA-01 can be connected to the tool channel or the fieldbus control channel of the drive. In the tool channel, the NETA-01 can be used for monitoring the drive and the drive does not need any configuration.

- ACS800 tool channel = Channel 3
- ACS800 fieldbus control channel = Channel 0

## Configuring IP address for the first time

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**Note:** Out-of-the-box IP address of the module is 10.58.18.11. This can be used to access the web pages for further configuration. Simple tool for setting the IP address of the module is also available in the ABB Library. See instructions below for changing the IP address with the ARP protocol.

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This example demonstrates how to set the IP address of the NETA module with ARP protocol commands. For more information about configuring the network settings, see section [Network configuration](#) in chapter [Communication](#). The PC has to be configured for point-to-point connection; see [Appendix C: PC configuration](#).

- Set all configuration DIP switches to OFF position. Switch the auxiliary 24 V DC power on.
- Open the DOS prompt on the PC.
- Type `'arp -s <IP address> <MAC address>'`  
Substitute `<MAC address>` with the MAC address of your module (e.g. 00-30-11-02-02-90). The MAC address is printed on the label on the side of the module. Substitute `<IP address>` with the IP address you wish to use for the module (e.g. 10.0.0.7). Ask your network administrator for a free IP address. Type 'arp' at the command prompt for more instructions.
- Type `'ping <IP address>'`
- Type `'arp -d <IP address>'`

The module will adopt the IP address specified in the `'arp -s'` command after restarting the module.

### Completing or changing network settings

- You can now complete or change the network settings with a browser (NETA-1.3 onwards) or by editing the 'ethcfg.cfg' file. Type the IP address you defined earlier into the browser's address bar. In some cases the proxy server used by the browser must be disabled (see [Appendix C: PC configuration](#)).
- Fill in the authorization information:
  - User name: admin
  - Password: admin

**Enter Network Password**

Please type your user name and password.

Site: 10.0.0.7

Realm: ABB Webmodule

User Name:

Password:

Save this password in your password list

OK Cancel

Figure 2. Enter Network Password

- Open the 'Configuration' menu from the upper left corner of the front page. Select the 'Network' tab and click the 'Ethernet settings' button. Complete the network settings using the form.

**General Configuration**

IP address:

Subnet mask:

Gateway address:

**Domain Configuration**

DNS1 address:

DNS2 address:

Host name:

Domain name:

**SMTP Configuration**

SMTP server:

SMTP user name:

SMTP password:

**DHCP**

DHCP enabled:

OK Cancel

Figure 3. Ethernet form

## Drive configuration

- Power up the drive
- If the NETA-01 is connected to the tool channel, the 'Connected to Tool Channel (ch3)' checkbox should be selected on the 'Network' tab of the 'Configuration' menu (See figure [Tool Channel](#).)

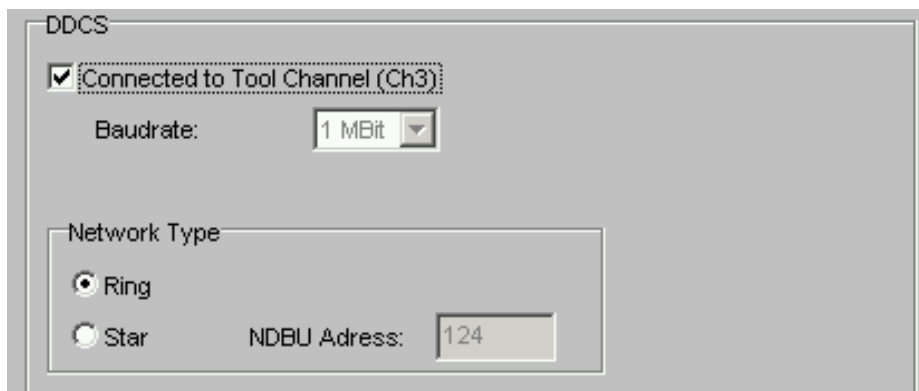


Figure 4. Tool Channel

- If the NETA-01 is connected to the fieldbus control channel, the communication should be activated with a drive parameter. With an ACS800 Std drive, set parameters 98.02 COMM. MODULE LINK to FIELDBUS and 98.07 COMM PROFILE to ABB DRIVES.
- Check that the fieldbus configuration group is activated. This is Group 51 with an ACS800 Std drive.
- Verify that MODULE TYPE is NETA-01 V1.x
- Configure the drive to accept Start/Stop, Direction, Fault Reset and Reference from the module. Examples of appropriate values on the ACS800 Std are shown in the following table.

Drive parameter	Example setting for ACS800 Std
98.02 COMM.MODULE LINK	FIELDBUS
98.07 COMM. PROFILE	ABB DRIVES
10.01 EXT1 STRT/STP/DIR	COMM.CW
10.03 REF DIRECTION	REQUEST
11.02 EXT1/EXT2 SELECT	COMM. CW
11.03 EXT1 REF SELECT	COMM. REF
16.04 FAULT RESET SEL	COMM. CW

**Note:** If the module is connected to several drives it has to be configured from the 'Network' tab located in the 'Configuration' menu.

# Mechanical installation

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## Overview

This chapter contains module mounting instructions. Depending on the drive, the module can be installed either inside or outside the drive housing or cabinet. See the user's manual of the drive for module placement options.

## Mounting outside the drive

Choose the location for the module. Note the following:

- The cabling instructions in chapter [Electrical installation](#) must be followed.
- The ambient conditions should be taken into account (see chapter [Appendix B: Ambient conditions](#)). The degree of protection of the module is IP 20.
- Observe the free space requirements for the module<sup>\*</sup> (see the figure below) and the drive (see the drive documentation).
- Module earth is connected to the mounting rail by means of an earthing clip (see the figure below). The mounting rail onto which the option module is to be mounted must be earthed to a noiseless earth. If the rail is not mounted on a properly earthed base, a separate earthing conductor must be used. The conductor must be as short as possible and its cross-sectional area must be 6 mm<sup>2</sup> at least.

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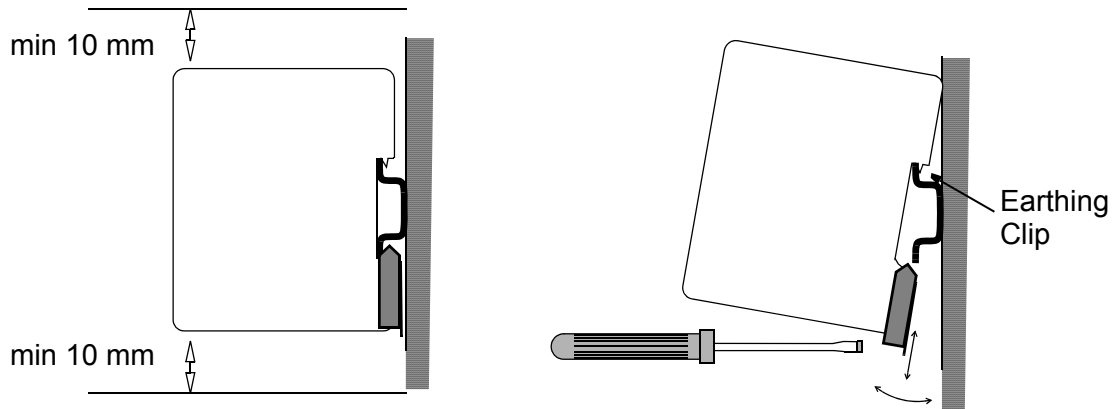
**Note:** No solid copper conductor may be used (stranded wire allowed only).

---

Mounting instructions:

- Switch off all dangerous voltages in the enclosure that the module is to be mounted in.
- Fasten the rail and ensure the proper earthing as described above.

- Push the module onto the rail. The module can be released by pulling the locking spring with a screwdriver (see below).



\*) Minimum of 10 mm from adjoining equipment or wall.

## Mounting inside the drive

Only a qualified electrician should carry out the work inside the drive.



**WARNING!** Pay attention to the slowly discharging voltage of the capacitor bank and the voltages that are connected from external control circuits to the inputs and outputs of the drive.



**WARNING!** Do not touch the printed circuit boards. The integrated circuits are extremely sensitive to electrostatic discharge.

Mounting instructions:

- Stop the drive.
- Switch off the power supply of the drive and all dangerous voltages connected to the inputs and outputs.
- Wait for five minutes to ensure that the capacitors in the intermediate circuit have discharged.
- Remove the front cover of the drive.
- Ensure that the mains cable, motor cable and capacitor bank (UDC+ and UDC-) are not powered.
- Locate the position for the module (see the drive documentation). Fasten the mounting rail to its place if not already installed. Observe the free space requirements for the module (see the figure above).
- Push the module onto the rail. The module can be released by pulling the locking spring with a screwdriver (see the figure above).



# Electrical installation

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## Overview

This chapter contains:

- general cabling instructions
- module earthing instructions
- instructions on setting the IP address
- instructions on connecting the module to the drive and to the Ethernet network.



**WARNING!** Before installation, switch off the drive power supply. Wait for five minutes to ensure that the capacitor bank of the drive is discharged. Switch off all dangerous voltages connected from external control circuits to the inputs and outputs of the drive.

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## General cabling instructions

Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. Use bushings at cable entries.

Handle fibre optic cables with care. When unplugging optic cables, always grab the connector, not the cable itself. Do not touch the ends of the fibres with bare hands, as the fibre is extremely sensitive to dirt.

The maximum long-term tensile load for the fibre optic cables is 1 N.  
The minimum short-term bend radius is 25 mm.

## Earthing the module

The NETA-01 module earth is connected to the rail onto which the module is mounted. If the rail is fastened to an earthed metallic assembly plate, the module is automatically earthed, and no external earthing wire is needed. If the rail is fastened to a base that is not earthed, the rail must be connected to the nearest earthing terminal. However, the earthing wire should not be connected to the same terminal as the power cable screens. (See the mounting instructions in chapter [Mechanical installation](#).)

## DIP switch settings

The DIP switches on the front of the NETA-01 module can be used to select the IP address for the module.

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**Note:** The new settings take effect only when the module is powered up or rebooted for the next time.

---

By default, the IP address is defined by software settings (see chapter [Communication](#)). Setting any DIP switch to ON enables the DIP switch selection. DIP switches 1 to 8 define the last octet of the IP address 192.168.0.xxx as a binary number (in decimals 1...254, 255 is reserved for broadcast), DIP switch 8 being the least significant bit.

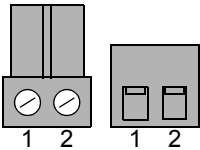
## NETA-01 connections

### Ethernet connection

The network cable is connected to the RJ45 connector on the NETA-01. The connector is internally terminated. Add a ferrite core to the PC end of the network cable to avoid EMC disturbance caused by power cables.

### Power supply connection

The NETA-01 module requires a 24 V DC power supply. Connect the supply wires to the connector on the lower side of the module.

Pole	Description	Terminal designations
1	+24 V DC	
2	0 V	

The power can be taken either from the drive's internal power supply (see drive manuals) or from a dedicated external power supply.

### Drive connection

The NETA-01 module is connected to the drive using a fibre optic cable link. Consult the drive documentation as to the corresponding terminals inside the drive. Multiple drives are connected through the NDBU-85/95 DDCS Branching Unit or using ring topology. Drives can be configured through the web pages of the module.

With the ACS800 NETA module can be connected to channels CH0 and CH3. Fieldbus control channel CH0 is used for control and monitoring the drive. The tool channel CH3 is intended to monitoring and debugging purposes.

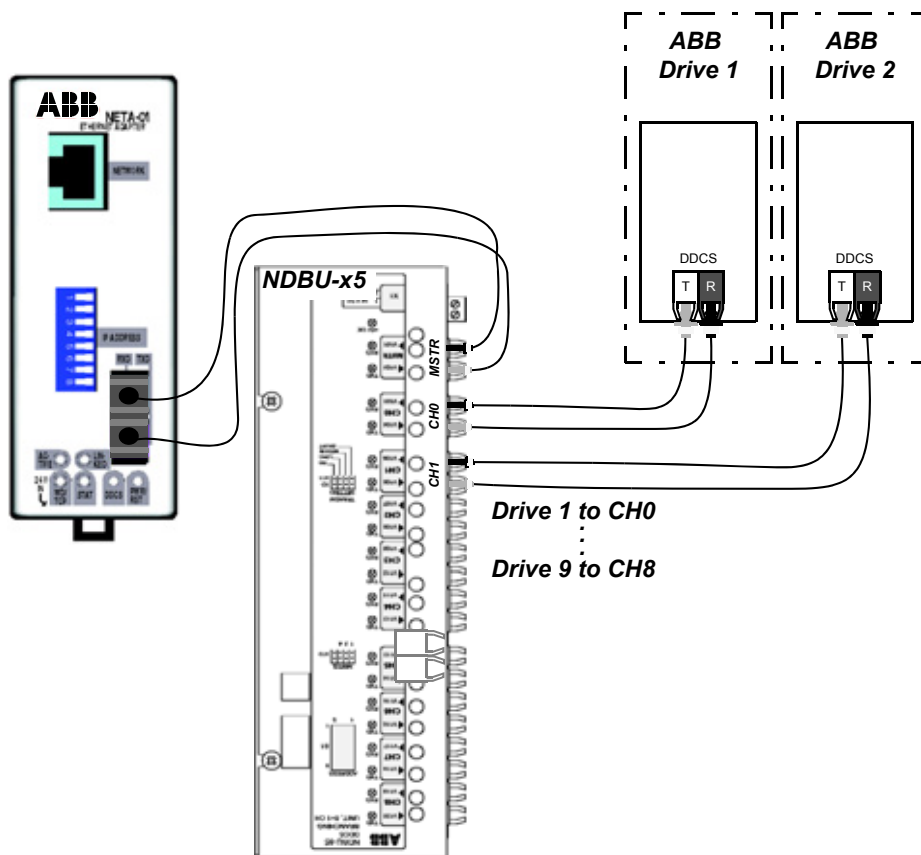


Figure 5. Fibre optic link connecting the NETA-01 to the drives through the NDBU-85/95

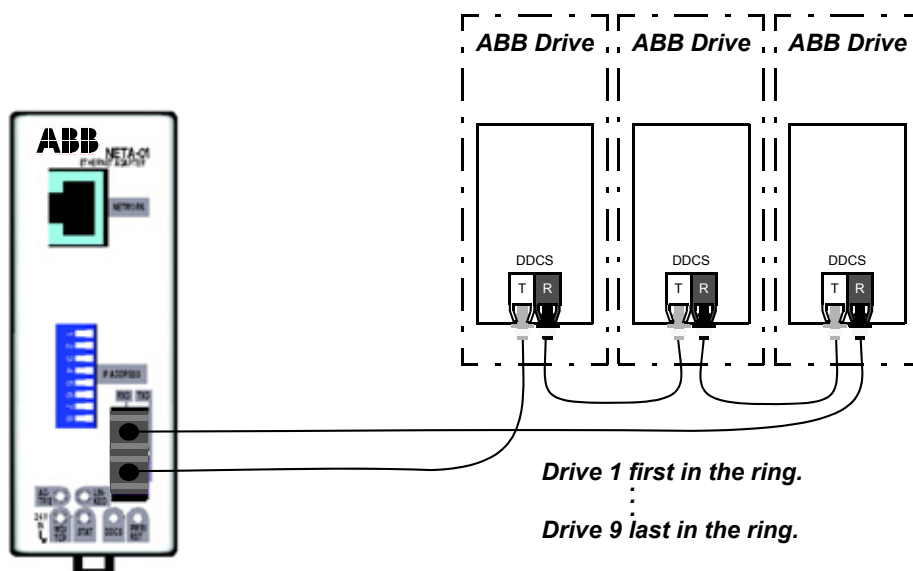


Figure 6. Fibre optic link connecting the NETA-01 to drives with ring topology



# Drive configuration

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## Overview

This chapter gives information on configuring the NETA-01 Ethernet Adapter module to work with the drive.

## Configuring the system

After the NETA-01 Ethernet Adapter module has been mechanically and electrically installed according to the instructions in chapters [Mechanical installation](#) and [Electrical installation](#), the drive must be prepared for communication with the module.

### Control locations

ABB drives can receive control information from multiple sources including digital inputs, analogue inputs, the drive control panel and a communication module (e.g. NETA-01). ABB drives allow the user to separately determine the source for each type of control information (Start, Stop, Direction, Reference, Fault Reset, etc.) See the user documentation of the drive for information on the selection parameters.

The detailed procedure of activating the NETA-01 module for communication with the drive is dependent on the drive type and used DDCS communication channel.

### Tool channel

Tool channel is intended for drive tools. As with ACS800 Standard application, the DDCS channel 3 is used. If the NETA-01 module is connected to tool channel the drive does not need any configuration. However NETA-01 module's web pages should be used to select 'Connected to *Tool Channel (Ch3)*' checkbox from the 'Configuration' menu's 'Network' tab.

### Fieldbus control channel

Communication through fieldbus control channel is faster than through tool channel and this should be used for control applications with higher performance requirements. Normally, when connected to the fieldbus control channel, a drive parameter must be adjusted to activate the communication. See the drive documentation.

As communication between the drive and the NETA-01 is established, a configuration parameter group shown in [Table 1](#). is copied to the drive.

---

**Note:** The grouping, numbering, and adjustment procedure of parameters vary from drive to drive. See the drive documentation for information.

---

Table 1. The NETA-01 configuration parameters (All parameters are read only.)

Fieldbus par. no.	Parameter name	Alternative settings	Default setting
1	MODULE TYPE	NETA-01 V1.x	NETA-01 V1.x
2	CHANNEL ADDRESS	1...254	1
3	BAUD RATE	(0) 10/100 MBit/s	(0) 10/100 MBit/s
4	STATUS	(0) SELF TEST; (1) NO CONNECT; (2) CONNECTED; (3) TIMEOUT; (4) DUP. MAC ERR; (5) BUS_OFF; (6) COM. ERROR; (7) WRONG ASMBLY	
5	PROFILE SELECTION	(0) ABB DRIVES	(0) ABB DRIVES
6	IP ADDRESS 1	1...255	10
7	IP ADDRESS 2	1...255	58
8	IP ADDRESS 3	1...255	18
9	IP ADDRESS 4	1...255	11
10	SUBNET MASK 1	1...255	255
11	SUBNET MASK 2	1...255	255
12	SUBNET MASK 3	1...255	255
13	SUBNET MASK 4	0...255	0

**Note:** The fieldbus parameters are only visible when the *Connected to Tool Channel (ch3)* check box in the *Configuration* menu is not selected.

#### 01 MODULE TYPE

Shows the connected communication adapter module type and its software version.

#### 02 CHANNEL ADDRESS

Identifies the channel address for the node (i.e. drive).

##### 1...254

On a DDCS network, each node is identified by a unique node number. This node number is between 1 and 254, and is called channel address.

#### 03 BAUD RATE

The baud rate for the Ethernet interface (auto-negotiated).

##### 10/100 MBit/s

#### 04 STATUS

This Status parameter indicates the status of the Ethernet module. See chapter [Fault tracing](#) for more detailed information.

**SELF TEST; NO CONNECT; CONNECTED; TIME-OUT;  
DUP. MAC ERR; BUS OFF; COM. ERROR; WRONG ASMBLY**

#### 05 PROFILE SELECTION

The communication profile between the drive and the module.

##### ABB DRIVES

#### 06 IP address 1 - 09 IP address 4

IP address of the module.

*10 Subnet mask 1 - 13 Subnet mask 4*

Subnet mask of the module.

---

**Note:** The NETA-01 supports only the ABB DRIVES communication profile.

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# The Web User Interface

---

## Overview

This chapter gives instructions on using the Java applets in the NETA-01 module. The Java applets are used to communicate with the drive or the drives. Depending on user access level, parameters can be changed and the drives can be configured and controlled.

## Starting up the applets

After the module has been configured for the Ethernet network, use a PC to start up a web browser and type the IP address of the module in the address field e.g. 'http://10.58.18.11'. Press enter and login with a username and a password. (See section [Password files](#) in chapter [Appendix G: File system](#).)

## Configuration applet

The module can be configured in the Configuration applet. It contains five different tabs labelled Drives, Network, Dataset, Scanning Parameters and Advanced Options.

---

**Note:** Any changes made using the Configuration applet take effect only after rebooting the module.

---

## Drives tab

Figure 7. Configuration applet, Drives tab

---

**Note:** Starting from NETA-01 version 1.4 the DDCS network can be scanned for drives. After constructing and configuring the DDCS network the drives can be found by clicking the 'Find drives' button. If 'Issue channel address' check box is selected the module will set the DDCS channel address for the drives starting from channel address 1. If the 'Issue channel address' checkbox is not selected the drive will use the existing DDCS channel addresses configured to the drives. To separate the drives from each other they should have individual channel addresses.

---

**Note:** NETA-01 versions 1.0-1.3 do not have the 'Find drives' button or the 'Issue channel address' checkbox. The Drives tab can be used to configure which drives are connected to the module by activating the 'State' field. Drive 1 should be connected to channel 1 on the NDBU-85/95, Drive 2 to the channel 2, etc. In case ring topology is used, it is necessary to put the drives in order, starting with Drive 1 and ending the ring with the last drive.

---

The 'State' field contains the following selections:

- Disabled: No drive connected.
- FBA DSET1: the drive uses datasets 1 and 2 as the source for control and status of the drive.
- FBA DSET10: the drive uses datasets 10 and 11 as the source for control and status of the drive.

A description of the drive can be written in the 'Name' field (max. 20 characters). The 'Addr:' field presents the DDCS channel address, which can be configured with a drive parameter.

By default, 'Allow dataset editing' check box is not selected, meaning that manual editing of datasets through the Datasets applet (see below) is disabled. The applet will only display the values currently stored in the memory of the NETA-01 module.

With 'Allow dataset editing' selected, the datasets in the memory of the NETA-01 can be manually edited through the Datasets applet, and the datasets are cyclically written to the drive (independent of whether the module is connected to fieldbus control channel or tool channel).

The 'Enable Motor control applet' enables the Motor Control applet where it is possible to start and stop the motor.

### Network tab

Figure 8. Configuration applet, Network tab

The 'Ethernet settings' button opens a form that can be used for Ethernet address configuration (Figure 9).

The 'Ethernet DDCS Port' is the DDCS server port number the applets use to communicate with the drives. The default port number can be changed if another user-defined server already uses it.

The 'Web and FTP access' field is used to define the allowed IP address range for using the web and FTP interface of the module.

The 'Modbus/TCP access' field is used to define the allowed IP address range for accessing the Modbus/TCP registers of the module.

The 'Modbus Timeout' is the maximum time between two consecutive Modbus/TCP messages. If the master station does not write to dataset registers of the module in the specified time, the module stops writing to datasets of the drives. Depending on the "communication fault function" parameter setting in the drive, the motor either stops or continues running.

If the module is connected to the fibre optic tool channel (CH3) of the drive, verify that the 'Connected to Tool Channel (Ch3)' checkbox is selected. Tool channel is scanned less frequently than fieldbus control channel, which makes the communication to tool channel slower.

By default the baud rate is set to 4 Mbit in fieldbus control channel and to 1 Mbit in tool channel. The communication speed can be changed to 1 Mbit in fieldbus control channel if the drive cannot handle 4 MBit/s. The module sets the selected baud rate accordingly on the drive side.

The radio buttons under 'Network Type' define the DDCS network type, either Ring or Star topology. If the star topology is selected, the NBDU Branching Unit address must be given.

Figure 9. Ethernet settings form (NETA-1.3 onwards)

Field	Description
IP address	IP address of NETA-01 module (Required)
Subnet mask	Subnet mask of the module (Required)
Gateway address	Gateway address of the module (Required if used)
DNS1 address	Address to primary Domain Name Server that translates Internet domain names such as 'www.abb.com' into IP numbers (Optional)
DNS2 address	Secondary DNS server (Optional)

Field	Description
Host name	Is the name of the module e.g. 'neta' (Optional)
Domain name	Is the default domain name for the module e.g. 'abb.com' (Optional)
SMTP server	IP address for the SMTP server (Optional)
SMTP username	Username for the SMTP server (Optional)
SMTP password	Password for the SMTP server (Optional)
DHCP enabled	IP address setting through DHCP is enabled if the check box is selected.

### Dataset tab

Figure 10. Configuration applet, Dataset tab

20 additional datasets can be read from or written to the drives in addition to the basic dataset (FBA DSET 1 or FBA DSET 10). The additional datasets can be allocated to one or several drives. The datasets can be accessed through Modbus TCP registers presented in the applet or through 'Datasets applet'.

---

**Note:** Some datasets are read only and they cannot be written by NETA-01. See the *Firmware Manual* of the drive for information on dataset numbering and write protection.

---

Datasets can either be added or removed. To add a dataset, select the drive number (Drive 1 to Drive 9), enter the dataset number and click the Insert button. By ticking the 'Writable' checkbox, a writable dataset (e.g. dataset 3) is added to the list and it can be accessed through the 'Modbus OUT' area. Also the readable dataset (e.g. dataset 4) is mapped to the 'Modbus IN' area. If 'Writable' checkbox is not selected only the readable dataset is added. To remove a dataset, select the line to be removed and click the Remove button.

---

## Scanning Parameters tab

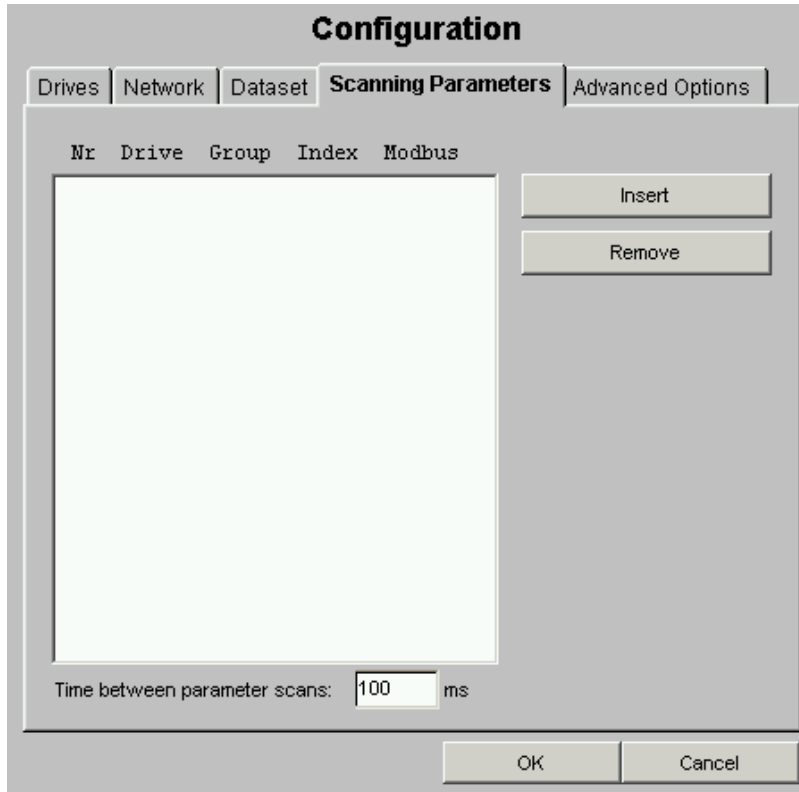


Figure 11. Configuration applet, Scanning Parameters tab

The Scanning Parameters feature can be used to monitor parameters of the drives. A maximum of 45 parameters can be monitored. The parameters can be distributed between several drives.

The 'Time between parameter scans:' field controls how often a parameter should be updated from the drive. The minimum setting of this parameter is 100 ms. For example if the list had four parameters it would take 400 ms to update the values.

The parameters can be accessed through Modbus TCP registers presented in the applet or through internal memory address in e-mail.

## Advanced Options tab

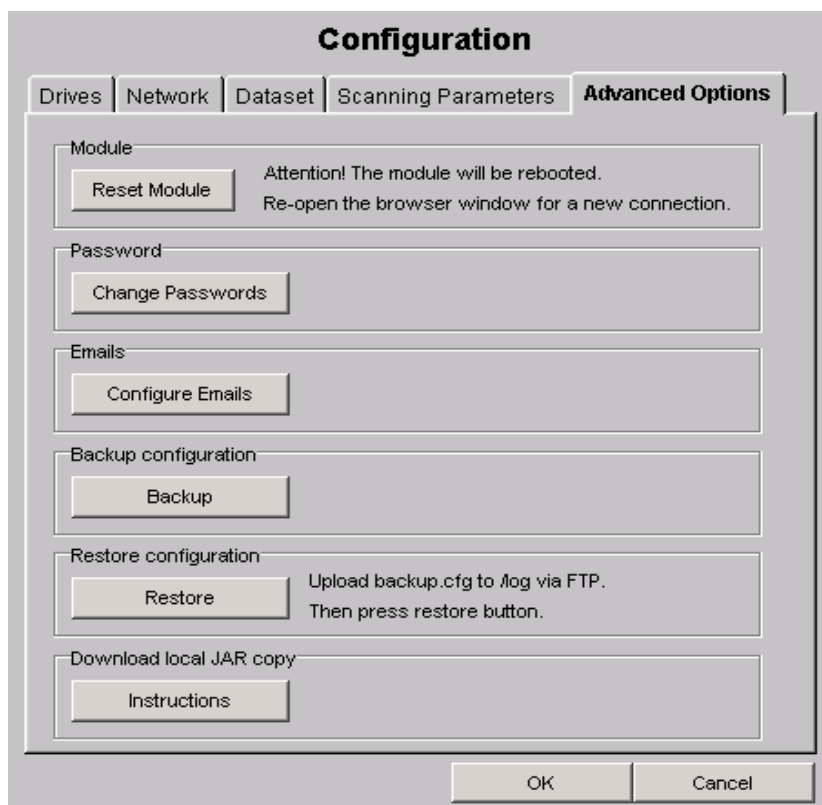


Figure 12. Advanced Options tab (NETA-1.5 onwards)

### Reset Module

The 'Reset module' button in the 'Advanced Options' tab reboots the NETA-01. The reboot is required e.g. for enabling configuration changes. If the connection to the module is lost, it can be re-established by logging in again.

NETA-01 version 1.5 onwards the 'Advanced tab' has also a number of other services. When clicking the buttons new menus open for additional configuration of the module.

### Change passwords

The 'Change Passwords' opens a menu that can be used to change the usernames, passwords and access rights.

Figure 13. Change password menu

'Select username' selection list displays the active users.

'Access level' displays the system level access (file system) for each user. The system level access level is fixed and only the first user in the list can have administrator rights.

The user name can be changed through the 'Type new username' field.

New password can be set through the 'Type new password' field and verified in the next field called 'Type password again'.

Check boxes can be used to activate access to the configuration and motor control menus. User can write any of the drive parameters if the 'Enable parameter write access' is selected.

New settings are activated after clicking the 'OK' button or declined with 'Cancel'.



## Configure Emails

From NETA-1.5 onwards it is possible to configure emails through the web pages. The message field of the email can contain parameter information, fault logger and data logger of the drive in addition to plain text. The module sends email when the trigger condition is fulfilled.

Figure 14. Email configuration menu

It is possible to configure nine emails through the 'Select email:' selection list.

The 'Offset:' line defines a trigger condition for the email. The selection list can be used to select a variable that triggers an email as long as the equation defined with the mask, operand and target value is true.

The module can also send email periodically if the 'Periodically after every' checkbox is ticked and the amount of minutes set.

'To:' and 'From:' fields have to be filled to send email to correct receivers. The email addresses of multiple receivers have to be separated with a semicolon (;).

The message field can contain plain text and so called SSI functions. 'Add parameter' button creates SSI function that includes drive parameters and dataset to the message.

Fault and data log files can be added to the email with corresponding buttons. The content of the files is written to the message field instead of attaching them. Bit 2 of the 'System status word' notifies when data log file is written to the module. The bit can be used to trigger an email, which has the data log file included. Data logger files are written automatically if the 'Automatic write to file when filled' checkbox is ticked from the Datalogger 'Settings' menu.

Any changes to an active email is saved after clicking the 'OK' button or selecting another active email from the selection list. Changes can be cancelled by clicking the 'Cancel' button.

#### *Backup and restore module configuration*

NETA-01 has several files that contain configuration information. When clicking the 'Backup' button these files are packed to one file called 'backup.cfg'. This file can be copied from a folder called 'Log' and saved to PC for further use. To restore the configuration the backup file has to be uploaded to the folder 'Log' again with FTP and the 'Restore' button clicked.

---

**Note:** The 'backup.cfg' file is compatible only with NETA-01 modules that have the same software version.

---

#### *Download local JAR copy*

The Java Applet application running on the browser is packed to a file called 'Appletsxxx.jar'. When connecting to NETA-01 module through the browser this file is downloaded every time. To save time and bandwidth this package should be saved to the file system of the Java Virtual Machine as a local copy. Further instructions is presented after clicking the 'Instructions' button.

## **Status applet**

The Status applet reads the status words from the module determining whether the drive is running properly or has faulted. The lamp button indicates green for Healthy, red for Fault and yellow for Alarm/Warning.

The applet uses Modbus commands to read dataset 2 from the drive, which is then stored in the memory of the module. Depending on the drive type, the drives have the status word either in dataset 2 or in dataset 11. The dataset information has to be configured in the Configuration applet. (See section [Configuration applet](#) above.)

The drive has faulted if status word:

bit 3 is set

bit 15 is set (Communication loss, e.g. broken DDCS link fibre)

bit 7 is set or all bits are zero. (Causes a Warning/Alarm)

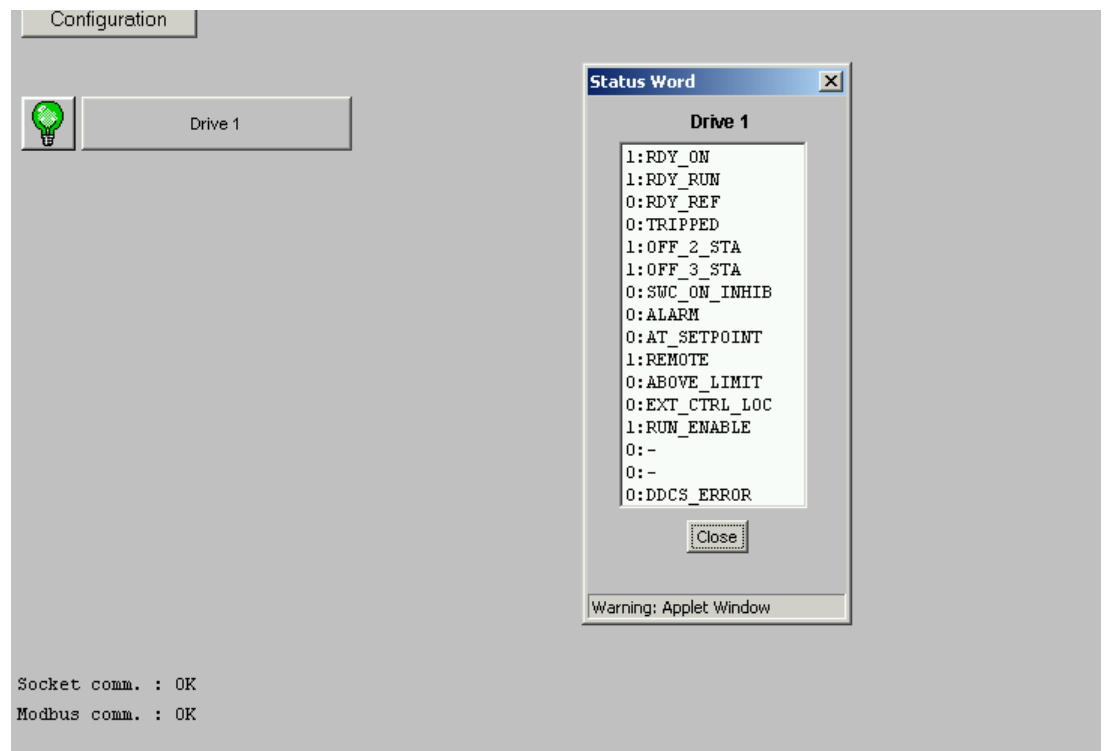


Figure 15. Status Applet

The Status applet for all the drives is always visible. The drive dataset numbers and drive names are configured in the Configuration applet.

Clicking the “light bulb” button loads the applet showing all the bits in the status word. The display shows the meaning of each bit. The uppermost bit corresponds to LSB, the lowermost bit to MSB.

Clicking the name of the drive loads the Menu applet where the other applets, such as Parameters, Datasets and Logger applets, can be started.

## Menu applet

All the other applets can be started from the Menu applet. The buttons in the menu applet can be disabled from the Configuration menu or by modifying the ‘drv\_comp.cfg’ file. There are two reasons for disabling the buttons. First of all, some drive applications do not support every NETA-01 feature and secondly the target application might set some limitations. For instance, in some cases starting a motor remotely without supervision is dangerous and control features should be disabled.

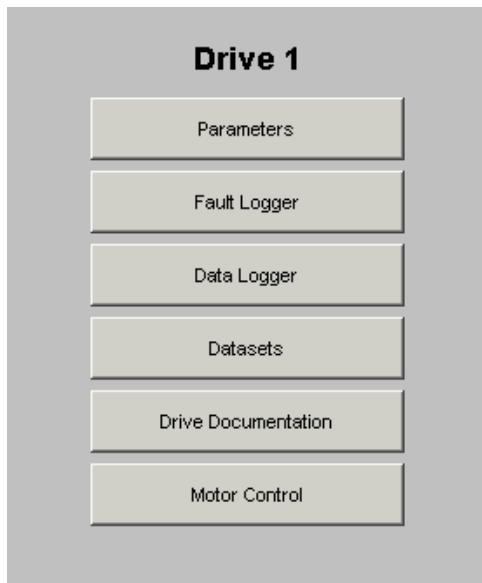


Figure 16. Menu applet

### Parameters applet

The drive set-up can be done using the Parameters applet.

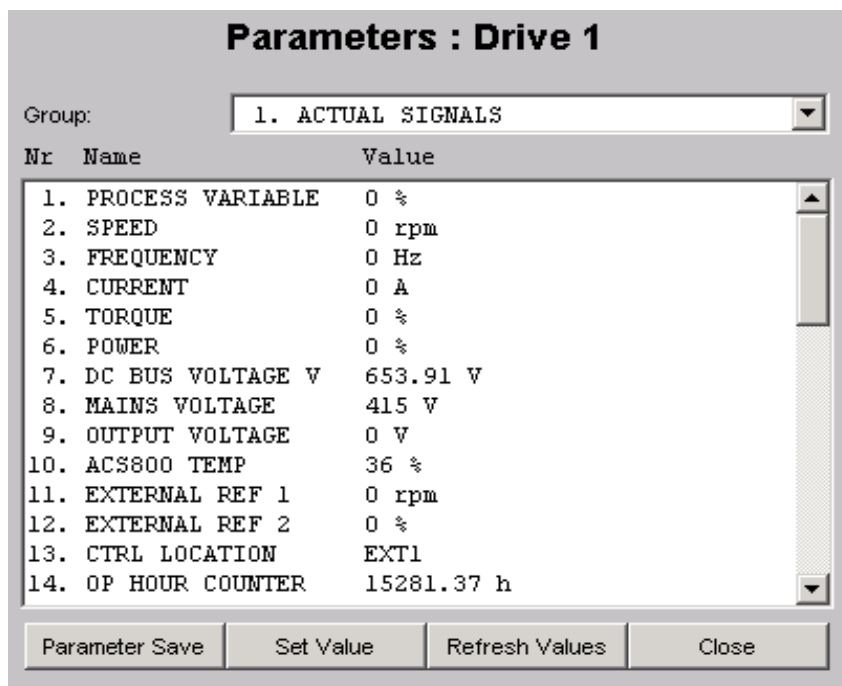


Figure 17. Parameters applet

The parameter group is selected from the drop down menu, after which all the available parameters in that group are presented with names and values.

The values are formatted as follows:

Type	Value presentation
1. Boolean	Two display strings. 'True' or 'False'.
3. Integer 16	Displays strings if any, otherwise decimal value.
4. Integer 32	Not supported.
8. Float	Floating integer shown in 2 decimals.
9. Visible	Visible string of 20 bytes.
10. Octet String	Not supported.
14. Bit String	Hex format i.e. 0x1A3F.

There are four buttons in the applet.

- Parameter Save button saves all the parameters to a file.
- The Refresh Values button updates the parameter values from the drive.
- The Close button closes the applet.
- If the user has the access to change parameter values, the Set Value button opens a Set Value window. Otherwise the button is disabled.

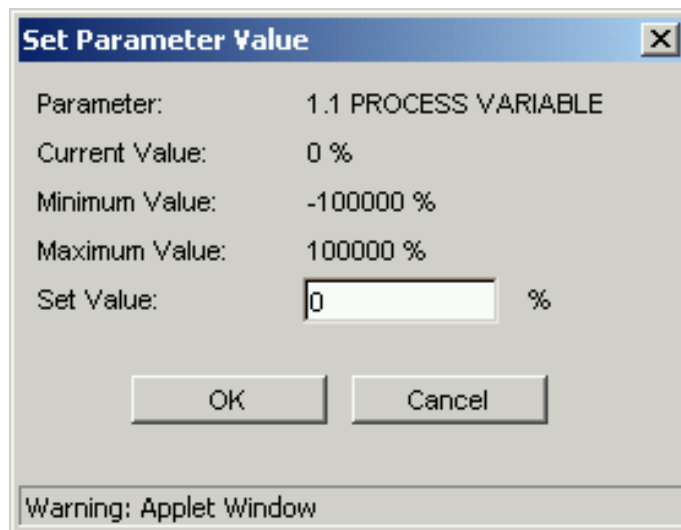


Figure 18. Set Parameter Value

The applet does not accept values outside the minimum and maximum limits.

### Fault Log applet

The Fault Log applet reads all recent faults stored in the drive.

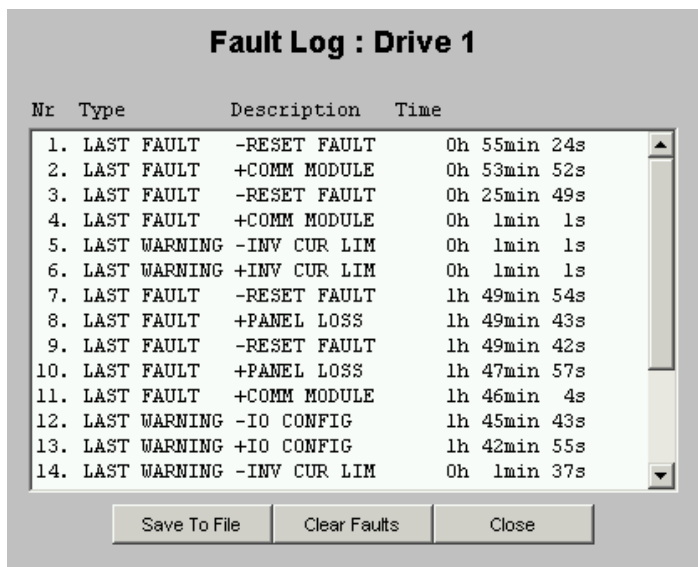


Figure 19. Fault Log applet

The Save To File button saves the fault logger content to a file that can be downloaded from the module.

The Clear Faults button clears the fault log and uploads the fault list again from the drive to make sure that the fault log has been cleared.

**Datalogger applet**

The Datalogger applet utilises the internal data loggers of the drives.

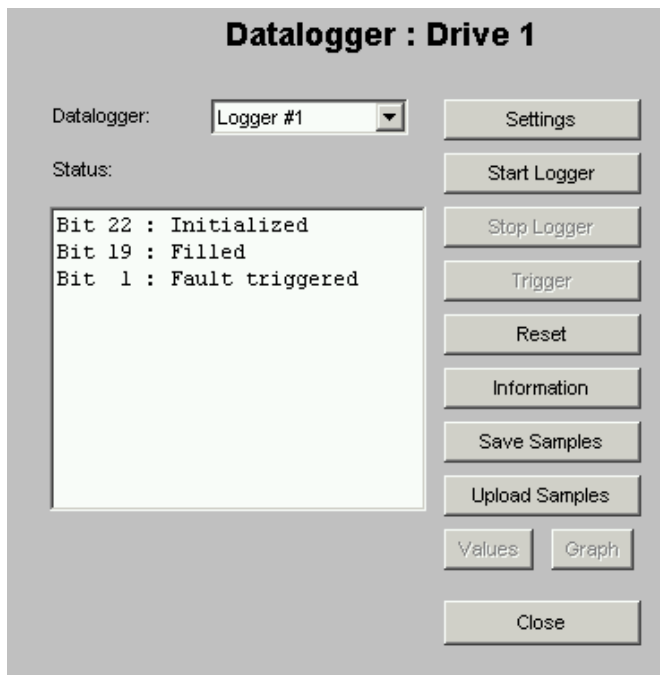


Figure 20. Datalogger applet

If the drive has more than one datalogger, the desired logger can be selected from the drop down menu. The status window is updated once a second.

Only users with privileged or administrator access can control the Datalogger.

To configure the datalogger, click the Settings button (only available when the datalogger is stopped). To start or stop the logger, use the Start Logger or Stop Logger buttons respectively. To reset the logger, click the Reset button. The Information button shows the datalogger configuration.

To view the contents of the log, first click the Upload Samples button, then click the Values button to view the log contents in numerical format or the Graph button to view the log contents in graphical format.

'Save To File' button can be used to save the content of selected data logger to a file and download it to a PC.

### Datalogger initialization

Figure 21. Datalogger Initialization

The Datalogger Initialization applet is loaded by pressing the Settings button in the Datalogger applet. It is available only for privilege and administrator users.

The applet defines

- the datalogger sample rate (Time Coefficient)
- the signals to be recorded (Add/Remove Variables)

- the amount of samples before triggering condition occurs
- the triggering condition
- the triggering reference signal (Set Trig Variable)
- the trigger level (Trig Level) and trigger level hysteresis (Trig Hyst.)
- whether the data logger file is written automatically to a file or not when the data logger is filled.

### *Datalogger information*

The screenshot shows a window titled "Datalogger Information" with a close button in the top right corner. The window contains the following configuration fields:

- Time Coefficient:** 3
- Base Time (us):** 1000
- Samples/channel:** 256
- Max Samp/ch :** 1024
- Variables:**

```
1.3 FREQUENCY
1.4 CURRENT
1.5 TORQUE
3.4 LIMIT WORD 1
```
- Trig Time:** 0h 1min 1s
- Pre-trig count:** 230
- Trig Condition:**

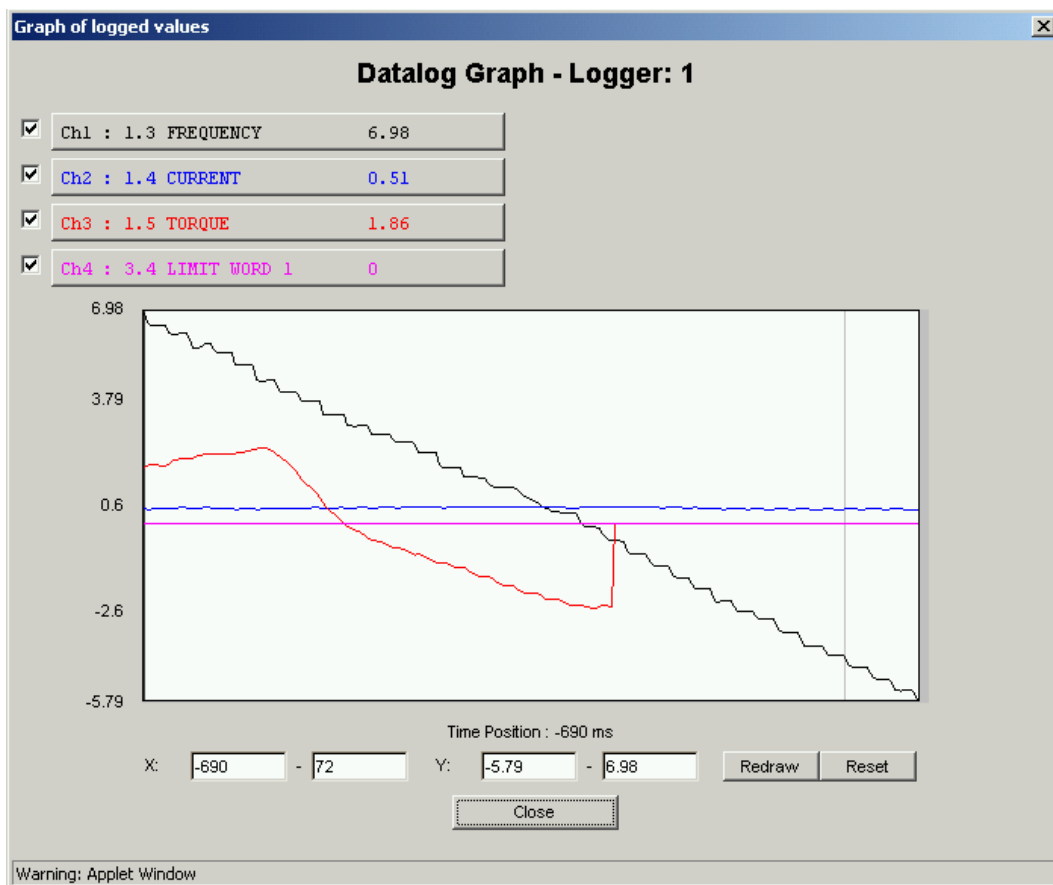
```
Bit 7 : External
Bit 0 : Fault
```
- Trig Variable:** 104.1 FC DUTY
- Trig Level:** 90.0
- Trig Hyst. :** 0.0

At the bottom of the window is a "Close" button and a warning message: "Warning: Applet Window".

*Figure 22. Datalogger Information*

The Datalogger Information window gives an overview of how the datalogger has been configured.





*Figure 23. Datalog Graph*

Datalogger Graph window draws the values of each channel of the data logger to a graph. Maximum and minimum values of X and Y axes can be changed to scale the view. Reset button scales the axes back to original values.

## Datasets applet

The Datasets applet monitors and writes (if enabled) datasets.

The output datasets at the drive are polled and updated every 500 ms. The first dataset for all the drives is always visible. Another 20 datasets can be selected for monitoring and editing in the Configuration applet. The values can be displayed in either decimal or hexadecimal format.

**Datasets: Drive 1**

Dataset:

Output		Input	
Statusword:	<input type="text" value="1208"/> Hex	Controlword:	<input type="text" value="0"/> Hex
Actual Value 1:	<input type="text" value="0"/> Dec	Ref. Value 1:	<input type="text" value="0"/> Dec
Actual Value 2:	<input type="text" value="0"/> Dec	Ref. Value 2:	<input type="text" value="0"/> Dec

*Figure 24. Datasets applet*

Writing manually to the datasets is possible if 'Allow dataset editing' is enabled in the Configuration applet. If disabled, the values of the input datasets are read cyclically from the memory of the NETA-01.

## Drive documentation

This button opens an URL defined by a drive parameter. The feature is not available for all drive types. If the URL parameter is undefined (empty), or not present in the drive type in question, [www.abb.com](http://www.abb.com) is opened.

## Motor Control applet

The applet is available if 'Enable Motor control applet' is enabled in the Configuration applet.

The Motor Control applet can Start/Stop and Reset the drive. The reference speed can be set between -100% and 100%. 'Actual Speed' shows the integer value of dataset 2 index 2. (See the *Drive Manual* for integer scaling.)

**Note:** When the Motor Control applet is active, scanning parameters are not updated.

**Control buttons**

*Local/Remote:* Toggles control between Motor Control applet (Local) and external source (e.g. I/O, fieldbus) (Remote)

*Start:* Starts the drive (Local mode only)

*Stop:* Stops the drive (Local mode only)

*Reset:* Resets a fault or warning (Local mode only)

**Speed set point bar**

Range: -100%...+100%  
(100% corresponds to nominal speed of motor)

**Drive status**

Upper LED: Ready (Green)  
Warning (Yellow)  
Communication Loss (Yellow)  
Fault (Red)

Lower LED: Running (Green)  
Stopped (Yellow)

**Actual motor speed indication**

Shows the integer value of dataset 2, index 2.

Figure 25. Motor Control applet – drive ready



Figure 26. Motor control applet – drive running



Figure 27. Motor control applet – drive faulted

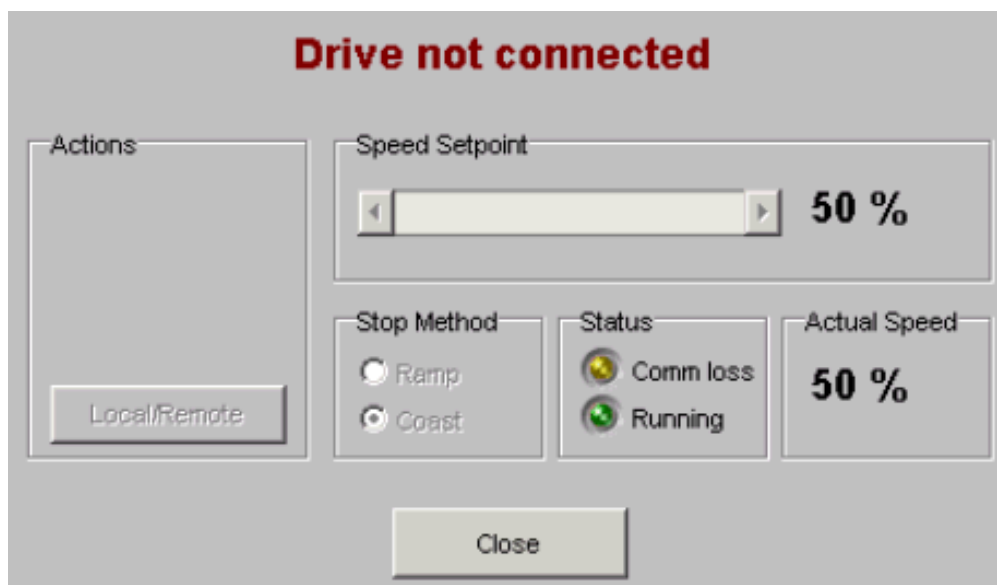


Figure 28. Motor control applet – DDCS communication error

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**Note:** In case of a DDCS communication error, the drive Status Word is not updated. The status information given will be based on the last valid Status Word received before the communication break.

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# Communication

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## Overview

This chapter describes briefly the Ethernet applications protocols, tools used in configuring the NETA-01 and NETA-01 communication interfaces.

## Protocols

### BOOTP

The Bootstrap Protocol (BOOTP) is a protocol that lets a network user automatically receive an IP address and have an operating system initiated without user involvement. BOOTP is the basis for a more advanced network manager protocol, the Dynamic Host Configuration Protocol (DHCP).

### DHCP

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information.

### FTP

The File Transfer Protocol (FTP) is a standard Internet protocol that enables a simple and efficient way of exchanging files between computers on the Internet.

### HTTP

The Hypertext Transfer Protocol (HTTP) provides a set of rules for exchanging files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web. Relative to the TCP/IP suite of protocols, HTTP is an application protocol.

### TCP/IP

TCP/IP is commonly used for communication within networks and on the Internet. It consists of a Transport Control protocol (TCP) and Internet Protocol (IP). The Internet Protocol is a method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet. For a working connection the IP needs three different addresses:

### *IP address*

The IP address identifies each node on the network. IP addresses are written as four decimal integers (1...254, 0 and 255 are reserved) separated by periods where each integer represents the value of one byte (8 bits, octet) in the IP address.

### *Gateway address*

Gateways connect individual physical networks into a system of networks. When a node needs to communicate with a node on another network, the gateway transfers the data between the two networks. The gateway address is given in the same format as the IP address.

### *Subnet mask*

Subnet masks are used for splitting networks into subgroups, or subnets. The subnet mask is a binary pattern that is matched up with the IP address to turn part of the address field into a field for subnets.

## **SMTP**

The Simple Mail Transfer Protocol (SMTP) is a TCP/IP protocol used in sending and receiving e-mail.

## **UDP**

The User Datagram Protocol (UDP) is a communications protocol that offers a limited number of services when messages are exchanged between computers in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP). UDP uses the Internet Protocol to actually get a data unit from one computer to another. UDP does not provide the division of a message into packets and reassembling it at the other end. Specifically, UDP does not provide sequencing of the packets that the data arrives in.

## **Higher level protocols**

### *Modbus TCP*

The Modbus protocol in the module is conformable to the Modbus TCP specification 1.0. More information about the Modbus TCP protocol can be found at <http://www.modbus.org/>.



## Network configuration

Description of the different IP configuration options:

Method	Description	Note
DIP switch	If the DIP switches are set to a value between 1 and 255, the IP settings are: IP address: 192.168.0.xxx (where xxx stands for a value between 1 and 255) Subnet mask: 255.255.255.0 Gateway address: 0.0.0.0 (No gateway set)	Must be set before initialisation. The predefined subnet can only be used on an intranet.
DHCP/BOOTP	If DHCP/BOOTP is enabled in the network configuration (see section <a href="#">Configuration files 'ethcfg.cfg'</a> in chapter <a href="#">Appendix G: File system</a> ), and the appropriate server is found on the network, the module's IP settings are defined by the DHCP/BOOTP server.	A DHCP or BOOTP server is required.
Predefined in the flash memory of the module	If no configuration is stored in the flash memory, the module will indicate an error on the status LED and the module will only run the ARP protocol (see below).	
ARP (Address Resolution Protocol)	Change the IP address from a PC with following commands: <pre>arp -s &lt;IP address&gt; &lt;MAC address&gt; ping &lt;IP address&gt; arp -d &lt;IP address&gt;</pre> <p>The <code>arp -s</code> command will store the IP and MAC address in the PC ARP table. When the <code>ping</code> command is executed, the PC will send the message to the module, by using the MAC address. The module changes its IP address to the given one. The <code>arp -d</code> command is not required. It removes the static route to from the ARP table.</p>	Module MAC address required (printed in the label of the module). The new IP address is stored in the flash memory of the NETA-01.  The NETA-01 must be in the same subnetwork as the PC. Normally, the first three bytes (octets) of the new IP address must be the same as the IP address of the PC executing the command.
Web pages (NETA-1.3 onwards)	Network settings can also be changed through a web page form in the "Configuration" menu.	The IP address has to be set first with ARP or DIP switches to be able to access the web pages.
IP Config Tool	Simple PC tool for configuring the IP address of the module.	Available at the ABB Library in the Internet.

## HTTP server

The module features a complete web server. With the web pages created in the module, a web browser can access the configuration of the module and control multiple drives connected to the module.

### Virtual files

The module contains a set of virtual files that can be used when building a web page for configuration of network parameters. These virtual files can be overwritten (not erased) by placing files with the same name in the root directory of the file system.

By using this feature it is for example possible to replace the ABB logo by uploading a new logo named '\logo.gif'.

## Security

The web system in NETA-01 features three different security levels: Administration, Privilege and Normal.

- A Normal user can only monitor the drive but not control it or change configuration.
- A user with Privilege rights can view and change parameters and datasets (if enabled), and has access to the motor control applet.
- An Administrator, in addition to above, has access to the Configuration menu.

In versions 1.0, 1.1 and 1.2 each of these security levels has their own username and password files ('normal\_login.psw', 'priv\_login.psw', 'admin\_login.psw'). The format and usage of these files are described in the section [Appendix G: File system / Password files](#).

Starting from NETA-01 version 1.3 the above files are removed and replaced by files called 'web\_login.psw' and 'access.cfg'. Format of the files is described in the section [Appendix G: File system / Password files](#).

Files within the file system can be protected from web access through username/password authorisation. By default, all files can be viewed with the exception of those in the directories '\user\pswd\' and '\pswd\' and those named 'web\_accs.cfg'. Placing a file called 'web\_accs.cfg' in a directory protects the directory from unauthorized web access. The file contains a list of users that are allowed to browse that directory, or a redirection file path. See section [Appendix G: File system / Password files](#) 'web\_accs.cfg' for a specification of the file format and usage.

It is also possible to configure which IP addresses and protocols are allowed to access the module. See section [Appendix G: File system / Description of the files](#) for description of the file 'ip\_accs.cfg'.

## FTP server

The FTP server is used to upload/download files to the file system with standard FTP client programs. Depending on the security settings, different parts of the file system can be accessed by the user:

---

**Note:** Also a web browser can be used to upload and download files. To enable the feature from Internet Explorer, select:  
Tools -> Internet Options -> Advanced -> Enable folder view for FTP sites checkbox.  
Type ftp://<address> into the address field and use system username and password to log in.

---

## Security

The FTP server has two security levels: Normal and Administrator. The user must login using a valid username/password combination to access the file system. The security level can be set individually for each user login.

### *Normal user*

In Normal mode the access is restricted to the 'user/' directory. The username and password are defined in a file called 'sys\_pswd.cfg' located in the 'user/pswd/' directory. Files in this directory cannot be accessed from a web browser. The format of the file is described in the section [Appendix G: File system / Description of the files](#).

### *Administrator*

In Administration mode, the user has full access to the file system. Username/password combinations are defined in an administration password file called 'ad\_pswd.cfg' and located in the '/pswd/' directory. See section [Appendix G: File system / Description of the files](#) for the format of the file.

## Telnet server

Through a Telnet client, the file system can be accessed using a command line interface similar to MS-DOS™.

## Security

The Telnet server also has two security levels: Normal and Administrator. It uses the same username/password combinations defined for the FTP server.

## General commands

The following help menu can be viewed with the `help` command.

General commands:

```

help          - Help with menus
version      - Display version information
exit         - Exit station program

```

Also try "help [general|diagnostic|filesystem]"

## Diagnostic commands

The following help menu can be viewed with the `help diagnostic` command.

Diagnostic commands:

```

arps         - display ARP stats and table
iface        - display net interface stats
sockets      - display socket list
routes       - display IP route table

```

## File system commands

The following help menu can be viewed with the `help filesystem` command.

Filesystem commands:

```

dir          - Lists the content in a directory
md           - Make a directory
rd           - Delete a directory
cd           - Change current directory
format       - Format the file system
del          - Delete a file
ren          - Rename a file or directory
move        - Move a file or directory
copy        - Copy a file
type        - Type the content of a file
mkfile      - Make a file
append      - Append a line to a file

```

For commands with file names, directory names or paths the names can be written as they are or within “ “ characters. For names with spaces “ “ must be used.

---

**Note:** The `format` command can only be used in the administration mode. (See section [Security](#) above.)

---

## E-mail client

The e-mail client sends e-mails from the module. To send e-mail, the IP address of an SMTP server must be set from the ‘Configuration’ menu of the web pages (see section [The Web User Interface / Network tab](#)). Without a valid SMTP address the module will not be able to send any e-mail messages.

### Sending predefined e-mail on data event

It is possible to send predefined e-mail messages to predefined receivers, triggered by an event in the memory of the module. The module has a scan time of 0.5 seconds. The event must be present longer than 0.5 seconds to ensure that the module detects it.

Up to 10 user defined e-mails can be triggered on different events. Each e-mail has their own configuration file ‘email\_(x).cfg’ (‘x’ stands for the number of the email). The files are placed in the directories ‘\user\email\’ for user configurable e-mails and ‘\email\’ for non-user configurable e-mails. See [Appendix D: Using predefined e-mail](#) for more information. Starting from NETA-01 version 1.5 the email file can be configured through a graphical user interface.

## SSI functions

SSI functions give the web browser access to edit configuration settings and alter data in the memory of the module. The functions can also be included in e-mails. See [Appendix E: Server Side Includes](#) for more information.

## Modbus TCP

The implementation of the Modbus TCP server is done according to the Modbus TCP specification 1.0. All commands according to class 0 and class 1 are implemented and some of the class 2 commands. (See [Table 2](#).)

The Modbus TCP protocol allows the module to be used as an Ethernet bridge to control the drive(s). The module can handle eight simultaneous connections.

*Table 2. Supported commands*

Function code	Function name	Class	Affects area	Addressing method
3	Read multiple registers	0	Read/Write	Word
4	Read input registers	1	Read/Write	Word
6	Write single register	1	Write	Word
16	Force multiple registers	0	Write	Word
22	Mask write register	2	Write	Word
23	Read/Write registers	2	Read/Write	Word

### Modbus TCP addressing

The NETA-01 Read and Write areas can be configured to a maximum size of 2048 bytes each. When accessing these areas with Modbus commands, the addressing is done according to the following tables.

---

**Note:** NETA-01 uses 4xxxx holding register area for Modbus TCP communication.

---

### Internal memory address

The internal memory addresses are used as triggering conditions or for accessing Modbus TCP registers in e-mail. For more information, see [Appendix D: Using predefined e-mail](#) and [Appendix E: Server Side Includes](#).

OUT: Modbus register Write area (Modbus TCP master to drive):

Modbus TCP Address (DEC)	Internal Memory Address (hex)	Name	Information
<i>Basic Dataset 1 (or 10) (Control Word and references)</i>			
41025	0×800	Drive 1 – Main Control Word	Sent to each drive as Dataset 1 (or 10) and responded to by the drives in Dataset 2 (or 11) (see the Read area).
41026	0×802	Drive 1 – Reference 1	
41027	0×804	Drive 1 – Reference 2	
41028	0×806	Drive 2 – Main Control Word	
41029	0×808	Drive 2 – Reference 1	
41030	0×80A	Drive 2 – Reference 2	
41031	0×80C	Drive 3 – Main Control Word	
...			
41051	0×834	Drive 9 – Reference 2	
<i>Additional datasets</i>			
41052	0×836	1st dataset – Index 1	Additional datasets defined in the Configuration applet (Dataset tab). See also the Read area.
41053	0×838	1st dataset – Index 2	
41054	0×83A	1st dataset – Index 3	
41055	0×83C	2nd dataset – Index 1	
41056	0×83E	2nd dataset – Index 2	
41057	0×840	2nd dataset – Index 3	
41058	0×842	3rd dataset – Index 1	
...			
41111	0×8AC	20th dataset – Index 3	
<i>Write Parameter Command (Area 1)</i>			
41249	0×9C0	DRIVE NUMBER	Drive number (range from 0 to 8)
41250	0×9C2	GROUP WRITE	Parameter group no.
41251	0×9C4	INDEX WRITE	Parameter index
41252	0×9C6	DATA	Parameter value
41253	0×9C8	Message ID	Must be unique

Modbus TCP Address (DEC)	Internal Memory Address (hex)	Name	Information
<i>Read Parameter Command (Area 1)</i>			
41254	0×9CA	DRIVE NUMBER	Drive number (range from 0 to 8)
41255	0×9CC	GROUP READ	Parameter group no.
41256	0×9CE	INDEX READ	Parameter index
41257	0×9D0	Message ID	Must be unique
<i>Write Parameter Command (Area 2)</i>			
41265	0×9E0	DRIVE NUMBER	Drive number (range from 0 to 8)
41266	0×9E2	GROUP WRITE	Parameter group no.
41267	0×9E4	INDEX WRITE	Parameter index
41268	0×9E6	DATA	Parameter value
41269	0×9E8	Message ID	Must be unique
<i>Read Parameter Command (Area 2)</i>			
41270	0×9EA	DRIVE NUMBER	Drive number (range from 0 to 8)
41271	0×9EC	GROUP READ	Parameter group no.
41272	0×9EE	INDEX READ	Parameter index
41273	0×9F0	Message ID	Must be unique
<i>System Control Word (NETA-1.3 onwards)</i>			
41113	0×8B0	System Control word	Control word for activating system operations (see below).

*IN: Modbus register Read area (Drive to Modbus TCP master):*

<b>Modbus TCP Address (DEC)</b>	<b>Internal Memory Address (hex)</b>	<b>Name</b>	<b>Information</b>
<i>Basic Dataset 2 (or 11) (Status Word and actual values)</i>			
40001	0×00	Drive 1 – Main Status Word	This dataset is the response to Dataset 1 (or 10) (see the Write area).
40002	0×02	Drive 1 – Actual value 1	
40003	0×04	Drive 1 – Actual value 2	
40004	0×06	Drive 2 – Main Status Word	
40005	0×08	Drive 2 – Actual value 1	
40006	0×0A	Drive 2 – Actual value 2	
40007	0×0C	Drive 3 – Main Status Word	
...			
40027	0×034	Drive 9 – Actual value 2	
<i>Additional datasets – Response</i>			
40028	0×036	1st dataset – Index 1 (Response)	Response to additional datasets defined in the Configuration applet (Dataset tab) (see the Write area).
40029	0×038	1st dataset – Index 2 (Response)	
40030	0×03A	1st dataset – Index 3 (Response)	
40031	0×03C	2nd dataset – Index 1 (Response)	
40032	0×03E	2nd dataset – Index 2 (Response)	
40033	0×040	2nd dataset – Index 3 (Response)	
40034	0×042	3rd dataset – Index 1 (Response)	
...			
40087	0×0AC	20th dataset – Index 3 (Response)	
<i>Scanning Parameters – Response</i>			
40161	0×140	Parameter 1 value	Parameters to be scanned (and scanning rate) are selected using the Configuration applet. The selected values are read cyclically from the drive.
40162	0×142	Parameter 2 value	
...			
40204	0×196	Parameter 44 value	
40205	0×198	Parameter 45 value	
<i>Write Parameter – Response (Area 1)</i>			
40225	0×1C0	WRITE_STATUS	0 = OK; 1 = Error
40226	0×1C2	Message ID	Given at register 41253



Modbus TCP Address (DEC)	Internal Memory Address (hex)	Name	Information
<i>Read Parameter – Response (Area 1)</i>			
40227	0×1C4	READ_STATUS	0 = OK; 1 = Error
40228	0×1C6	DATA	Parameter value
40229	0×1C8	Message ID	Given at register 41257
<i>Write Parameter – Response (Area 2)</i>			
40241	0×1E0	WRITE_STATUS	0 = OK; 1 = Error
40242	0×1E2	Message ID	Given at register 41269
<i>Read Parameter – Response (Area 2)</i>			
40243	0×1E4	READ_STATUS	0 = OK; 1 = Error
40244	0×1E6	DATA	Parameter value
40245	0×1E8	Message ID	Given at register 41273
<i>System Status Word (NETA-1.3 onwards)</i>			
40089	0×0B0	System Status Word	Status word of the system operations (see below).

### Supported exception codes

Exception code	Name	Description
01	Illegal function	The module does not support the function code in the query.
02	Illegal data address	The data address received in the query is outside the initialized memory area.
03	Illegal data value	The data in the request is illegal.

### System control and status words

System control and status words are used to access some of the NETA-01 module's functions through the Modbus TCP interface (NETA-1.3 onwards). It is possible to start the writing of data and fault logger files, and to reboot the module.

## System control word description

Bits	Bits 15-8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Description</b>	Reserved	Drive selection (1 to 9)				Reboot module	Write fault log file	Data logger number	Write data log file
<b>Usage</b>		These bits are used to select the drive.				0 ->1 reboot	0 -> 1 write	0 = DL1 1 = DL2	0 -> 1 write
<b>Default values</b>	N/A	0	0	0	1	0	0	0	0

## System status word description

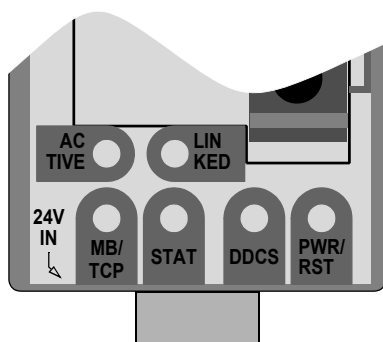
Bits	Bits 15-10	Bit 9	Bit 8	Bits 7-4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Description</b>	Reserved	Periodical trigger bit	DDCS link break	These bits present the active drive.	Fault log ready	Data log ready	Writing fault log file	Writing data log file
		1 = when timer resets 0 = timer running	1 = Link brake 0 = Link OK		0 = Not ready 1 = Ready	0 = Not ready 1 = Ready	0 = IDLE 1 = Writing	0 = IDLE 1 = Writing
<b>Default values</b>	N/A	0	0	0	0	0	0	0

# Fault tracing

## Overview

This chapter gives diagnostic information for finding out the root causes and corrections to the most common problems with the NETA-01 module.

## Diagnostic LEDs



The LEDs are bicolour (green/red) with white diffused lens.

LED	Mode	Description
ACTIVE	Off	Not on-line / Not powered
	Flashing green	A packet is received or transmitted through the Ethernet module
LINKED	Off	Not on-line / Not powered
	Steady green	Module connected to Ethernet network
MB/TCP	Off	Not on-line / Not powered
	Flashing green	The number of established Modbus TCP connections to the module equals the number of flashes.
STAT	Off	Not powered
	Steady green	OK
	Flashing green	The IP address is not configured by the configuration DIP switches.
	Flashing red 1 Hz	Ethernet configuration failed
	Flashing red 2 Hz	Failed to load ethernet configuration from memory.
	Flashing red 4 Hz	Internal error (fatal)

LED	Mode	Description
DDCS	Off	Not powered
	Flashing green	DDCS initialisation in progress
	Green	DDCS communication established
	Flashing red 2Hz	DDCS communication errors
	Red	Drive not supported
PWR/RST	Off	Module not powered
	Green	Module powered
	Flashing red	DDCS configuration failed
	Red	Hardware failure

## Status bars applet

Socket communication:	Indicates the state of the communication between the applets and the module.
OK:	The DDCS socket communication is ok.
Socket fail:	Unable to create DDCS connection to module.
Illegal data size:	Too much data was send over the connection.
Write error:	The applets failed to write to module.
Timeout error:	The module failed to send response.
Could not read header:	The response from the module was corrupted on the way.
Exception:	There response had errors.
Wrong data size:	The response does not match the query.
Illegal command:	The DDCS command was illegal.
Error in read:	Some undefined error occurred during read operation.
Modbus communication: (removed from v1.5)	Indicates the state of the Modbus communication between the applets and the module.
OK:	Modbus communication is ok.
Socket fail:	Unable to create Modbus connection to module.
Write error:	Modbus message exchange did not succeed.
Bad reply:	The Modbus response was wrong.
Read error:	The Modbus read operation failed.
Exception:	The response had errors.
NDBU Status:	The status of the branching unit (visible only when branching unit is connected).
OK:	The communication is working correctly.
Error:	Cannot communicate with the connected branching unit.

## Installation problem

Verify all the connections on the module:

- Power and Ethernet cables are connected as described in chapter [Electrical installation](#).
- Fibre optic cables are connected on the correct fibre optic channel of the drive or the NDBU-85/95, and the NETA-01 module.
- Check that there is a ferrite core on the Ethernet cable.

## Drive setup

If NETA-01 is used for controlling the drive and the fieldbus parameter group is not shown on the drive panel:

- Enable the NETA by setting the appropriate drive parameter.
- Check that the '*Connected to Tool channel (ch3)*' checkbox is not selected

If the drive actual values can be read, but the control commands (start/stop or reference) do not go through:

- Check that the control location parameters of the drive are set to use the NETA as the source of the required command.
- Check that the drive is in REMOTE control.
- Check the channel address.



## Appendix A: Technical data

---

### DDCS link

**Compatible devices:** ABB ACS800, ACS 600, ACX 400, DCS 800, DCS 600, ACS 6000, ACS 1000, ACS 5000 drives.

**Size of the link:** 2 stations

**Medium:** Fibre optic cable

- Construction: Plastic core, diameter 1 mm, sheathed with plastic jacket
- Attenuation: 0.31 dB/m
- Maximum Length between Stations: 10 m
- Specifications:

Parameter	Minimum	Maximum	Unit
Storage Temperature	-55	+85	°C
Installation Temperature	-20	+70	°C
Short Term Tensile Force		50	N
Short Term Bend Radius	25		mm
Long Term Bend Radius	35		mm
Long Term Tensile Load		1	N
Flexing		1000	cycles

**Topology:** Point-to-point

**Serial communication type:** Asynchronous, half Duplex

**Transfer rate:** 4 Mbit/s

**Protocol:** Distributed Drives Communication System (DDCS)

**Connectors:** Blue – receiver; grey – transmitter

## Fieldbus link

**Compatible devices:** Ethernet standard IEEE 802.3 and 802.3u devices

**Medium:** 10base-TX, 100base-TX

- Termination: Internal
- Wiring: CAT 5 UTP, CAT 5 FTP\* or CAT 5 STP\* (\*recommended)
- Connector: RJ-45
- Maximum segment length: 100 m

**Topology:** bus, star

**Serial communication type:** half and full Duplex

**Transfer rate:** 10 / 100 Mbps

**Carrier protocol:** TCP/IP

**Application protocols:**

- HTTP (Port 80)
- FTP (Port 21)
- Telnet (Port 23)
- Modbus TCP (Port 502)
- SMTP
- DDCS over Ethernet (Default port 46823)

## NETA-01

**Enclosure:** Plastic, dimensions 93 × 35 × 76.5 mm (H×W×D); degree of protection IP 20

**Mounting:** Onto a standard mounting rail

**Settings:** Through drive parameters and/or DIP switches

**Current consumption:** 80 mA at 24 V DC ±10%

**Connectors:**

- Light transmitter (grey) and receiver (blue) (Hewlett-Packard Versatile Link) for connection to the drive
- RJ-45 connector for Ethernet connection

**General:**

- All materials are UL/CSA approved
- Complies with EMC Standards EN 50081-2 and EN 50082-2



## Appendix B: Ambient conditions

---

### Ambient conditions, operation

Ambient operating conditions refer to the conditions the option module is subjected to when installed for stationary use.

**Air temperature:** 0 to +50°C

**Relative humidity:** 5 to 95%, no condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.

**Contamination levels:**

Chemical gases: IEC 60721-3-3, Class 3C2

Solid particles: IEC 60721-3-3, Class 3S2

**Installation site altitude:** 0 to 2000 m. If the installation site is above 2000 m, contact local ABB representative.

**Vibration:** Max. 0.3 mm (2 to 9 Hz), max. 1 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC 60068-2-6)

**Shock:** Max. 70 m/s<sup>2</sup>, 22 ms (IEC 60068-2-27)

### Ambient conditions, storage

Ambient storage conditions refer to the conditions the option module is subjected to during storage in the protective package.

**Temperature:** -40 to +70°C.

**Relative humidity:** Less than 95%, no condensation allowed

**Atmospheric pressure:** 70 to 106 kPa

**Vibration:** Max. 1.5 mm (2 to 9 Hz), max. 5 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC 60068-2-6)

**Shock:** Max. 100 m/s<sup>2</sup>, 11 ms (IEC 60068-2-27)

### Ambient conditions, transportation

Ambient transportation conditions refer to the conditions the option module is subjected to during transportation in the protective package.

**Temperature:** -40 to +70°C

**Relative humidity:** Less than 95%, no condensation allowed.

**Atmospheric pressure:** 60 to 106 kPa

**Vibration:** Max. 3.5 mm (2 to 9 Hz), max. 15 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC 60068-2-6)

**Shock:** Max. 100 m/s<sup>2</sup>, 11 ms (IEC 60068-2-27)

**Bump:** Max. 300 m/s<sup>2</sup>, 6 ms (IEC 60068-2-29)

**Free Fall:** 250 mm



# Appendix C: PC configuration

---

## PC requirements

The NETA-01 module can be configured and used with a normal PC that has:

- An Ethernet network adapter
- Windows™ 98/ME/2000/XP, Linux
- A World Wide Web browser, such as Microsoft Internet Explorer 5.5 or higher, or Netscape 6.2 or higher.
- Microsoft VM or Java Virtual Machine installed for the browser in use
- Telnet and FTP clients for module configuration (if needed).

## Java Virtual Machine

---

**Note:** This instruction is for Microsoft Internet Explorer only.

---

The NETA-01 application uses Java Applets that require Java Virtual Machine (JVM) to run on a browser. To check if the browser already uses JVM,

- Open the browser
- Open the 'Internet Options...' from the 'Tools' drop down menu
- Select 'Advanced' tab and scroll down the list to find headers 'Java (Sun)', 'Microsoft VM' or both. (See Figure [Internet options.](#))

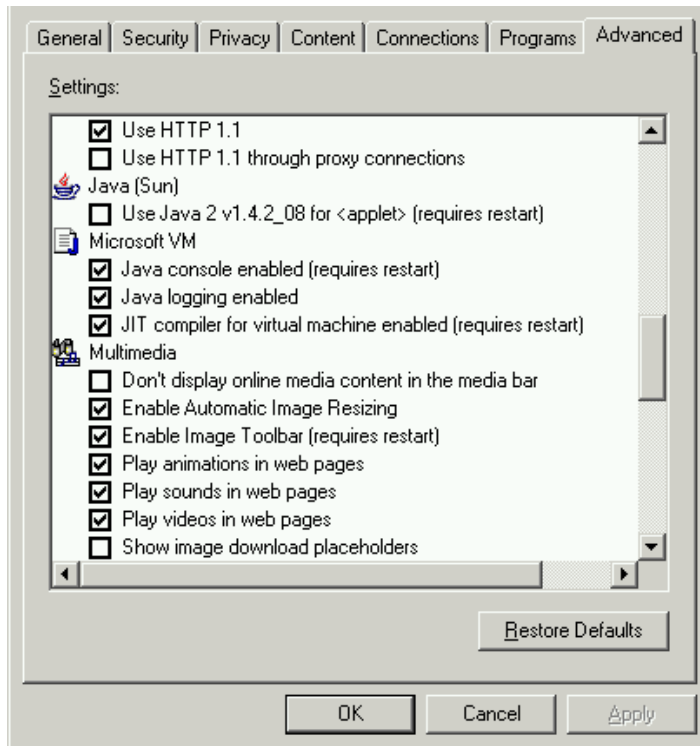


Figure 29. Internet options

- If 'Java (Sun)' exists, its check box should be selected.
- If only 'Microsoft VM' exists all the check boxes should be selected to activate it. However it is recommended to use the 'Java (Sun)' virtual machine.
- If the list does not contain either of the virtual machines, Java (Sun) Runtime Environment should be downloaded and installed.

### Downloading and installing Java runtime environment

If the browser does not have Java Virtual Machine, it should be installed. Java Runtime Environment (JRE) is a package that contains Java Virtual Machine. The latest version is available at:

- <http://www.java.com/en/download/index.jsp>

There are several older versions available at the Java Sun archive Web site:

- <http://java.sun.com/products/archive/>

You should download and install the latest version. If the latest version does not work properly, install an older version of the JRE.

If you have installed JRE5.0 and the Java applets of the NETA-01 operate slowly, add the IP address and name of your module to Windows' 'hosts' file. This procedure bypasses a bug in JRE5.0.

In Windows XP, the file is located in folder

C:\WINDOWS\system32\drivers\etc

and in Windows NT or 2000

C:\WINNT\system32\drivers\etc

The 'hosts' file that can be opened e.g. with WordPad usually contains some comments and the following line:

```
127.0.0.1      localhost
```

Add the IP address and a name (any name you want to use) of your module after the last line of the file. For instance:

```
127.0.0.1      localhost
10.0.0.7       neta
```

Save the file and try to connect to NETA-01.

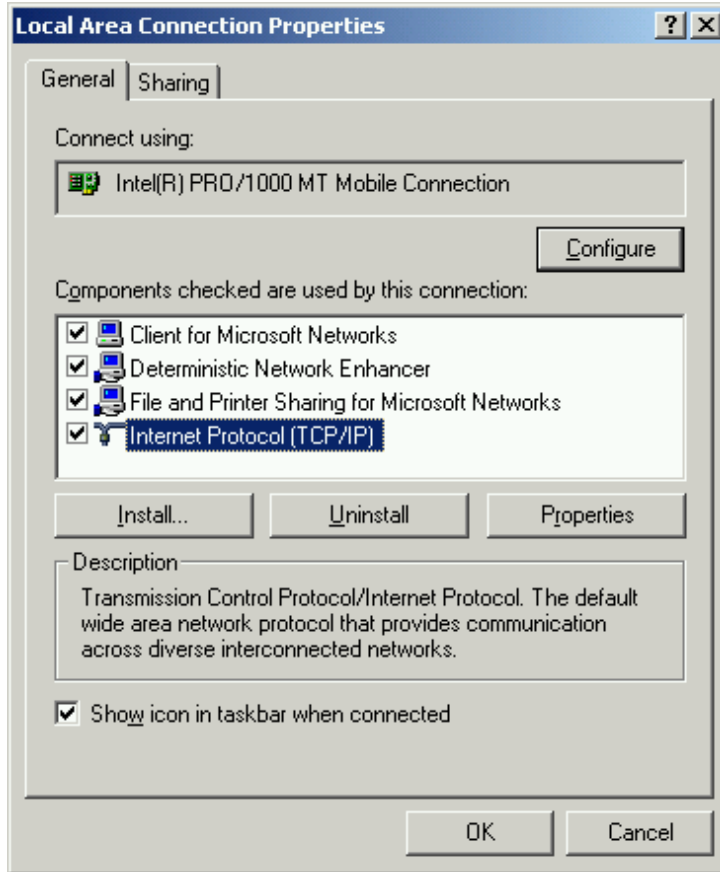
After installation, activate the Java (Sun) Virtual Machine from the browser according to the instructions above. To connect to the NETA-01 with a browser, just type 'http://neta' in to the address bar.

## Configuring the PC for point-to-point connection

In this case, point-to-point connection means that the PC is directly connected to an IP device such as the NETA-01. The connection is used to configure the NETA-01 module for the first time. Ethernet settings of the PC need to be changed to enable the connection.

- Connect the NETA-01 and the Ethernet card of the PC with a crossed Ethernet cable.
- Switch on the auxiliary 24 V DC power of the NETA-01 and wait for the PC to recognize the network connection.

- Select the 'Local Area Connection' menu corresponding to the network adapter of the PC (or to whatever is used to connect to the NETA-01 module) and click the 'Properties' button.



*Figure 30. Local Area Connection Properties*

- Select the 'Internet Protocol (TCP/IP)' from the selection list and click 'Properties'.

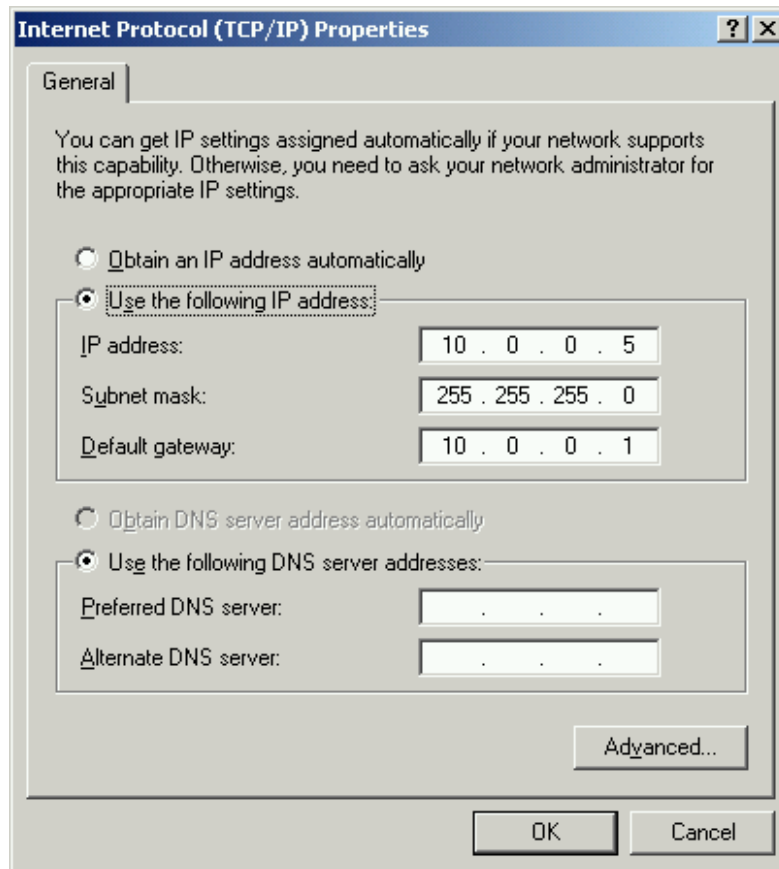


Figure 31. Internet Protocol Properties

- Select 'Use the following IP address:' radio button and enter the IP address you want to use. For instance:
  - IP address: 10.0.0.5
  - Subnet Mask: 255.255.255.0
  - Gateway address 10.0.0.1
- The NETA-01 module and the PC should be in the same subnet, so the NETA-01 could have the following address:
  - IP address: 10.0.0.7
  - Subnet Mask: 255.255.255.0
  - Gateway address: 10.0.0.1
- If the web pages of the module cannot be accessed in point-to-point connection the proxy server used by the browser must be disabled. Open the 'Internet Options' menu of the browser and go to the 'Connections' tab. Click the 'LAN Settings...' button and disable the Proxy server.

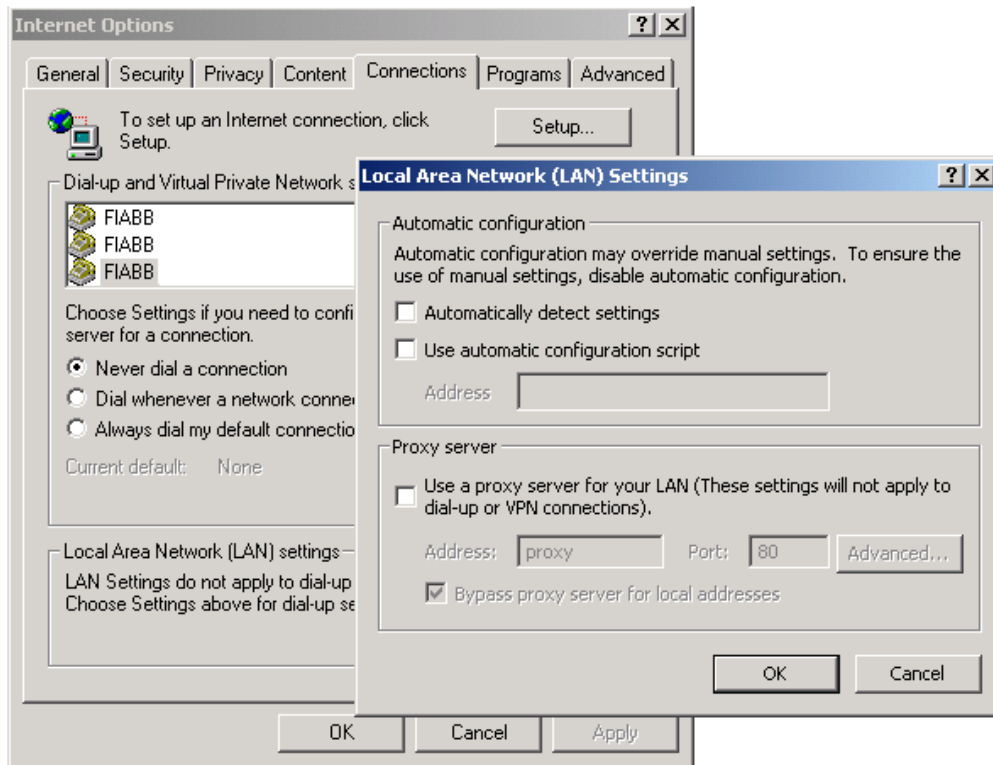


Figure 32. Proxy server disabled

## Firewall protection

Virus and firewall protection is essential whenever an IP device is connected to Internet. The NETA-module does not have a built-in firewall and an external solution is often added or already in use on the network. The module is often accessed through a corporate firewall and problems occur if the firewall is not configured correctly for the connection. The Communication ports that the NETA-01 uses might be blocked by the firewall. The ports and protocols used are:

- 80 for HTTP
- 21 for FTP
- 23 for Telnet
- 502 for Modbus TCP
- 46823 for DDCS over Ethernet (alterable).

These ports should be opened in the firewall for the NETA-01 to enable faultless transmission of data.



## Appendix D: Using predefined e-mail

---

**Note:** Starting from NETA-01 v1.5 it is possible to configure the emails through a graphical user interface. See chapter [The Web User Interface](#).

---

### The format of the e-mail configuration file

[Register]  
Area, Offset, Type

[Register match]  
Match Value, Mask, Match operand

[To]  
Recipients Address

[From]  
Sender Address

[Subject]  
Subject line

[Headers]  
Extra Headers

[Message]  
Message body

Parameter	Description
Area	Source area in the memory. Possible values are 'IN' (Modbus Read area) or OUT (Modbus Write area). See Modbus TCP register table in the section <a href="#">Modbus TCP addressing</a> in chapter <a href="#">Communication</a> .
Offset	Source offset in the memory, written in decimal or hexadecimal. <b>Note:</b> The internal memory addresses are listed in the Modbus TCP register table in section <a href="#">Modbus TCP addressing</a> . See also <a href="#">Example 2 (email_2.cfg)</a> :
Type	Source data type. Possible values are 'byte', 'word' and 'long'. See drive manual for parameter types.
Match value	Value to compare with the source data written in decimal or hexadecimal.
Mask	The module performs a logical 'and' on the source data and the Mask parameter before the value is compared with the Match Value. The value is written in decimal or hexadecimal.

Parameter	Description
Match operand	The parameter specifies how the data shall be compared with the Match Value. Possible values are '<', '=' and '>'.
Recipients address	Destination e-mail address.
Sender address	Sender e-mail address.
Subject line	E-mail subject (Only one line).
Extra headers	Can be used when sending for example HTML e-mails (Optional).
Message body	The actual e-mail message. The message body may contain text and SSI functions to print e.g. parameter values. See section <a href="#">Description of the SSI functions</a> in chapter <a href="#">Appendix E: Server Side Includes</a> .

---

**Note:** Hexadecimal values are written in the format 0xN where 'N' is the hexadecimal value.

---

The data is read in the memory from the area and offset specified by the parameters Area and Offset. The data size to read is specified by the Type parameter. The module performs a logical 'AND' between the read data and the parameter Mask. The result is compared with the parameter Match Value. The Match Operand specifies how to compare the data.

---

**Note:** If the [Register] or [Register match] information is changed, the module must be rebooted for changes to take effect. Other changes will take effect directly without the reboot.

---

Example 1 (email\_1.cfg):

E-mail is sent every time the motor of drive 1 starts. The status word of the drive 1 is included in the message body with a SSI function.

[Register] IN, 0x0000, word	The Main Status Word of Drive 1 is read from the IN area, at internal memory address 0x0000.
[Register match] 0x1737, 0xFFFF, =	The module performs a logical AND operation between the contents of register 0x0000 and the value 0xFFFF. This means that every bit of the register value is used in the comparison.
[To] support@abb.com	If the value in the register 0x0000 is 0x1737, the e-mail message is sent.

```
[From]
NETA@abb.com
[Subject]
Drive 1
[Message]
Motor started
```

Status word:

```
<?--#exec cmd_argument='printf("%X",InReadUWord( 0 ))'-->
```

### Example 2 (email\_2.cfg):

E-mail is sent every time the motor exceeds the defined speed limit.

```
[Register]
IN, 0x0002, word
```

The Actual value 1 of drive 1 is read from the internal memory address 0x0002.

```
[Register match]
0x0100, 0xFFFF
```

If the value in address 0x0002 is larger than 256 rpm (0x0100 in hex), the e-mail is sent.

```
[To]
support@abb.com
```

```
[From]
NETA@abb.com
[Subject]
Drive 1 Alarm
[Message]
```

Motor speed exceeded alarm limit: 256 rpm.



## Appendix E: Server Side Includes

---

Server Side Includes (SSI) functions can be used to include dynamic information on e-mail messages.

The following functions are supported:

- DisplayIP
- DisplaySubnet
- DisplayGateway
- DisplayDhcpState
- DisplayHostName
- DisplayDomainName
- DisplaysSMTPServer
- IncludeFile
- Printf

### Description of the SSI functions

SSI functions are simple to use. The function strings attached to e-mail are replaced by the response to the function call. The syntax and response of the functions are described briefly in the following text.

#### DisplayIP

Returns the IP address of the module.

*Syntax:*

```
<?--#exec cmd_argument='DisplayIP'-->
```

#### DisplaySubnet

Returns the subnet mask of the module.

*Syntax:*

```
<?--#exec cmd_argument='DisplaySubnet'-->
```

#### DisplayGateway

Returns the gateway address of the module.

*Syntax:*

```
<?--#exec cmd_argument='DisplayGateway'-->
```

## DisplayDHCPState

This function returns whether DHCP/BootP is enabled or disabled.

*Syntax:*

```
<?--#exec cmd_argument='DisplayDhcpState( "ON", "OFF")'-->
```

## DisplayHostName

This function returns the host name.

*Syntax:*

```
<?--#exec cmd_argument='DisplayHostName'-->
```

## DisplayDomainName

This function returns the domain name.

*Syntax:*

```
<?--#exec cmd_argument='DisplayDomainName'-->
```

## DisplayEmailServer

This function returns the IP address of the email server.

*Syntax:*

```
<?--#exec cmd:argument='DisplayEmailServer'-->
```

## IncludeFile

This function includes the contents of a file in an e-mail message.

*Syntax:*

```
<?--#exec cmd_argument='IncludeFile( "File name" )'-->
```

## Printf

This function includes text and values from the module's internal data addresses presented in the [Modbus TCP addressing](#) table. The function can be used to include parameter information in the email. The formatting of the strings resemble the standard C function 'printf()'.

*Syntax:*

```
<?--#exec cmd_argument='printf("Some text", Arg1, Arg2,...)'-->
```

"Some text" consists of characters and conversion specifications. Each argument (Arg1, Arg2, ..., ArgN) require a conversion specification that

prints and modifies the argument value. Conversion specifications start with the '%' character and end in one of the conversion characters listed below.

### End conversion characters

End character	Argument type, Converted to
d, l	byte, short; decimal notation. (For signed representation, use signed argument.)
o	byte, short; octal notation (without a leading zero).
x, X	byte, short; hexadecimal notation (without a leading 0x or 0X), using abcdef for 0x or ABCDEF for 0X.
u	byte, short; decimal notation.
c	byte, short; single character, after conversion to unsigned char.
s	char; characters from the string are printed until a "\0" is reached or until the number of characters indicated by the precision have been printed.
f	float; decimal notation of the form [-]mmm.ddd, where the number of d's is specified by the precision. The default precision is 6; a precision of 0 suppresses the decimal point.
e, E	float; decimal notation of the form [-]m.ddddd e+-xx or [-]m.dddddE+-xx, where the number of d's specified by the precision. The default precision is 6; a precision of 0 suppresses the decimal point.
g, G	float; %e or %E is used if the exponent is less than -4 or greater than or equal to the precision; otherwise %f is used. Trailing zeros and trailing decimal point are not printed.
%	no argument is converted

### Other conversion characters

Other conversion characters may be used in between the start character and end conversion characters. If characters are used they have to be in the following order:

Other character	Description	
Flags: (in any order)	-	Specifies left adjustment of the converted argument in its field.
	+	Specifies that the number will always be printed with a sign.
	(space)	If the first character is not a sign, a space will be prefixed.
	0	For numeric conversions, specifies padding to the field with leading zeroes.
	#	Specifies an alternate output form. For o, the first digit will be zero. For x or X, 0x or 0X will be prefixed to a non-zero result. For e, E, f, g and G, the output will always have a decimal point; for g and G, trailing zeroes will not be removed.
Number	A number specifying a minimum field width. The converted argument will be printed in a field at least this wide, and wider if necessary.	
(period)	A period, which separates the field width from the precision.	

Other character	Description
Number	A number defines the precision, that specifies the maximum number of characters to be printed from a string, or the number of digits to be printed after the decimal point for e, E, or F conversions, or the number of significant digits for g or G conversion, or the minimum number of digits to be printed for an integer.
Length modifier	A length modifier h, l (letter ell), or L. "h" indicates that the corresponding argument is to be printed as a short or unsigned short; "l" indicates that the argument is along or unsigned long.

### Possible arguments

Arguments are used to read data from internal data addresses. The correct argument should be selected according to the target parameter type and memory area. The parameter types are presented in the drive manual and the 'IN, OUT' memory areas in section [Modbus TCP addressing](#) in chapter [Communication](#).

Argument	Description
InReadSByte(offset)	Reads a signed byte from position <i>offset</i> in the IN area.
InReadUByte(offset)	Reads an unsigned byte from position <i>offset</i> in the IN area.
InReadSWord(offset)	Reads a signed word (short) from position <i>offset</i> in the IN area.
InReadUWord(offset)	Reads an unsigned word (short) from position <i>offset</i> in the IN area.
InReadSLong(offset)	Reads a signed longword (long) from position <i>offset</i> in the IN area.
InReadULong(offset)	Reads an unsigned longword (long) from position <i>offset</i> in the IN area.
InReadString(offset)	Reads a string (char*) from position <i>offset</i> in the IN area.
OutReadSByte(offset)	Reads a signed byte from position <i>offset</i> in the OUT area.
OutReadUByte(offset)	Reads an unsigned byte from position <i>offset</i> in the OUT area.
OutReadSWord(offset)	Reads a signed word (short) from position <i>offset</i> in the OUT area.
OutReadUWord(offset)	Reads an unsigned word (short) from position <i>offset</i> in the OUT area.
OutReadSLong(offset)	Reads a signed longword (long) from position <i>offset</i> in the OUT area.
OutReadULong(offset)	Reads an unsigned longword (long) from position <i>offset</i> in the OUT area.
OutReadString(offset)	Reads a NULL terminated string (char*) from position <i>offset</i> in the OUT area.

Example:

The current signal of the drive is mapped to Scanning parameters list as parameter 1. Internal data address for the parameter 1 is 0x140. The current signal is a positive integer and format for 'printf' could be the following:

```
<?--#exec cmd_argument='printf("Current %d", InReadUWord(0x140))'-->
```

The function returns:

```
Current <value>
```



# Appendix F: Taking a backup

---

## Overview

NETA-01 Ethernet adapter can be used in a number of different applications. The out-of-box configuration does not always work as such and the adapter must be configured for the application. The configuration is saved to the file system of the adapter and not to the drive. To ease the maintainability of NETA-01 adapter and the drive, it is recommended to take a backup of the adapter's file system during the start-up. This backup can be restored to a new adapter if the original must be replaced.

This appendix describes how to take a backup copy of the FTP folder contents. If needed, it can be restored by copying the contents of the whole FTP folder back into the adapter.

---

**Note:** NETA-01 v1.5 has a graphical user interface for taking backup and restoring the configuration. It is recommended to use this interface for backups in NETA-01 v1.5. For instructions on taking backups WITH the graphical user interface, see section [Backup and restore module configuration](#) in chapter [The Web User Interface](#) on page 42.

---

**Note:** This appendix describes taking backups with NETA-01 versions older than v1.5 OR taking backups with NETA-01 v.1.5 WITHOUT using the graphical user interface.

---

**Note:** Backups are mutually compatible only between adapters that have the same software version. E.g. backup from NETA-01 version 1.2 is not compatible with version 1.3 or the other way around.

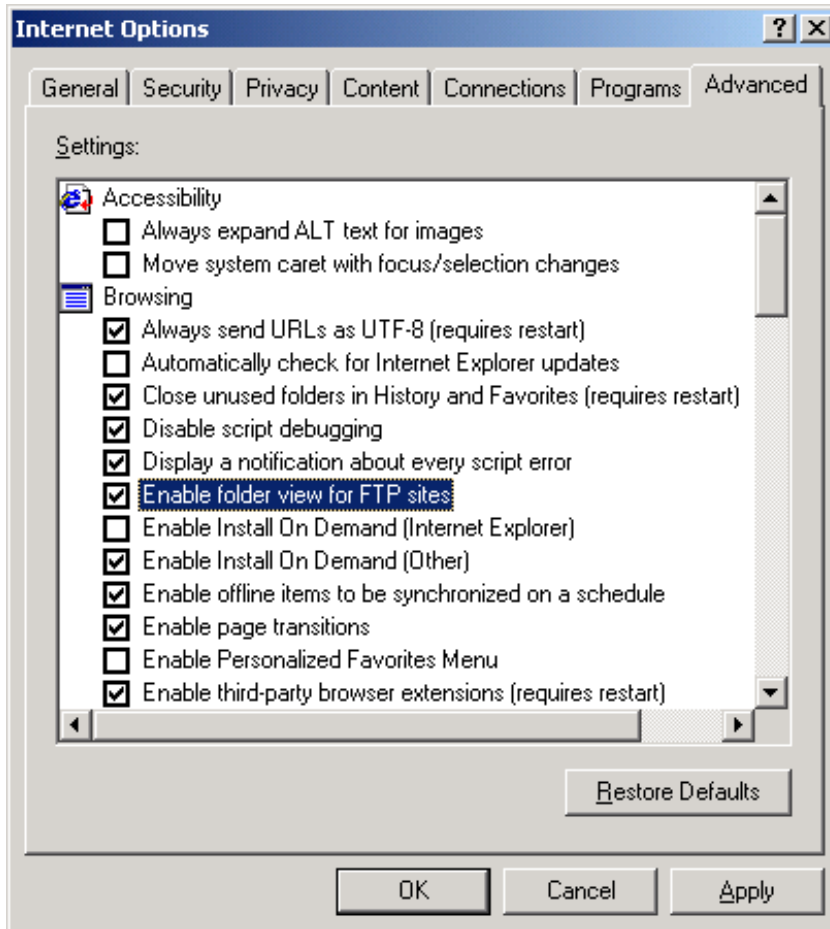
---

**Note:** Backup files taken with the graphical user interface are NOT compatible with backups described in this [Appendix F: Taking a backup](#). If you have taken a backup with the graphical user interface, restore the configuration also with the graphical interface. For instructions, see section [Backup and restore module configuration](#) in chapter [The Web User Interface](#) on page 42.

---

## Taking the backup

1. Follow the chapter *Quick start-up guide* to configure the system.
2. When the configuration is done, save all the system files (except folder 'log') through the browser or FTP (File Transfer Protocol) software. Example (Internet Explorer):
  - a. Make sure that the 'Enable folder view for FTP sites' checkbox is selected in the browser settings.



- b. Type 'ftp://ipaddress' in the browser's address field and use administrator username and password to login.
  - c. Select all the files and folders (except folder 'log') and copy them to your PC's hard disk.
3. Write down the NETA-01 adapter software version (printed on a sticker on the housing of the adapter).

## Restoring the backup

If you have taken the backup according to the instructions in section [Taking the backup](#) on page 90, restore the backup, following these steps.

---

**Note:** Backup files taken with the graphical user interface of NETA-01 v1.5 are NOT compatible with backups described in this [Appendix F: Taking a backup](#). If you have taken a backup with the graphical user interface, restore the configuration also with the graphical interface. For instructions, see section [Backup and restore module configuration](#) in chapter [The Web User Interface](#) on page 42

---

1. Follow the chapter [Quick start-up guide](#) to connect to the new adapter.
2. If a suitable backup exists
  - a. Use Telnet to format the file system of the new adapter. Type 'telnet <ipaddress>' in the DOS prompt to open the connection.
  - b. Login with administrator username 'admin' and password 'admin'.
  - c. Check that the previously copied FTP folder with all its files and folders is on the hard disk of your PC.
  - d. Type 'format' and wait until the format operation is complete.
  - e. Type 'exit' to close Telnet.
  - f. Power-cycle the adapter and set the IP address as instructed in the manual.
  - g. Copy the backup files from your PC's hard disk to the adapter with FTP software or the browser (see above).
  - h. Power-cycle the adapter again and check the configuration through the web pages.
3. If a suitable backup is not available, use the web pages of the adapter for application-specific configuration.



# Appendix G: File system

---

## Overview

The file system is a fixed-size storage area with a hierarchical directory structure. It is located on a flash memory of the module. Any data, user or application can be stored in files within the file system. Files can be grouped in directories for readability.

The file system features two security levels. Depending on the security level, different users can have access to different files and directories. The application however, always has unrestricted access to the file system.

The file system is accessible via FTP, Telnet and HTTP.

## Case sensitivity

The file system is case sensitive. This means that the file 'abb.txt' is not identical to the file 'ABB.TXT'.

## File name / path name length

File names can be maximum 48 characters long. Path names can be 256 characters in total (filename included).

## File size

The file size is not restricted. However, a file can not be larger than the available free space.

## Free space

There is approximately 1 mega bytes of free space available for user files.

## Structure of the file system

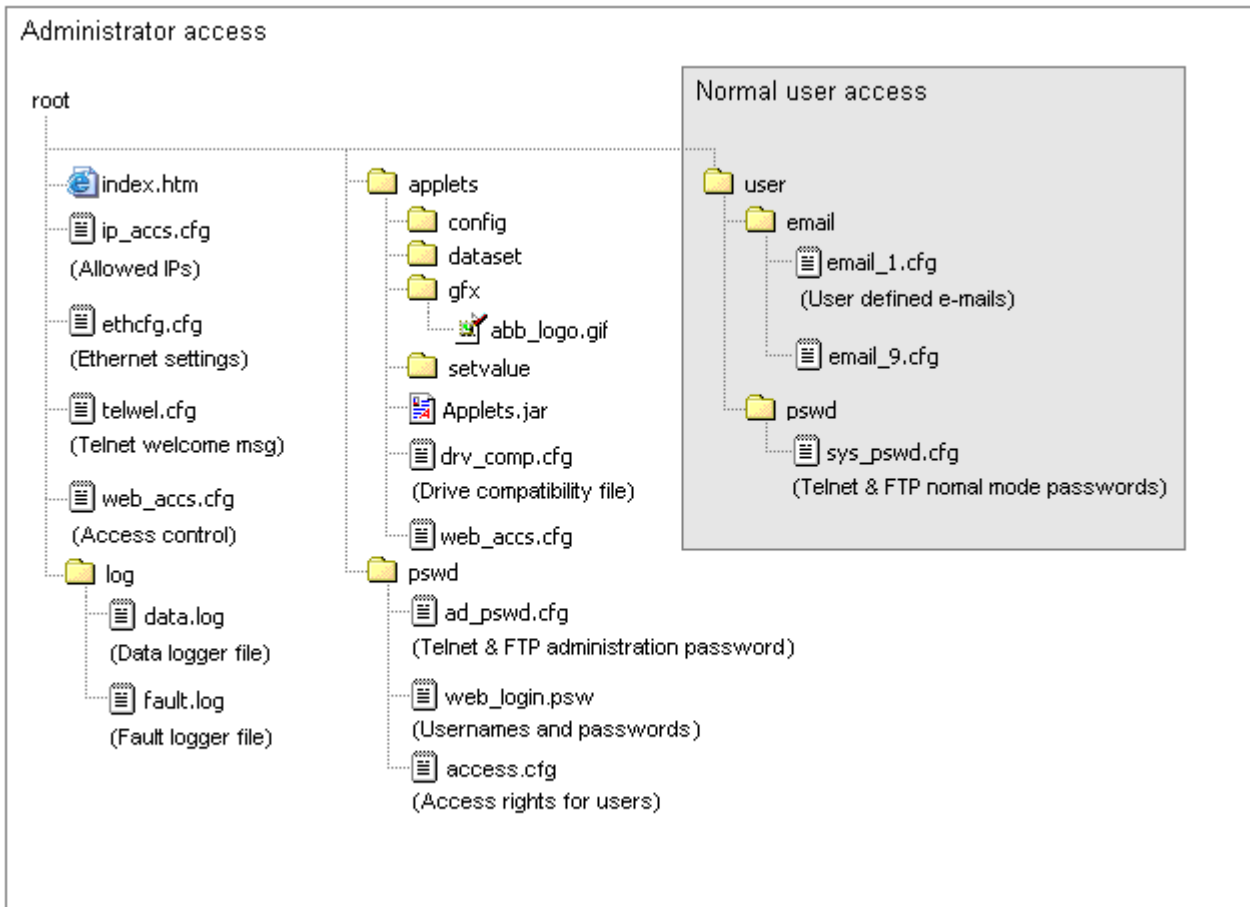


Figure 33. Structure of the file system, location of the system files and areas that can be accessed in Administration mode and Normal mode.

**Note:** Also a web browser can be used to upload and download files. To enable the feature from Internet Explorer, select:  
Tools -> Internet Options -> Advanced -> Enable folder view for FTP sites checkbox.  
Type ftp://<address> into the address field and use system username and password to log in.

## Description of the files

The module uses these files for configuration purposes. The system files are ASCII files and can be edited with any text editor. Depending on the security settings, the files may be inaccessible for normal users.

**Note:** These files are not to be used to store any user or application data.

## Configuration files

### 'ethcfg.cfg'

This file contains the network configuration and it is read by the module at start up. For more information about network configuration see section [Network configuration](#) in chapter [Communication](#).

---

**Note:** The module needs to be rebooted for changes in this file to take effect.

---

The format of the file is the following (an example):

[IP address]	Module IP address
10.58.18.11	
[Subnet mask]	Module subnet mask
255.255.255.128	
[Gateway address]	Module gateway address
10.58.18.1	
[DHCP/BOOTP]	ON - Enabled OFF - Disabled
OFF	
[Speed]	Auto - Default. Auto negotiation will be used.
Auto	100 - Forces the module to operate only at 100 Mbit 10 - Forces the module to operate only at 10 Mbit
[Duplex]	Auto - Default. Auto negotiation will be used.
Auto	Full - Forces the module to operate only at full duplex Half - Forces the module to operate only at half duplex
[SMTP address]	SMTP address must be configured in order to be able to send e-mails.
0.0.0.0	
[SMTP username]	SMTP server username
[SMTP password]	SMTP server password
[DNS1 address]	Address to primary Domain Name Server that translates Internet domain names such as 'www.abb.com' into IP numbers. (Optional)
0.0.0.0	
[DNS2 address]	Secondary DNS server. (Optional)
0.0.0.0	
[Domain name]	Is the default domain name for the module e.g.'abb.com'. (Optional)
abb.com	
[Host name]	Is the name of the module e.g. 'neta'. (Optional)
neta01	

The contents of this file can be redirected by placing the line '[File path]' on the first row, and a file path on the second.

Example:

```
[File path]
\user\eth_settings.cfg
```

In this example, the settings described above will be loaded from the file 'user\eth\_settings.cfg'. This permits normal users to access the network configuration settings.



**'drv\_comp.cfg'**

(NETA-1.3 onwards)

The NETA-01 supports multiple drive applications and drive types. However due to differences in application interfaces, some of the NETA-01 features do not work with every application. These features can be deactivated by modifying the 'drv\_comp.cfg' file (located in the '/applets' folder). Deactivating unsupported feature simply means that the menu button to "Parameters", "Fault Logger", "Data Logger", "Datasets", "Motor Control" applet or the "Status" lamp is disabled.

The 'drv\_comp.cfg' file has a list of application software names and for each a simple binary code stating the supported module features. It is possible to modify the binary code of existing applications and add new application names in the list. If NETA-01 does not recognize the drive it uses the line 'XXXXX : 111100' in the file to activate and deactivate features. The application name in the file is composed of the first five characters of the application software version (e.g. ACS800 Standard parameter 33.02 = ASAR7200 and the value in file is ASXX7).

Description of the binary code:

Bit	Bits 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Feature	Parameters	Fault logger	Data logger	Status lamp	Dataset	Motor Control

A feature is activated if the corresponding bit is set (1) and deactivated if it is reset to zero (0).

The format of the file is following:

```

ABXX5 : 1 1 1 1 0 0
ACXX5 : 1 1 1 0 0 0
ADXX5 : 1 1 1 1 0 0
AEXX5 : 1 1 1 1 1 1
AFXX5 : 1 1 1 1 0 0
AGXX5 : 1 1 1 1 0 0
AHXX5 : 1 1 1 1 1 0
AJXX5 : 1 1 1 1 0 0
ALXX5 : 1 1 1 1 0 0
AMXX5 : 1 1 1 1 1 1
ANXX5 : 1 1 1 1 0 0
AOXX5 : 1 1 1 1 0 0
APXX5 : 1 1 1 1 1 1
AQXX5 : 1 1 1 1 0 0
ARXX5 : 1 1 1 1 0 0
ASXX5 : 1 1 1 1 1 1
ASXX7 : 1 1 1 1 1 1

...
XXXXX : 1 1 1 1 0 0

```

---

**Note:** The format of the file should not be changed in any way (e.g. no extra white spaces or line breaks) to guarantee successful operation.

---

### **'ip\_accs.cfg'**

It is possible to configure which IP addresses and protocols are allowed to connect to the module. This information is stored in the file 'ip\_accs.cfg'. The file contains one or several of the headers below.

```
[Web]
[FTP]
[Telnet]
[Modbus TCP]
[All]
```

The allowed IP addresses are written under each header. The wildcard '\*' can be used to allow IP address ranges. If a protocol header is not given, the system will use the configuration set under the header 'All'. If the 'All' header is not given, the protocol will not accept any connections.

Example:

```
[Web]
10.10.12.*
10.10.13.*
[FTP]
10.10.12.*
[Telnet]
10.10.12.*
[All]
*.*.*.*
```

The example file above allows all IP addresses beginning with 10.10.12 to access all protocols in the module. IP addresses beginning with 10.10.13 cannot access the FTP and Telnet servers. The Modbus TCP server accepts connections from every IP address. The contents of this file can be redirected by placing the line "[File path]" on the first row, and a file path on the second.

Example:

```
[File path]
\my_settings\ip_access_rights.cfg
```

In this example, the settings described above will be loaded from the file 'my\_settings\ip\_access\_rights.cfg'. (Default settings: file located in root directory, all connections allowed.)

---

**Note:** For data security reasons, it is highly recommended to limit access to the module to authorised IP addresses only.

---

---

**Note:** The module has to be restarted in order for any changes in this file to take effect.

---

## Password files

### 'ad\_pswd.cfg' & 'sys\_pswd.cfg'

These files contain the administrator and the system user usernames and passwords for FTP and Telnet access. The 'ad\_pswd.cfg' file is used for administration mode and the file 'sys\_pswd.cfg' for the system user mode. The files are located in the directories '\pswd' and '\user\pswd' respectively.

These directories are protected from web browser access.

Example:

```
User:Password
User2:Password2
```

In this example, the first username is 'User', and the corresponding password is 'Password'.

If no ':' is present, the password will be equal to the username.

Example:

```
Username
```

In this example, both username and password will be 'Username'.

---

**Note:** The default settings for 'ad\_pswd.cfg' and 'sys\_pswd.cfg' are `admin:admin` and `user:user` respectively. It is highly recommended that these passwords are changed after first use.

---

### 'web\_accs.cfg'

Files within the file system can be protected from web access through user authentication. To protect the filesystem, place a file called 'web\_accs.cfg' in the same directory as the files to protect. All files within that directory and its subdirectories will be protected. Multiple password files may be present in the system, giving different users access to different files and directories.

Example:

```
User:Password
[Auth Name]
(Message goes here)
```

The optional parameter 'Auth Name' will be presented in the login dialog box. If it is not given, the requested file/pathname will be presented instead.

The contents of this file can be redirected by placing the line '[File path]' on the first row, followed by a list of password files.

Example with NETA-01 versions 1.0-1.2 (with default settings):

```
[File path]
\user\pswd\admin_login.psw
\user\pswd\priv_login.psw
\user\pswd\normal_login.psw
```

```
[Auth Name]
(ABB Webmodule v1.2)
```

In this example, the accepted user/passwords will be loaded from the files 'user\pswd\admin\_login.psw', 'user\pswd\priv\_login.psw' and 'user\pswd\normal\_login.psw'.

Example with NETA-01 version 1.3 onwards:

```
[File path]
\pswd\web_login.psw
```

```
[Auth Name]
(ABB Webmodule v1.3)
```

In this example, the accepted user/passwords will be loaded from the file 'pswd\web\_login.psw'.

If any errors in the format of these files is detected the user name/password protection will be ignored.

**'normal\_login.psw', 'priv\_login.psw' & 'admin\_login.psw'**

**Note:** Only in NETA-01 versions 1.0, 1.1 and 1.2.

The web pages have three different access levels.

- The normal user has only access to view.
- The privilege user has access to view and change parameters and datasets (if enabled).
- The administrator user has access to view and change parameters and datasets (if enabled) and has access to the configuration applets.

Place the files to the 'user\pswd' directory to define users at different levels.

Example:

```
User:Password
[Auth Name]
(Message goes here)
```

The optional parameter 'Auth Name' will be presented in the login window.

The contents of this file can be redirected by placing the line '[File path]' on the first row, followed by a list of password files.

---

**Note:** The default settings for 'normal\_login.psw', 'priv\_login.psw' and 'admin\_login.psw' are `normal:normal`, `priv:priv` and `admin:admin` respectively. It is highly recommended that these passwords are changed after first use.

---

### 'web\_login.psw' and 'access.cfg'

---

**Note:** Supported from NETA-01 version 1.3 onwards.

---

The web pages have three different access levels as described above. 'web\_login.psw' file is used to define the usernames and passwords. 'access.cfg' file is used to grant access to configuration menu, parameters and control features. The files are placed to the 'pswd' directory.

Example of the 'web\_login.psw':

```
Username:Password
admin:admin
```

---

**Note:** The default settings for 'web\_login.psw' is `admin:admin`, `priv:priv` and `normal:normal`. It is highly recommended that these passwords are changed after first use.

---

Example of the 'access.cfg':

```
Username:000
admin:111
```

---

**Note:** The default settings for the 'access.cfg' is `admin:111`, `priv:011` and `normal:000`.

---

Description of the bits:

100: The first bit activates the configuration menu

010: The second bit gives parameter write access

001: The third bit enables dataset and motor control access

000: Only monitoring is possible

The contents of these files can be redirected by placing the line '[File path]' on the first row, followed by a list of files where the usernames, passwords and access rights are defined.

## Other

### 'telwel.cfg'

The Telnet welcome message can be changed by editing this file. It contains the new welcome message in ASCII format.

---

The contents of this file can be redirected by placing the line '[File path]' on the first row, and a file path on the second.

Example:

```
[File path]
\my_settings\telnet_welcome_message.txt
```

In this example, the welcome message will be loaded from the file '\my\_settings\telnet\_welcome\_message.txt'.

The default setting is "ABB Drive Web Controller" without redirection.

### **'data.log'**

(NETA-1.3 onwards)

The Data logger contents of each drive can be saved to a file one at a time. A file called 'data.log' is created in a folder called '/log' when the contents of the data logger are saved through the applets or the System Control word. The file can be saved to the PC and imported to e.g. Microsoft Excel. Analyzing the content is possible by using the basic Excel operations.

---

**Note:** Before saving the contents of another data logger the file should be saved to the PC. The same file is used for every data logger in the system.

---

### **'fault.log'**

(NETA-1.3 onwards)

'fault.log' file is created to folder '/log' when the content of the drive's fault logger is saved. The file format corresponds to the format of the fault log applet.

---

**Note:** Before saving the contents of another fault logger the file should be saved to the PC. The same file is used for every fault logger in the system.

---

### **E-mail files** (email\_1.cfg, email\_2.cfg...email\_10.cfg)

These files contain predefined e-mail messages and information on how and when to send them. It is possible to have a maximum of 10 user defined e-mail files. The files must be named 'email\_1.cfg'...'email\_10.cfg', and placed in the folders '\email' and '\user\email' respectively.

For a specification of the file format, see [Appendix D: Using predefined e-mail](#).

If the SMTP server is not configured the e-mail will not be sent. See section [Configuration files](#) / 'ethcfg.cfg'.

---

**Note:** There will be no indication to the user whether the system fails to send the email.

---





---

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