

# NX Dynamics Manual

---



## Version

---

Document version	Date of creation	Changes
1.0.1	21.09.2010	Base Version
1.0.2	06.01.2012	NX Dynamics SDK moved to other document
1.0.3	01.10.2012	Content updated/Images added

For further information on the use of the device, consult the following documents:

1. [NPE instructions](#)
2. [NxDynamics instructions](#)

For further information or in case of finding any inaccuracy, please use the technical support portal [TechBase Support](#) in order to submit an application.

## Table of Contents

---

1. [Table of contents](#)
2. [Installing NX Dynamics \(Using Soft-manager\)](#)
3. [Starting NX Dynamics](#)
4. [Available NX Dynamics Functions](#)
5. [General Information](#)
6. [Status](#)
7. [Ethernet](#)
8. [GPRS](#)
9. [Inputs/Outputs](#)
10. [System](#)
11. [Services](#)
12. [Custom Modules](#)

## Installing NX Dynamics (Using Soft-manager)

Log in to the device console with root authorization (SuperUser). After logging in correctly, enter the command:

```
softmgr update nx
```

The Soft Manager will automatically download the newest version of NxDynamics and other required packages from the server <ftp.a2s.pl> and install them.

The result of a correct installation is shown below:

```
src
Deleting Old Versions If Exists...
Installing...
Copying files. Please wait...
/mnt/nand-user/apache
Adding initsrv startup...
Increasing IPC Queue...
Setting the NXDYNAMICS_VERSION variable to: "1209121335 installdir=/mnt/nand-use
r/hdocs_src"
httpd (pid 9208409884768) already running
There are no remaining processes at port 4670 to stop
Stopping nxserver
Nxserver stopped
Starting nxserver...
NXSERVER STATUS: ON
FOUND PID: 10034 root /mnt/mtd/Flex/./nx_server 4670
10036 root /mnt/mtd/Flex/./nx_server 4670
10037 root /mnt/mtd/Flex/./nx_server 4670
Channels Monitor:
Successfully installed NxDynamics package
Now you can start NxDynamics by going to http://THIS_NPE_IP_ADDRESS/nx
Successfully installed downloaded package (nxdynamics_install_1209121335)
Successfully finished update (It took 80 seconds)
```

*Successful installation*

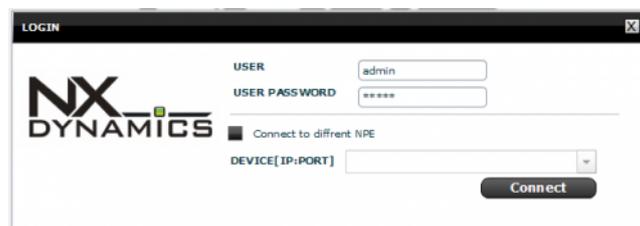
# Starting NX Dynamics

After correct installation of NX Dynamics, start the interface. This is done by entering the following address in the internet browser: (replace IP\_ADDRESS with the NPE computer IP address)

```
http://IP_ADDRESS/nx/npe.html
```



After the application loads correctly, the login screen shown below will be displayed:



*Login screen*

In order to log in to the interface, enter the following data:

user: admin  
pass: admin

or

user: user  
pass: user

The logo on the login screen is easily configurable and there is a simple way to change it. The same applies to the interface background and the company logo. The way of customizing interface is described in NX SDK.

During logging in, a channel is created and all parameters on the tab are read. After about 6 seconds, the parameters read from the device should be displayed on the first tab - status.

# Available NX Dynamics Functions

---

The standard configuration version of NX Dynamics has the following capabilities:

- automatic indicators of current usage of all memories available in the NPE
- automatic refreshing of all values (setting of refreshing time)
- time synchronization
- remote restart
- editing of start files (rcs, syscfg)
- real-time preview of NPE/iMod logs
- expanded I/O control
- regulated I/O refreshing time (max every 200 ms)
- display of the IP address of the Ethernet and GPRS connection
- Ethernet network settings (Ethernet tab)
- GPRS connection management
- indicator of the signal strength of the GPRS network
- capability of connection to another NPE using the same running NX interface
- Telnet connection terminal with the function of reconnection during a brief network malfunction
- preview of computer parameters (name, time of operation, kernel and firmware version)
- creation of custom templates (modules) based on the available example

## General Information

A *Refresh* button can be found on every tab. It forces refreshing of the parameters found on all tabs.

Changing a parameter results in a blue halo displayed around the component containing the changed parameter. The change is effected by clicking on the *Apply Changes* button. Pressing this button sends the entered changes to the task queue. During this operation, the halo around the components turn orange. If the interface has received confirmation of execution of the command, the halo disappears during animation. These steps have been presented below:



The interface has the capability of active checking the correctness of entered parameters. If the format is incorrect, the halo will change its color to red, e.g. the IP field must be strictly defined.



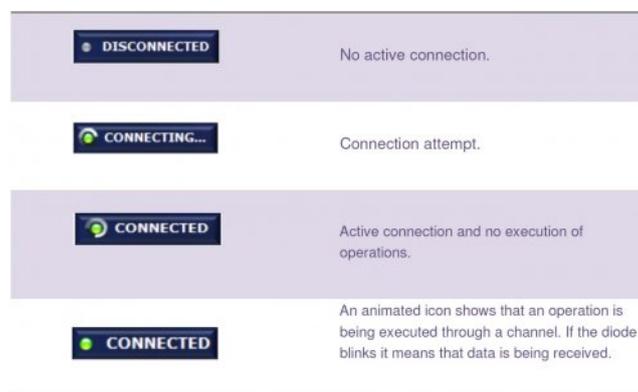
*An example of an incorrect format*

## Connection

NX Dynamics possesses 3 communication channels.

### Background Channel

The main channel is the *background channel*, which is responsible for refreshing information in tabs. The status of this channel transfers to the main status shown in the bottom left corner of the screen. Possible statuses have been presented below:



*Possible statuses*

### Command Channel

Responsible for executing commands related to user actions such as, e.g. changes of settings, service start-up. The status of this channel is presented in the middle part of the bottom of the screen. An example of a status has been presented below:



*Loading bar*

The loading bar informs of the amount of commands remaining for execution. The absence of this bar signifies that a channel has not been initiated or that there are no commands in the queue.

## Long Channel

The third channel, called the *long channel*, is responsible for executing long operations related to e.g. installation/updating of packages, and browsing system or iMod logs. The status of this channel is presented in the lower left corner of the screen.



*Left: active channel with no operations, right: animated icon indicating operation through the long channel*

The presence of a green LED indicates an active channel but no executed operations on it. A green LED surrounded by an animated icon indicates that an operation is being executed on the *long channel*.

# Status



Status tab

## System

Contains the most important information on the NPE device. It contains basic information such as the kernel version, system time, TBF time, and the unique device ID assigned during production.

The Resources panel can be seen in the lower part of the screen, and it contains indicators of data carrier capacity and an indicator of processor load for the last minute

(the refreshing time of this parameter is dependent on the settings in the neighboring *NX Dynamics* panel).

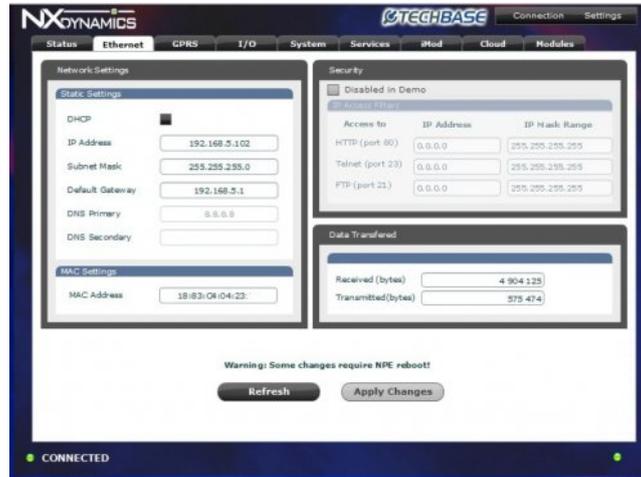
## NX Dynamics

Enables setting of the time interval for refreshing of all parameters found in all tabs. The *AutoRefresh* option activates automatic refreshing. If it is inactive, data is read at the moment of switching tabs, when the times set by the above mentioned time interval are reached from the time of reading. This panel also gives information on the current interface version.

## Networks

Contains basic information on active connections, that is, the cable connection to the Ethernet network and the GPRS connection.

# Ethernet



Ethernet tab

## Network Settings

Contains editable fields for configuration of the IP address, network mask, default gate, and DNS servers. The DHCP server can also be started (this change required NPE restart). It is also possible to modify the MAC address. However, changing the factory address will cause a loss of the capability to use the Soft-Manager for updating packages.

## Security

Enables blocking of access to the appropriate services (TCP/IP ports) of a specified range of IP addresses. Changes modify *iptables* in the NPE.

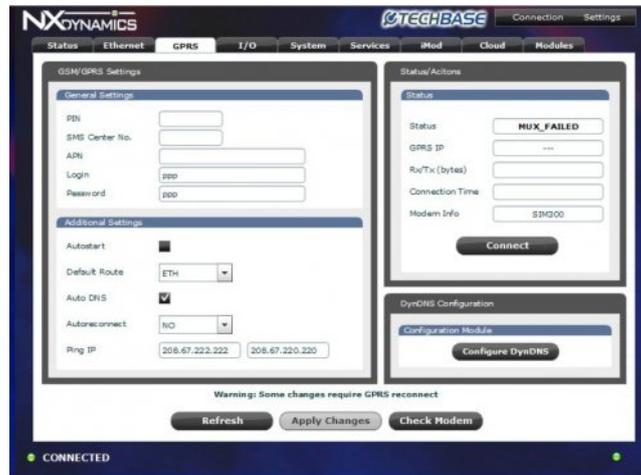
Before using this options please be aware that wrong settings might block the access to the device!

## Data Transferred

Presents the amount of sent data bytes.

Caution: Always be certain of the executed operations, because it is possible to block the telnet connection in this panel, which would require using the service terminal for restoring the function.

# GPRS



GPRS tab

The *GPRS* tab enables detailed configuration of the GPRS connection. Most of these parameters are based on the *syscfg* configuration file.

## GSM/GPRS Settings

The following parameters can be modified here: PIN, APN, Login, Password, SMS Center No., Baudrate (of the modem), Default Route and IP for testing connection status for autoreconnect. Detailed information on variables in the *syscfg* file can be found in the general NPE documentation.

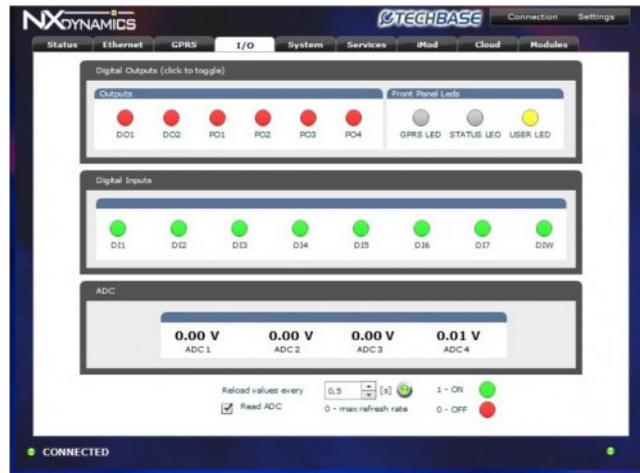
## Status/Actions

presents the current status of the GPRS connection, IP address, the amount of sent data bytes, and the connection time. The *Connect* button at the bottom of the panel can change its description depending on the current status. There is a capability of previewing the course of the connection procedures. The current operations status will be displayed on the This window can be called up by clicking on the *long channel* status LED.

## DynDNS

the newest NX versions have the capability of assigning a device to DynDNS configurations.

# Inputs/Outputs



I/O tab

## I/O tab and channel statistics

makes it possible to control outputs and conduct digital input and analog transducer readings. The maximum refreshing frequency is 500 ms, and it can be modified using the component in the lower part of the tab.

The LEDs in the first panel, called *Digital Outputs*, have the capability of changing states. Clicking on one of them will cause a state change command to be sent. The LED color is changed immediately after entering the operation and blocked during the time of command execution. Flashing around the LED indicates the execution of the state change operation.



An orange halo signifies that an operation is being executed in the background (change in state to logical value 1 for the PO1 output and 0 for PO2)



Disappearance of the border signifies that the operation has been executed

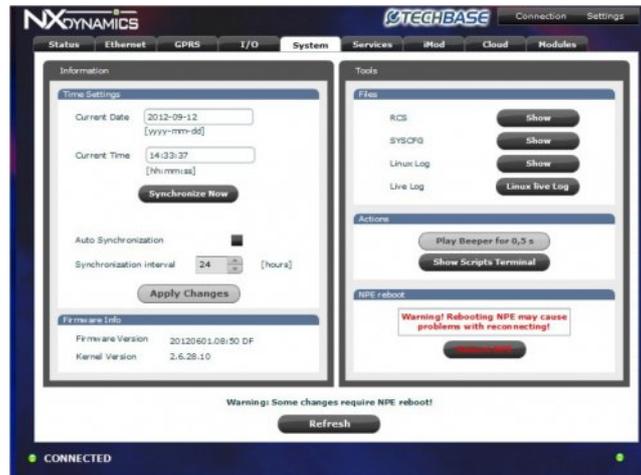


*Read ADC* starts reading of analog inputs.

*Reload Values every* sets the refreshing time for readings.

An animated icon indicates that data is currently being received.

# System



System tab

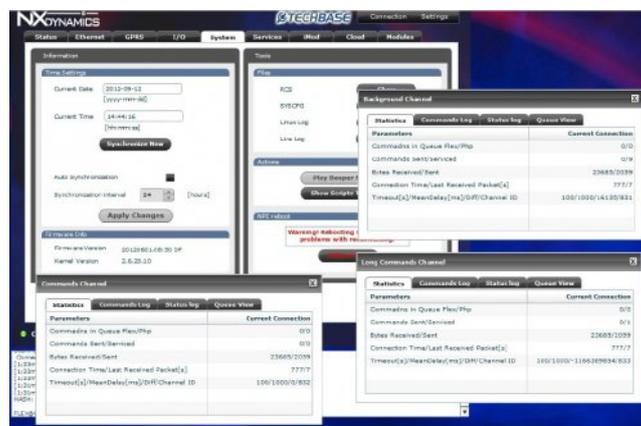
## Information

This panel makes it possible to change system date and time settings. The *Synchronize Now* button starts the process of time synchronization with the server. By selecting the *AutoSynchronization* option, time updating will be automatic, with a set time interval. It can be changes using the option (*Synchronization Interval*). This panel also shows the kernel version ( *Firmware Version and Kernel Version*).

## Tools

This panel enables previewing and editing of the *rcs* start file and the *syscfg* configuration file. A preview of system and iMod logs is also available.

The word Live on buttons signifies that log previews are in real-time, that is, new entries are immediately displayed in the interface (no refreshing required). The *Play Beeper for 0.5s* button activates the test beeper integrated into the NPE. The *Show Script Console* button starts the script console with a root user permissions . A screenshot of the open terminal is shown below.



System tab - Script terminal

In order to send a command, press *Enter* or click the *Send* button. In order to interrupt execution of a command, use the *Abort* button, which can also be activated by using the (CTRL+C) keyboard shortcut.

It should be stressed that the console window does **not** fully emulate a regular Telnet console. Among other things, syntax hints displayed using the *TAB* key are not supported.

The *Reboot NPE* button causes NPE restart. After about 4-5 minutes, the interface should be able to make a connection again. This time can increase depending on the amount of started services at system start-up. To restart connection please go to *Menu*→ *New Connection*.

# Services

Type	Service Name	Description	Version	Autostart	Status	Action
System	RTC RESTORE	Synchronize Time with RTC (Real-Time Clock)			ON	Actions
System	OUT RESTORE	Buffer all outputs states and reload after reboot		ON	OFF	Actions
System	START CONSOLE	Start-up of system console for serial port COM1 (/dev/ttyS0)		ON	ON	Actions
System	START BLINK	Start Status Led Blinking		OFF	OFF	Actions
System	START DHCP	DHCP client start-up (dynamic IP)		OFF	OFF	Actions
System	START FTP	FTP server start-up		ON	ON	Actions
System	START TELNET	Telnet service start-up		ON	ON	Actions
System	START SNMP	SNMP service start-up. Available only for version with SNMP		OFF	OFF	Actions
System	START NTPSRV	Start daemon that enables searching NPE computers in local network		ON	ON	Actions
System	GRS RECONNECT	Start-up of process reconnecting GRS connection after its disconnection		OFF	OFF	Actions
System	AUTO SYNCTIME	Auto Time Synchronization with the time server			OFF	Actions
System	DynDNS	Start refreshing subdomain that points to your NPE's IP address		OFF		Actions
Package	NANDON	A tool to Install/Uninstall available NAND partition			ON	Actions
Package	NXDYNAMICS	Modern interface for operating and monitoring NPE based computers	1209121335	OFF	ON	Actions
Package	APACHE	Web HTTP server	1208160956		ON	Actions

Services tab

## Services Tab

Contains tables on which services and installation packages are listed. The table contains the following columns:

### Type

Informs of the type of service. Available options are as follows: system (system service always present in the NPE), package (service available after package installation).

### Service Name

Service name.

### Description

Service description

### Version

Date of package release.

### Autostart

Informs whether a service is started during system start-up. Information pertains to rcs or syscfg configuration files.

### Status

Specifies whether a given service is currently active

### Actions

This field contains a button that expands the menu with available options for a given service. Available options are as follows:

## **Set Autostart OFF / Set autostart ON**

Activates/deactivates service autostart

## **Turn ON / Turn OFF**

Activates/deactivates the service at a given time

## **Update Service Name Service**

Checks the availability of new service versions and installs the new version. Updates are made using the Soft-Manager package. Updates are downloaded from the a2s.pl server

## **Configuration Manager**

Option available for service that have additional configurable options. Currently, additional configurations are available in the DynDNS service.

Screenshot showing additional options for DynDNS.

## Custom Modules

---

The *NX Dynamics* interface has the capability to start custom modules. They enable the design of a custom graphical interface for execution of any operations on the NPE computer. Thanks to this feature, you can build a module for control of another device.

*NX Dynamics* gives access to API (Application Programming Interface), simply put, functions available for the user. Their use makes it possible to use communication channels (*Background Channel, Command Channel and Long Channel*). This enables sending of any command for Telnet connection and the appropriate processing of the received answer. A basic knowledge of programming gives the capability to create even highly developed modules.

## Modules Tab

---

This tab enables the starting of custom modules created in Adobe Flash Builder 4.6. An expandable list of modules detected on the NPE can also be found in this tab. In order to start a custom module (.swf extension file), use ftp to copy it to the directory:

*apache\_server\_directory/NxModules*

(exemplary modules should already be in this directory).

or use upload module button on „Modules” Tab to upload

**The HOW-TO is included in the separate SDK document which explains how to create custom modules.**

Download the newest SDK from the FTP server:

server: [ftp.a2s.pl](ftp://ftp.a2s.pl)

login: [nxdynamics@ftp.a2s.pl](mailto:nxdynamics@ftp.a2s.pl)

\*pass: nx\_d143\_7

file name: ModuleSDK.zip