

# **Instruction Manual**

"ENERGYPLC1000"



Article number ENERGYPLC1000 CE

Version 01/23

**ENERGYPLC1000** Instruction Manual

## Software and Initial Startup

The programming of the NRGYPLC1000 determines its way of functioning. The NRGYPLC1000 PLCs offer a high degree of flexibility and can therefore be used for many different purposes. Once programmed, your NRGYPLC1000 provides its service, e.g. as temperature control, light control, alarm system or house control. In case that other tasks are desired, the NRGYPLC1000 PLC can be reprogrammed as often as required.

Inside the NRGYPLC1000 works a microcontroller. This is a small computer on a chip which includes the program and memory as well as various other peripherals. Through the FLASH technology the user program is retained even if the operating voltage is disconnected from the system. The programming of the NRGYPLC1000 is done with the help of the "Arduino IDE" in the popular Programming language "C".

### **Install Arduino**

Before using NRGYPLC1000 and start programming it, you have to do various preparations. These include installation of the programming / development environment for Arduino. Therefore first download the current Arduino IDE from the Internet.

You can download the ARDUINO IDE here: http://www.arduino.cc

# Download the Arduino Software



#### ARDUINO 1.6.13

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other opensource software. This software can be used with any Arduino board. Refer to the **Getting Started** page for Installation

instructions.

Windows Installer Windows ZIP file for non admin install

Windows app Get

Mac OS X 10.7 Lion or newer

Linux 32 bits Linux 64 bits Linux ARM (experimental)

Release Notes Source Code Checksums (sha512)

Figure 1: Download Arduino IDE

ENERGYPLC1000 Instruction Manual

Arduino versions for Windows, Linux and MAC OSX are available. Select your operating system and start the installation.

**ATTENTION!** We always recommend to download the latest version of Arduino IDE.

## Step by step guide for NRGYPLC1000 hardware installation

		iketchbook location:
Editor font size: 12 Interface scale: Automatic 100 \$% (requires restart of Arduino) Show verbose output during: compilation upload Compiler warnings: None Display line numbers Enable Code Folding Verify code after upload Use external editor Check for updates on startup Update sketch files to new extension on save (.pde -> .ino) Save when verifying or uploading Additional Boards Manager URLs:	Bro	/home/mint/Arduino
Interface scale:   Automatic 100 % (requires restart of Arduino)  Show verbose output during: compilation upload  Compiler warnings: None   Display line numbers  Enable Code Folding  Verify code after upload  Use external editor  Check for updates on startup  Update sketch files to new extension on save (.pde -> .ino)  Save when verifying or uploading  Additional Boards Manager URLs:	ault 🗸 (requires restart of Arduino	ditor language: S
Show verbose output during: compilation upload Compiler warnings: None Display line numbers Enable Code Folding Verify code after upload Use external editor Check for updates on startup Update sketch files to new extension on save (.pde -> .ino) Save when verifying or uploading Additional Boards Manager URLs:		ditor font size: 1
Compiler warnings: None  Display line numbers Enable Code Folding Verify code after upload Use external editor Check for updates on startup Update sketch files to new extension on save (.pde -> .ino) Save when verifying or uploading Additional Boards Manager URLs:	ic 100 🗘 % (requires restart of Arduino)	nterface scale:
<ul> <li>Display line numbers</li> <li>Enable Code Folding</li> <li>Verify code after upload</li> <li>Use external editor</li> <li>Check for updates on startup</li> <li>Update sketch files to new extension on save (.pde -&gt; .ino)</li> <li>Save when verifying or uploading</li> </ul>	ion 🗌 upload	show verbose output during:
<ul> <li>Enable Code Folding</li> <li>Verify code after upload</li> <li>Use external editor</li> <li>Check for updates on startup</li> <li>Update sketch files to new extension on save (.pde -&gt; .ino)</li> <li>Save when verifying or uploading</li> <li>Additional Boards Manager URLs:</li> </ul>		Compiler warnings: N
<ul> <li>Verify code after upload</li> <li>Use external editor</li> <li>Check for updates on startup</li> <li>Update sketch files to new extension on save (.pde -&gt; .ino)</li> <li>Save when verifying or uploading</li> <li>Additional Boards Manager URLs:</li> </ul>		Display line numbers
Use external editor Check for updates on startup Update sketch files to new extension on save (.pde -> .ino) Save when verifying or uploading Additional Boards Manager URLs:		Enable Code Folding
<ul> <li>Check for updates on startup</li> <li>Update sketch files to new extension on save (.pde -&gt; .ino)</li> <li>Save when verifying or uploading</li> <li>Additional Boards Manager URLs:</li> </ul>		Verify code after upload
<ul> <li>Update sketch files to new extension on save (.pde -&gt; .ino)</li> <li>Save when verifying or uploading</li> <li>Additional Boards Manager URLs:</li> </ul>		Use external editor
Save when verifying or uploading		Check for updates on startup
Additional Boards Manager URLs:	save (.pde -> .ino)	🗹 Update sketch files to new e>
-		Save when verifying or upload
More preferences can be edited directly in the file		Additional Boards Manager URLs:
note preferences can be called an elegy in the file	the file	More preferences can be edited (
/home/mint/.arduino15/preferences.txt		home/mint/.arduino15/preferenc
(edit only when Arduino is not running)		edit only when Arduino is not run

After installing, open Arduino IDE software and navigate to File **O** Preferences (Figure 2)

Figure 2: Arduino IDE preferences

Copy-paste the following link into the field labelled "Additional Boards Manager URLs:" (Figure 3) and press "OK" button.

https://mcudude.github.io/MegaCore/package\_MCUdude\_MegaCore\_index
.json

		Preferences
ettings	Network	
Sketchb	ook location:	
/home,	/mint/Arduino	Browse
Editorla	inguage:	System Default 🗸 (requires restart of Arduino)
Editor fo	ont size:	12
Interfac	e scale:	Automatic 100 🗘 % (requires restart of Arduino)
Show ve	rbose output during:	compilation upload
Compile	er warnings:	None Y
Enat	lay line numbers ole Code Folding fy code after upload external editor ck for updates on start ate sketch files to new e when verifying or uplo	extension on save (.pde -> .ino)
Addition	nal Boards Manager URL	.s: https://mcudude.github.io/MegaCore/package_MCUdude_MegaCore_index.json
/home/n	eferences can be edite nint/.arduino15/prefere ly when Arduino is not ru	ences.t×t
		OK Canc

Figure 3: Arduino IDE preferences updated

Then navigate to Tools Board: "Arduino (name of your last used board)" Boards Manager (figure 4).

	sketch_jan22a   Arduino 1	1.6.13	_ 🗆 😣		
<u>F</u> ile <u>E</u> dit <u>S</u> ketch	<u>T</u> ools <u>H</u> elp				
	Auto Format	Ctrl+T			
sketch jan22a	Archive Sketch				
<pre>void setup() {</pre>	Fix Encoding & Reload				
	Serial Monitor	Ctrl+Shift+M			
}	Serial Plotter	Ctrl+Shift+L			
<pre>void loop() {</pre>	WiFi101 Firmware Updater				
// put your m	Board: "Arduino/Genuino Uno"	>	Boards Manager		
}	Port	>	Arduino AVR Boards		
	Get Board Info		🔿 Arduino Yún		
	Programmer: "AVRISP mkll"	<ul> <li>Arduino/Genuino Uno</li> </ul>			
	Burn Bootloader	O Arduino Duemilanove or Diecimila			
		🔿 Arduino Nano			
			🔿 Arduino/Genuino Mega or Mega 2560		
		🔿 Arduino Mega ADK			
		🔿 Arduino Leonardo			
			🔿 Arduino/Genuino Micro		
			🔿 Arduino Esplora		
			🔿 Arduino Mini		
			<ul> <li>Arduino Ethernet</li> <li>Arduino Fio</li> </ul>		
			🔿 Arduino BT		
1		🔿 LilyPad Arduino USB			
		<ul> <li>LilyPad Arduino</li> </ul>			
		O Arduino Pro or Pro Mini			
			<ul> <li>Arduino NG or older</li> </ul>		
			🔿 Arduino Robot Control		
			<ul> <li>Arduino Robot Motor</li> </ul>		
			🔿 Arduino Gemma		

Figure 4: Navigating to Boards Manager

In the Boards Manager type "megacore" into the search box. Megacore Package will be shown. Click the "Install" button (figure 5).

Boards Manager					
ype	All	~	megacore		
Board	ga640, ATmega329, AT <u>help</u>	ATmeg	3290, ATmega3250, ATmega2561, ATmega2560, ATmega1281, ATmega1280, ATmega649, ATmega645, 25, ATmega169, ATmega165, ATmega128, ATmega64, AT90CAN128, AT90CAN64, AT90CAN32.		
			2.2.2 🗸 Instal	ι	
				Close	

Figure 5: Boards Manager before Installation

After the automated installer finished its work the item will be labelled "INSTALLED" (figure 6).

				Boards Manager		8
Type All		~	megacore			
Boards include ATmega6490,	d in this packa ATmega6450,	ge: ATmega	2.2 INSTALLED 13290, ATmega3250, ATmega 15, ATmega169, ATmega165,			ga645,
						Close

Figure 6: Boards Manager after Installation

## Installation successful

The Megacore Hardware package will allow you to see and select Megacore microcontrollers now (figure 7): for NRGYPLC1000 to work, you have to choose ATmega64 microcontroller.

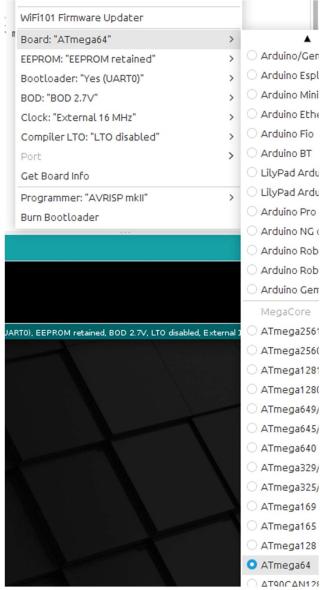


Figure 7: Megacore pack microcontrollers

After selecting ATmega64 microcontroller, you can set varius properties: it's mandatory that 'External 14,7456 MHz' is choosen in clock section. You can refer to figure 8 for an example of configuration:

Tools <u>H</u> elp	
Auto Format	Ct
Archive Sketch	
Fix Encoding & Reload	
s Serial Monitor	Ctrl+Shif
Serial Plotter	Ctrl+Shi
WiFi101 Firmware Updater	
Board: "ATmega64"	
EEPROM: "EEPROM not retained"	
Bootloader: "No bootloader"	
BOD: "BOD 2.7V"	
Clock: "External 14.7456 MHz"	
Compiler LTO: "LTO enabled"	
Port	
Get Board Info	
Programmer: "AVRISP mkll"	
Burn Bootloader	

Figura 8: Configuration example

More detailed informations can be found to Megacore homepage:

https://github.com/MCUdude/MegaCore

## **Service and Maintenance**

This product is free of maintenance. For cleaning of the housing please use a dry, soft and clean cloth. Under no circumstances use aggressive detergent or chemical solvents, because they may damage the housing (e.g. cause discolorations).

## Disposal

At the end of its lifespan, please dispose of this product according to current legal regulations.



Figure 16

## Imprint

This instruction manual is published by Takius srl. All rights, including the copyrights of translation reserved. Reproductions of any kind, e.g. photocopies, microfilming, recordings or the capturing in electronic data processing facilities require the written approval of the publisher. Reproduction, also partly, is prohibited. This instruction manual corresponds to the technical state at the time of printing. Subject to change in technology and equipment.



© Copyright 2023 by Takius srl.