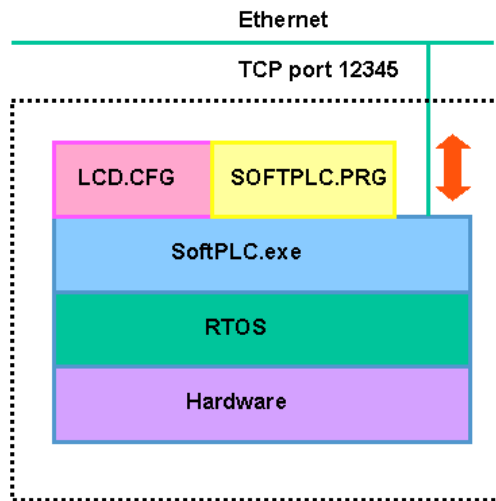


1 Contents

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1 MiniPLC Basics

MiniPLC is a freely programmable PLC controller with integrated web access, using 186-based processor. This how the layers are organized:



1.1 RTOS

At the lowest level, a Real Time Operating System is running, which takes care of following services:

- control of access to hardware resources
- Flash memory file management system
- ftp service access
- telnet service access
- launching of runtime which processes the application.

RTOS must be V 1.10B and above. The version number is displayed in the Platform Config dialogue – see below, or can be retrieved with a Chiptool software, which also can download latest RTOS version.

1.2 SoftPLC.exe

The runtime file is launched after MiniPLC boot and its correct start is indicated by a double short beep. If the application is not found or can not be read properly, the program gives two short and one long beeps and the display reads

```
CANNOT LOAD  
THE PROGRAM
```

In this case it is necessary to upload the application again.

The runtime also communicates over a TCP port (12345 by default), to which the IDE connects. This is how a new application, web pages, LCD definition, and MiniPLC configuration are uploaded.

If the program is damaged so that the runtime stops responding, it is not possible to connect to the controller even through IDE. Therefore a DIP switch close to the Ethernet socket is installed with following functionality: if ON, the SoftPLC.exe is run after reboot but does not process the application. Then it is possible to connect from IDE, load a correct application, put the switch back to OFF and reboot the controller.

1.3 Application

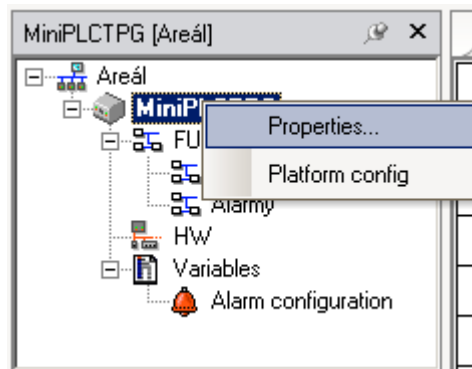
It consists of several files which specify the functionality of the control program and variable values, alarm definitions, LCD menu description etc.

The files are uploaded in the *Platform config* dialogue – see below.

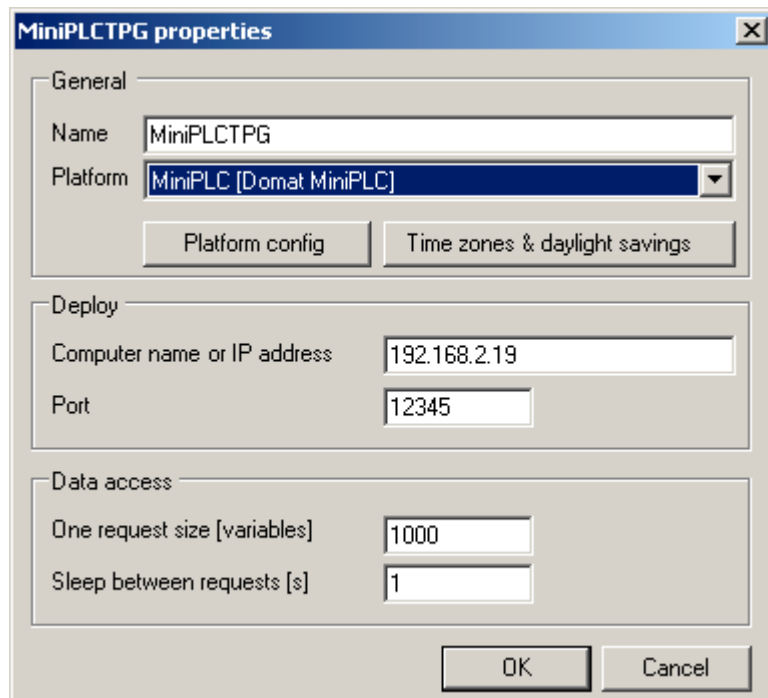
2 Application development in the IDE

The proceedings are the same as for the XP/XPem platforms, with following differences:

Right click on the project icon opens the context menu *Project Properties*:



In the Properties choose the *MiniPLC* platform:



Then, set the IP address of the MiniPLC. Default address is 192.168.1.160, mask 255.255.255.0. The IP address and other parameters can be changed in the *Platform Config* menu.

Usually it is not necessary to change the port number from its default (12345). Change it only if necessary for remote control or network security reasons – consult your network administrator.

One request size – number of variables to read at one request. Decrease if the network has high latency or dropouts. It is not necessary to change under normal conditions.

Sleep between requests – time span between the requests for variables update, not necessary to change under normal conditions.

2.1.1 Time zones

For safe daylight saving time change it is possible to define individual table as far as to 2024.

The table is set in the *Time zones and daylight savings* menu.

Year	Daylight start time [UTC]	Standard time start [UTC]
2005	27.3.2005 1:00:00	30.10.2005 2:00:00
2006	26.3.2006 1:00:00	29.10.2006 2:00:00
2007	25.3.2007 1:00:00	28.10.2007 2:00:00
2008	30.3.2008 1:00:00	26.10.2008 2:00:00
2009	29.3.2009 1:00:00	25.10.2009 2:00:00
2010	28.3.2010 1:00:00	31.10.2010 2:00:00
2011	27.3.2011 1:00:00	30.10.2011 2:00:00
2012	25.3.2012 1:00:00	28.10.2012 2:00:00
2013	31.3.2013 1:00:00	27.10.2013 2:00:00
2014	30.3.2014 1:00:00	26.10.2014 2:00:00
2015	29.3.2015 1:00:00	25.10.2015 2:00:00

Choose appropriate time zone above.

Name – name of the time zone

Zone offset – deviation between local time and UTC

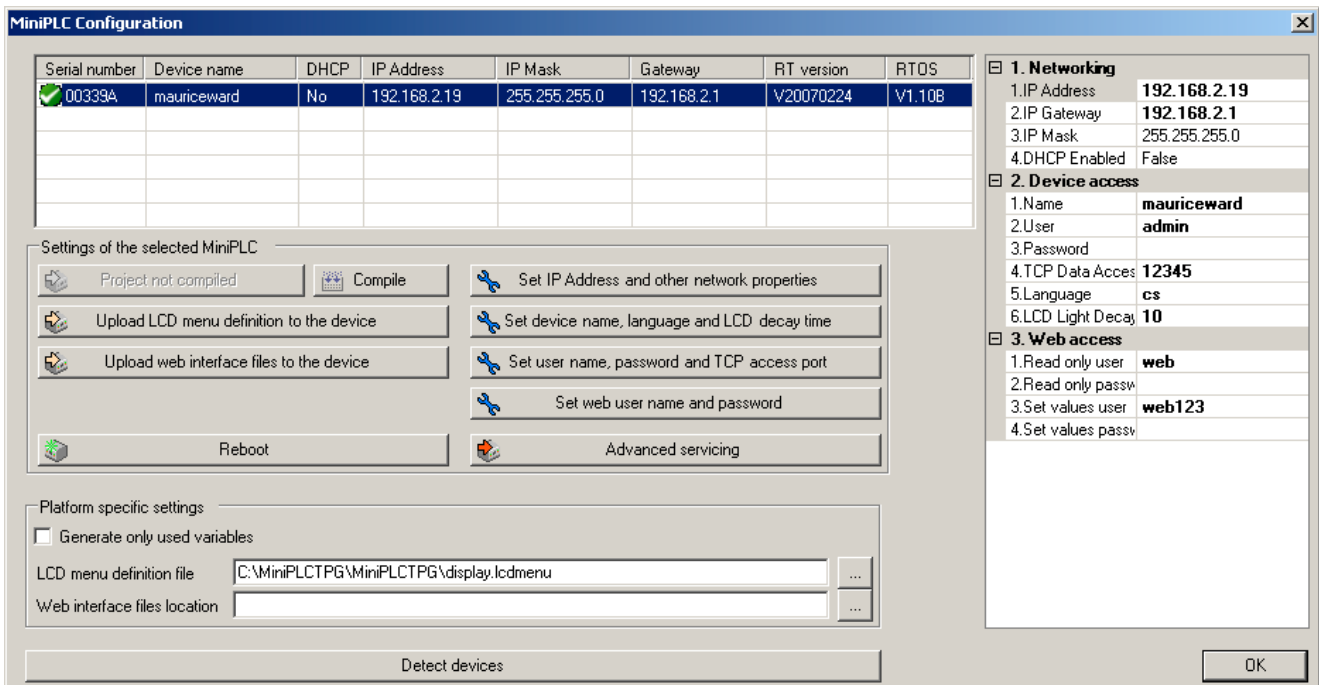
Daylight shift – difference between normal and daylight saving time (some countries use different value than 60 minutes, therefore any value can be set here)

In the table it is possible to set exact dates and times of the daylight saving time change and back. Finally confirm with the OK button.

Generally, there is no reason for changing the time zone settings unless the MiniPLC is deployed in another region than Western, Central and Eastern Europe, where standard predefined rules apply.

2.2 The Platform config menu

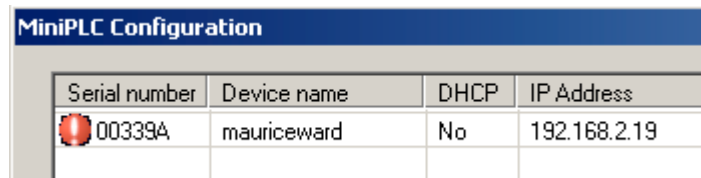
This menu is the basic means for MiniPLC controller configuration.



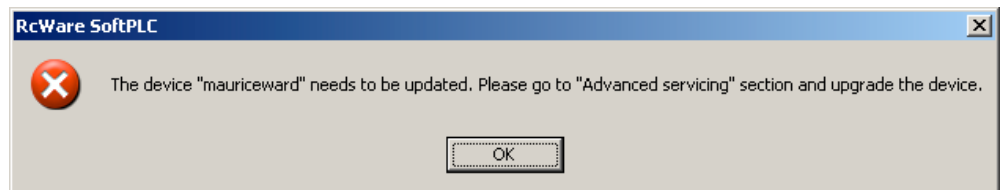
In the upper part of the window there is a table with all the MiniPLC controllers which have been detected in the network. The controller is detected even if its IP address is out of the current subnet (defined by IP address and subnet mask at the PC where IDE is running).

2.2.1 Firmware update

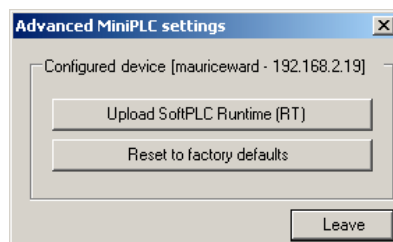
If MiniPLC and IDE contain identical firmware version there is a green tick symbol in the table. If it is not the case, which might result in misinterpretation of some function blocks, it is necessary to update the firmware. This is indicated by a red exclamation mark:



and if the MiniPLC is selected by clicking in the corresponding line, a window appears:



There are two buttons in the *Advanced servicing* section:



Upload SoftPLC Runtime – this is where the most recent firmware version is uploaded to the controller. The process contains several steps and is lead by a dialogue.

Reset to factory defaults – all the SoftPLC-related data is deleted from the MiniPLC flash memory and the controller is ready to receive new SoftPLC components. This is only necessary if the installation is damaged badly and the controller behaves oddly.

2.2.2 Network properties setup

The *Set IP address and other network properties* button sets those parameters:

IP Address – IP address of the MiniPLC

IP Gateway – default network gateway

IP Mask – subnet mask

DHCP Enabled – if True, the controller reads automatically its IP address from a DHCP server, the IP address is not assigned by the **IP Address** parameter. This is not the usual setting, consult your network administrator.

Enter new values to the first part of the table at right and then write them clicking the *Set IP address and other network properties* button.

2.2.3 Controller name, language, and backlight setting

This is what the *Set device name, language and LCD decay time* button is for.

In the *Device access* section writes those parameters:

Name – a string with controller name (location) for easier identification of the MiniPLC in the table

Language – language of the LCD display. Now, those languages are available:

en	English
de	German
cs	Czech
hu	Hungarian
si	Slovenian

Other languages will be added on demand.

LCD Light Decay (min) – user inactivity time after which the display backlight goes off - only at IPLC300. The IPLC200 controllers have backlight on permanently.

2.2.4 Runtime access settings

The button *Set user name, password and TCP access port* sets the parameters for client connections – for IDE, OPC server, Touchscreen etc.

User – user name, default value is *admin*

Password – password, default value is *rw*

TCP Data access port – default value is 12345, must be the same as that in the *Project properties* in the IDE.

2.2.5 Web access settings

The button *Set web user and password*. If the controller works as a web server for values monitoring and control over a web browser, here are user names and passwords for read-only and read/write levels set.

The *Web access* section contains those parameters:

Read only user – user name for read-only access

Read only password – password for read-only access

Set values user – user name for read / write access

Set values password – password for read / write access

Default name is *softplc*, default password is *web* for both access levels.

The actual passwords are not read from the MiniPLC, however it is possible to define new passwords and write them to the MiniPLC.

If the controller is set up accordingly, go on in the left column and upload the application data:

2.2.6 Program upload

The button *Upload compiled program*. If the program is not compiled, the button is disabled and reads *Program not compiled*. The program can be compiled directly from the *Platform config* window clicking the *Compile* button.

2.2.7 LCD display menu upload

The button *Upload LCD menu definition to the device*. The menu is created in the HMI editor, see **RcWare SoftPLC HMI Editor**. The path to the *.lcdmenu* file must be set in the *LCD menu definition file* window in the lower part of the dialogue. The *.lcdmenu* file is compiled automatically and results in *LCD.CFG* which is uploaded to the device.

In case the LCD menu definition contains variables which do not exist in the MiniPLC, the display reads

??? – for analog values

UNKNOWN STATE – for binary and multistate values.

Then it is necessary to correct the variables assignments to the menu items in the HMI editor, or re-read the variables from the IDE project to the HMI project (menu *File – Variables Manager* – choose connection name – *Edit connection*, and reselect and reread the project file *.splcproj*).

2.2.8 Web pages upload

The web pages are edited in the HMI editor, see **RcWare SoftPLC HMI Editor**. There must be file path to the files correctly set in the *Web interface files location* box in the lower part of the dialogue.

The contents is copied by clicking the *Upload web interface files to the device* button.

2.2.9 Restart

After new data is uploaded to the controller, the MiniPLC must be rebooted. In case of remote access when the power off / power on procedure is difficult to exercise it is possible to restart the MiniPLC by clicking the *Reboot* button.

Click *OK* to close the *Platform Config* dialogue.

2.3 Connection with a running MiniPLC

Connect to MiniPLC to watch process values online, change them, and plot the trend values when commissioning and tuning the plant.

Select *Remote connection* at the toolbar and click *Connect*.

A dialogue with connection parameters opens:



Check and set here:

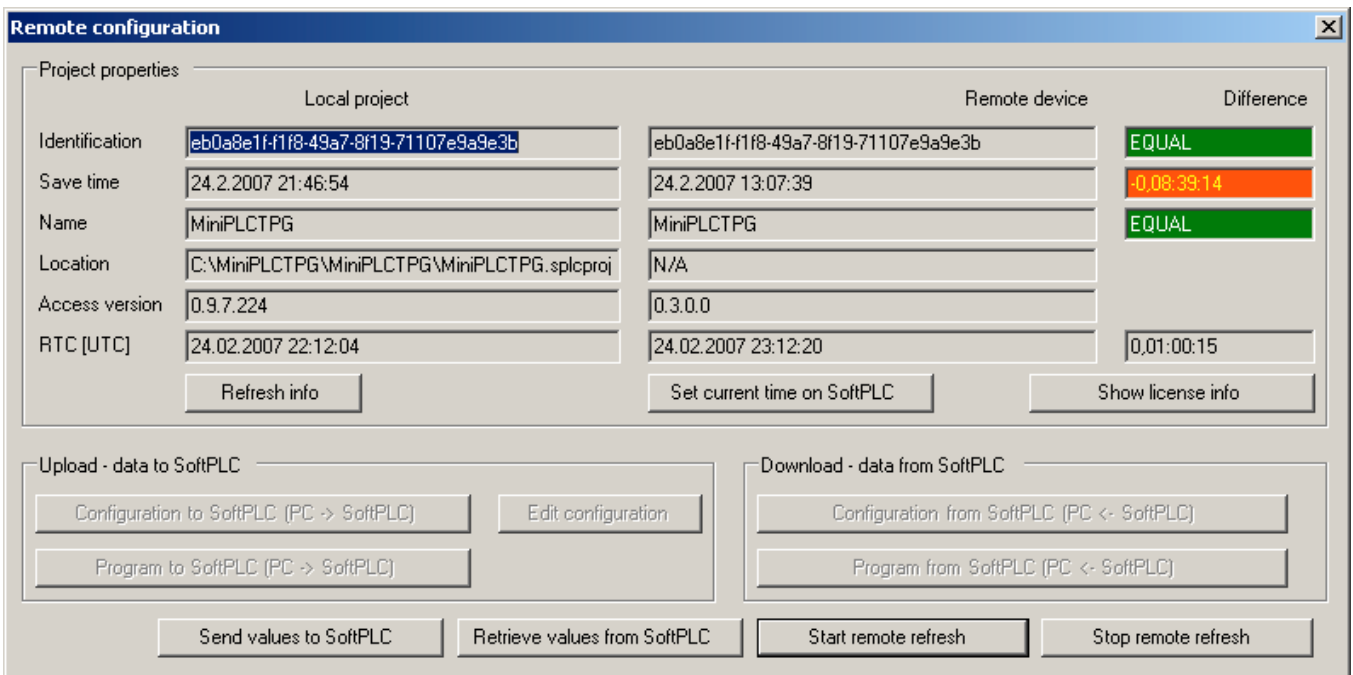
Computer name or IP address – IP address of the target MiniPLC controller, predefined value is that which has been set in the Project Properties, the drop-down menu contains previously entered values.

Port – TCP port for connection with the runtime, default value is 12345.

User name – user name, default value is *admin*

Password – user password, default value is *rw*

After the connection has been established successfully, a window opens:



2.3.1 Connection error

If the connection can not be established and a message window appears, check those items:

- is the MiniPLC connected to the network?
- is the IP address of the MiniPLC properly set and the controller is in the same subnet as the PC where IDE runs?
- is user name, password and port number set correctly?

- does the runtime at the MiniPLC run properly? (Green LED close to the buzzer must flash in the program processing cycle.)
- is the PC not protected by a firewall which blocks the connection?

2.3.2 Remote Configuration window

This window contains useful information about the program status in IDE as well as in MiniPLC:

Identification – unique GUID of the program. In order to upload a new version of the program here, GUID must be identical in IDE as well as in MiniPLC. If it is not the case, the complete project must be uploaded in the *Platform Config - Upload compiled program* menu and MiniPLC must be rebooted.

Save time – date of the last program save. May be useful at version checks and may prevent accidental deletion of a newer version in the MiniPLC by an older version in IDE.

Name – Application name, this is defined in the *Project Properties*.

Location – where the project resides (on a disk, CF card etc.). Not applicable for MiniPLC as there is only one possible location here given by internal settings.

Access version – runtime or IDE version, just for information. Have those values ready when contacting technical support.

RTC/UTC – system times in IDE as well as in MiniPLC.

Buttons:

Refresh info – refreshes values from IDE as well as from MiniPLC

Set current time on SoftPLC – takes the PC (IDE) time and sets it in the MiniPLC.

Show licence info – displays runtime licence number, not applicable for MiniPLC.

The buttons for program upload and download are not relevant for the MiniPLC platform, they only work for SoftPLC (*Full featured SoftPLC*, i.e. runtime working on OS Windows XP/XPem and Linux).

Send values to SoftPLC – write values from IDE to MiniPLC once only. Used e.g.:

- if the time programs have been set offline in the IDE and we want to transfer them to MiniPLC while we do not wish to stop the program and upload it as a whole
- if the user set some values or time programs by mistake and we want to upload a previously created backup from IDE to MiniPLC.

Retrieve values from SoftPLC – unrepeated transfer of the values the other way round, i.e. from MiniPLC to IDE. It is used

- to backup current values incl. time programs
- if we want to change the program structure with our program backup and do not want to discard user settings which have been made in the meantime

Start remote refresh – starts periodic update of the values from MiniPLC to IDE, used for commissioning, when there are live process values displayed in the FUPLA schemas and all the changes and settings made in the IDE are written to MiniPLC.

Stop remote refresh – stops periodic update of the values from MiniPLC to IDE which is useful e.g. before the web pages are uploaded (the refresh takes up a substantial processing capacity of the MiniPLC and may slow down the file transfer).

2.3.3 Disconnect

Click the *Disconnect* button at the toolbar to disconnect. The disconnecting may take some time as there are values read and written into files.