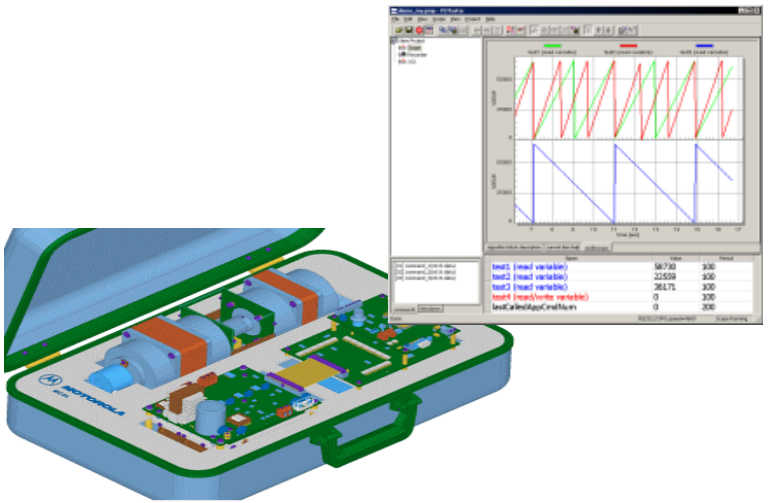
Embedded PC Master Application



Overview

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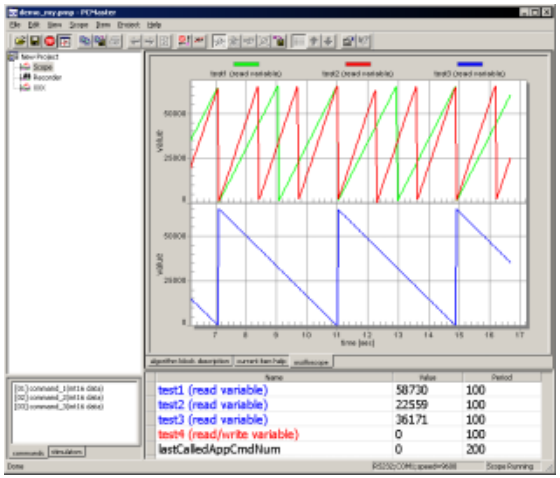
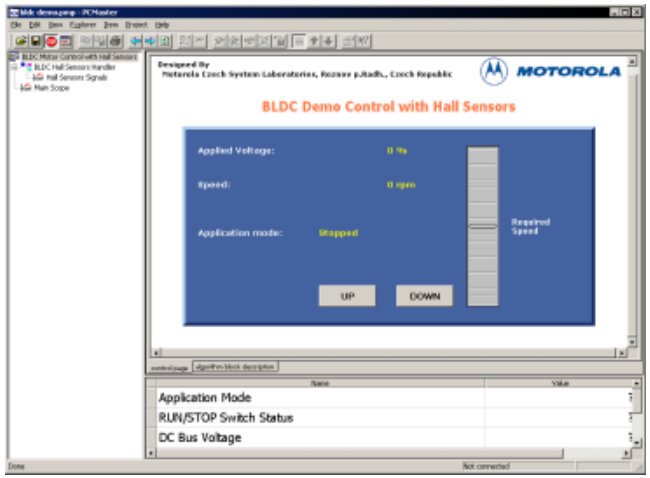
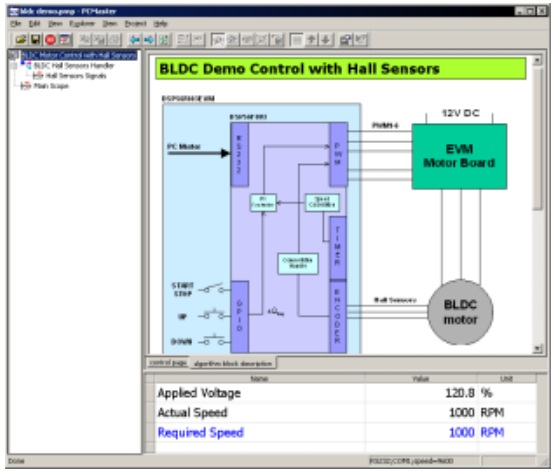
What is PC master software?

- Real Time Monitor
- Control Panel
- Demonstration Platform/ Selling tool

FOR YOUR EMBEDDED APPLICATION







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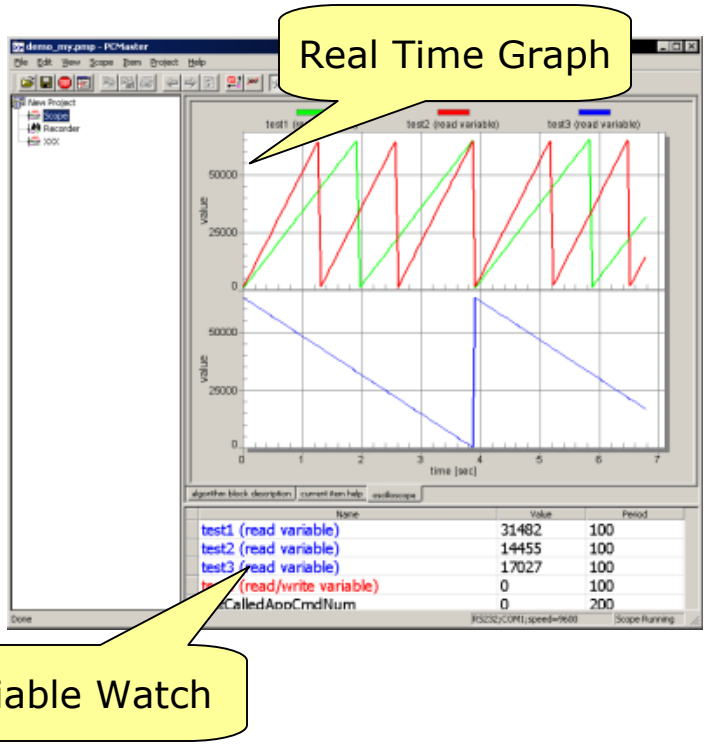
1. Real Time Monitor

Watching on-board variables or memory locations in various formats:

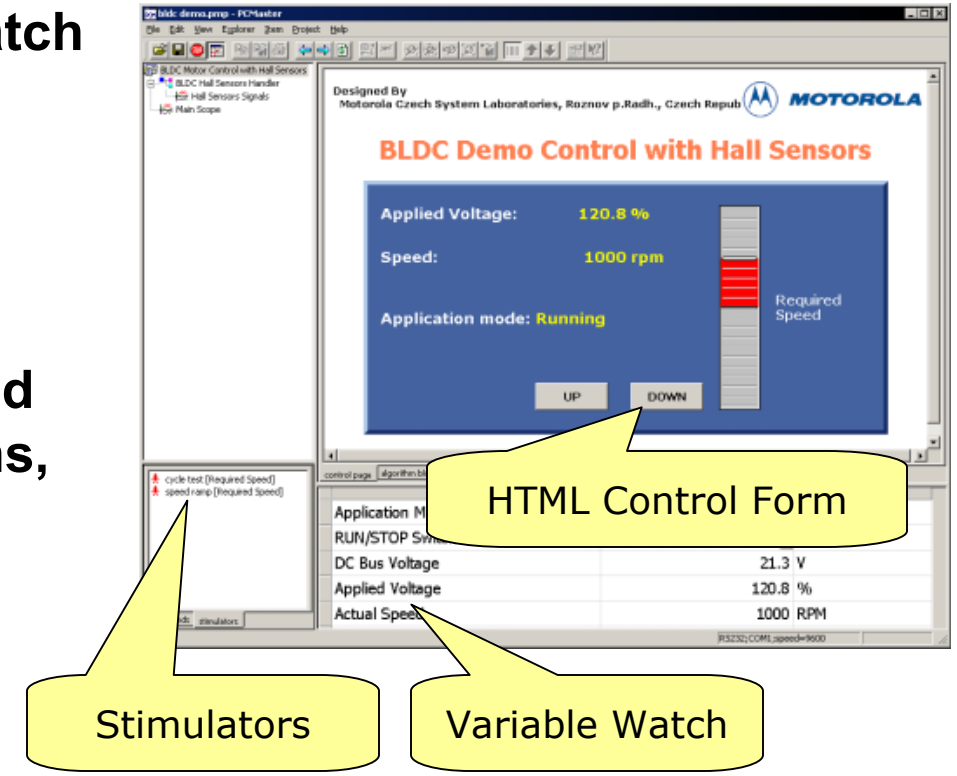
- **Text**
  - **name**
  - **value - hex, dec, real, …**
  - **min, max**
  - **enumerated labels**
- **Real-time waveform (real-time oscilloscope)**
- **High-speed recorded data (on-board memory oscilloscope)**



2. Control Panel

Several ways how to control embedded applications:

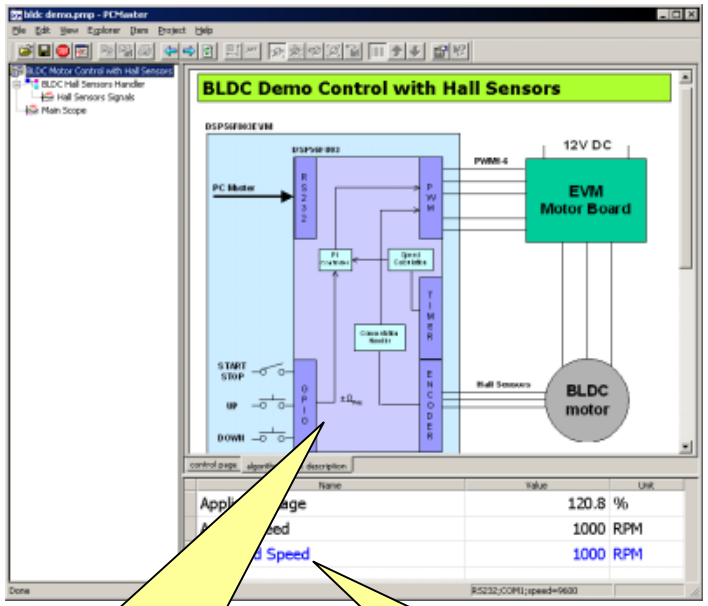
- **Direct setting of the variable value from the variable watch**
- **Time-table stimulation of the variable value**
- **User command / message control**
- **VisualBasic script-powered HTML Forms (push buttons, indicators, sliders, …)**
- **By external application (e.g. Excel) embedded in GUI**



3. Demonstration Platform

The features of an embedded application can be both described and demonstrated

- **By HTML pages that can contain**
  - **text and pictures**
  - **sounds, video sequences**
  - **internet links**
  - **and any other web contents**
- **Simultaneous live data monitoring**
- **Browsing through the functional blocks of embedded application**



HTML Description Page

Variable Watch

Sell your work using this tool !

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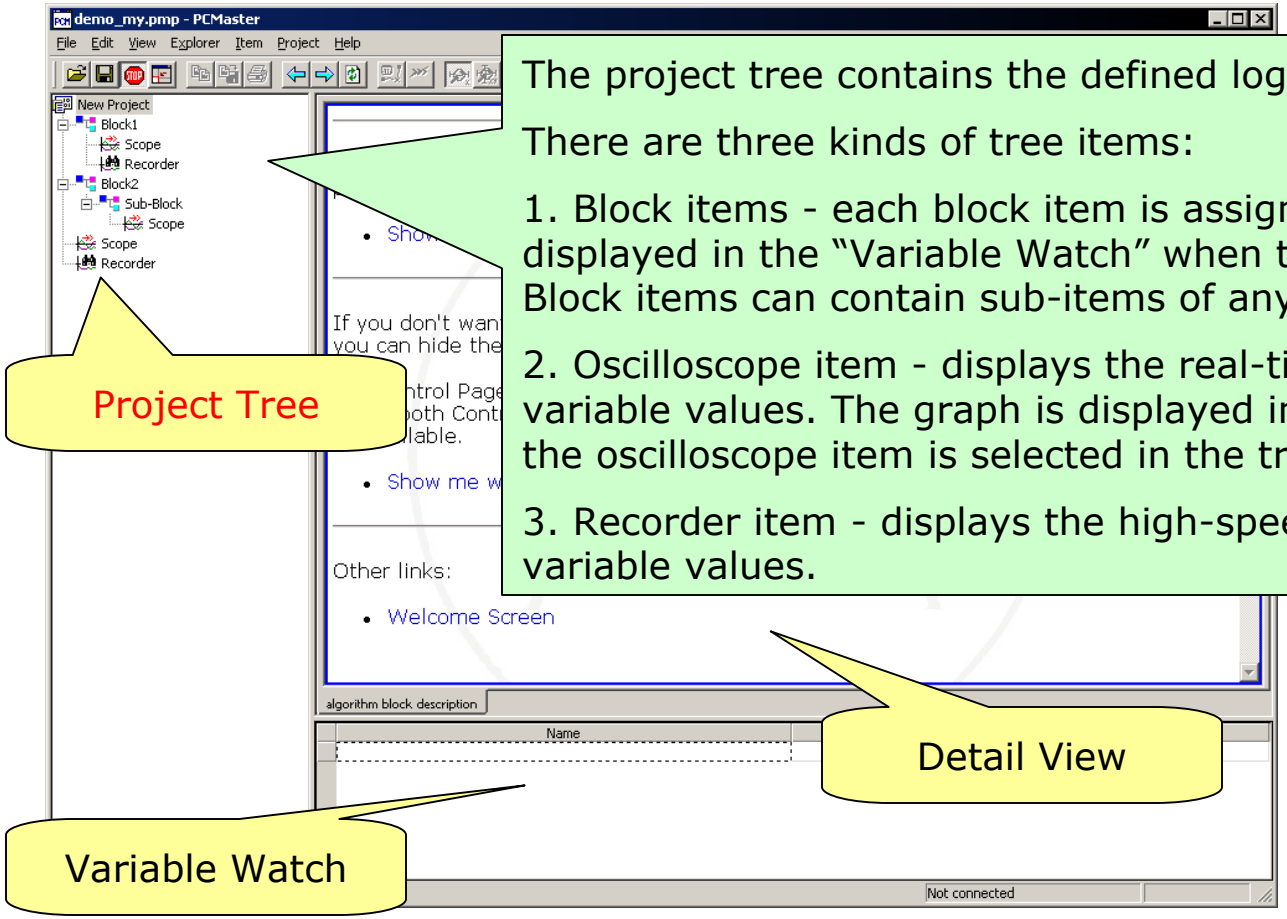
Application Window: Project Tree



The project tree contains the defined logical project structure.

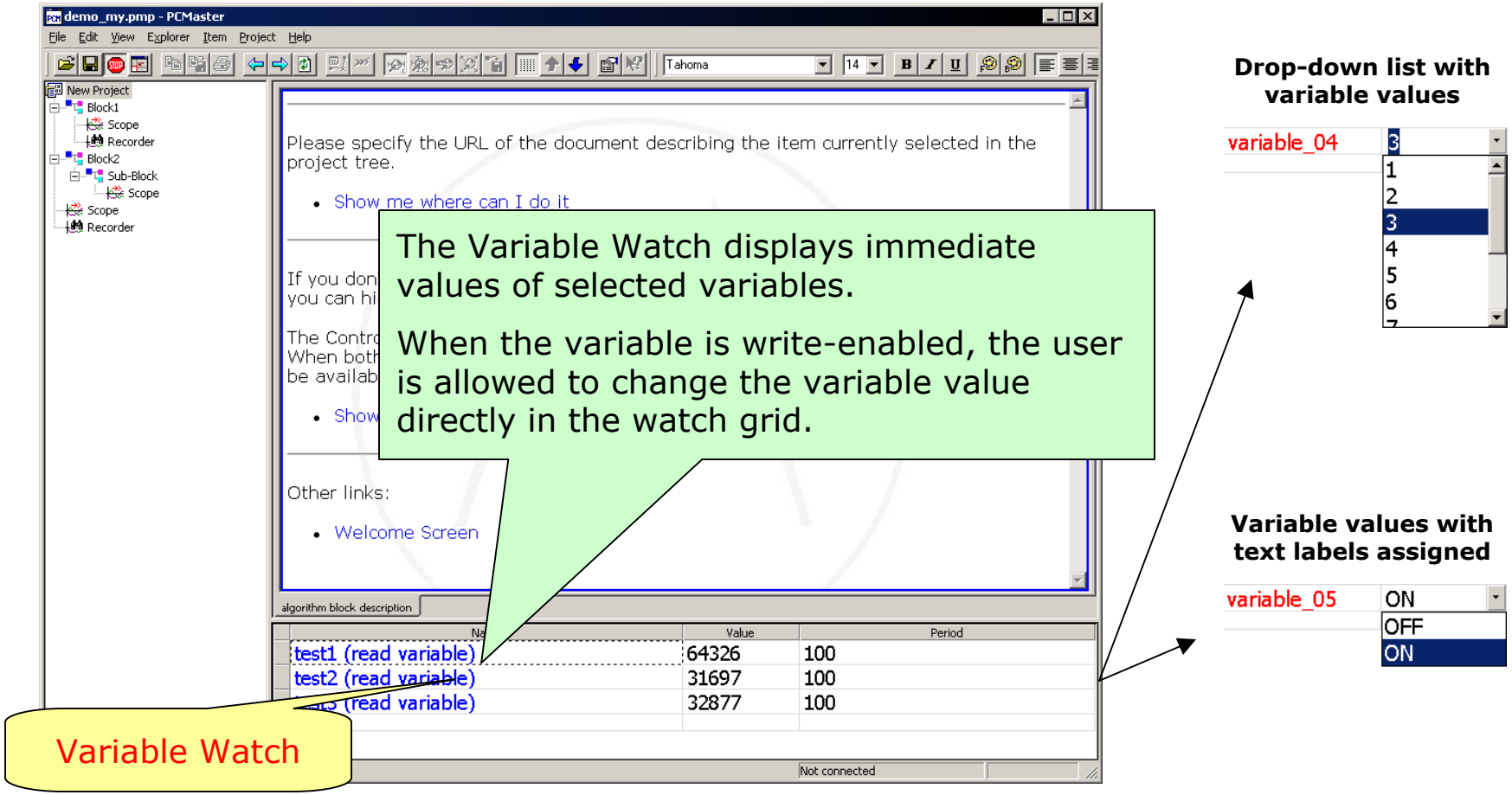
There are three kinds of tree items:

1. Block items - each block item is assigned a list of variables displayed in the "Variable Watch" when the item is selected. Block items can contain sub-items of any kind.

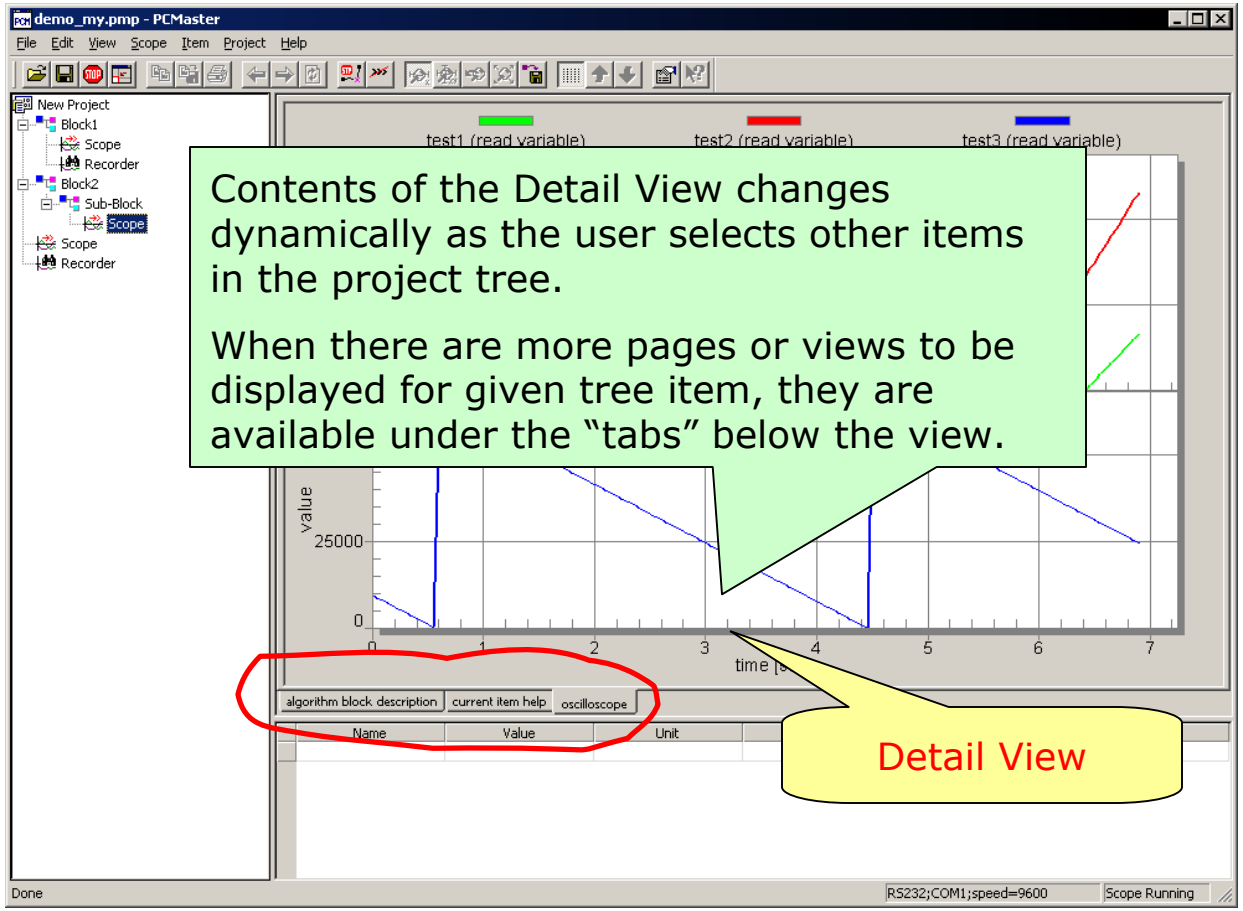
2. Oscilloscope item - displays the real-time graph of selected variable values. The graph is displayed in the Detail View when the oscilloscope item is selected in the tree.

3. Recorder item - displays the high-speed graph of selected variable values.

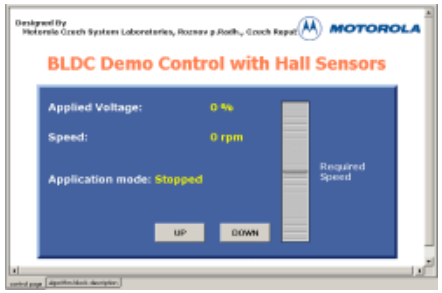
Application Window: Variable Watch



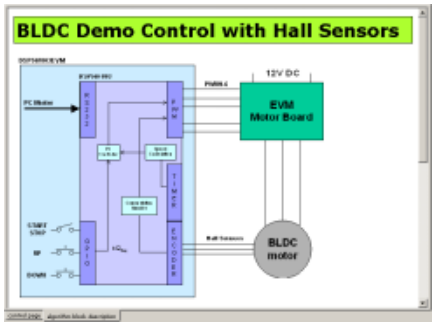
Application Window: Detail View



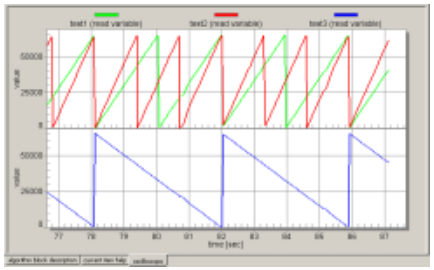
Control Page



Description Page



Scope or Recorder Page



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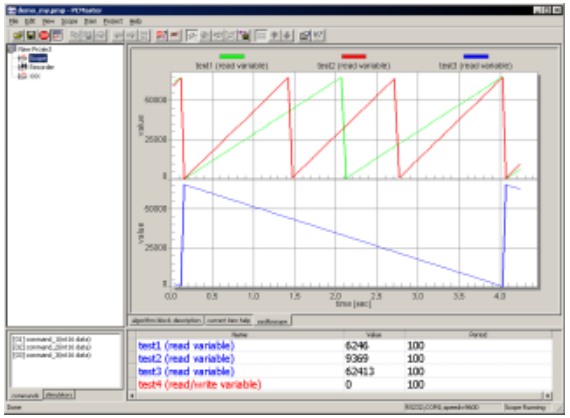
How it Works?: Communication



PC Communication Library

Plug-in Module | RS232

On the PC side, the application uses a separately loaded dynamic library to handle the communication with the target.

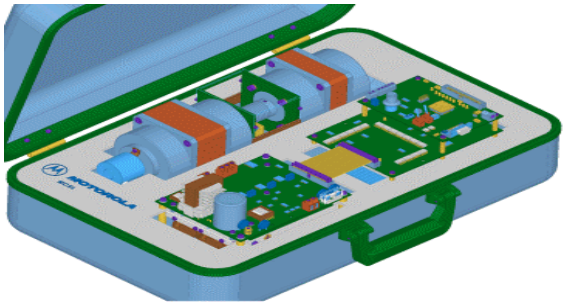
In the simplest scenario, the library uses built-in RS232 implementation to communicate with the target.

Both the communication protocol and the library are documented and may be used in custom applications.

RS232

On the embedded side, the communication and protocol is implemented in the object module, which has to be linked together with an embedded application.

Source code of the module is available.



Embedded Application

Protocol Implementation

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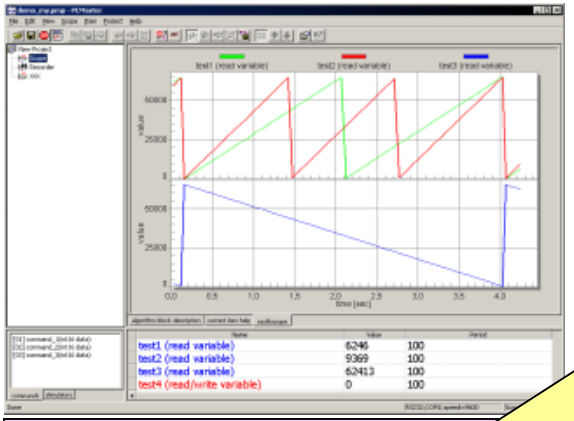
How it Works?: Comm. Plug-in Modules



PC Communication Lib...

Plug-in Module (any media)

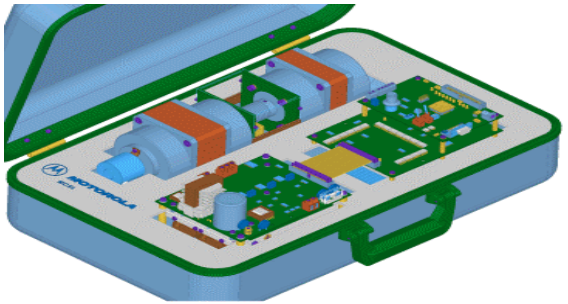
RS232

A custom communication plug-in module can be used instead of the RS232 interface.

User can write own modules to implement the transport layer for the defined protocol.

Plug-in modules can be written in any programming language. They are distributed and used in a binary form of the ActiveX component (Microsoft COM technology).

USB, Ethernet, ...



Embedded Application

Protocol Implementation

Typically, the user would use or create a custom plug-in module to implement a connection via alternative interfaces.

For example: USB, CAN or Ethernet

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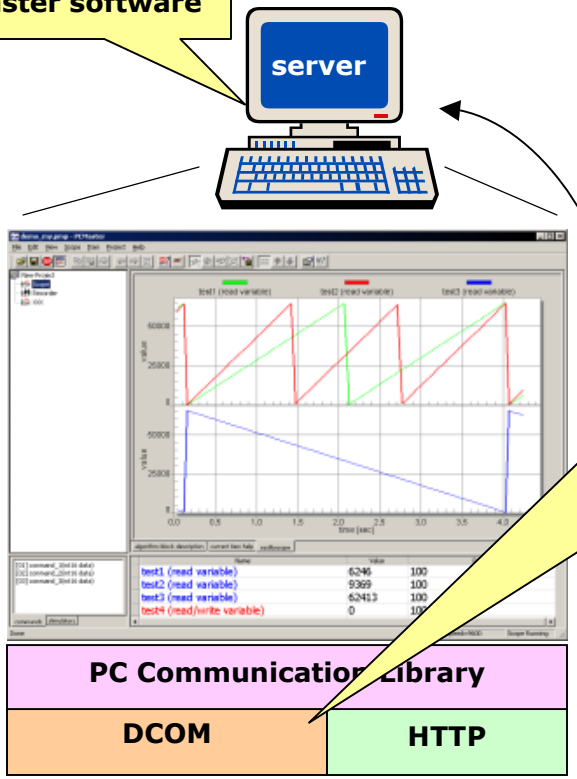
How it Works?: Remote Connection

The remote server has the PC master software

As an example of using the communication plug-in modules, there are two plug-in modules installed directly with the PC application.

One module implements the flexible Microsoft DCOM communication. The second module implements the standard HTTP protocol.

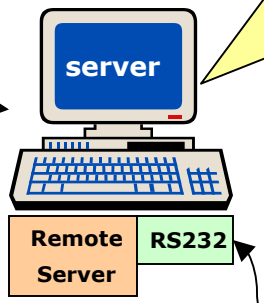
Both modules handle communication with the Remote Server application enabling remote access to the embedded application.

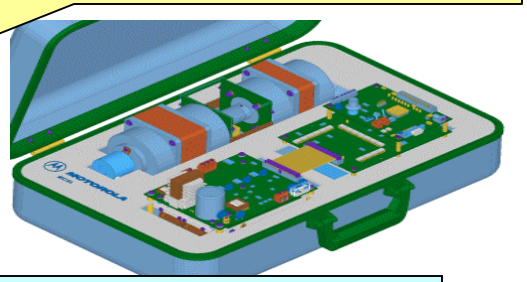


DCOM or HTTP

The local server computer runs the Remote Server application.

The embedded application is connected to the local server computer again with RS232 or other plug-in module.





Embedded Application

Protocol Implementation

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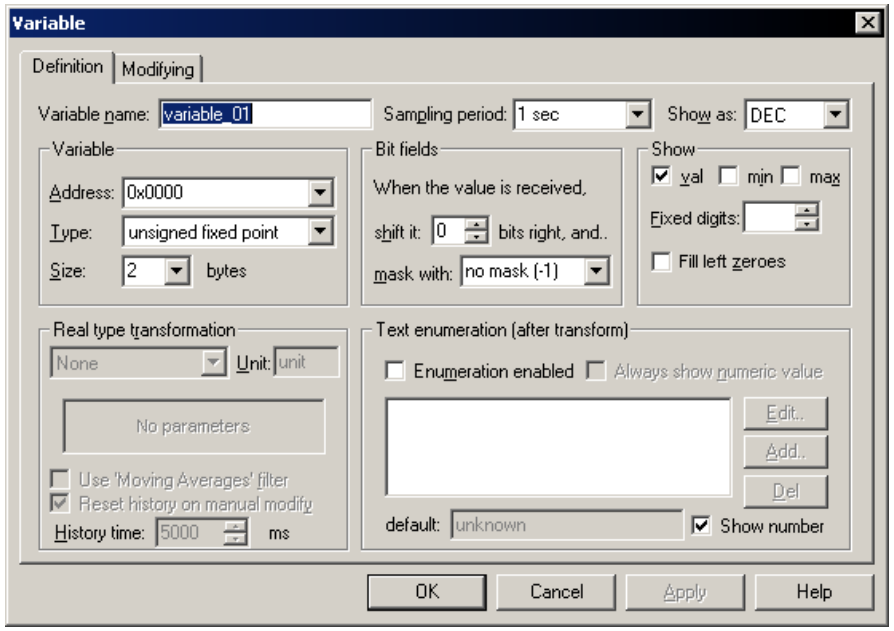
Variables

A variable represents a memory location in the embedded application. It is defined by:

- **name**
- **sampling frequency**
- **address (or symbol from ELF or MAP file)**
- **type**
- **size or bit field**
- **display format**
- **numeric transformation**
- **text labels assignment**



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Application Commands

An application command is a message sent to the embedded application from the master

- **Application command can be defined to have any number of numeric parameters, which are delivered to embedded application too**
- **Embedded application is notified about receiving the command by setting the dedicated flag bit**
- **Master application periodically polls the result value to determine when the command is processed**
- **Any text can be assigned to the command result value and displayed in GUI when the command is processed**

Project Deployment

It is very easy to deploy the GUI project to other users or customers:

- **Whole project is saved to a single file**
- **Resource files (HTML code, scripts, images, etc.) are packed into the project file and unpacked in other computer's temporary space**
- **The project can be protected against changes by activating the "demo mode"**
- **The "demo mode" can be password-protected**