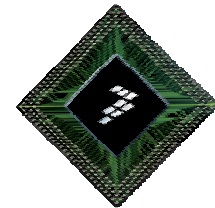


FREEMASTER

September 2005

Overview



Michal Hanak
Embedded Software Group, Roznov CSC

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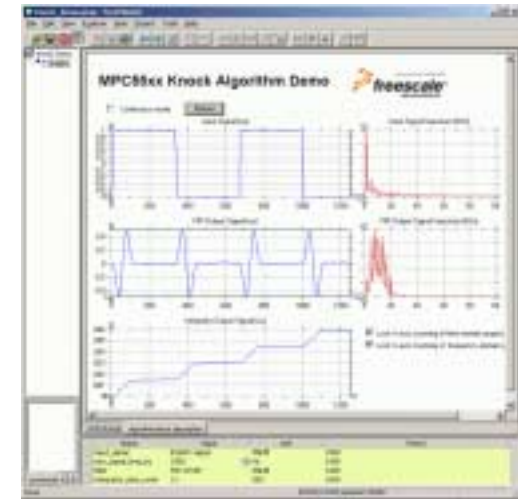
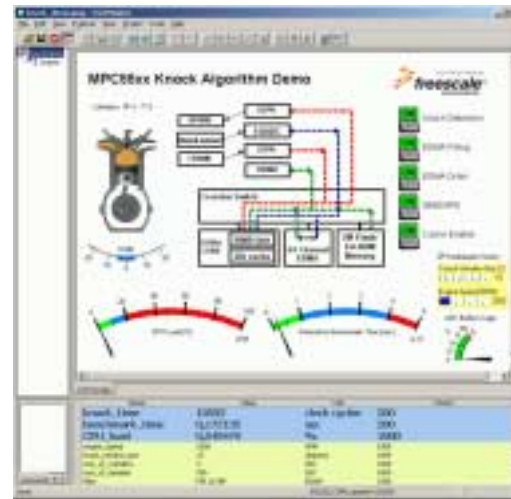
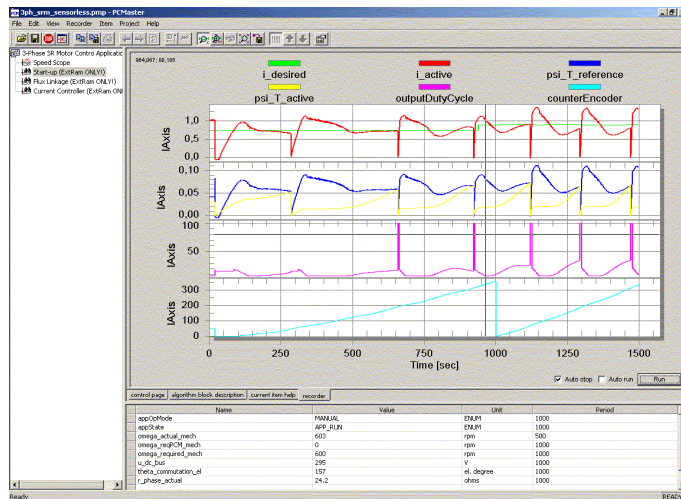


What is FREEMASTER ?

- ▶ Real-time Monitor
- ▶ Graphical Control Panel
- ▶ Demonstration Platform & Selling Tool



FOR YOUR
EMBEDDED
APPLICATION



FREEMASTER

as a Real-time Monitor

► FreeMASTER Overview

FreeMASTER as a Real-time Monitor

FreeMASTER as a Real-time Monitor

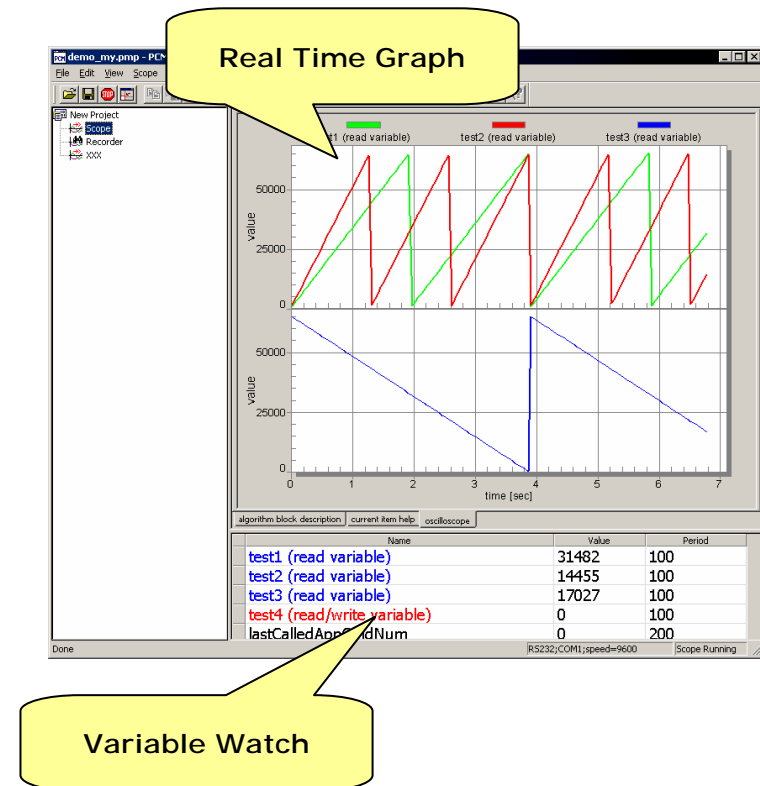
- Connects to an embedded application
 - SCI, UART
 - JTAG/EOnCE (56F8xxx only)
 - BDM (HCS08, HCS12 only)
 - CAN Calibration Protocol
 - Ethernet, TCP/IP
 - Any of the above remotely over the network
- Enables access to application memory
 - Parses ELF application executable file
 - Parses DWARF debugging information in the ELF file
 - Knows addresses of global and static C-variables
 - Knows variable sizes, structure types, array dimensions etc.

FreeMASTER as a Real-time Monitor

FreeMASTER as a Real-time Monitor

- Displays the variable values in various formats:

- **Text**, tabular grid
 - variable name
 - value as hex, dec or bin number
 - min, max values
 - number-to-text labels
- **Real-time waveforms**
 - up to 8 variables simultaneously in an oscilloscope-like graph
- **High-speed recorded data**
 - up to 8 variables in on-board memory **transient recorder**



FreeMASTER as a Real-time Monitor

Additional features:

- Variable Transformations
 - Variable value can be transformed to the custom unit
 - Variable transformations may reference other variable values
 - Values are transformed back when writing a new value to the variable
- Application Commands
 - Command code and parameters are delivered to an application for arbitrary processing
 - After processed (asynchronously to a command delivery) the command result code is returned to the PC
- Ability to protect memory regions
 - Describing variables visible to FreeMASTER
 - Declaring variables as read-write to read-only for FreeMASTER
 - the access is guarded by the embedded-side driver

FreeMASTER as a Real-time Monitor

Highlights:

- FreeMASTER helps developers to debug or tune their applications
- Replaces debugger in situations when the processor core can not be simply stopped (e.g. motor control)
- Recorder may be used to visualize transitions in near 10-us resolution

FREEMASTER

**as a Graphical User Interface
for the Embedded Application**

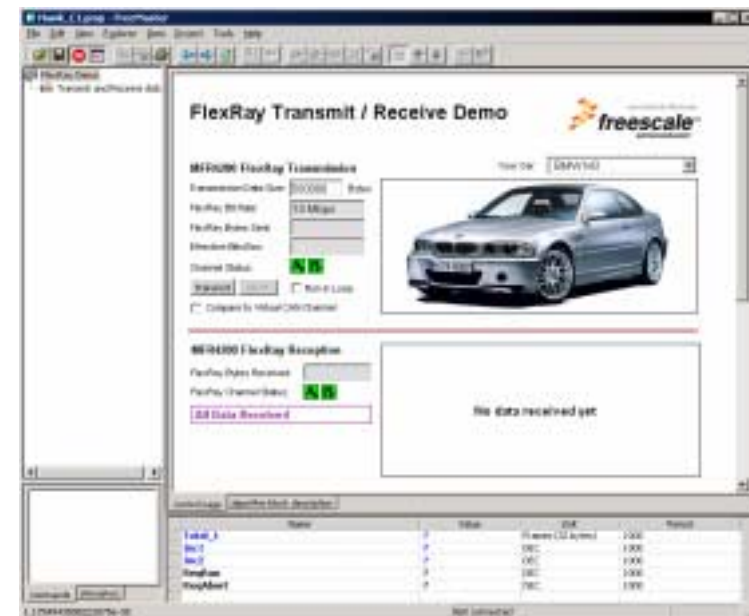
► FreeMASTER Overview

FreeMASTER as a Graphical User Interface

Using FreeMASTER as a Graphical Control Panel

- Variable Watch pane enables direct setting of the variable value
- Sending Application Commands from the application GUI
- Time-table stimulation of the variable value

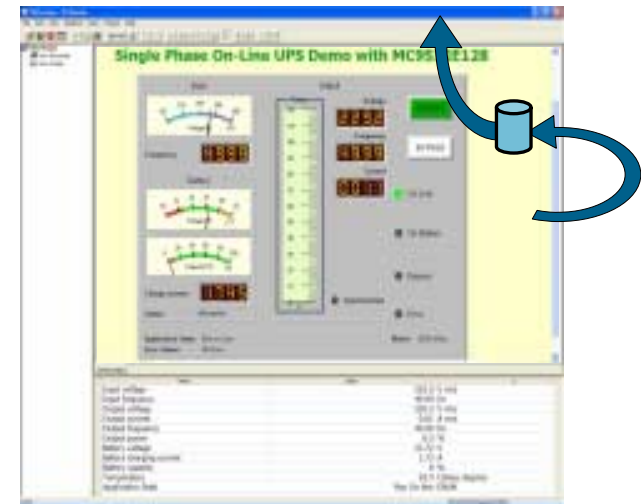
- HTML Pages and Forms
 - JScript or VBScript
 - Push buttons
 - Images, indicators
 - Sounds, videos
 - Sliders, gauges and other 3rd party ActiveX controls



FreeMASTER as a Graphical User Interface

Scripting in FreeMASTER

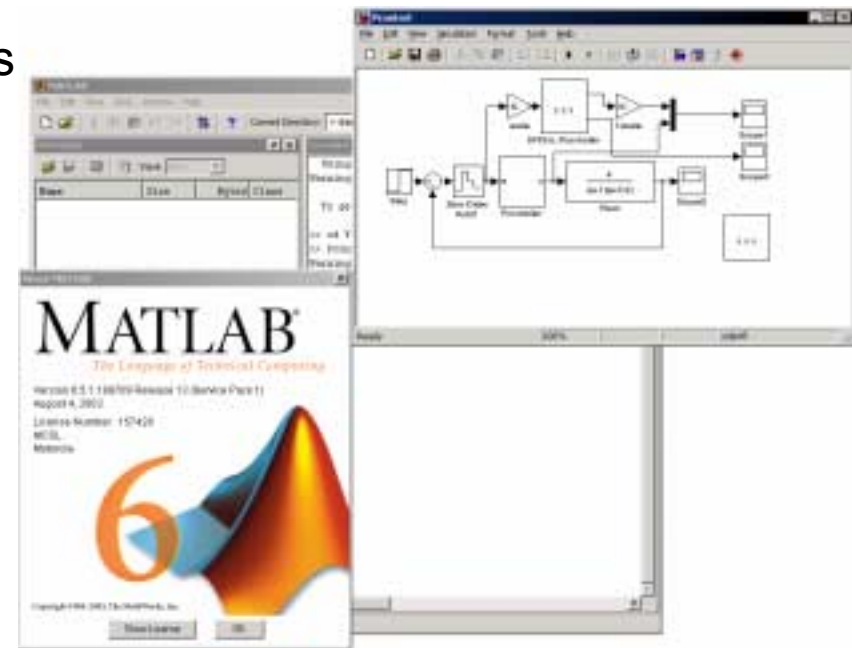
- HTML pages are displayed directly in the FreeMASTER window
- HTML may contain scripts and ActiveX objects
 - FreeMASTER itself implements an invisible ActiveX object
 - Script accesses the FreeMASTER functionality through this object
 - Variable access
 - Stimulator access
 - Application Commands
 - Recorder Data
- HTML may host whole applications, for example Excel
 - Excel Visual Basic macros may access FreeMASTER as well



FreeMASTER as a Graphical User Interface

Target-in-loop Simulations

- FreeMASTER invisible ActiveX object is accessible also by external standalone applications
 - Standard C++ or VB applications
 - Excel & Visual Basic for Applications
 - Matlab, Simulink
- Target-in-loop Simulation
 - Matlab or Simulink engine lets embedded application to perform calculations



FREEMASTER

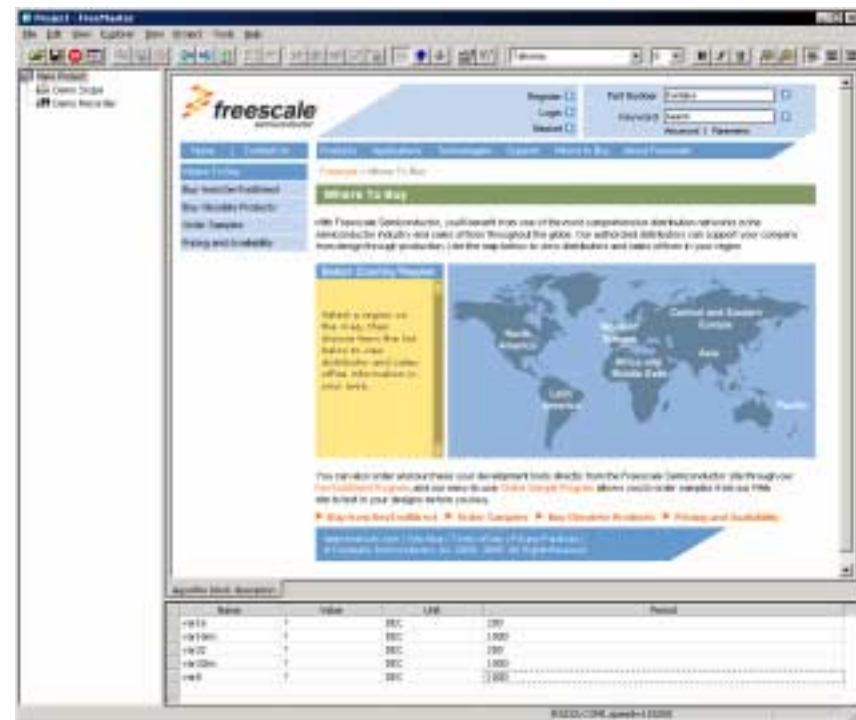
**as a Demonstration Platform
& Selling Tool**

► FreeMASTER Overview

FreeMASTER as a Selling Tool

FreeMASTER helps Freescale Marketers to sell our work

- FreeMASTER project can visualize any detail of how the embedded application works
- HTML Pages embed text images, videos together with live application data
- FreeMASTER acts as a web-browser so it is possible to navigate to online shop directly without even leaving a FreeMASTER environment
- **FreeMASTER helps Freescale customers to sell their work**



FreeMASTER is Free!

- The FreeMASTER is freely available from the Freescale web
- License agreement prevents using FreeMASTER with processors from competition
- Free redistribution enables Freescale customers to pack FreeMASTER with their products

http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=FREEMASTER



Version Control

- ▶ Sep 7 2005: Draft version 0.1
 - created all new slides
- ▶ Sep 9 2008: Draft version 0.2
 - **the right Freescale template applied**