

softMC Training

ControlStudio



Overview

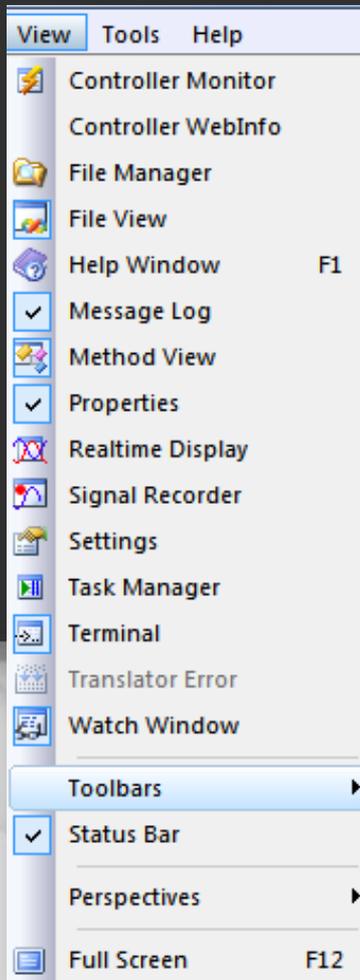
- ControlStudio is the integrated development environment (IDE) for the softMC.
- Used to write programs (tasks), debug tasks, record data.
- Graphical user interface.
- Provides a command line interface (terminal) to the softMC

Overview

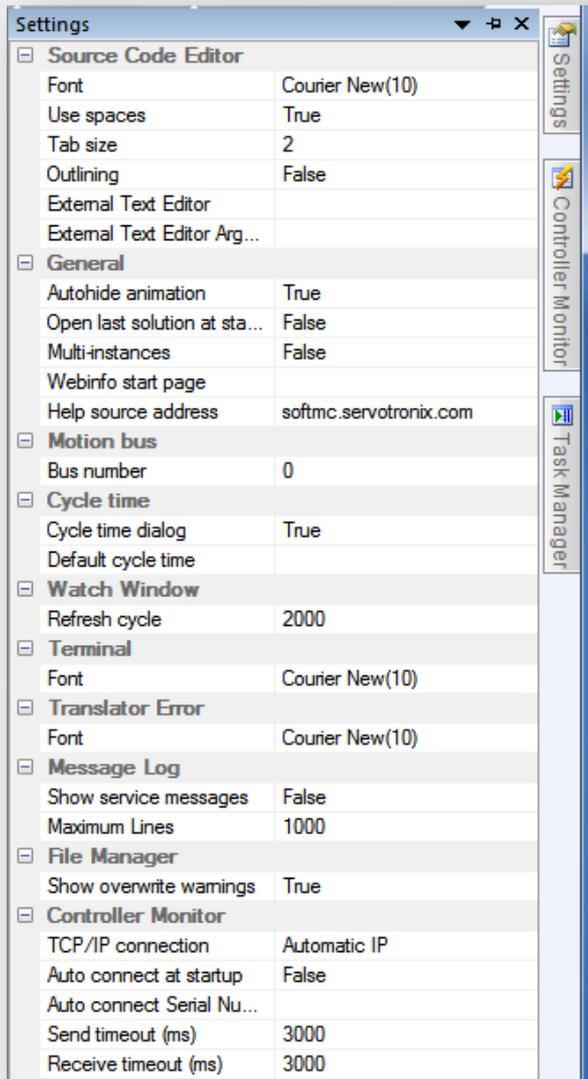
The screenshot displays the controlStudio environment with several key components highlighted by callouts:

- Project/Method Directory:** A tree view on the left showing the project structure, including folders like 'main', 'AUTOEXEC.PRG', and 'EC_CMO.LIB'.
- Messages:** A window at the top center showing a log of system messages, such as 'AX1 set OK' and 'starting task ComInt prg'.
- Terminal (command line interface):** A window at the bottom center showing command-line input and output, including '--->reset all' and '--->load autoexec.prg'.
- Running Tasks:** A 'Task Manager' window on the right showing a list of tasks with columns for Name, State, Priority, IP Address, and Serial Num.
- softMCs Available on the Network:** A 'Controller Monitor' window on the right showing a table of available soft motion controllers.
- System Settings:** A 'Settings' window at the bottom right showing various configuration options like 'Font', 'Use spaces', and 'Autolife animation'.
- Watch Variables:** A 'Watch' window on the left showing a table of variables and their current values.
- Program Editor:** A 'Source Code Editor' window at the bottom showing the source code for a task, including subroutines and control logic.

Views (Windows and Panes)



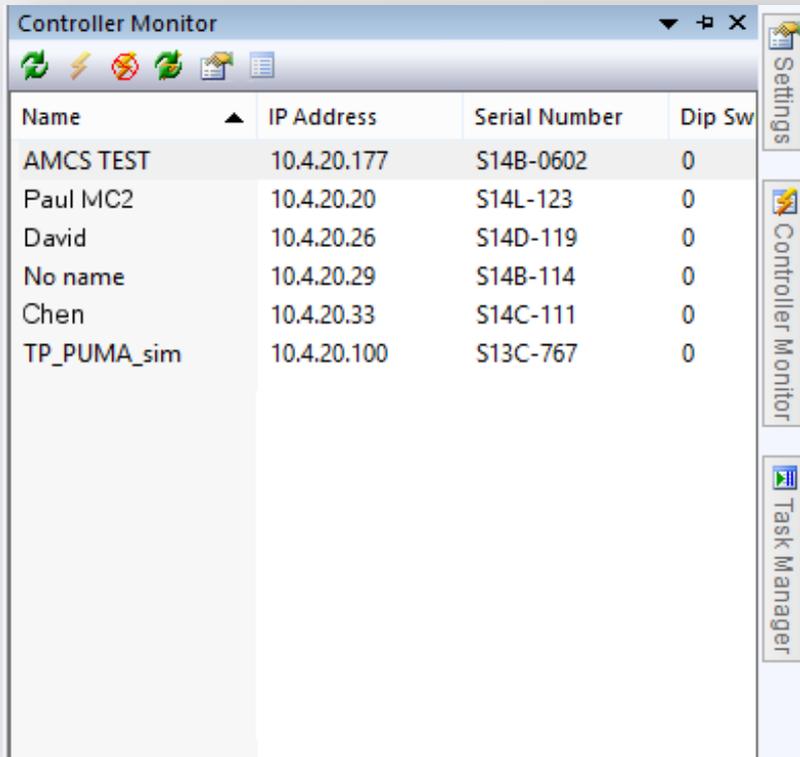
Settings



- General system settings
- **TCP/IP Connection** - Ethernet access is the most important setting

Controller Monitor

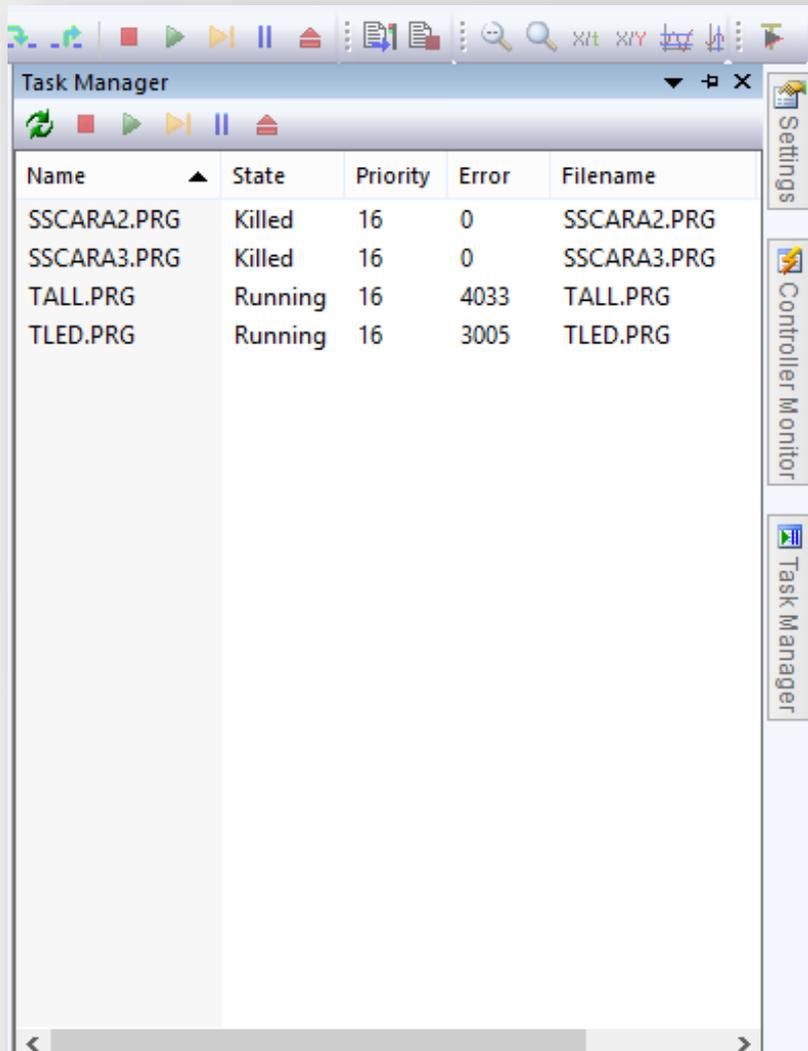
- Shows the softMCs available on the network



The screenshot shows a window titled "Controller Monitor" with a toolbar at the top containing icons for refresh, power, stop, and other functions. Below the toolbar is a table with four columns: Name, IP Address, Serial Number, and Dip Sw. The table lists six entries. On the right side of the window, there is a vertical sidebar with buttons for "Settings", "Controller Monitor", and "Task Manager".

Name	IP Address	Serial Number	Dip Sw
AMCS TEST	10.4.20.177	S14B-0602	0
Paul MC2	10.4.20.20	S14L-123	0
David	10.4.20.26	S14D-119	0
No name	10.4.20.29	S14B-114	0
Chen	10.4.20.33	S14C-111	0
TP_PUMA_sim	10.4.20.100	S13C-767	0

Task Manager

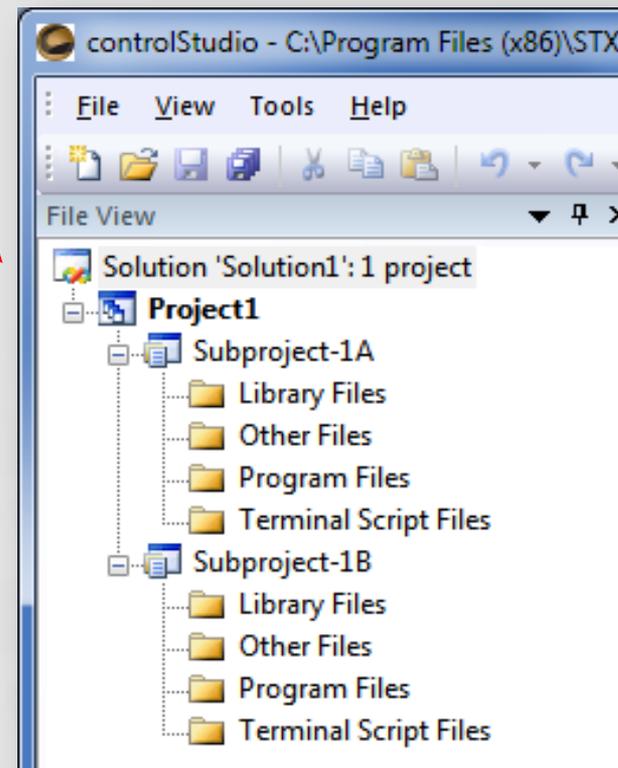
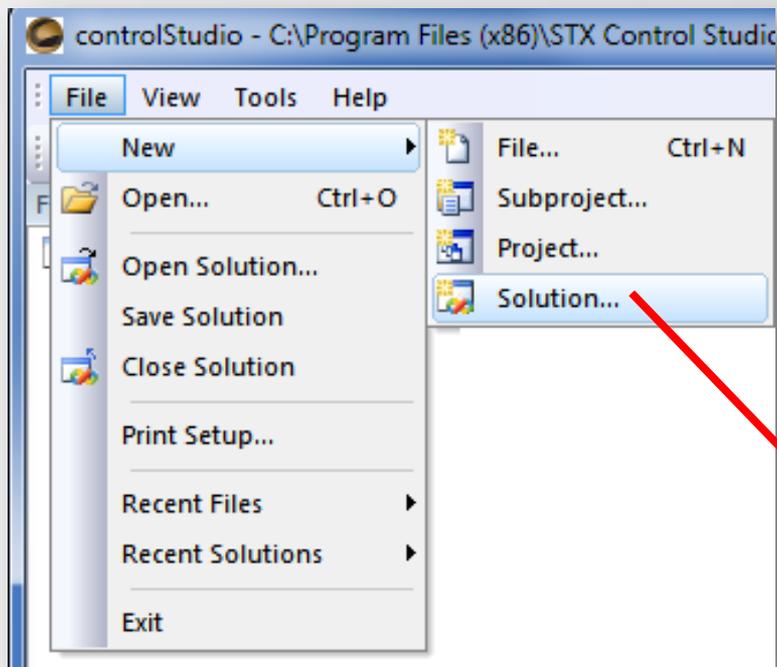


The screenshot shows a software window titled "Task Manager" with a toolbar at the top containing various control icons. Below the toolbar is a table with the following columns: Name, State, Priority, Error, and Filename. The table contains four rows of data. On the right side of the window, there is a vertical sidebar with three buttons: "Settings", "Controller Monitor", and "Task Manager".

Name	State	Priority	Error	Filename
SSCARA2.PRG	Killed	16	0	SSCARA2.PRG
SSCARA3.PRG	Killed	16	0	SSCARA3.PRG
TALL.PRG	Running	16	4033	TALL.PRG
TLED.PRG	Running	16	3005	TLED.PRG

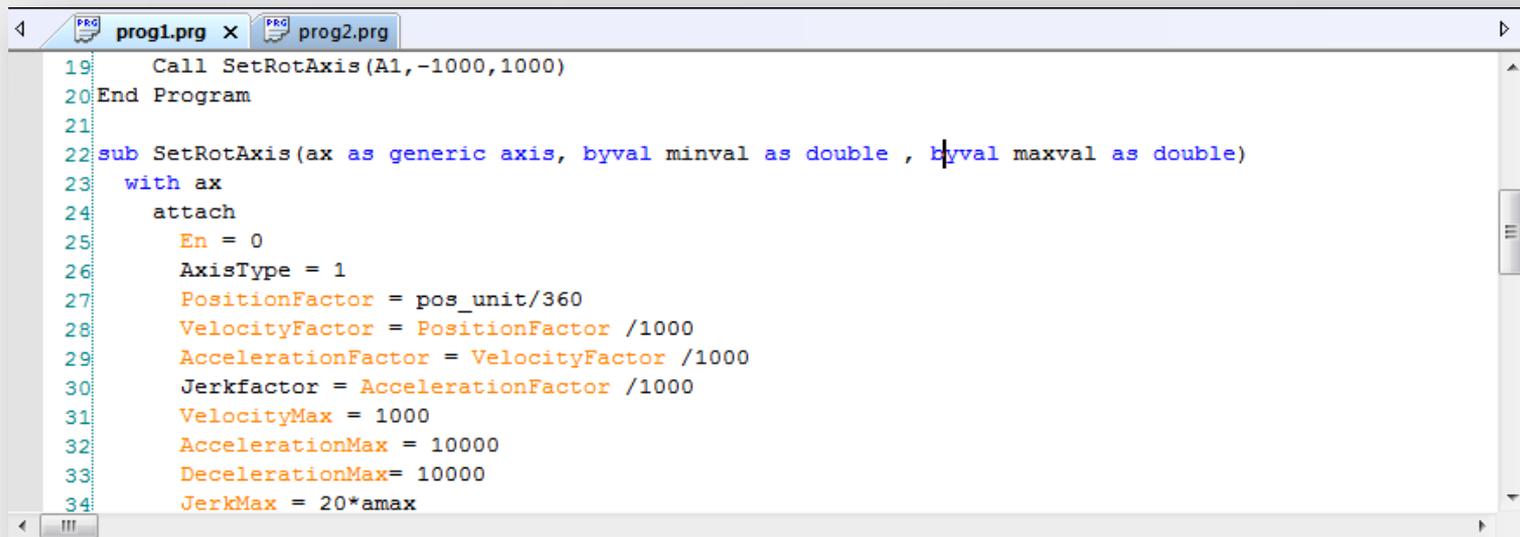
- Shows tasks that are loaded in the selected softMC

File Manager



Program Editor

- Used for developing and debugging programs
- A tab opens for each task or library file that is created or opened
- Color enhanced



The screenshot shows a program editor window with two tabs: 'prog1.prg' and 'prog2.prg'. The code is color-coded: keywords like 'sub', 'with', and 'attach' are in blue; variables and constants are in orange; and comments are in black. The code defines a subprogram 'SetRotAxis' that configures a servo motor axis with various parameters like position, velocity, acceleration, and jerk factors and limits.

```
19 Call SetRotAxis(A1,-1000,1000)
20 End Program
21
22 sub SetRotAxis(ax as generic axis, byval minval as double , byval maxval as double)
23   with ax
24     attach
25       En = 0
26       AxisType = 1
27       PositionFactor = pos_unit/360
28       VelocityFactor = PositionFactor /1000
29       AccelerationFactor = VelocityFactor /1000
30       Jerkfactor = AccelerationFactor /1000
31       VelocityMax = 1000
32       AccelerationMax = 10000
33       DecelerationMax= 10000
34       JerkMax = 20*amax
```

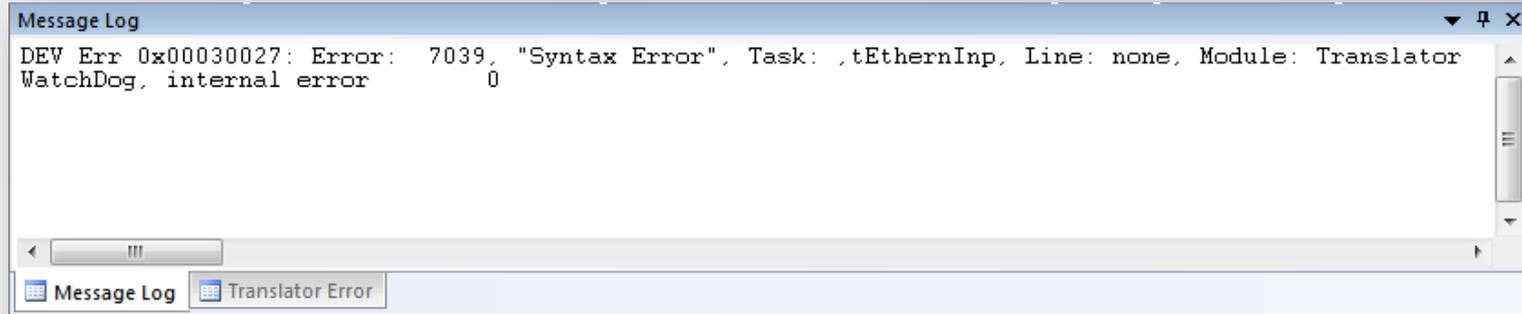
Terminal

- Command line interface to the softMC
- Displays messages from softMC that are related to actions performed in Terminal

```
Terminal (Working folder: "D:\CS")
-->?ver
Version Number = AMCS 0.4.13.2rc3m1-C2 , Date = Jan 28 2015 [15:39:06]
-->retrieve
DEV Err 0x00030027: Error: 7019, "Variable or constant does not exist Token :RETR
-->retrieve stat.lib (stat.lib -> D:\CS\stat.lib)... done
-->
```

Message Log | Translator Error

- **Message Log** - displays messages from softMC that are not related to actions performed in Terminal

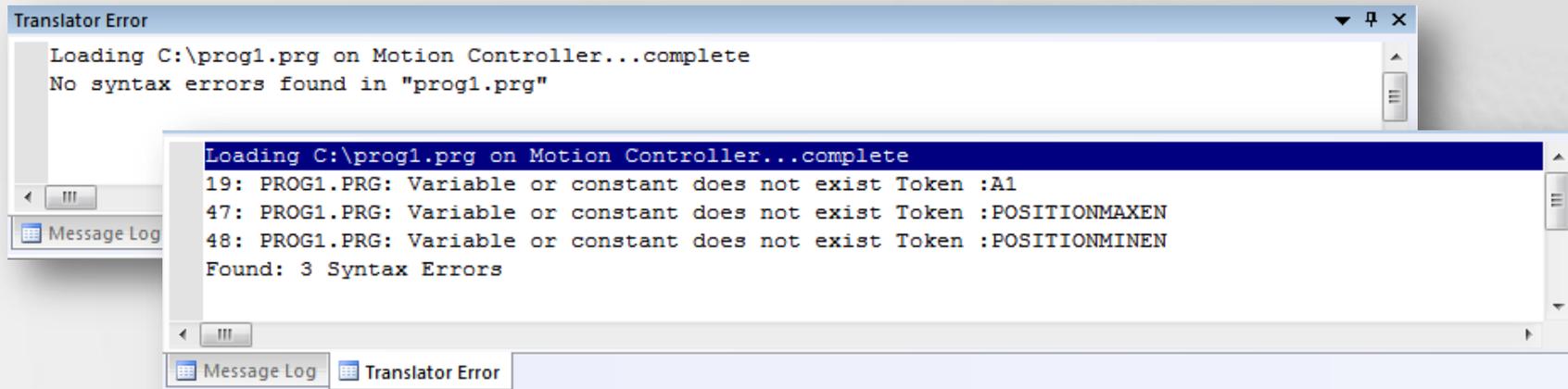


The screenshot shows a window titled "Message Log" with a single error message:

```
DEV Err 0x00030027: Error: 7039, "Syntax Error", Task: ,tEthernInp, Line: none, Module: Translator WatchDog, internal error 0
```

The window has a scrollbar on the right and a taskbar at the bottom with buttons for "Message Log" and "Translator Error".

- **Translator Error** displays syntax errors in programs



The screenshot shows a window titled "Translator Error" with the following text:

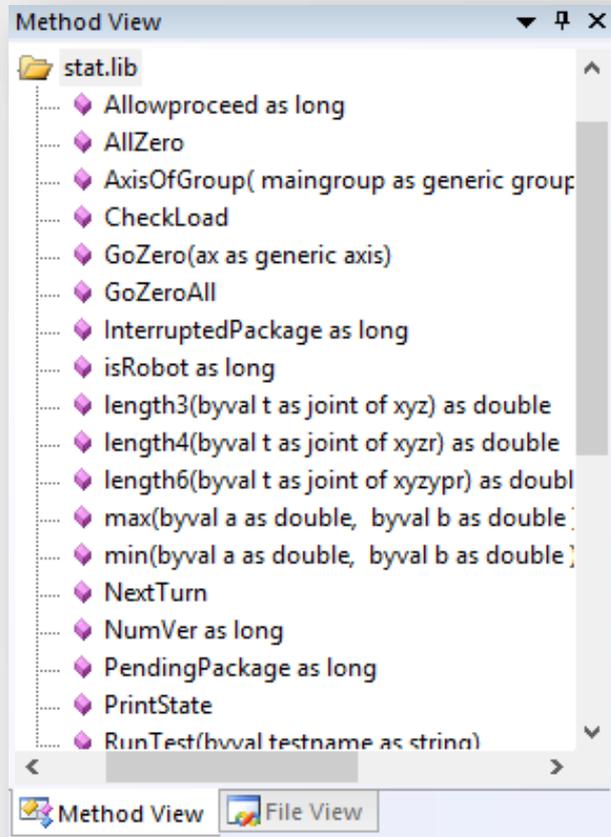
```
Loading C:\prog1.prg on Motion Controller...complete  
No syntax errors found in "prog1.prg"
```

A second window is overlaid on top, showing a detailed error report for the same file:

```
Loading C:\prog1.prg on Motion Controller...complete  
19: PROG1.PRG: Variable or constant does not exist Token :A1  
47: PROG1.PRG: Variable or constant does not exist Token :POSITIONMAXEN  
48: PROG1.PRG: Variable or constant does not exist Token :POSITIONMINEN  
Found: 3 Syntax Errors
```

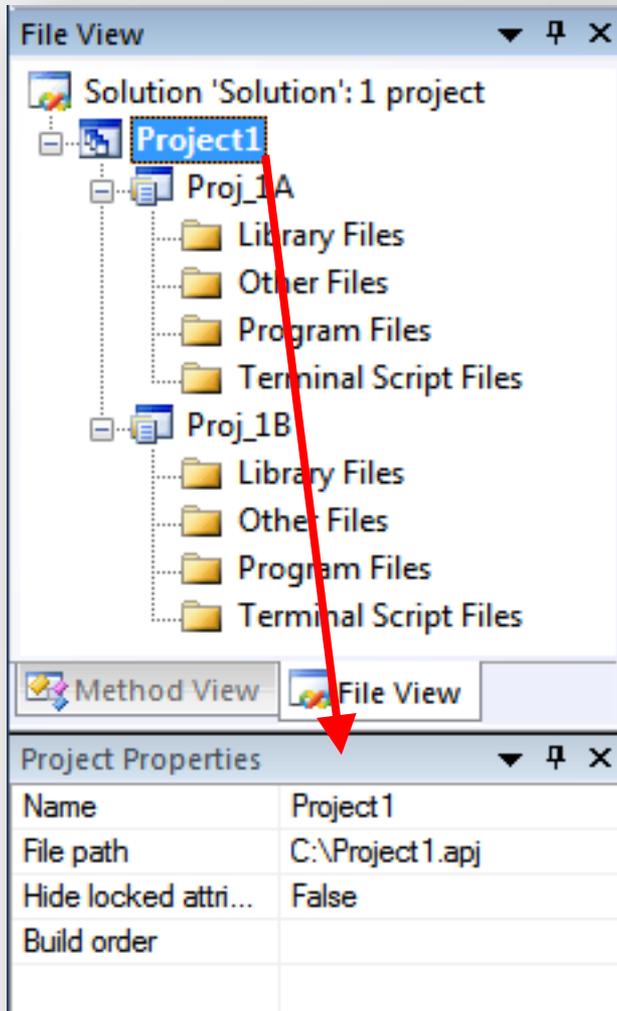
The window has a scrollbar on the right and a taskbar at the bottom with buttons for "Message Log" and "Translator Error".

Method View | File View



- List of subroutines in the project
- Double-click on the subroutine name; program editor cursor jumps to that subroutine

Properties



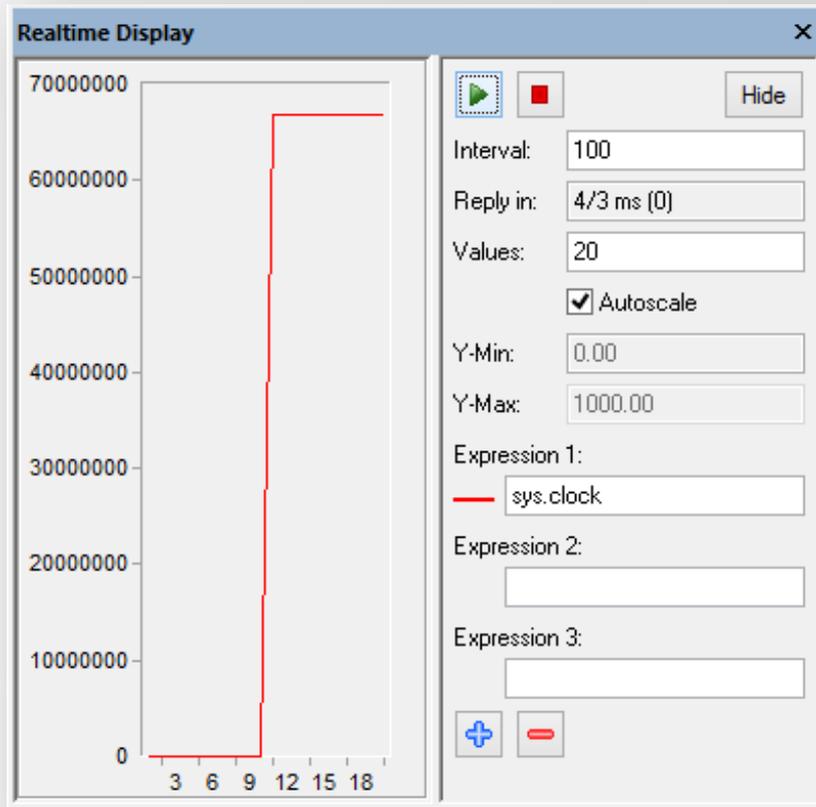
- Displays the name and location of the project.
- Relates to the **File View** pane.

Watch Window

Watch			
	Variable Name	Context	Value
<input checked="" type="checkbox"/>	A	_Global	{0, 0, 0, 0}
<input checked="" type="checkbox"/>	kd[1][6]	_Global	295
<input checked="" type="checkbox"/>			

- Allows you to select variables to watch.
- Displays the changes in values of the selected variables.
- **Context** is name of task (.prg)
- If task is not specified, Context is **_Global**

Realtime Display



- An animated graphic representation of changing variable values

Signal Recorder

- Sets up the data recording

The screenshot shows the Signal Recorder window with the following settings and annotations:

- Start recording**: Points to the green play button.
- Stop recording**: Points to the red stop button.
- Recording progress bar**: Points to the progress bar area.
- Signals to be recorded (expressions)**: Points to the list of signals.
- Recording file name (*.REC)**: Points to the Session name field.
- Number of motion bus cycles between recording samples**: Points to the Record Gap field.
- Size of the recording buffer**: Points to the Data points field.

Signals to record	
Number of Signals	6
Signal 1	axb.vcmd
Signal 2	setpoint{1}
Signal 3	Setpoint{2}
Signal 4	Setpoint{3}
Signal 5	Setpoint{4}
Signal 6	Setpoint{5}

Session name	Default
Record Gap	1
Data points	10000
Bus cycle time	4000 μ s
Recording duration	40000 ms
Show record	In a new document

Toolbars



File Management



- Standard Windows file functions:
Save, Save All, Cut, Copy, Paste, Undo, Print, etc.

Program Editing and Bookmarks



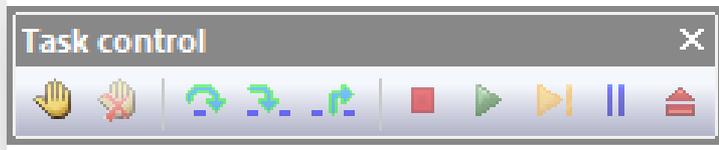
- Bookmarks
 - Toggle bookmark on/off – places/removes a bookmark at a program line
 - Jump to next bookmark
 - Jump to previous bookmark
 - Clear all bookmarks in program being edited
- Line Indentation - increase and decrease
- Comment - insert and remove

Load/Unload



- Save and load file to controller
- Unload library file from controller

Task Control and Debugging

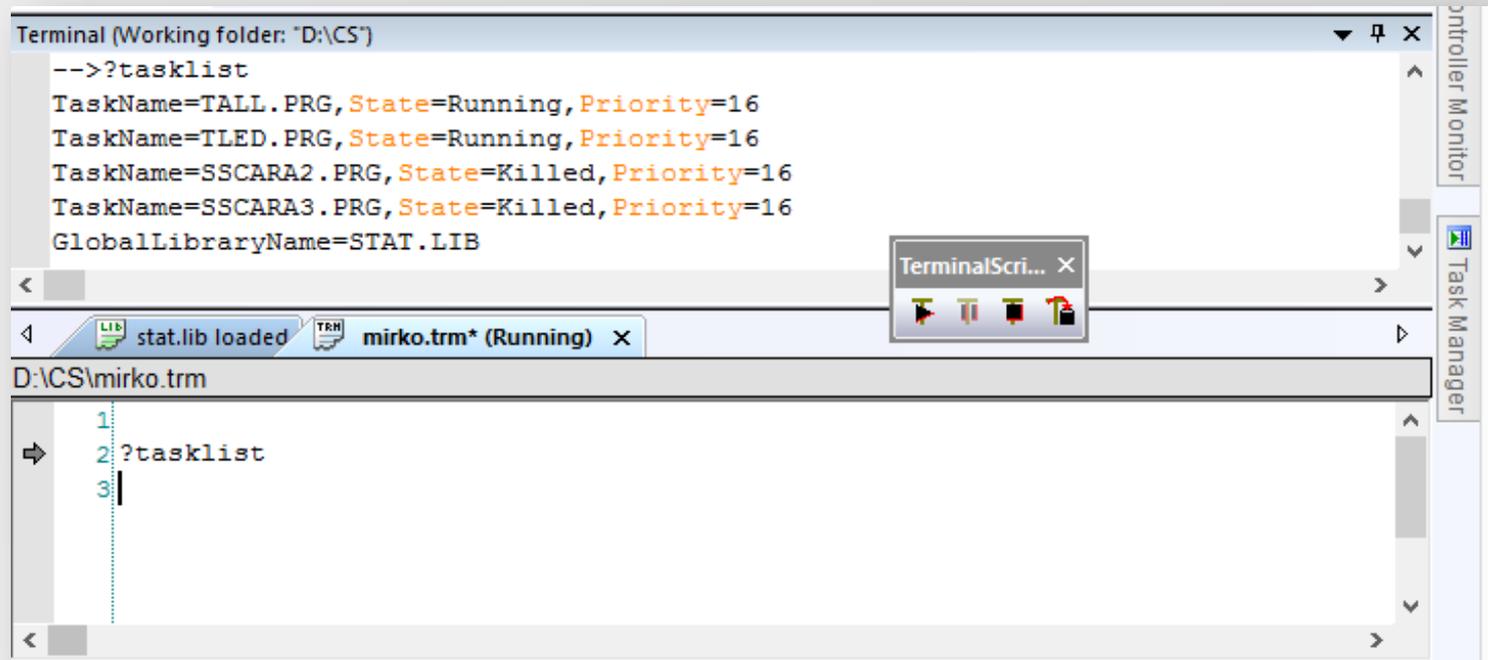


- Breakpoints: insert/remove a breakpoint; remove all breakpoints
- Step commands: over, into and out of
- Kill task
- Start (Continue) task
- Pause task
- Idle task
- Kill and unload task

Terminal Script Control



- When working in Terminal, used to store the sequence of commands entered (in a TRM file) and to run them again



View Data Recording



- Zoom out
- Zoom tool
- Show XT View
- Show XY View
- X-Axis distance line
- Y-Axis distance line

END