

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 software interface, which is used for configuring and managing robotic systems. The interface is divided into several panes, each with a specific function:

- Project/Method Directory:** Located on the left, it shows a hierarchical tree of project files and methods.
- Messages:** A pane at the top center displaying system messages and status updates.
- Terminal (command line interface):** A pane at the bottom center showing the command line interface for executing tasks.
- Running Tasks:** A pane at the top right showing a list of tasks currently running or ready to run.
- softMCs Available on the Network:** A pane on the right side showing a list of available soft motion controllers (softMCs) on the network.
- Watch Variables:** A pane at the bottom left showing a table of variables being monitored.
- Program Editor:** A large central pane for editing the control program code.
- System Settings:** A pane on the right side showing various system configuration options.

Callouts are provided for each of these components, highlighting their role in the overall system.

**Messages**

**Terminal (command line interface)**

**Running Tasks**

**Project/Method Directory**

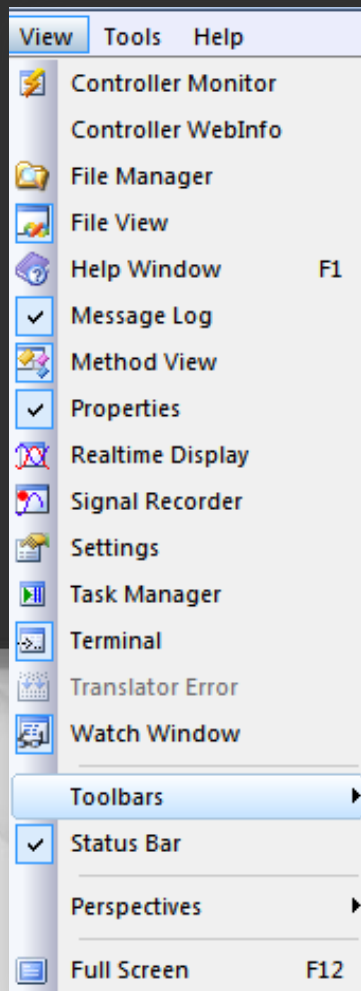
**softMCs Available on the Network**

**System Settings**

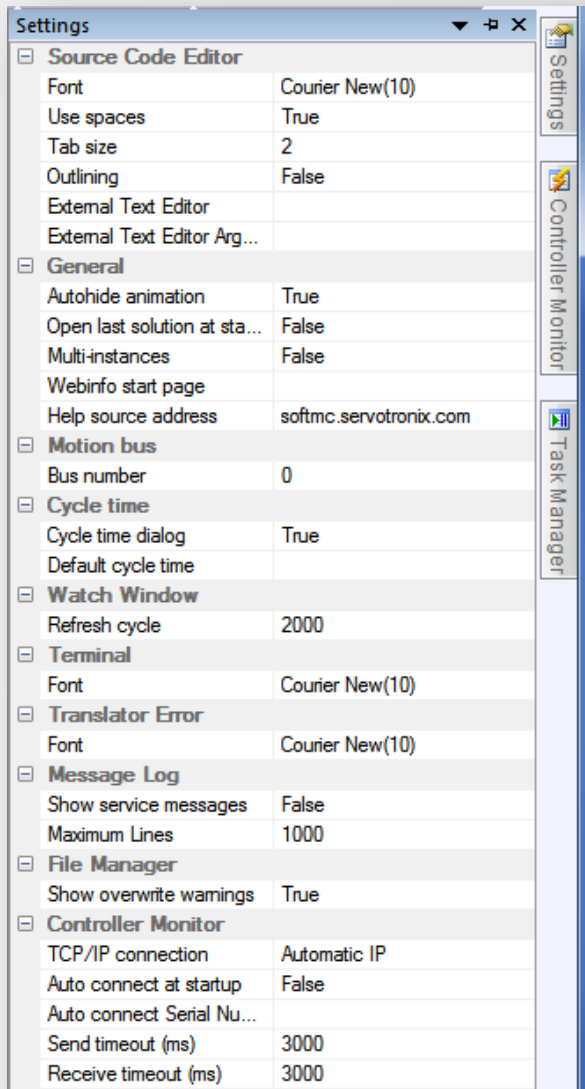
**Watch Variables**

**Program Editor**

# Views (Windows and Panes)



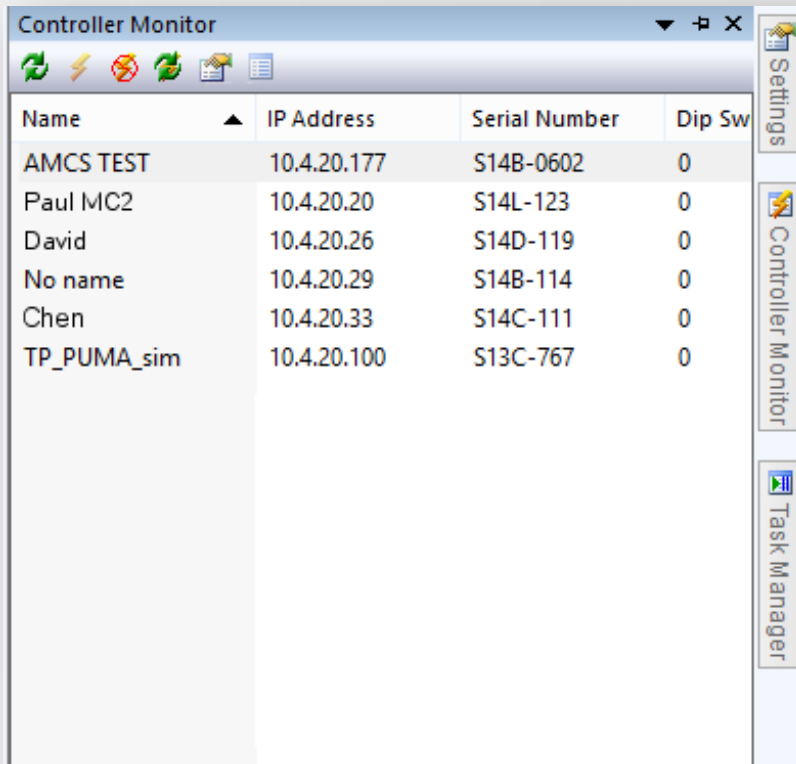
# Settings



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

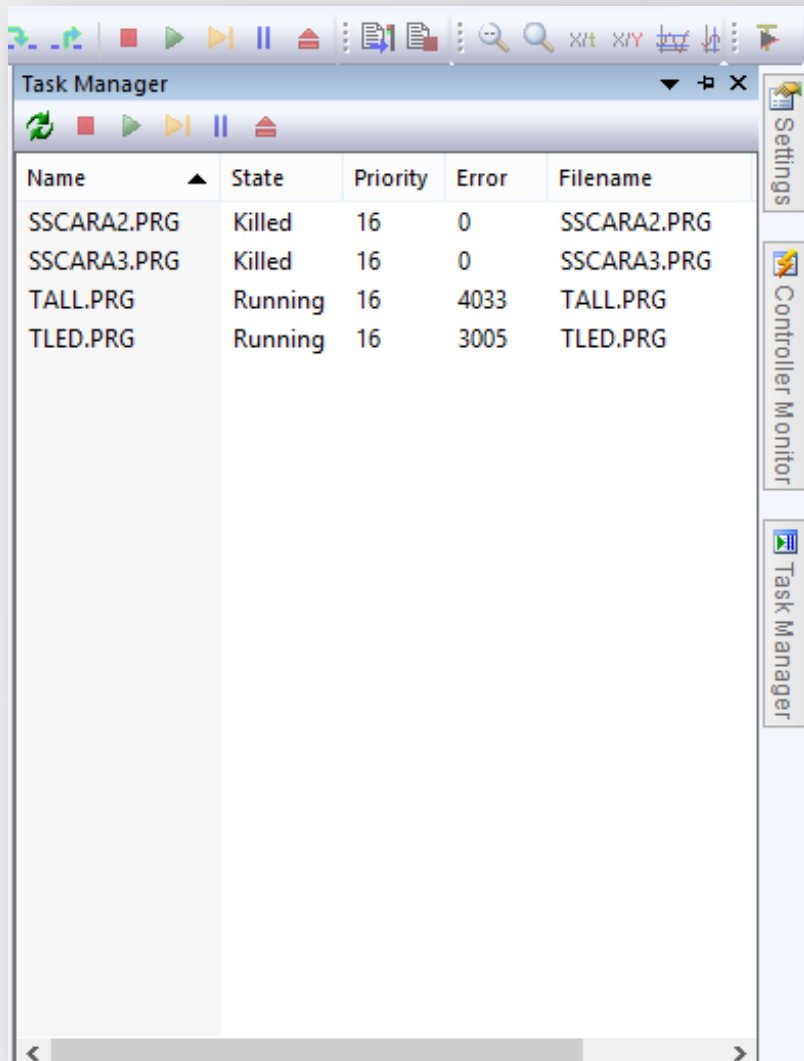
# Controller Monitor

- Shows the softMCs available on the network



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

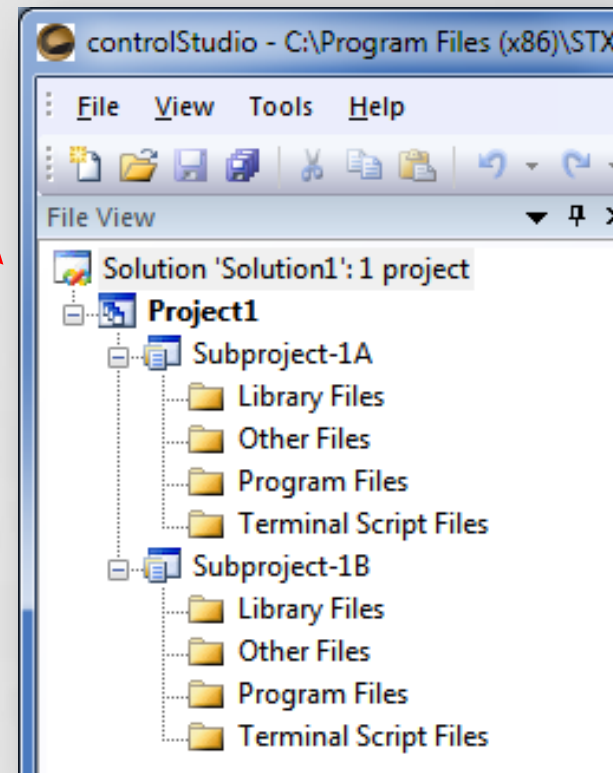
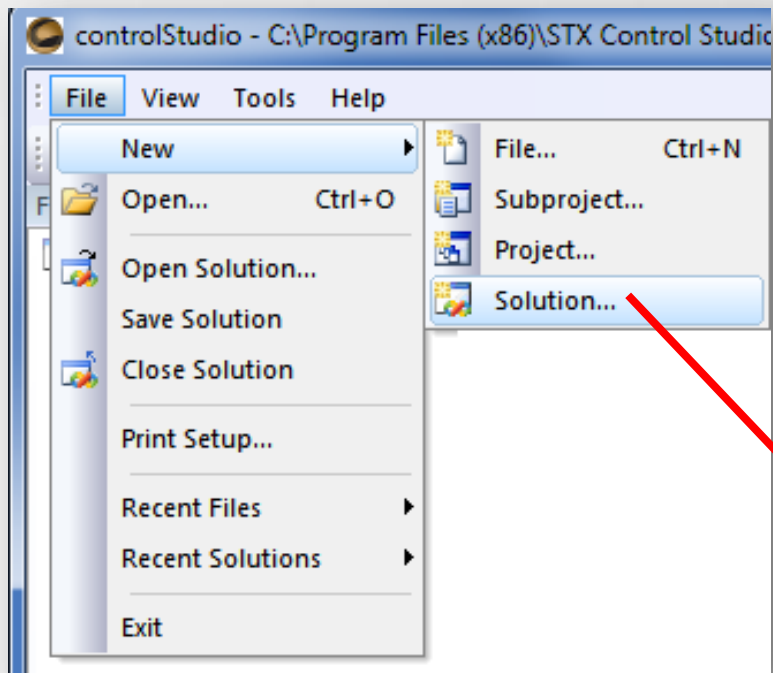


The screenshot shows a software window titled "Task Manager". It features a toolbar at the top with various icons for task management. Below the toolbar is a table with five columns: Name, State, Priority, Error, and Filename. The table lists four tasks: SSCARA2.PRG (Killed), SSCARA3.PRG (Killed), TALL.PRG (Running), and TLED.PRG (Running). On the right side of the window, there is a vertical sidebar with three buttons: Settings, Controller Monitor, and Task Manager (which is currently selected).

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

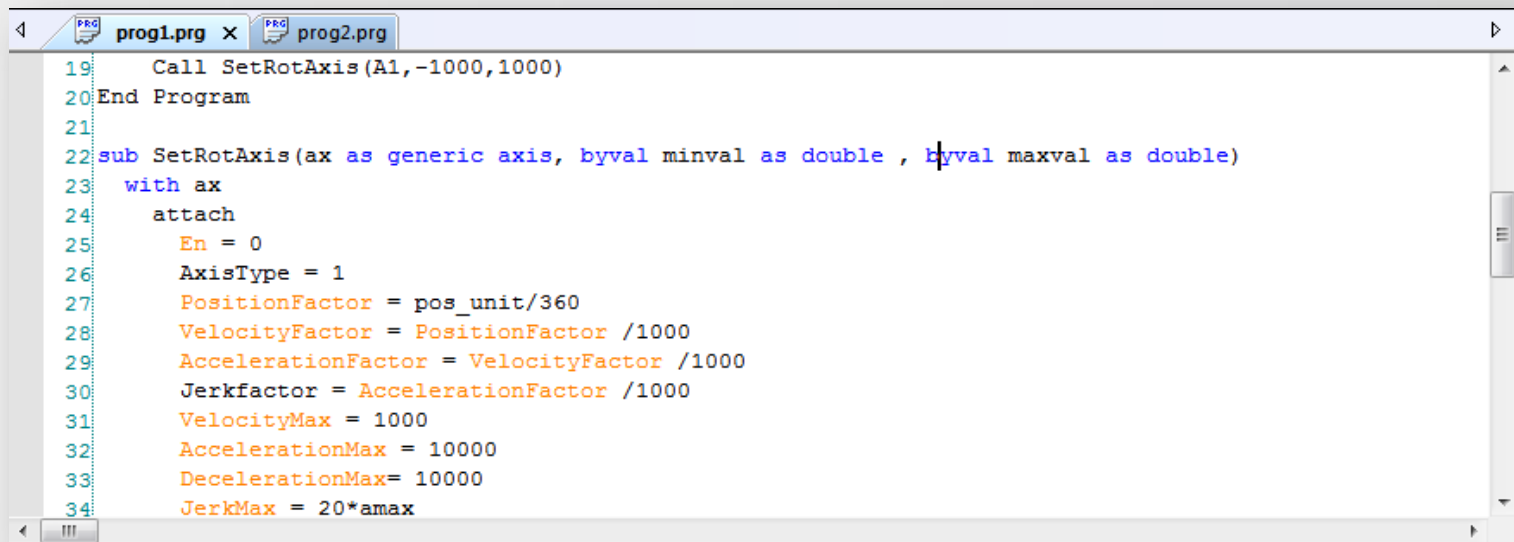
# File Manager





# Program Editor

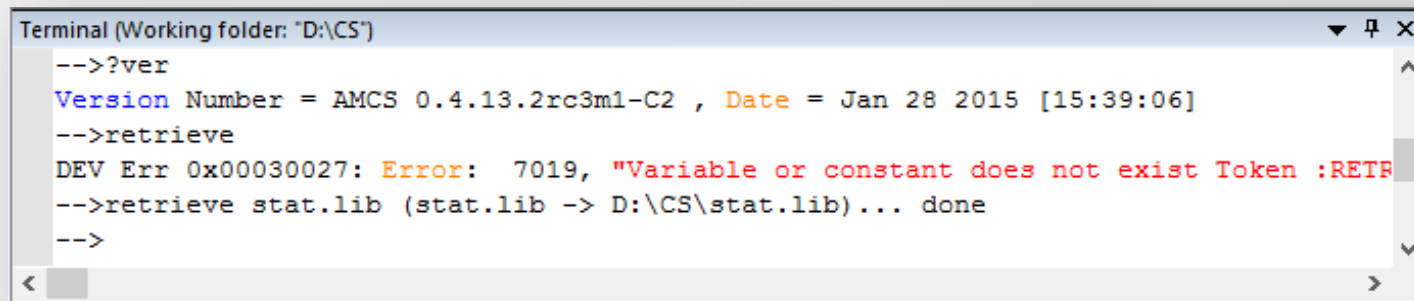
- Used for developing and debugging programs
- A tab opens for each task or library file that is created or opened
- Color enhanced



```
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

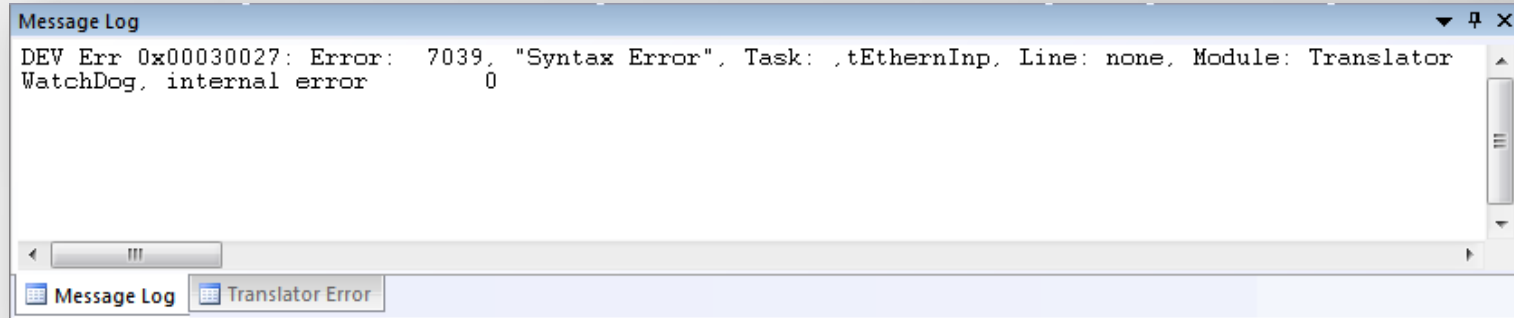
- Command line interface to the softMC
- Displays messages from softMC that are related to actions performed in Terminal



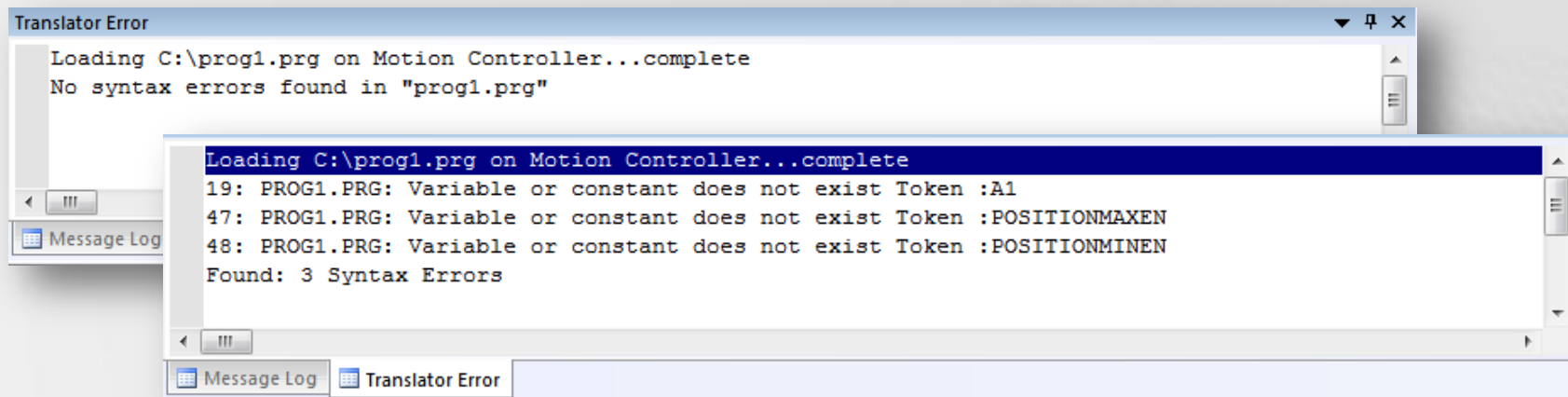
```
Terminal (Working folder: "D:\CS")
-->?ver
Version Number = AMCS 0.4.13.2rc3m1-C2 , Date = Jan 28 2015 [15:39:06]
-->retrieve
DEV Err 0x00030027: Error: 7019, "Variable or constant does not exist Token :RETR
-->retrieve stat.lib (stat.lib -> D:\CS\stat.lib)... done
-->
```

# Message Log | Translator Error

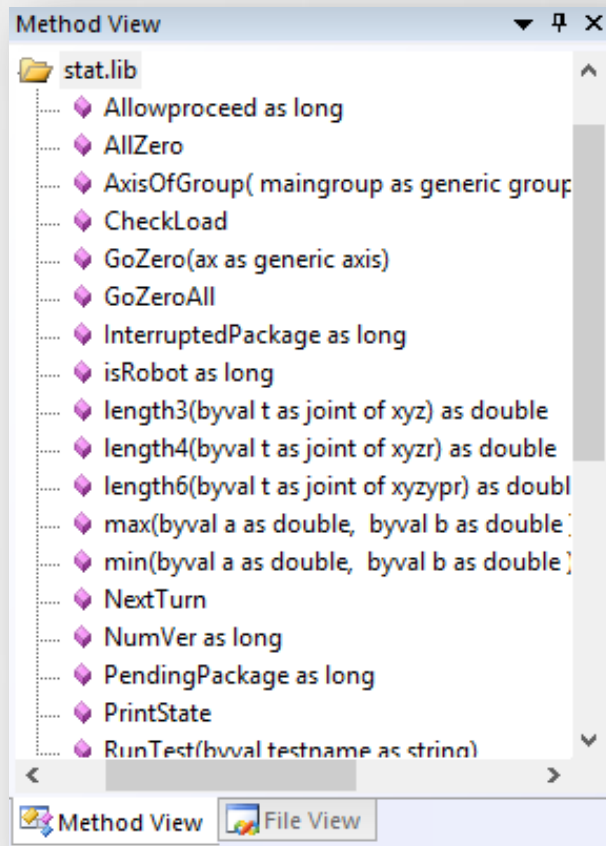
- **Message Log** - displays messages from softMC that are not related to actions performed in Terminal



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

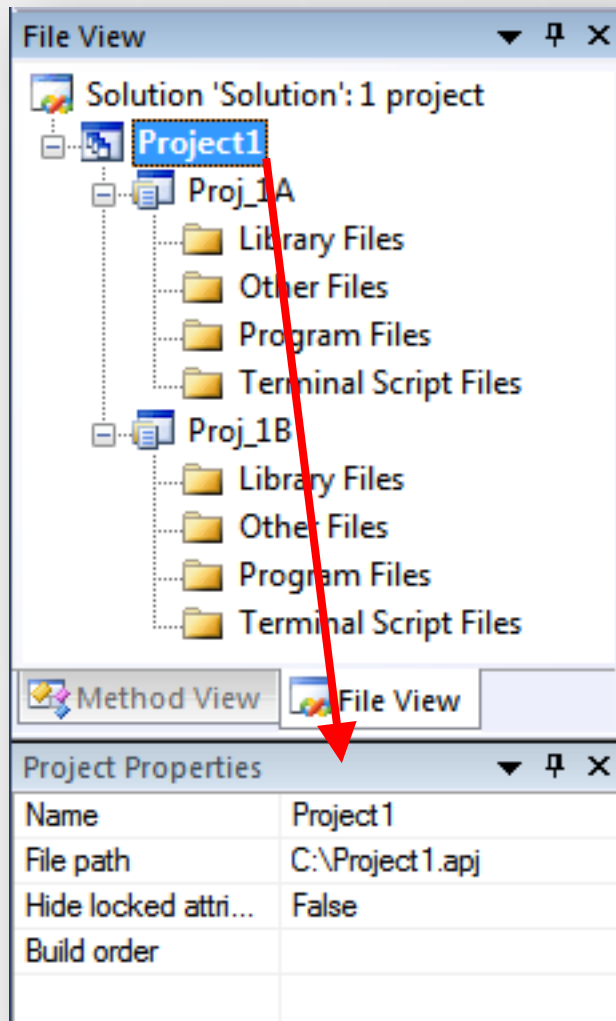


# Method View | File View






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

# Properties



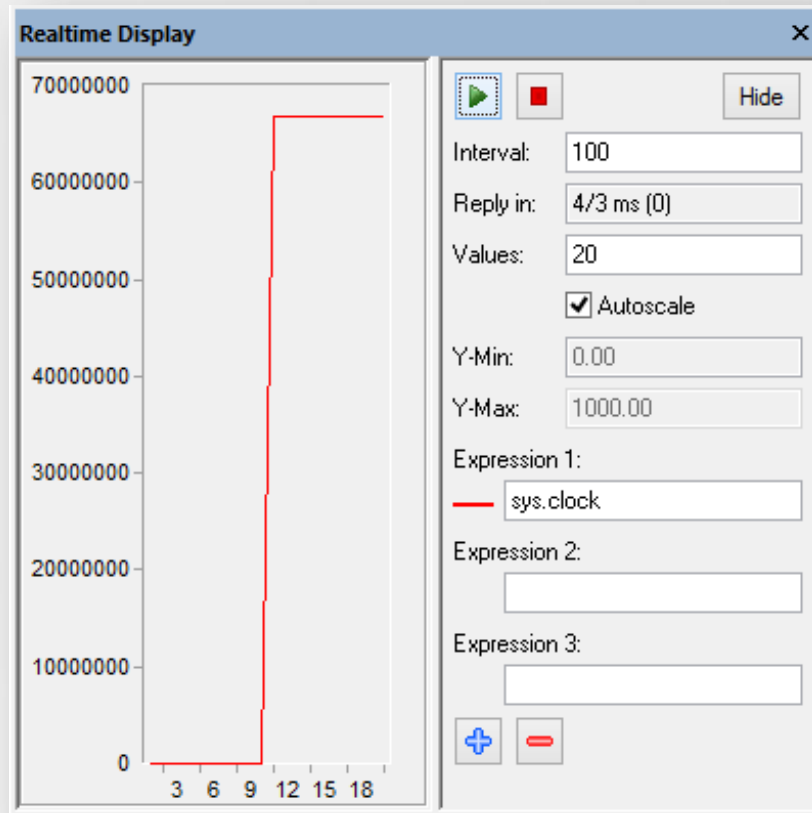
- Displays the name and location of the project.
- Relates to the **File View** pane.

# Watch Window

Watch			
	Variable Name	Context	Value
	A	_Global	{0, 0, 0, 0}
	kd[1] [6]	_Global	295
			

- 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' dialog box with various settings and a list of signals to be recorded. Purple arrows point from text labels to specific UI elements:

- 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 'Data points' field.
- Size of the recording buffer**: Points to the 'Recording duration' 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 $\mu$ s
Recording duration	40000 ms
Show record	In a new document

**Advanced**



# Toolbars



# File Management



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

# Program Editing and Bookmarks



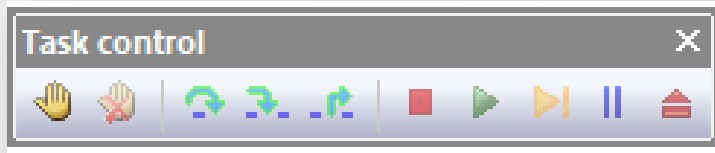
- Bookmarks
  - Toggle bookmark on/off – places/removes a bookmark at a program line
  - Jump to next bookmark
  - Jump to previous bookmark
  - Clear all bookmarks in program being edited
- Line Indentation - increase and decrease
- Comment - insert and remove

# Load/Unload



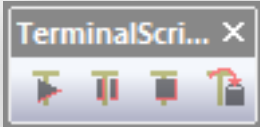
- Save and load file to controller
- Unload library file from controller

# Task Control and Debugging

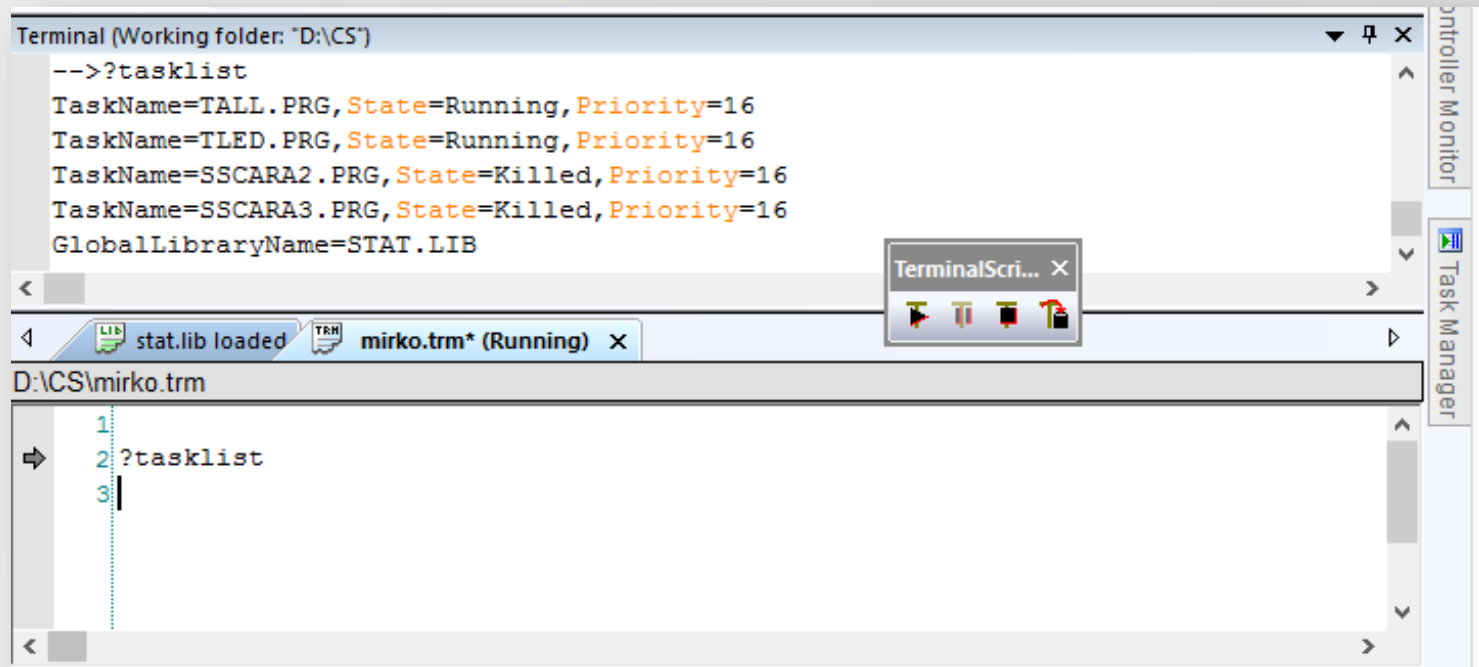


- Breakpoints: insert/remove a breakpoint; remove all breakpoints
- Step commands: over, into and out of
- Kill task
- Start (Continue) task
- Pause task
- Idle task
- Kill and unload task

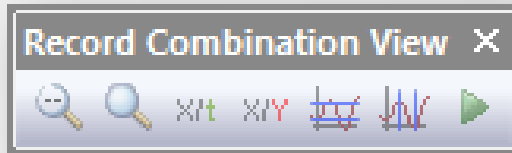
# Terminal Script Control



- 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**