**softMC Training – Module 3**

Files

Contents

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- RAM and Flash Memory
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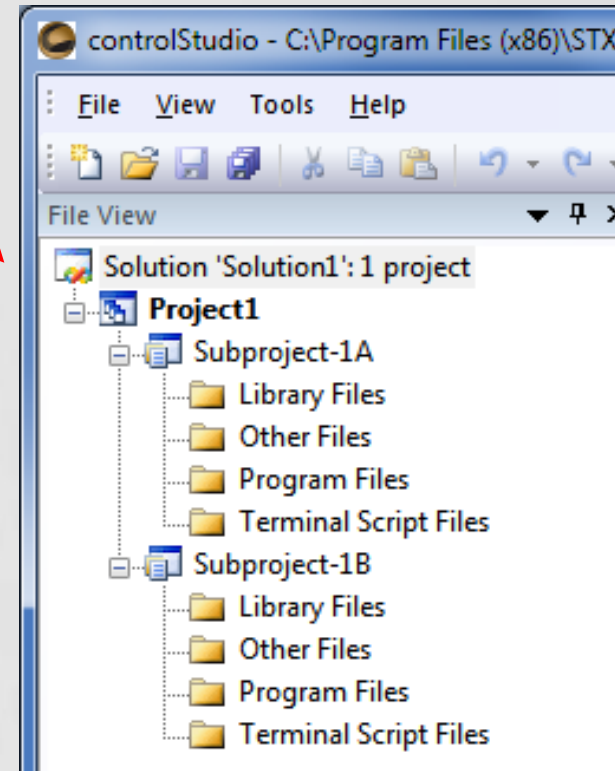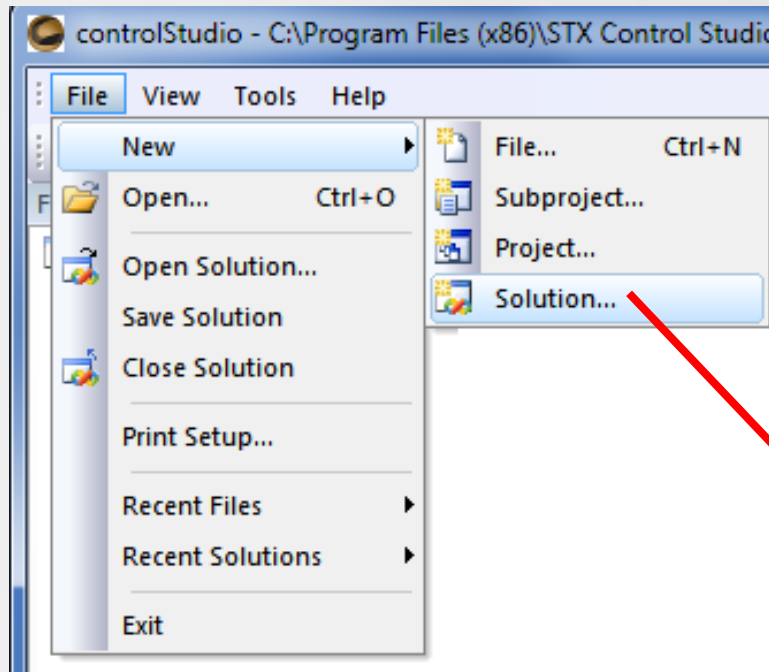
Application Development

- A PC is used to develop and test the application programs that coordinate all the required motions and machine functions.

- Once complete, the PC may be removed and the softMC controller will operate standalone or within a network.
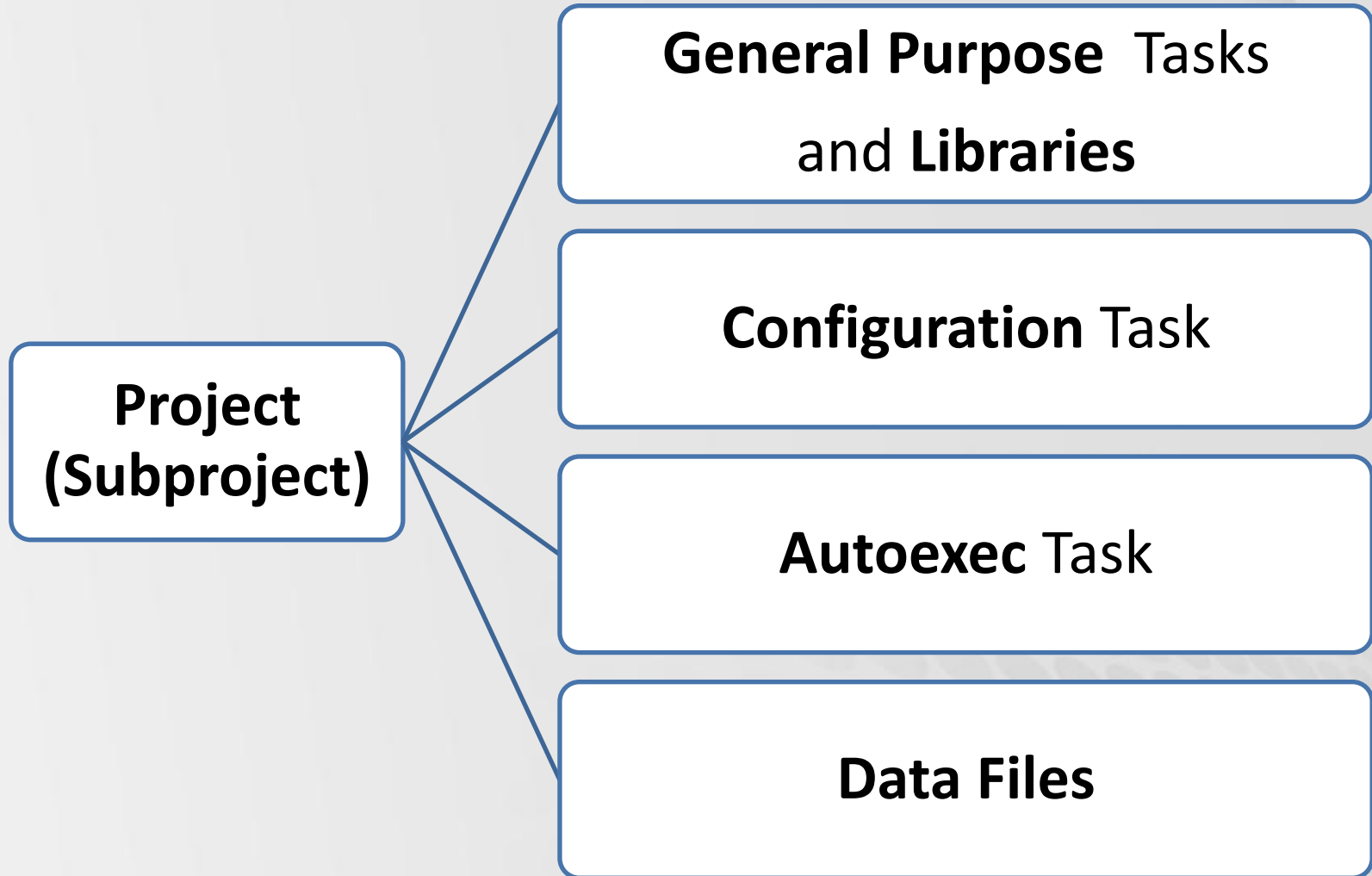

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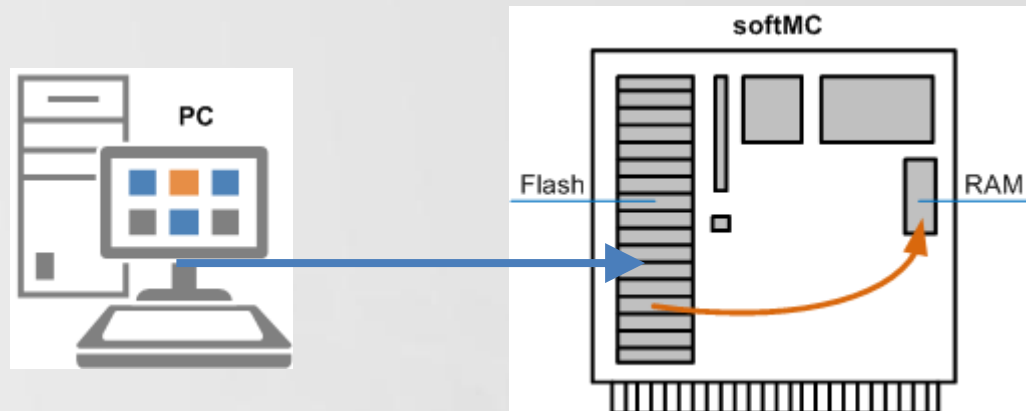
Application Files

- **Solution/Project/Subproject** – ControlStudio method for organizing application files on the PC. Not a reflection of softMC controller file system.

- **Solution** – the application

- **Project / Subproject** – the collection of files written for an application
  - **Task** (program) files
  - **Library** files
  - **Data** files

ControlStudio Application File Management

Project Structure

General Purpose Tasks and **Libraries**

Configuration Task

Autoexec Task

Data Files

Project (Subproject)

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3 Types of Tasks

- General Purpose (***.prg**)
  - User program
  - Defines the work to be performed by the motion controller
  - Runs simultaneously with, and independently of, other tasks

- Configuration (**config.prg**)
  - Loaded and executed automatically at power up
  - Runs once
  - Used mainly to declare global objects and load all global libraries

- Auto Execute (**autoexec.prg**)
  - Loaded and executed automatically at power up
  - Runs once
  - Used to start the application tasks

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General Purpose Tasks – *.prg Files

- File name is user-defined. Can contain 8 characters. Extension is always .prg

- User programs

- Defines the work to be performed by the motion controller

- Runs simultaneously with, and independently of, other tasks

- Application may have unlimited number of *.prg files
  (but limited to 256 tasks in softMC controller RAM)

- After a program is loaded into memory (Load command),
  it does not begin execution until StartTask command is issued.

- Tasks may be prioritized

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Configuration Task – config.prg

- File is named **config.prg**

- Executed automatically at power up, or when **Reset All** command is issued.

- Used to declare number of axes, groups, programmable limit switches (PLS), cams, global variables and to load global libraries

- All data and structure types that are shared across tasks must be declared in the configuration task

- Cannot start other tasks

AutoExecute Task – autoexec.prg

- File is named **autoexec.prg**

- Executed once at power up, just after Configuration task

- Used to start other tasks in the system

- For safety considerations, do not start motion from the AutoExec task

- To run AutoExec utomatically on power up ,
  use the command **Program Continue** (instead of just **Program**)

IO.DAT File

- IO.DAT can be used to automatically start config.prg and autoexec.prg

- softMC starts these file during boot

- Example of IO.DAT:
  DIP=0xFF
  INP=0x00

ControlStudio – File Open/Edit

Open File on PC

Open File Manager

Terminal Pane
(requires communication with softMC controller)
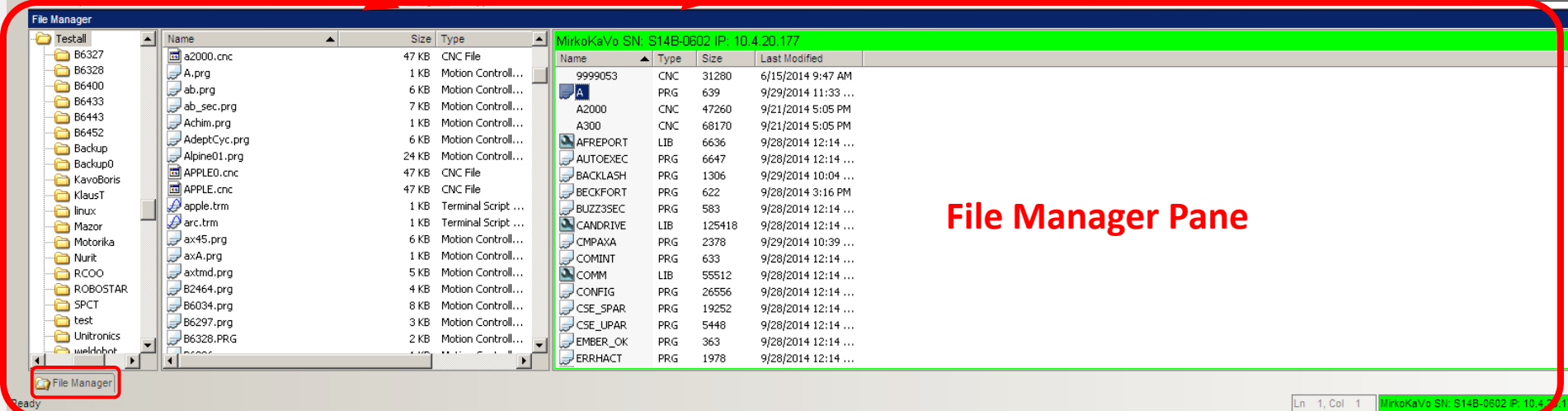
File Editing Pane (on PC)

ControlStudio – File Manager
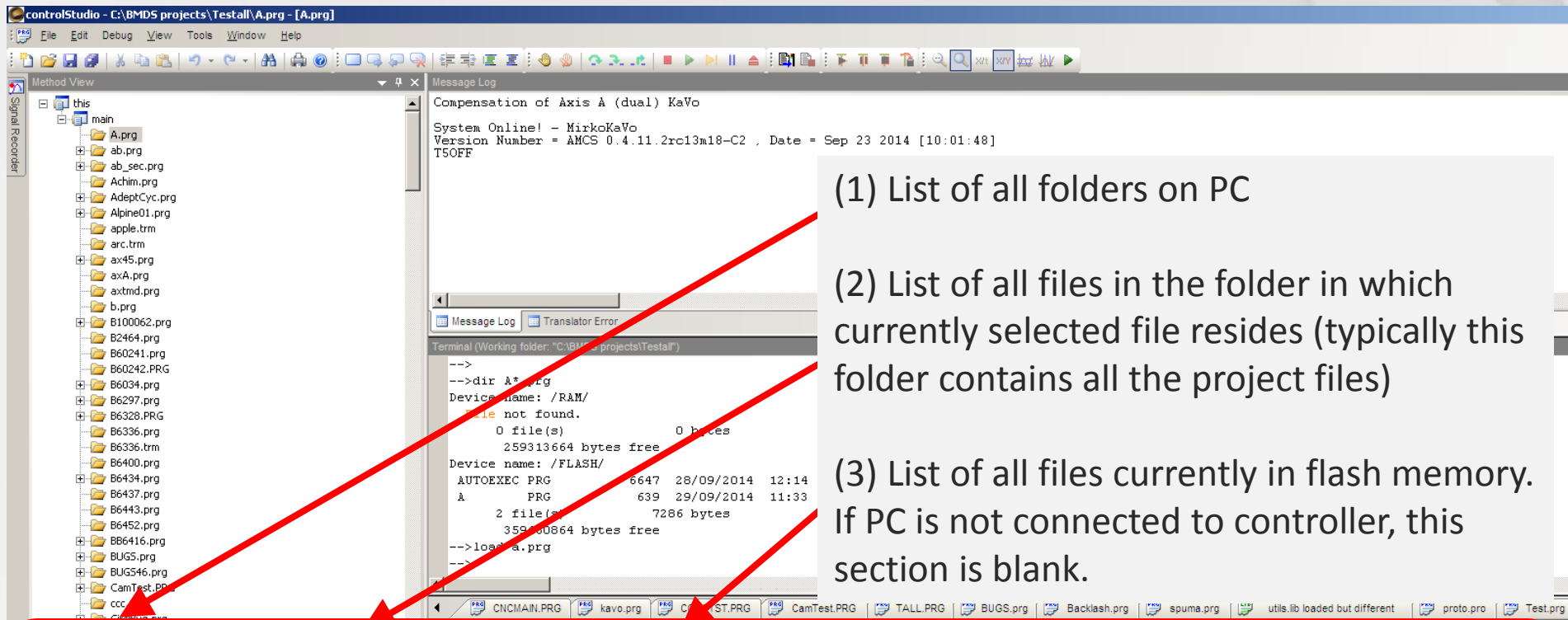
(1) List of all folders on PC

(2) List of all files in the folder in which currently selected file resides (typically this folder contains all the project files)
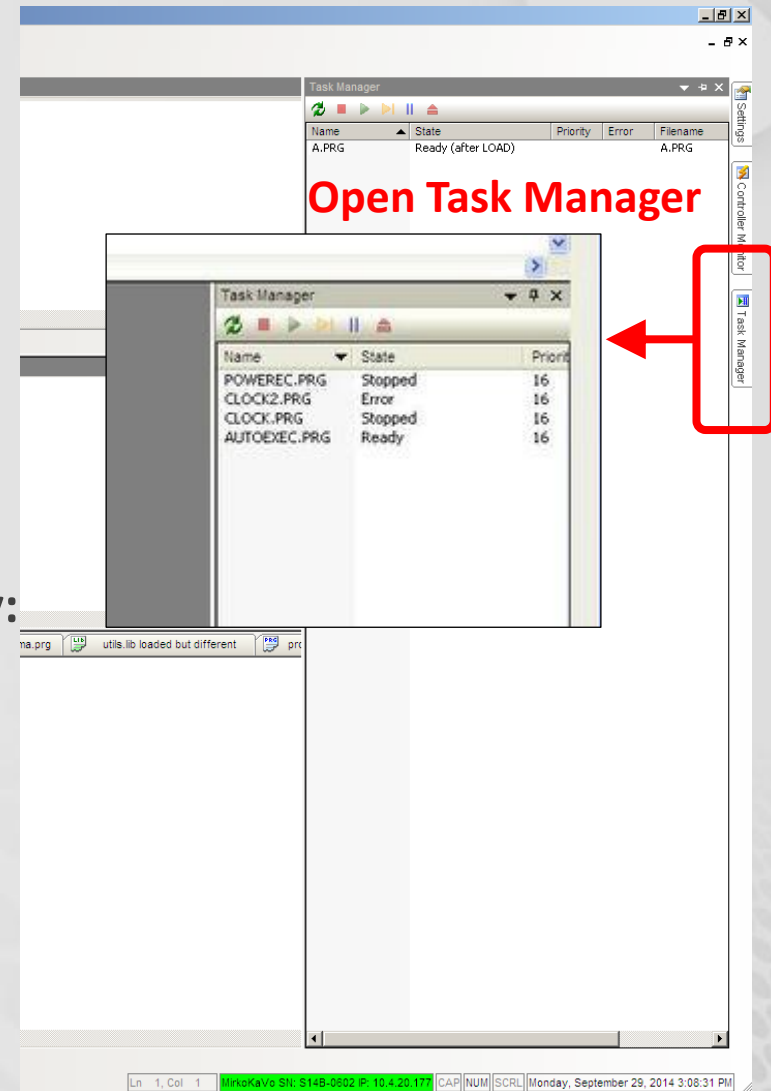
(3) List of all files currently in flash memory. If PC is not connected to controller, this section is blank.

File Manager Pane

ControlStudio – Task Manager

- Task Manager shows the tasks that are loaded into **RAM** memory

- (Terminal) Show list of **tasks** in **RAM**:

      ?tasklist

- (Terminal) Show list of **files** in **flash memory:**

      dir

Open Task Manager

Moving Files

Task files must be in RAM for execution

- **Send** command: transfer from **PC** to the softMC **flash memory**

- **Load** command: transfer from softMC **flash memory** to softMC **RAM**

- **Retrieve** command: transfer from softMC **flash memory** to **PC**

Note: Send and **Retrieve** are ControlStudio instructions, not MC-Basic commands

- Files in flash memory remain in memory during power cycle

- Files in RAM are erased during power cycle
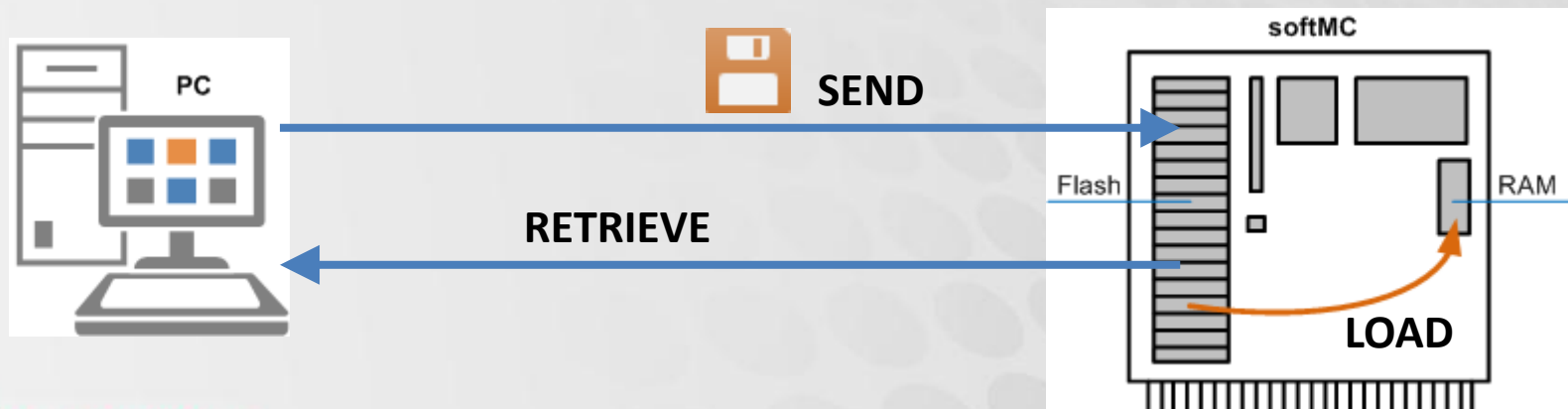
Save and Load Button
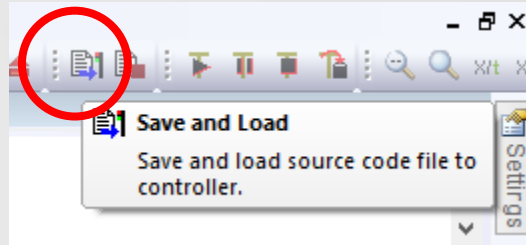
Save and Load button executes 4 actions on the active task file (tab) in the **File Editing** pane

While Task is Running

- Kills task
- Saves latest version on PC
- Sends file from PC to flash
- Loads to RAM

While Task is being Edited

- Saves latest version on PC
- Sends file from PC to flash
- Loads to RAM

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END