CODESYS Development Software

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Programming tools simplify software development

CODESYS Development Tools

- Program motion control and logic using standard IEC 61131-3 tools
- Suite of programming languages and charting tool simplifies machine development and support
- Select among graphical and text-based languages -- Relay Ladder Logic, Function Block Diagram, Structured Text, Instruction List, Sequential Function Chart or Continuous Function Chart

PLCopen Motion Control Library

- Standard library of motion function blocks which cover all of the IEC 61131-3 languages.

ORMEC Motion Control Extensions

- ServoWire Motion Blocks provide enhanced functionality for high performance electronic gearing and coordinated multi-axis control.
- Analog feedback control.
- Registration control.

Built-in Networking Support

- Standard networking solutions and support for Ethernet, TCP/IP, Modbus/TCP, Profibus DP and OPC server.
- Connectivity for motion and I/O control, HMIs and factory data networks.

Application Specific Function Blocks

Application Specific Function Blocks (ASFB) are available for common applications. Use these to reduce your development and programming efforts for the SMLC controllers. Drop in the pre-engineered and tested ASFB and then add features that are unique to your equipment.

ServoWire Pro

- ServoWire Setup: menus and software wizards to simplify configuration of ServoWire SD Drives
- ServoWire Monitor: diagnostic utilities for monitoring drive and network performance
- ServoWire Tune: tuning scope optimizes performance
- ServoWire Upgrade: tools for maintaining new firmware

Developing motion control and I/O programming using a standard set of software tools streamlines software development and creates application programs that are more effective and easier to support in the field.

The CoDeSys Development Software utilizes standard IEC 61131-3 programming and PLCopen motion function blocks to provide proven, open standard tools for developing application programs for motion control and I/O control -- running on a single controller.

IEC 61131-3 Programming

ORMEC offers PLCOpen Certified IEC 61131-3 and training classes at our facility or at your site. Contact us for further information.

The key advantage of IEC 61131-3 is that it provides *an integrated set of software tools and graphical interfaces* to meet a wide range of software development needs:

- Relay Ladder Logic (LD)
- Structured Text (ST)
- Sequential Function Chart (SFC)
- Function Block Diagram (FBD)
- Instruction List (IL)

Developing application programs using IEC 61131-3 offers the following advantages:

- Reduces training costs by learning one set of programming languages used by multiple control vendors.
- Provides flexibility for selecting the best programming approach and methods for specific application tasks and requirements.
- Offers the ability for the programmer to develop and deploy reusable function blocks which can reduce future software development costs and protect your company's intellectual property.

PLCopen Motion Control Library

PLCopen is an independent, worldwide association promoting IEC 61131-3 that has defined standard motion programming function blocks which cover all the IEC 61131-3 programming languages.

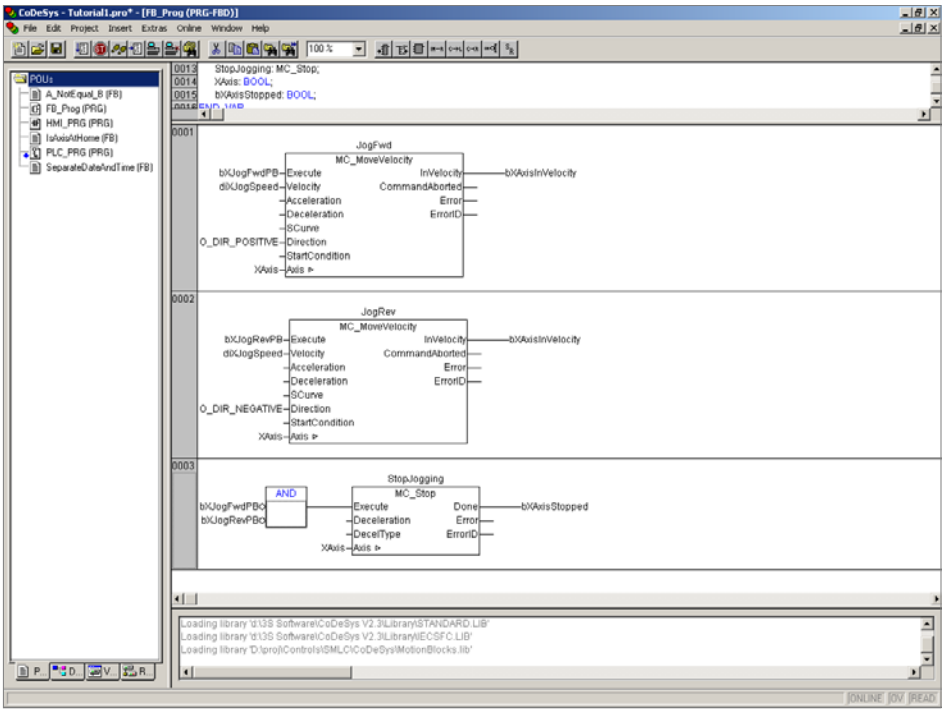
ORMEC's motion programming implementation (ServoWire Motion Blocks) conforms to the PLCopen motion block definitions and provides powerful, flexible functionality beyond that defined in the standard. Using the ServoWire Motion Blocks, a variety of applications can be written in any of the IEC 61131-3 programming languages.

The ServoWire Motion Blocks provide the following enhanced functionality:

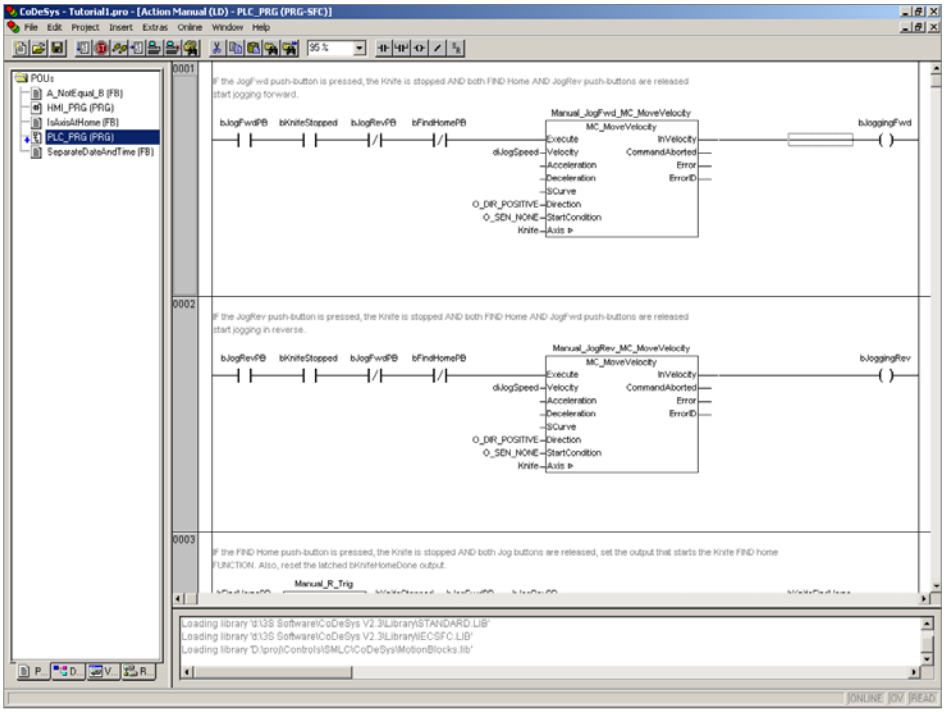
- Move Relative At Velocity
- Move Relative In Time
- Move Absolute At Velocity
- Move Absolute In Time
- Gear Relative At Ratio
- Gear Relative In Master Distance
- Cam Relative
- Plus administrative function blocks including enhanced diagnostic capabilities

Move Relative and **Gear Relative** motions can also be "superimposed" on a **Gear In** motion-- ideal for adjusting the phasing of a slave axis relative to the master position axis, as in flying shear, rotary knife and registered labeling applications.

ServoWire Motion Blocks can be inserted into relay ladder logic or function block diagrams to coordinate motion with I/O updates. Optional parameters allow motions to be triggered at the position command update rate using high-speed drive inputs, and *automatically repeated* independent of, and faster than the I/O updates. This motion command flexibility allows an SMLC system to meet the high performance requirements of demanding automation applications.



Function block diagrams provide a graphical tool for creating effective motion control and I/O programming. Pre-defined function blocks can be easily configured and combined in a logical program flow which makes the application program both easier to understand and "self-documenting" for plant personnel.



Using ServoWire motion blocks in ladder logic makes application software both simpler to develop and easier to support in the factory. Ladder logic provides a graphical, power flow for viewing program structure and execution.

IEC 61131-3 Development Tools

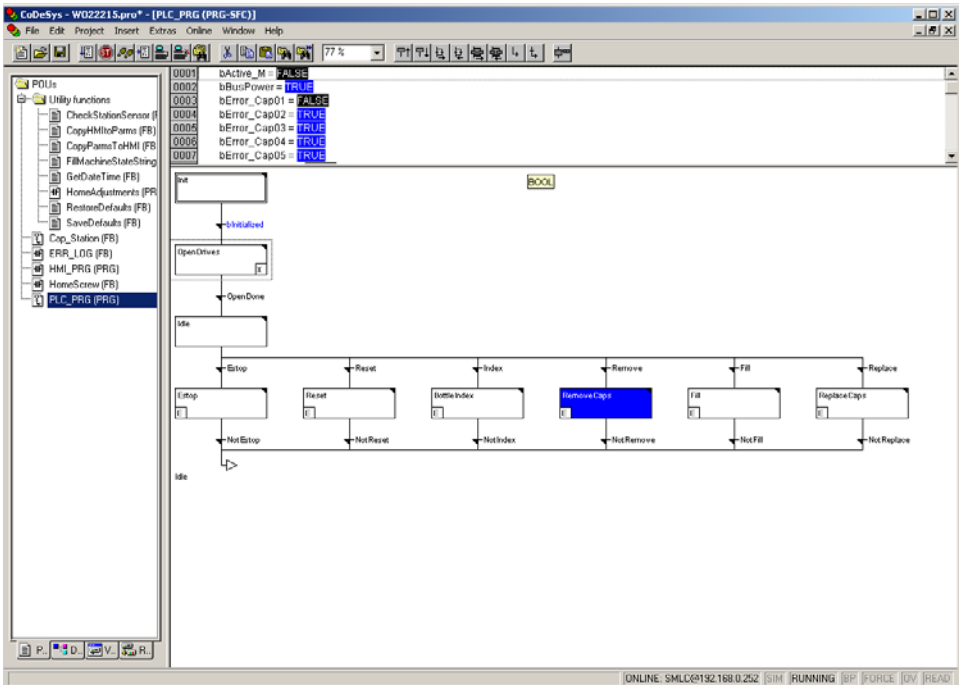
Powerful IEC 61131-3 development tools are provided for writing, debugging and maintaining application programs. This development environment will assist you in writing your application program by providing automatic variable declaration, automatic code formatting, syntax coloring and global search/replace functionality. There are tools for importing and exporting code modules, and a Library Manager for adding additional system libraries to your project.

The Input Assistant identifies possible entries for input variables, function calls and IEC keywords. A simulation mode is available for testing your program logic without needing the controller and other hardware.

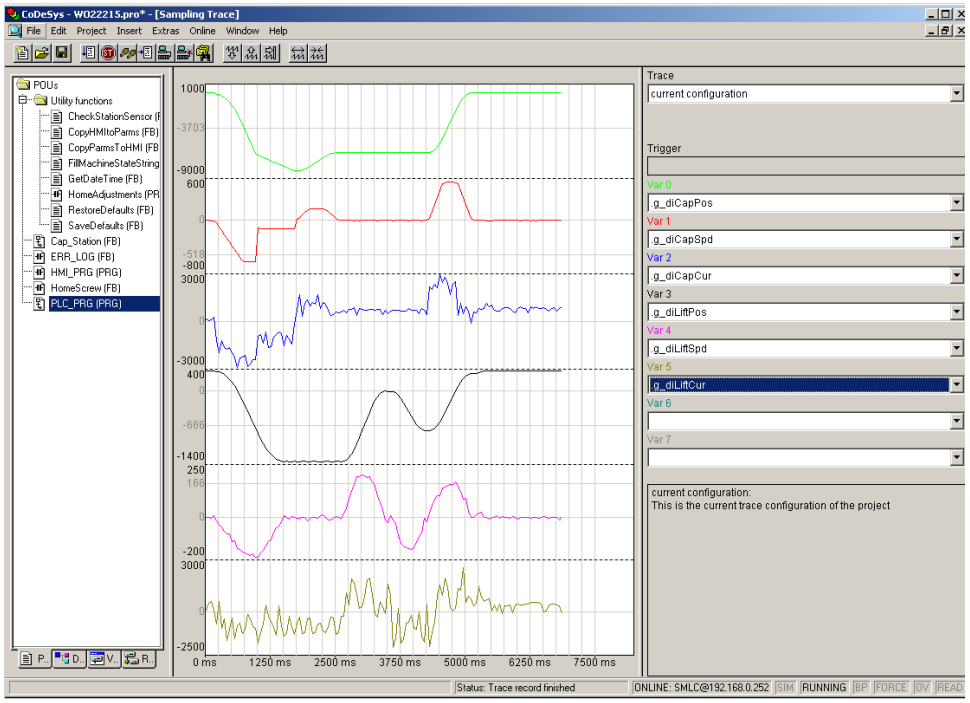
To debug your application, a *watch window* is provided for monitoring and writing variable values, along with tools for setting real-time program breakpoints -- single stepping or single cycling through the program. To monitor your machine during operation, a digital storage scope provides cyclic or single-shot storage and can display up to eight program variables.

The development environment provides tools for creating visualizations which can be used to build operator entry and diagnostic displays useful for testing and debugging the application.

When your application program is complete, all the source and supporting files can be downloaded to the SMLC. Application program source files can be password protected to limit access to authorized personnel only, and the controller acts as a storage medium for the application software, making field maintenance a snap.



Sequential Function Chart provides a graphical flow charting tool that illustrates the program flow and structure of the user's application program. SFC makes it easy to view a multi-layered, graphical model of the program and provides excellent tools for application development and maintenance.



The Sampling Trace tool can be used to trigger and view eight program variables with up to 500 data points for each variable. It is useful for application debugging, monitoring performance and capturing process information

ORDERING GUIDE

CoDeSys Development Software

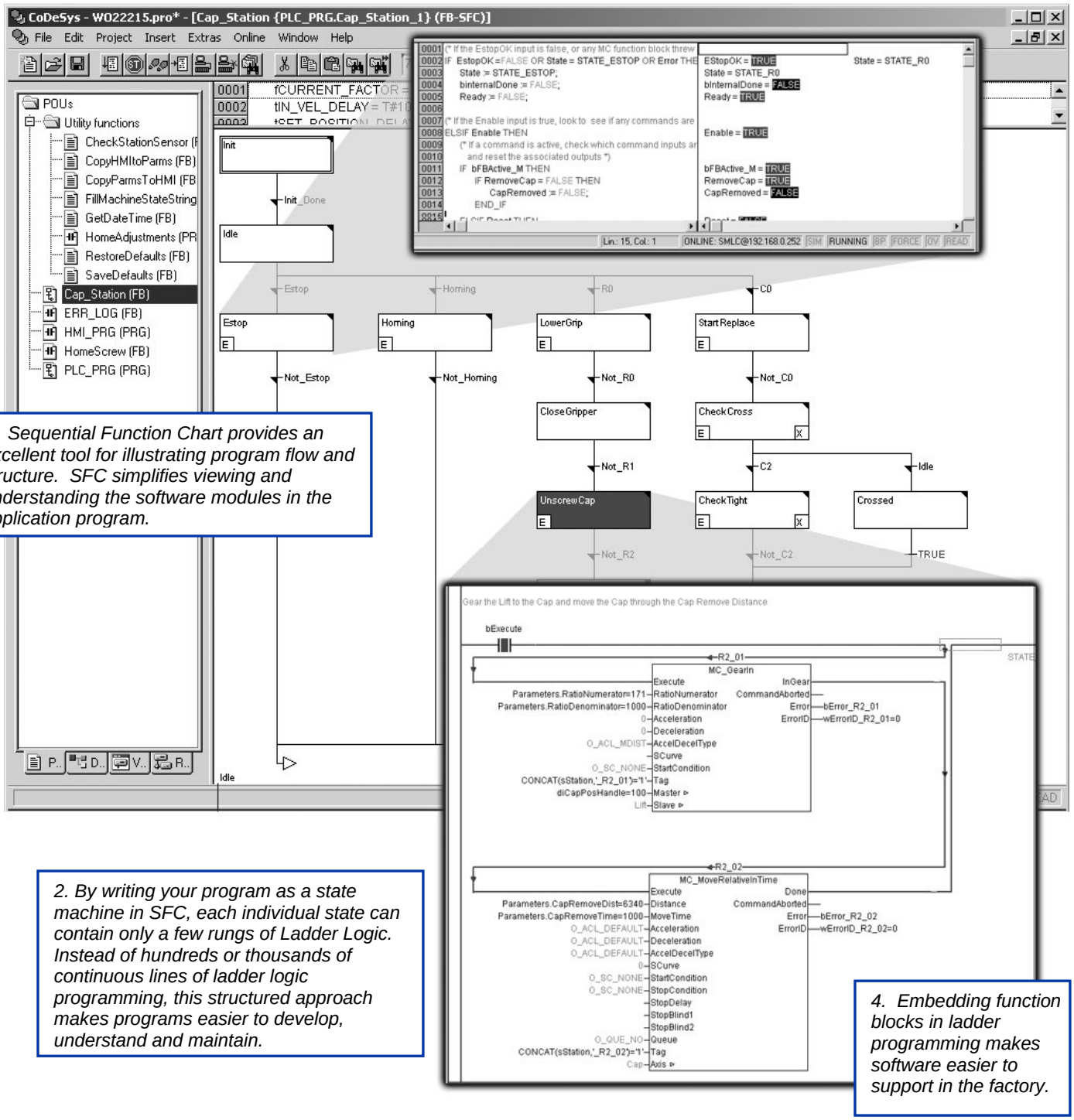
CDS-SDK/C	CoDeSys Developers Kit, CD-ROM, Includes ServoWire Pro, serial cable and one year of maintenance & support for all SMLC models.
CDS-SDK-MAINT	CoDeSys SDK Annual Maintenance & Support Contract Renewal.

Programming Example

Programming languages and graphical tools simplify software development

A key strength of the development environment is the different types of graphical and text-based programming tools it provides for a particular job -- simplifying both the software development process and support of the machine by engineering and plant personnel.

3. Structured text programming is easily integrated into the programming structure and flow, simplifying development and support. support for a variety of programming techniques provides a range of effective tools for creating powerful yet manageable application programs.



1. Sequential Function Chart provides an excellent tool for illustrating program flow and structure. SFC simplifies viewing and understanding the software modules in the application program.

2. By writing your program as a state machine in SFC, each individual state can contain only a few rungs of Ladder Logic. Instead of hundreds or thousands of continuous lines of ladder logic programming, this structured approach makes programs easier to develop, understand and maintain.

4. Embedding function blocks in ladder programming makes software easier to support in the factory.

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