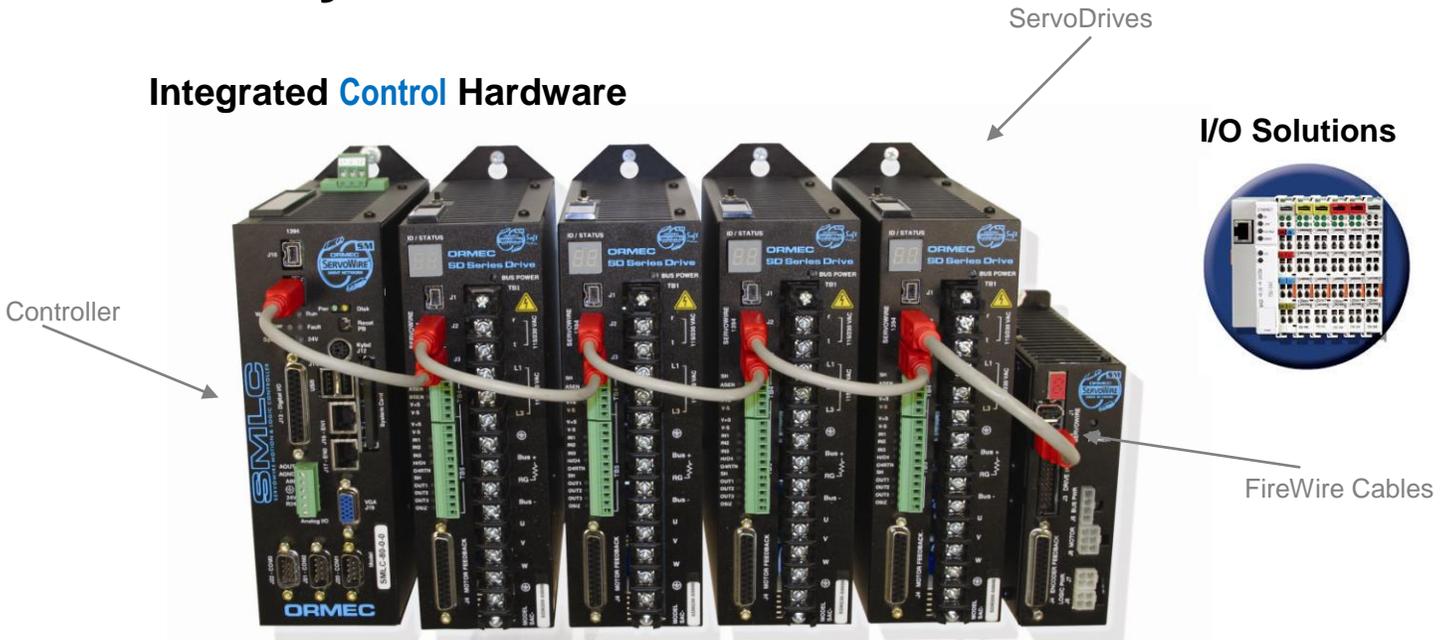


# SMLC System Overview

## Integrated Control Hardware



## FireWire-Based ServoDrive Networking



IEC 61131-3 programming and high performance motion for up to 16 axes in a simple, cost-effective package.

**Motion and Logic.** All in one. You can combine the best of both worlds with IEC 61131-3 programming tools and powerful motion control software for up to 16 axes.



ORMEC's ServoWire Motion & Logic Controller (**SMLC**) product family provides integrated, cost-effective control that leverages industry-standard hardware and software solutions.

Reduce your software development and support costs by using the common "look and

feel" of our CoDeSys software solution for programming applications using sequential function chart, relay ladder logic, function block diagrams, instruction list and structured text. Use the PLCopen motion control library, Application Specific Function Blocks and powerful ORMEC extensions for electronic gearing, camming, registration control, superimposed motion and coordinated, for multi-axis applications.

Check out our line-up of FireWire-



based digital drives and servo motors, and solutions for machine I/O, factory networking and HMI.

## IEC 61131-3 programming and high performance motion for up to 16 axes in a single package.

- Up to 16 servos can be daisy-chained and interfaced to the SMLC using standard IEEE-1394b network interfacing and cabling.
- Machine I/O solutions include Ethernet or Profibus DP.
- Quality AC brushless servomotors offer continuous stall torques from 3 to 845 lb-in (0.32-75 N-m).

# Fully Integrated Total System Solutions...

## Integrated Control Hardware

### The ServoWire® Motion and Logic Controller

The SMLC is a cost-effective control platform offering rugged, industrial hardware, a proven RTOS and industry standard networking, programmed using standard IEC 61131-3 languages. An SMLC system offers low cost, compact, proven and reliable components.

- Featuring Pentium-class processors.
- Two built-in Ethernet ports, two or three FireWire ports\* (with or without screw downs), three or four serial ports\*.
- Compact Flash program storage (eliminates hard disk) and 32k battery-backed SRAM data storage.
- Reliable, QNX real-time operating system.

\*Model Dependent

### FireWire motion networking reduces cost & complexity

- Control one to 16 servos directly from one controller without specialized motion control hardware.
- ServoWire® S2D drives are available in 200V and 400V series. Fourteen models provide continuous output power from 600 watts to 24 kilowatts,

### Conveniently interface a variety of Servo Motors

- Mix and match servo technologies (DC brushless rotary, linear, DC brush-type or voice coil motors) in the same drive hardware.
- Continuous stall torques from 3 to 665 lb-in (0.32-75 N-m).

## Solutions for I/O Needs



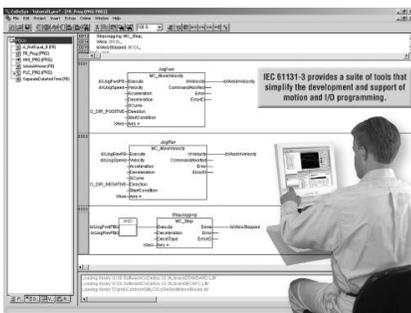
Conserve panel space by utilizing Modbus/TCP (Ethernet) or Profibus DP to connect up to 512 I/O per bus coupler and thousands of I/O points.



### HMI Touchscreens

Standalone touchscreen HMIs utilize Modbus RTU (Serial) or Modbus/TCP (Ethernet) communications. Or you can utilize Windows-based HMIs such as Wonderware InTouch, Rockwell Automation RS View, Intellution iFIX, CiTect or GE Cimplicity that communicate with the SMLC using an OPC Server.

## CoDeSys Development Software



Using industry-standard IEC 61131-3, you can develop a motion and I/O program using standard tools that streamline development and create application solutions that are

both more effective and easier to support in the field. There are no software costs when using the ORMEC SMLC in your application.

- Select among text-based and graphical languages to pick the right one for the job -- Relay Ladder Logic, Function Block Diagram, Structured Text, Instruction List or Sequential Function Chart programming.
- Program motion control and logic using standard IEC 61131-3 tools.
- Suite of programming languages and diagnostic tools streamlines development and simplifies support.
- PLCopen standard Motion Control Library, plus powerful ORMEC extensions, bring new levels of motion performance for electronic gearing, camming, registration control and coordinated, multi-axis applications
- Application Specific Function Blocks are provided for many common motion control applications.

## Models 30, 80 & 160

ORMEC's ServoWire Motion & Logic Controller (SMLC) is at the center of a complete machine control solution that can meet all of your motion, I/O and networking needs. By combining Pentium processors, IEEE 1394b FireWire drive networking and Ethernet connectivity, the SMLC is a system that can control your entire machine. This allows you to focus on your application instead of integrating control components.

The SMLC, ServoWire Drive Network, Modbus/TCP and Ethernet IP provide state-of-the-art I/O and motion control (for up to 16 axes), all programmed using any of the five IEC 61131-3 standard languages including relay ladder logic.

### SMLC Family of Controllers

The ServoWire Motion & Logic Controller (SMLC) family features high performance computing capability combined with a true real-time operating system (RTOS). Using the industry standard family of Intel 32-bit processors running the QNX RTOS provides plenty of cost effective, robust computing power for even the most demanding multi-axis motion control and machine control applications.

### Machine I/O

The SMLC provides a multi-tiered, flexible approach to meeting machine I/O requirements. It has the ability to interface high-speed drive based I/O for microsecond position capture and single servo update response to sensor signals. It also provides sub-millisecond programmable limit switch outputs that are tightly coupled to the motion control.

General purpose I/O options are fully supported using WAGO 750 Series Ethernet I/O as well as optional Profibus DP Master support. For both options, a wide variety of analog and digital I/O modules can be cost effectively connected to and controlled by the SMLC.

## SMLC

### 1. Processor Options

- Intel architecture microprocessor
- 128 Mbytes DRAM
- 128 Mbytes of FLASH memory for program storage
- 32 Kbytes SRAM (battery packed) for non-volatile data storage

### 2. Communication Ports

- Two or three IEEE 1394b ServoWire (FireWire) Ports
- Two Ethernet Communication Ports.
- Three RS-232 Communication Connectors.

### 3. Input Power Supply

- 115/230 VAC input power (auto-ranging), 50/60 Hz
- +5, +/-12 VDC logic power output

### 4. Status LEDs

- Eight status LEDs on the face for indicating system status.

## ServoWire Drive Network

ORMEC's AC brushless servomotors and ServoWire digital ServoDrives offer tested and guaranteed performance with the SMLC. The result is maximum performance from a tightly integrated, pre-engineered package that simplifies everything from system integration to maintenance.

Fully digital control offers compelling benefits eliminating manual ServoDrive setup and providing real-time software access to all parameters. In an SMLC system, the position, velocity and torque loops are all closed by the digital signal processors (DSPs) in the ServoWire Drives. Position update commands are sent from the SMLC. Velocity observer software eliminates the need for analog tachometers, and potentiometers are eliminated since all gain and compensation parameters are set in software.

All loop adjustments are automatically computed when a motor and its load



inertia are specified in ServoWire Pro greatly simplifying servo system tuning.

## SMLC — At a Glance

- **Powerful and Robust:** Intel 32-bit processors running the QNX RTOS.
- **IEC 61131-3 Application Programming:** International programming standard for PLCs.
- **PLCopen Motion Blocks:** Standard compliant motion blocks, powerful ORMEC enhancements.
- **ServoWire:** High-bandwidth, synchronous, all-digital ServoDrive network based on IEEE 1394b.
- **Networking Options:** Modbus/TCP, OPC Server and Ethernet IP.
- **I/O Options:** WAGO 750 Series Ethernet I/O and Profibus DP Master.
- **Size:** Models 30 and 80 are 2.75" x 7.2" x 9" (w x d x h) and Model 160 is 4.25" x 7.2" x 9"

# Specifications

## General Specifications

- Input Voltage: 115/230 VAC, 1.0/0.5A (+15%, -20%), 50/60 Hz
- Operating Temperature: 0 to 50°C
- Relative Humidity: 10 to 95% @ 40C (non-condensing)
- Weight: Approx. 3.1/3.5 lbs
- Dimensions: Models 30 & 80 are 2.75" x 7.2" x 9.0" (69.9 x 182.9 x 228.6 mm), and Model 160 is 4.25" x 7.2" x 9.0" (108 x 182.9 x 228.6 mm) (w x d x h)

## Processor & Memory

- DRAM: 128 Mbytes
- Program Memory: 128 Mbytes (Removable Compact Flash)
- Non-Volatile Memory: 32 Kbytes (battery backed).

## Motion Control

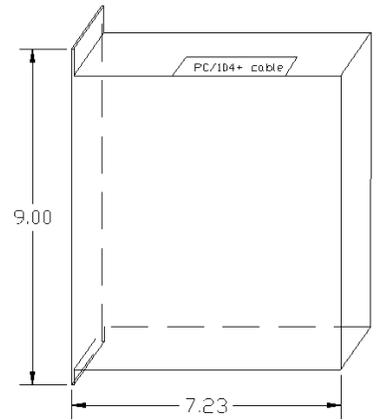
- All-digital control algorithms featuring velocity and acceleration feed-forward for optimal performance.
  - High-speed sensor inputs to initiate motion within one position command update.
  - High-speed hardware position capture is <1 μsec, ideal for use in high-speed registration applications.
  - Software controlled position, speed and current (torque) limits.
  - Drive fault protection circuits, watchdog timers and integrated diagnostics for fail-safe operation.
  - Full 32-bit position count or modulo position in user units.
  - SMLC Model 30 - 3 axes
  - SMLC Model 80 - 8 axes
  - SMLC Model 160 - 16 axes
- Equal number of 'virtual' axes for each model

## Inputs/Outputs

- SMLC I/O: 8 inputs, 8 outputs, 1 analog in, 1 analog out.
- General I/O: 64 modules per WAGO 750 Series bus coupler, up to 512 I/O points connected via Ethernet (Modbus/TCP). Multiple bus couplers can be used for additional I/O.
- Profibus DP Master (optional) supports up to 126 I/O nodes.

## Communications

- Standard RS-232 serial ports
- Standard Ethernet ports support Modbus TCP/IP or Ethernet/IP.



Side view all models

## SMLC Mounting Diagrams

ORDERING GUIDE	
<b>SMLC Model 30, 80 &amp; 160 Motion Controllers</b>	
SMLC - [ ] - [ ] - 0	
0	No Fieldbus adapter
PM	Profibus Master
30	SMLC Model 30, 115/230 VAC, <b>3 axis unit</b> , two Firewire ports (IEEE 1394b), two Ethernet, <b>three</b> RS-232 interfaces and one PC104+ expansion slot.
80	SMLC Model 80, 115/230 VAC, <b>8 axis unit</b> , two Firewire ports (IEEE 1394b), two Ethernet, <b>three</b> RS-232 interfaces and one PC104+ expansion slot.
160	SMLC Model 160, 115/230 VAC, <b>16 axis unit</b> , two FireWire ports (IEEE 1394b), two Ethernet, <b>four</b> RS-232 interfaces and <b>two</b> PC104+ expansion slots.

