# Fully integrated total systems solutions ...

*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 interface and cabling.*

*Machine I/O solutions include Ethernet or Profibus DP.*

## Integrated Control Hardware

*Quality AC brushless servomotors offer continuous stall torques from 3 to 665 lb-in (0.32-75 N-m).*

The ServoWire® Motion and Logic Controller 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 FireWire ports, 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.

*Firewire motion networking reduces cost & complexity*
✔ Control one to 16 servos directly from one controller without specialized motion control hardware.
✔ ServoWire® SD drives offer a power range from 200 to 24,000 watts, continuous output currents from 2.4 to 60 amps RMS/phase with input voltages including 24-96 VDC, 115/230 VAC, and 460 VAC.

*Conveniently interface a variety of servos*
✔ 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.
*See page 15 for more information.*

# HMI Touchscreens

Cost-effective, 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. *See page 13 for more information.*

# CoDeSys Development Software

Utilizing industry-standard IEC 61131-3, you can develop motion and I/O programming using standard tools that streamline development and create application programs that are both more effective and easier to support in the field. *See page 8 for more information.*

✔ 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.

> IEC 61131-3 provides a suite of tools that simplify the development and support of motion and I/O programming.

✔ Program motion control and logic using standard IEC 61131-3 tools.

✔ Suite of programming languages and diagnostic tools streamlines machine 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.

# ORMEC

## *ServoWire® Motion & Logic Controller - 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 solving your application instead of integrating control components.

The SMLC, ServoWire Drive Network and Modbus/TCP 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 Controllers

The ServoWire Motion & Logic Controller (SMLC) 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 and I/O 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. In either case, a wide variety of analog and digital I/O modules can be cost effectively connected to and controlled by the SMLC.

## SMLC Controller

### 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 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 based on position commands 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.

✔ **Compact Size:** 2.75" x 7.2" x 9" (W x D x H) for Model 30 and 80 or 4.25" x 7.2" x 9" for Model 160.

✔ **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, Ethernet/IP and OPC Server.

✔ **I/O Options:** WAGO 750 Series Ethernet I/O, Profibus DP Master.

## Specifications

### General Specifications

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

### Processor & Memory

- Main Processor: Industry standard 32-bit Intel microprocessors
- 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 feedforward for optimal performance.
- Position Command Update Rates: 1.0, 2.0, 2.66 kHz (axis count independent).
- High-speed sensor inputs to initiate motion within one position command update.
- High-speed hardware position capture (<1 usec), 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

## 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:  Three RS-232 serial ports, four on Model 160.
- Standard:  Two Ethernet 10/100baseT ports with RJ45 connectors.
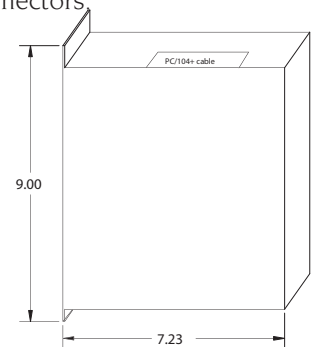


## SMLC Mounting Diagrams

All dimensions in inches.

Side view all.

Mounting hole .210 [5.3] dia. use 10-32 or M5 machine screw. Qty 3.

### ORDERING GUIDE

#### SMLC Model 30, 80 & 160 Motion Controllers

SMLC-☐-☐-0

| | |
|---|---|
| 0 | No Fieldbus adapter |
| PM | Profibus Master |

30   SMLC Model 30, 115/230 VAC, **3 axis unit**, two Firewire ports (IEEE 1394b), two Ethernet, three RS-232 interfaces and one PC104+ expansion slot.

80   SMLC Model 80, 115/230 VAC, **8 axis unit**, two Firewire ports (IEEE 1394b), two Ethernet, three RS-232 interfaces and one PC104+ expansion slot.

160   SMLC Model 160, 115/230 VAC, **16 axis unit**, two Firewire ports (IEEE 1394b), two Ethernet, **four** RS-232 interfaces and **two** PC104+ expansion slots.

SMLC-30, SMLC-80 Mounting dimensions

SMLC-160 Mounting dimensions