SMLC Machine I/O Options

WAGO Ethernet and Profibus DP I/O feature a wide variety of analog and digital I/O modules that reliably interface the ServoWire Motion & Logic Controller (SMLC) to industrial devices such as switches, sensors, solenoids, valves and motor starters.

WAGO I/O uses either an Ethernet or Profibus DP Fieldbus Coupler for each node, which is connected to DIN rail mounted I/O modules. Appropriate modules (AC In/Out, DC In/Out, sinking/sourcing, analog current/voltage, etc.) can be selected for specific applications.

The WAGO Fieldbus Couplers are compact, flexible, high-performance processors that provide the interface between the I/O modules and either a Profibus DP or dedicated Ethernet network. DIN rail mounted modules provide an efficient method for mounting that minimizes panel space.

The 24 VDC digital input modules include built-in noise filters, available with either a 3.0 or 0.2 msec time constant. The AC digital output modules utilize zero voltage turn-on and zero current turn-off of the load to greatly reduce generated EMI and RFI, and feature an internal dv/dt snubber network for protection from voltage transients on the line. All digital I/O modules feature internal LED indicators and digital output modules include electronic short-circuit protection.

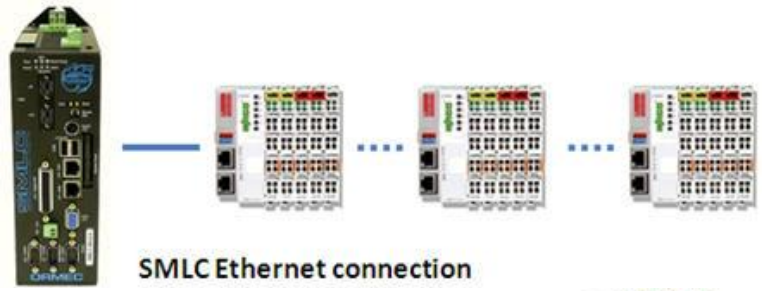
The analog input modules are available with 12 or 16-bit resolution, and support a variety of input signal current and voltage levels, including 0-20 mA, 4-20 mA, +/-10 V and 0-10V. Analog input modules are also available for use as interfaces to thermocouples, RTD sensors and resistor bridges. The analog output modules are 12-bit, and also support a variety of signal types.

WAGO I/O: At A Glance

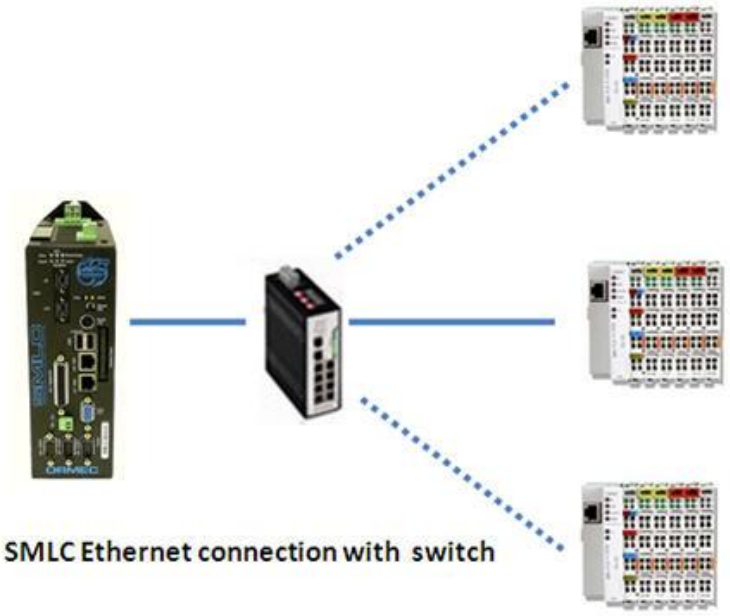
- **Standard Connectivity Solutions –** WAGO Ethernet and Profibus DP I/O provide standard connectivity solutions for interfacing digital and analog I/O to the ServoWire Motion & Logic Controllers (SMLCs) that is easy to implement, operate and maintain.
- **Flexible Interface –** All WAGO I/O modules connect to the SMLC using a Fieldbus Coupler, one per rack. The Fieldbus Coupler interfaces to the Ethernet or Profibus DP network providing a high-speed connection to all I/O in the rack. I/O can be remotely distributed throughout the machine.
- **Quick and Reliable Installation –** Each module incorporates CAGE CLAMP connection system for vibration-proof, fast and maintenance-free wiring with test points for easy access to signals with wiring in place.
- **Digital I/O Modules –** WAGO I/O provides a full line of digital I/O modules. DC inputs (5 & 24 VDC), DC outputs (5 & 24 VDC), AC inputs (80 to 230 VAC) and AC outputs (60 to 230 VAC) provide flexible interface options. Digital modules feature compact 2, 4 and 8 channel designs.
- **Analog I/O Modules –** Analog voltage inputs range from 0 to 10 volts, +/- 10 volts, and 4-20 mA. Analog output modules provide 0 to 10 volts, +/- 10 volts ranges. Analog input modules are available as efficient 2-channel devices. Interface to temperature sensors, load cells, dancer control systems, and other industrial analog voltage or current control points.
- **Minimum Panel Space –** Compact 12 mm (0.47 in) and 24 mm (0.94 in) wide, DIN rail mounted module designs allow the OEM designer to use a minimum amount of panel space.

Specialty modules are available with up/down counters, incremental encoder interfaces, SSI interfaces and more.

The I/O modules are color coded by function and provide a high degree of isolation and noise immunity between the motion controller and external components. Optional labeling components are available to clearly indicate I/O point number, power and ground connections for easier installation and maintenance.



SMLC Ethernet connection



SMLC Ethernet connection with switch

Specs for Ethernet:

- Data rate: 10 or 100 Mbits/sec*

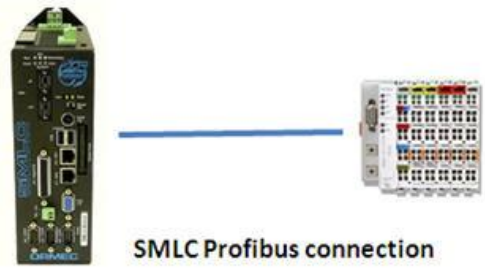
*WAGO-ETH2-KIT includes a 750-352 bus coupler and supports 100 Mbits/sec (Preferred implementation - includes a built-in Ethernet switch, is faster & more cost effective)

WAGO-ETH-KIT includes a 750-342 bus coupler and supports 10 Mbits/sec

- Physical Media: CAT-5 cable, RJ-45 connector
- Isolation: Transformer
- Max Distance Node to Node: 100M
- Max I/O Modules per Node: 64

Advantages:

- Transformer isolation for noise immunity
- Low cost industry standard cabling
- Long distance between nodes and long total network length
- Optional industrial hubs and switches for various network topologies



SMLC Profibus connection

Specs for Profibus:

- Data Rate: 12Mbaud (max) at 100M
  WAGO-PFB-KIT uses 750-333 modules
- Physical Media: Shielded twisted pair, 22 AWG
- Isolation: None, RS-485
- Max Distance Node to Node: 1200M at 93.75 kbaud or lower (9500M total network with repeaters)
- Max Number of Nodes: 96 (with repeaters)
- Max I/O Modules per Node: 63

Advantages:

- Long distances between nodes and long total network length
- Highly efficient data transmission, typically <1 msec/ node
- In addition to WAGO I/O, Profibus DP interfaces are available on a wide variety of devices, including sensors, pneumatic manifolds, HMIs, etc.

ORDERING GUIDE (All WAGO 750 Series are supported and available; part numbers below are not all inclusive.)

Fieldbus Coupler Kits (note 1)

WAGO-ETH-KIT	Ethernet Fieldbus Coupler Kit, 10baseT, 64 I/O modules (256 points) max. (one End Module & two 10 mm End Stops)
WAGO-ETH2-KIT	Ethernet Filedbus Coupler Kit, 10baseT, 64 I/O modules (256 points) max. (one End Module & two 10 mm End Stops)
WAGO-PFB-KIT	Profibus DP Fieldbus Coupler Kit, 12 Mbaud, 64 I/O modules (256 points) max. (one End Module and two 10 mm End Stops)

Digital Input Modules

WAGO-750-400	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter
WAGO-750-401	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter, hi spd
WAGO-750-402	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter
WAGO-750-403	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter, hi spd
WAGO-750-405	2-Ch AC In, 230 VAC (note 2)
WAGO-750-406	2-Ch AC In, 120 VAC (note 2)
WAGO-750-408	4-Ch DC In, Sinking (low-side sw), 24 VDC, 3.0 msec filter
WAGO-750-409	4-Ch DC In, Sinking (low-side sw), 24 VDC, 0.2 msec filter, hi spd
WAGO-750-410	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.msec filter, 2-wire prox. switch
WAGO-750-411	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.msec filter, hi speed, 2-wire prox. switch
WAGO-750-412	2-Ch DC In, Sourcing (high-side sw), 48 VDC, 3.0 msec filter (note 2)
WAGO-750-414	4-Ch DC In, Sourcing (high-side sw), 5 VDC, 0.2 msec filter, hi spd (note 2)
WAGO-750-415	4-Ch AC/DC In, 24 VAC/VDC, 20 msec filter, 2-wire connection (note 2)
WAGO-750-418	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter, diagnostics w/acknowledgment
WAGO-750-419	2-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter, diagnostics
WAGO-750-421	2-Ch DC in, Sourcing (high-side sw), 24 VDC, 3.0 msec, diagnostics
WAGO-750-422	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 1.0 msec filter, w/ 10 msec extension
WAGO-750-423	4-Ch AC/DC In, Sourcing (high-side sw), 24 VAC/DC, 50 msec filter, w/ power jumper contacts (supply module req'd for 24 VAC operation, note 2)
WAGO-750-425	2-Ch DC In, 24 VDC, 3.0 msec filter, NAMUR
WAGO-750-424	2-Ch DC In, Sourcing (high-side sw), 24 VDC, Intruder Detection
WAGO-750-430	8-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter
WAGO-750-431	8-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter, hi spd
WAGO-750-432	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec, 2-wire, connector
WAGO-750-433	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec, 2-wire
WAGO-750-435	1-Ch DC In, 24 VDC, 3.0 msec filter, NAMUR Ex i
WAGO-750-438	2-Ch DC In, 24 VDC, 3.0 msec filter, NAMUR Ex i
WAGO-750-1400	16-Ch DC In, 24 VDC, 3.0 msec, ribbon cable
WAGO-750-1402	16-Ch DC In, Sourcing (low-side sw), 24 VDC, 3.0 msec filter, ribbon cable
WAGO-750-1405	16-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter
WAGO-750-1406	16-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter
WAGO-750-1407	16-Ch DC In, Sourcing (low-side sw), 24 VDC, 3.0 msec filter
WAGO-750-1415	8-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter
WAGO-750-1416	8-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter
WAGO-750-1417	8-Ch DC In, Sourcing (low-side sw), 24 VDC, 3.0 msec filter
WAGO-750-1420	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 3.0 msec filter, 3 wire
WAGO-750-1421	4-Ch DC In, Sourcing (high-side sw), 24 VDC, 0.2 msec filter, 3 wire
WAGO-753-440	4-Ch AC In, Sourcing (high-side sw), 230 VAC, 10 msec filter

Digital Output Modules

WAGO-750-501	2-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A
WAGO-750-502	2-Ch DC Out, Sourcing (high-side sw), 24 VDC, 2.0 A
WAGO-750-504	4-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A
WAGO-750-506	2-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A, w/ diagnostics
WAGO-750-509	2-Ch AC/DC Out, SSR, 230 VAC/VDC, 300 mA (note 2)
WAGO-750-512	2-Ch Relay Out, normally open, 230 VAC/30 VDC, 2.0 A (note 2)
WAGO-750-513	2-Ch AC/DC Out, Isolated relay, 250 VAC/30 VDC, 2.0 A (note 2)
WAGO-750-514	2-Ch Relay Out, changeover contacts (SPDT), 125 VDC/30 VDC, 0.5 A (note 2)
WAGO-750-516	4-Ch DC Out, Sinking (low-side sw), 24 VDC, 0.5 A
WAGO-750-517	2-Ch Relay Out, changeover contacts (SPDT), 230 VDC/300 VDC, 1.0 A (note 2)
WAGO-750-519	4-Ch DC Out, Sourcing (high-side sw), 5 VDC, 20 mA (note 2)
WAGO-750-522	2-Ch AC Out, opto isolated, 35-230 VAC, 0.5 A, 3.0A for 30 sec once per hour (note 2)
WAGO-750-523	1-Ch AC Out, opto isolated 230 VAC, 16A, auto/manual operation
WAGO-750-530	8-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A
WAGO-750-535	2-Ch DC Out, Sourcing (high-side sw), 24 VDC Ex i
WAGO-750-1500	16-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A, ribbon cable
WAGO-750-1501	16-Ch DC Out, Sourcing (low-side sw), 24 VDC, 0.5 A, ribbon cable
WAGO-750-1504	16-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A
WAGO-750-1505	16-Ch DC Out, Sourcing (low-side sw), 24 VDC, 0.5 A
WAGO-750-1515	8-Ch DC Out, Sourcing (high-side sw), 24 VDC, 0.5 A
WAGO-750-1516	8-Ch DC Out, Sourcing (low-side sw), 24 VDC, 0.5 A

Digital Input/Output Modules

WAGO-750-1502	8-Ch DC In/Out, Sourcing (high-side sw), 24 VDC, 0.5 A, ribbon cable
WAGO-750-1506	8-Ch DC In/Out, Sourcing (high-side sw), 24 VDC, 0.5 A

note 1: WAGO Fieldbus couplers supply a limited amount of 24 VDC power to the I/O modules, which may not be sufficient for the application. A Power Supply and Supply Module may be required. Refer to the WAGO Ethernet I/O Manual or the WAGO Web Site for further information.

note 2: Any WAGO Digital I/O modules operating at voltages other than 24 VDC require a Power Supply and Supply Module with the appropriate voltage rating for input power and isolation. Also, this type of module passes its operating power supply on to next modules to the right in the rack, or none at all. A supply module will be required provide the appropriate input power and isolation for the I/O module operating on a different voltage to the right of this module. Refer to the WAGO Ethernet I/O Manual or the WAGO Web Site for further information.

ORDERING GUIDE continued

Analog I/O Modules

WAGO-750-452	2-Ch Analog In, 0-20 mA, 12-bit, differential (note 3)
WAGO-750-453	4-Ch Analog In, 0-20 mA, 12-bit, single-ended
WAGO-750-454	2-Ch Analog In, 4-20 mA, 12-bit, differential (note 3)
WAGO-750-455	4-Ch Analog In, 4-20 mA, 12-bit, single-ended
WAGO-750-456	2-Ch Analog In, +/- 10 V, 12-bit, differential (note 3)
WAGO-750-457	4-Ch Analog In, +/-10 V, 12-bit, single-ended
WAGO-750-459	4-Ch Analog In, 0-10 V, 12-bit, single-ended
WAGO-750-460	4-Ch Analog In for RTD, Pt100 resistance sensors (note 3)
WAGO-750-461	2-Ch Analog In for RTD (Contact ORMEC for resistance sensor types supported. (note 3)
WAGO-750-465	2-Ch Analog In, 0-20 mA, 12-bit, single-ended
WAGO-750-466	2-Ch Analog In, 4-20 mA, 12-bit, single-ended
WAGO-750-467	2-Ch Analog In, 0-10 V, 12-bit, single-ended (note 3)
WAGO-750-468	4-Ch Analog In, 0-10 V, 12-bit, single-ended (note 3)
WAGO-750-469	2-Ch Analog In for Thermocouple, w/ diagnostics (Contact ORMEC for Thermocouple types supported.) (note 3)
WAGO-750-472	2-Ch Analog In, 0-20 mA, 16-bit, single-ended
WAGO-750-474	2-Ch Analog In, 4-20 mA, 16-bit, single-ended
WAGO-750-474/005-000	2-Ch Analog In, 4-20 mA, 16-bit, single-ended, 60 Hz
WAGO-750-475	2-Ch Analog In, 0-1 amp, differential
WAGO-750-477	2-Ch Analog In, 0-10 V AC/DC, differential
WAGO-750-476	2-Ch Analog In, +/-10 V, 16-bit, single-ended
WAGO-750-478	2-Ch Analog In, 0-10 V, 16-bit, single-ended
WAGO-750-479	2-Ch Analog In, +/-10 V, 14-bit, differential (note 3)
WAGO-750-480	2-Ch Analog In, 0-20 mA, 13-bit, differential (note 3)
WAGO-750-483	2-Ch Analog In, 0-30 V14-bit, differential
WAGO-750-485	2-Ch Analog In, 4-20 mA, 12-bit, single-ended, explosion protection
WAGO-750-492	2-Ch Analog In, 4-20 mA, 12-bit, differential, isolated (note 3)
WAGO-750-491	1-Ch Analog In for Resistor Bridges, 16-bits, 250 msec conversion time (note 3)
WAGO-750-491/000-001	1-Ch Analog In for Resistor Bridges, 16-bits, 65 msec conversion time (note 3)

Analog Output Modules

WAGO-750-550	2-Ch Analog Out, 0-10 V, 12-bit (note 3)
WAGO-750-552	2-Ch Analog Out, 0-20 mA, 12-bit
WAGO-750-554	2-Ch Analog -20 Out, 4mA, 12-bit
WAGO-750-556	2-Ch Analog Out, +/-10 V, 12-bit (note 3)
WAGO-750-557	4-Ch Analog Out, +/-10 V, 12-bit
WAGO-750-559	4-Ch Analog Out, 0-10 V, 12-bit
WAGO-750-585	2-Ch Analog Out, 0-20 mA, 12-bit, explosion protection

Specialty Modules

WAGO-750-404	1-Ch Up/Down Counter, 24 VDC, 32-bit, 100 kHz
WAGO-750-511	2-Ch PWM Output, 24 VDC, 0.1A, 10-bit, 250 Hz, configurable duty cycle
WAGO-750-630/000	SSI Transmitter Interface (Contact ORMEC for transmitter interface types supported.)
WAGO-750-635	Digital Impulse Interface, for magnetostrictive distance measurement sensors
WAGO-750-637	Incremental Encoder Interface, 32-bit pos capture, pos compare, 5 VDC edr power output (note 2)
WAGO-750-638	2-Ch Up/Down Counter, 24 VDC, 16-bit, 500 Hz
WAGO-750-654	Data exchange module
WAGO-750-655	AS-Interface Master V2.1 M3
WAGO-750-670	Stepper Controller, RS-422, 24 V DC, 20 mA
WAGO-750-672	Stepper Controller, 70 V, 7.5 amp, 6 In, 2 Out
WAGO-750-303	Profibus DP/FM Fieldbus coupler, 12 Mbaud, digital and analog
WAGO-750-342	Ethernet TCP/IP Fieldbus coupler, 10Mbit/sec, digital and analog

Power Supplies and Accessories

WAGO-247-PWR	Power & Ground Label Strip Pack: blue “0V”, blue “-”, red “24V”, red “+”, lt green ground symbol, lt green “PE”, 100 each
WAGO-247-513/522	I/O Point Numbering Label Strip Pack, digits 00-99, 10 each
WAGO-249-117	End Stop
WAGO-750-600	End Module
WAGO-750-601	Supply module with fuse, 24 VDC
WAGO-750-602	Supply module, 24 VDC
WAGO-750-609	Supply module with fuse, 230 VAC
WAGO-750-610	Power Supply, 24V DC, fuse, diagnostics
WAGO-750-611	Power Supply, 230 V AC, fuse, diagnostics
WAGO-750-612	Supply module, 0-230 AC/DC (incl. 5 VDC modules)
WAGO-750-615	Supply module with fuse, 120 VAC
WAGO-750-622	Binary Spacer Module
WAGO-787-602	Power Supply 1.3A, 24 VDC output
WAGO-787-612	Power Supply 2.5A, 24 VDC output
WAGO-787-622	Power Supply 5.0A, 24 VDC output
WAGO-787-632	Power Supply 10A, 24 VDC output
WAGO-787-640	Power Supply 10A, 24 VDC output, 3-phase 230 VAC input

note 3: Some WAGO Analog I/O modules do not pass the power supply to other modules in the rack. A supply module will be required for the I/O module to the right of one of these Analog I/O modules in a WAGO I/O system. Refer to the WAGO Ethernet I/O Manual or the WAGO Web Site for further information.