

Appendix



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Output Load

NPN

Common

Common

Output Load

PNP

¥

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1-800-633-0405 Sinking and Sourcing Concepts

When choosing the type of input or output module for your PLC system, it is very important to have a solid understanding of sinking and sourcing concepts. Use of these terms occurs frequently when discussing input or output circuits. It is the goal of this section to make these concepts easy to understand, so one can make the right choice the first time when selecting the type of I/O terminations for your application. This section provides short definitions, followed by general example circuits.

First, you will notice that the diagrams on this page are associated with only DC circuits and not AC, because of the reference to (+) and (-) polarities. Therefore, sinking and sourcing terminology applies only to DC input and output circuits. Input and output points that are sinking or sourcing can conduct current in one direction only. This means it is possible to connect the external supply and field device to the I/O point, with current trying to flow in the wrong direction, and the circuit will not operate. However, the supply and field device can be connected every time based on an understanding of sourcing and sinking

The figure below depicts a sinking input. To properly connect the external supply, it must be connected so the input provides a path to supply common(-). So, start at the PLC input terminal, follow through the input sensing circuit, exit at the common terminal, and connect the supply (-) to the common terminal. By adding the switch between the supply (+) and the input, the circuit is completed. Current flows in the direction of the arrow when the switch is closed.

By applying the circuit principles to the four possible combinations of input/ output sinking/sourcing types, there are four circuits, as shown above. The common terminal is the terminal that serves as the common return path for all I/O points in the bank.



Sinking = provides a path to supply common (-) **Sourcing** = provides a path to supply source (+)



Sink/source I/O circuits combine sinking and sourcing capabilities. This means that the I/O circuitry in the PLC will allow current to flow in either direction, as shown at the right. The common terminal connects to one polarity, and the I/O point connects to the other polarity (through the field device). This provides flexibility in making connections to your field power supply. Please note:

- Wire all I/O points with a shared common as either sinking or sourcing.
- Do not use an AC power supply on a DC sink/source I/O point.





Field device examples - 3 wire connections



1-800-633-0405 For the la Sinking and Sourcing Concepts

Common terminals and how to use them

In order for a PLC I/O circuit to operate, current must enter at one terminal and exit at another. This means at least two terminals are associated with every I/O point. In the figure at the right, the input or output terminal is the main path for the current. One additional terminal must provide the return path to the power supply. Together, the main path and the return path create a loop, or a *complete circuit* for current to flow.

If there was unlimited space and budget for I/O terminals, then every I/O point could have two dedicated terminals. However, providing this level of flexibility is not practical or even necessary for most applications. So, most input or output points on PLCs are in groups that share the return path (called *commons*). The figure at the right shows a group (or bank) of four input points that share a common return path. In this way, the four inputs require only five terminals instead of eight.

NOTE: Assuming all input circuits have a similar resistance, the current at the common terminal is four times greater than the current at any one of the inputs. This effect is especially important to note for output circuits, where the current through a common terminal can reach several amperes. You will need to decide whether to fuse each output point individually, or to put a fuse in the common terminal path.



Wiring labels and how to interpret them

DL205, DL305, DL405 - Most DL205, DL305 and DL405 input and output modules group their I/O points into banks that share a common return path. The best indication of I/O common grouping is on the wiring label, such as the one shown below. The miniature schematic shows two circuit banks with eight input points in each. The common terminals are labeled "CA" and "CB," respectively.

In the wiring label example, the positive terminal of a DC supply connects to the common terminals. Some of the symbols you will see on wiring labels and their meanings are shown below.



Input Bank (DL05)						
C0		X	1	Х3		
	Х	(0	Х	2		

Two banks of four inputs and two banks of three outputs (DL05)

AC(I)	AC(I	V)	C)	Х	1	Х	3	Х	4	Х	6	С	2	Y	1	Y	′3	Y	5	
(3 (LG	#	Х	0	Х	2	С	1	Х	5	Х	7	Y	0	Y	2	Y	4	С	3

I/O Common Grouping Bar (DL105)



Two banks of four inputs and one bank of two (DL105)

5A OUT	5KHz HSC/INT INP	12-24VDC NPUT (SINK/SRC)					
24VDC	X0 X1 COM X2 X3	X4 X5 COM X6 X7 X10 COM X11					

1-800-633-0405 ISO 9001/UL/CUL/EU/RoHS

Throughout the world, there is a wide variety of regulatory codes, agency approvals, and other types of certification that may be required in order to install an automation system. These requirements vary and depend on your exact location and situation. For example, there may be national codes, state and local government codes, and even wide-ranging requirements such as the European Union (EU) Directives. The following are some of these codes and requirements, and explanations of how they may affect you as a PLC and industrial controls user.

ISO 9001

Some companies require their suppliers to use products that are built by companies that adhere to a documented set of quality-related procedures. ISO 9001 is one of the standards in the ISO 9000 family of standards for quality management systems. Koyo Electronics Industries Company, Ltd., the manufacturer of most of our PLC products, is an ISO 9001 certified company, as are many of our other Federation members.

Underwriters Laboratories (UL/CUL)

Underwriters Laboratories is one of the world's premier safety testing and certification sources. Many applications require UL approval for insurance and/ or other compliance purposes. There are several areas of interest, but the most applicable are: UL508, the standard for Industrial Control Equipment; and UL1604, the standard covering Hazardous Locations. For more information on the Underwriters Laboratories, check their Web site at www.ul.com. There are several tables in this section that show which of our products have a UL listing. (They also indicate the cUL approval, which is required in many applications in Canada.) Please check our Web site for the most current information.

European Union (EU) Directives

This area of certification and approval is absolutely vital to anyone who wants to do business in Europe. One of the key tasks that faced the EU member countries and the European Economic Area (EEA) was the requirement to bring several similar, yet distinct, standards together into one common standard for all members. The primary purpose of a single standard was to make it easier to sell and transport goods between the various countries and to maintain a safe working and living environment. The Directives that resulted from this "harmonization" of standards are now legal requirements for doing business in Europe. Products that meet these Directives are required to have a CE mark to signify compliance. A few key questions are always asked when the www.automationdirect.com

subject of CE is discussed.

Which Directives apply to me? Several Directives apply to our products, and Directives may be amended or added, as required.

- Electromagnetic Compatibility Directive (EMC) – Provides a means to ensure that products placed on the market do not generate electromagnetic disturbances that would affect other apparatus, including radio and/or telecommunications equipment.
- Machinery Safety Directive Covers the safety aspects of the equipment, installation, etc. There are several areas involved, including testing standards covering both electrical noise immunity and noise generation.
- Low Voltage Directive Is also safety related and covers electrical equipment that has voltage ranges of 50-1,000 VAC and/or 75-1,500 VDC.
- Battery Directive Covers the production, recycling, and disposal of batteries.

Who is responsible for ensuring compliance with these Directives? Ultimately, we are all responsible for our various pieces of the puzzle. Manufacturers must test their products and document any test results and/ or installation procedures necessary to comply with the Directives. As a machine builder, you are responsible for installing the products in a manner that will ensure compliance is maintained. You are also responsible for testing any combinations of products that may (or may not) comply with the Directives when used together. The end user of the products must comply with any Directives that may cover maintenance, disposal, etc., of equipment or various components. Although we strive to provide the best assistance available, it is impossible for us to test all possible configurations of the products we carry with respect to any specific Directive. Because of this, it is ultimately your responsibility to ensure that your machinery (as a whole) complies with these Directives and to keep up with applicable Directives and/or practices that are required for compliance.

Which programmable controller products carry the CE label? See Tables in our Agency Approval list (https:// cdn.automationdirect.com/static/specs/ agencyapprovals.pdf) for controller systems manufactured by Koyo Electronics Industries, Host Engineering or FACTS Engineering. When properly installed and used, the approved components conform to the Electromagnetic Compatibility (EMC), Low Voltage Directive, and Machinery Directive requirements of the standards on the next page.

EC 61000-3-2 Power Factor Correction

The IEC 61000-3-2 standard is intended to reduce the amount of disturbance a device feeds back into its power source.

AutomationDirect power supplies all carry the CE mark. Normally, 61000-3-2 is met or does not apply. Only our PS24-150D and PS24-300D could potentially be used in a manner not compliant with the 61000-3-2 standard.

RoHS 2

The RoHS Recast Directive (RoHS 2) was published in the Official Journal on 1 July 2011. Formally called Restriction of the Use of Certain Hazardous Substances Directive 2011/65/EC (RoHS 2) it restricts the use of six hazardous materials in the manufacture of various types of electrical and electronic equipment. RoHS 2 is linked with the Waste Electrical and **Electronic Equipment Directive (WEEE** Directive 2012/19/EU entered into force on 13 August 2012 and became effective on 14 February 2014), which sets collection, recycling and recovery targets for electrical goods and is part of a legislative initiative to solve the problem of large amounts of toxic e-waste.

Each EU member state will adopt its own enforcement and implementation policies using the directive as a guide. Therefore, there could be as many different versions of the directive as there are states in the EU.

RoHS 2 restricts the use of the following six substances:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium (chromium VI or Cr 6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

RoHS 3 (2015/863/EU ammends RoHS 2 and adds four additional restricted substances:

- Bis(2-ethylhexyl) phthalate (DEHP) (0,1 %)
- Butyl benzyl phthalate (BBP) (0,1 %)
- Dibutyl phthalate (DBP) (0,1 %)

• Diisobutyl phthalate (DIBP) (0,1 %) For a listing of all products and their compliance status see:

http://support.automationdirect.com/docs/ eu_rohs.pdf

1-800-633-0405 EU - European Union

EMC Directive Standards Relevant to PLCs

- EN50081-1 Generic emission standard for residential, commercial, and light industry
- EN50081-2 Generic emission standard for industrial environment
- EN50082-1 Generic immunity standard for residential, commercial, and light industry
- EN50082-2 Generic immunity standard for industrial environment

Low Voltage Directive Standards **Applicable to PLCs**

EN61010-1 – Safety requirements for electrical equipment for measurement, control, and laboratory use

Product Specific Standard for PLCs

- EN61131-2 Programmable controllers, equipment requirements and tests. This standard replaces the above generic standards for immunity and safety. However, the generic emissions standards must still be used in conjunction with the following standards:
- EN 61000-3-2 Harmonics
- EN 61000-3-2 Fluctuations. We are currently in the process of changing our testing procedures from the generic standards to the product specific standards.

We do have separate Declarations of Conformity that cover the specific products and part numbers approved. Not all of the products have been labeled for CE as of this writing, so you should check the tables in our Agency Approval list (https://cdn.automationdirect.com/ static/specs/agencyapprovals.pdf) to be sure. Please also check our Web site for the most up-to-date information on CE approvals or to obtain copies of our Declarations of Conformity.

Are there any special requirements necessary when using controller

equipment? Yes, the installation requirements to comply with the requirements of the Machinery Directive, EMC Directive and Low Voltage Directive are slightly more complex than the normal installation requirements found in the United States. First, check the Declaration for specific application conditions required.

Finally, check your user manual for EU information.

Are there any other sources of

information? Although the EMC Directive gets the most attention, other basic Directives, such as the Machinery Directive and the Low Voltage Directive, also place restrictions on the control panel builder. Because of these additional requirements, it is recommended that the following publications be purchased and used as guidelines:

- • BSI publication TH42073: February 1996 Covers the safety and electrical aspects of the Machinery Directive
- • EN60204-1:1992 General electrical requirements for machinery, including Low Voltage and EMC considerations
- IEC 1000-5-2: EMC earthing and cabling requirements
- • IEC 1000-5-1: EMC general considerations

It may be possible for you to obtain this information locally. However, the official source of applicable Directives and related standards is:

The Office for Official Publications of the European Communities at www.europa.eu.int

Another source is:

Global Engineering Documents

15 Inverness Way East Englewood, CO 80112-5776 1(800) 854-7179 (within the U.S.) (303) 397-7956 (international) (303) 397-2740 (fax)

www.global.ihs.com

The information contained in this section is intended as a guideline and is based on our interpretation of the Since the actual standards are issued by other parties and in some cases Governmental agencies, the requirements can change over time without advance warning or notice. Changes or additions to the standards can possibly invalidate any part of the information provided in this section.

Books

Following is a list of books that may be helpful to you:

Title: EMC For Systems and Installations

Authors: Tim Williams and Keith Armstrong Publisher: Newnes Woburn, MA

Title: CE From A to Z

Authors: Mette Winther Pedersen & Gert Bukkjaer Publisher: Levison & Johnson & Johnson a/s Denmark

Title: **EU Directive Handbook:** Understanding the European Union **Compliance Process and What it Means** to You

Authors: Allen R. Bailey & Melinda C. Bailev Publisher: St. Lucie Press Boca Raton, FL

Title: Practical Guide to the Low **Voltage Directive**

Authors: Gregg Kervill Publisher: Newnes Woburn, MA

C E Marking Handbook: A Title: Practical Approach to Global Safety Certification

Authors: David Lohbeck Publisher: Newnes Woburn, MA

NEC and NEMA

The National Electrical Code (NEC)

NEC provides regulations concerning the installation and use of various types of electrical equipment.

These classifications are being "harmonized" with the IEC and European Hazardous Location Ratings. A source of information about this "harmonization" is the Instrument Society of America (ISA).

Contact the ISA at:

67 Alexander Drive

RTP, NC 27709

Phone: (919)549-8411

www.isa.org

Another resource is: www.ul.com/hazloc

National Electrical Manufacturers Association (NEMA)

NEMA publishes many different documents that discuss standards for industrial control equipment. Please note that these standards are undergoing "harmonization" with the IEC and European standards and may be replaced. Global Engineering Documents handles the sale of NEMA, IEC and CE documents. For more information, please contact Global Information at:

1 (800) 854-7179 (within the U.S.)

(303) 397-7956 (international)

(303) 397-2740 (fax)

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- ICS 1, General Standards for Industrial Control and Systems
- ICS 2, Controllers, Contactors, and Overload Relays, Rated no more than 2000 Volts AC or 750 Volts DC
- ICS 3, Factory Built Assemblies
- ICS 6, Enclosures for Industrial Control Systems

National E	Electric Code (NEC) Article 500	Hazardous Location	n Classification
Class	Division	Group	
Class I Locations in which flammable gases or vapors are (or may be) present in the air in quantities great enough to produce explosive or ignitable mixtures.	DIVISION 1: Locations in which hazardous concentrations of flammable gases or vapors exist continuously, intermittently, or periodi- cally under normal conditions. -or- Locations in which hazardous concentra- tions of flammable gases or vapors may exist frequently because of repair or maintenance operations or because of leakage. -or- Locations in which breakdown or faulty operation of equipment or processes might release hazardous concentrations of flamma- ble gases or vapors. DIVISION 2: Locations in which volatile flam- mable liquids or flammable gases are handled, processed, or used, but are normally kept in closed containers and can only escape due to accidental ruptre. -or- Locations in which hazardous concen- trations of gases or vapors are normally prevented by mechanical ventilation and might become hazardous due to failure of the ventilating equipment. -or- Locations that are adjacent to Class I, Division 1 locations.	GROUP A: Atmospheres containing acetylene GROUP B: Atmospheres containing: acrolein(inhibited) butadiene ethylene oxide hydrogen gases containing more than 30% hydrogen by vol- ume propylene oxide GROUP C: Atmospheres containing: allyl alcohol carbon monoxide cyclopropane diethyl ether ethylene hydrogen sulfide methyl ether n-propyl ether or gases or vapors of equivalent hazard	GROUP D: Atmospheres containing: acetone ammonia benzene butyl alcohol ethane ethyl alcohol gasoline heptanes hexanes methyl alcohol methyl ethyl ketone (MEK) naphta octanes propane styrene toluene xylenes or gases or vapors of equivalent hazard
Class II Locations in which there are explosive mixtures of air and combustible dust.	DIVISION 1: Locations in which explosive or ignitable amounts of combustible dust are or may be in suspension of continuously, intermittently, or periodically under normal operating conditions. -or- Locations where mechanical failure or abnormal operation of machinery or equip- ment might cause explosive or ignitable mix- tures to be produced. -or- Locations in which combustible electrical- ly conductive dust is present. DIVISION 2: Locations where combustible dust deposits exist but are not likely to be thrown into suspension in the air, but where the dust deposits may be heavy enough to interfere with safe heat dissipation from elec- tric equipment. -or- Locations where combustible dust depos- its may be ignited by arcs, sparks, or burning material from electrical equipment.	GROUP E: Atmospheres co dusts regardless of resistivity ous characteristics having re- ohm-centimeter GROUP F. Atmospheres cor black, charcoal, or coke dust total volatile material or- car dusts sensitized by other ma an explosion hazard, and ha than 100 ohm-centimeter bu 100,000,000 ohm-centimeter GROUP G: Atmospheres co ity of 100,000,000 ohm-centi	ntaining combustible: metal or dusts of similarly hazard sistivity of less than 100,000 ntaining combustible: carboi s which have more than 8% bon black, charcoal, or coke terials so that they present ring a resistivity greater it equal to or less than ritaining dusts having resisti meter
Class III Locations in which there is the presence of easily-ignited fibers or flyings, but where the fibers or flyings are not likely to be in suspension in the air in quan- tities great enough to produce ignitable	DIVISION 1: Locations in which easily ignitable fibers or materials producing flyings are handled, manufactured, or used. DIVISION 2: Locations in which easily ignitable fibers are stored or handled (except in a manufacturing process).	(NOT GROUPED) Manufact clothing plants, and fiber pro Easily ignitable fibers include and jute.	urers include: textile mills, cessing plants. : Cotton, rayon, sisal, hemp,

	NEMA Electrical Enclosure Environmental Protection Ratings							
Туре	Protection	Location	Description					
1	General purpose	Indoor	Accidental contact					
2	Drip-proof	Indoor	Falling non-corrosive liquids and falling dirt (dripping and light splashes)					
3	Dust-tight, rain-tight	Outdoor	Windblown dust, water, and sleet; ice-resistant					
3R	Dust-tight, rain-tight	Outdoor	Same as above, plus melting of sleet/ice will not damage external enclosure or mechanisms					
4	Water-tight/dust-tight	Indoor/ outdoor	Splashing water, outdoor seepage of water, falling or hose-directed water					
4X	Water-tight/dust-tight	Indoor/ outdoor	Same as above, plus corrosion resistant					
5	Dust-tight	Indoor	Dust and falling dirt					
6	Water-tight/dust-tight	Indoor/ outdoor	Temporary entry of water limited submersion, formation of ice on enclosure					
6P	Water-tight/dust-tight	Indoor/ outdoor	Same as previous, plus prolonged submersion					
7	Explosion proof/Class I Group D Hazardous Locations	Indoor	Hazardous chemicals and gases					
9	Explosion proof/Class II Hazardous Locations	Indoor	Hazardous dust					
11	Drip-proof/corrosion Resistant	Indoor	Oil immersion, corrosive effects of liquids and gases					
12	Drip-tight/dust-tight	Indoor	Fibers, lint, dust, and splashing, and dripping condensation of non-corrosive liquids					
13	Oil-tight/dust-tight	Indoor	Dust, spraying of water, oil, and non-corrosive coolant					

How to interpret IP Ratings

The first number defines the degree of protection against penetration of solid objects into the housing.

The second number defines the degree of protection against penetration of liquid into the housing.

IP-67 (sample IP rating)

First Number	Level of Protection
X	Not evaluated
0	No protection against contact or entry of solids
1	Protection against accidental contact by hand, but not deliberate contact. Protection against large foreign objects. 1: >/= 50mm 2: >/= 12.5 mm 3: >/= 2.5 mm 4: >/= 1.0 mm
2	Protection against contact by fingers. Protection against medium- size foreign objects. 1: >/= 50mm 2: >/= 12.5 mm 3: >/= 2.5 mm 4: >/= 1.0 mm
3	Protection against contact by tools, wires, etc. Protection against small foreign objects 1: >/= 50mm 2: >/= 12.5 mm 3: >/= 2.5 mm 4: >/= 1.0 mm
4	Protection against contact by small tools and wires. Protection against small foreign objects 1: >/= 50mm 2: >/= 12.5 mm 3: >/= 2.5 mm 4: >/= 1.0 mm
5	Complete protection against contact with live or moving parts. Protection against harmful deposits of dust.
6	Complete protection from live or moving parts. Protection against penetration of dust.

Second Number	Level of Protection
X	Not evaluated
0	No Protection
1	Protection against drops of condensed water. Condensed water falling on housing shall have no effect.
2	Protection against drops of liquid. Drops of falling liquid shall have no effect when housing is tilted to 15° from vertical.
3	Protection against rain. No harmful effect from rain at angles less than 60° from vertical.
4	Protection against splashing from any direction.
5	Protection against water jets from any direction.
6	Protection against conditions on ships and decks. Water from heavy seas will not enter.
7	Protection against immersion in water. Water will not enter under stated conditions of pressure and length of time.
8	Protection against indefinite immersion in water under a specified pressure.
8K	Protection against indefinite immersion in water under a specified pressure.
9	Protection against indefinite immersion in water under a specified pressure.
9K	Protection against high-pressure/steam-jet cleaning.

Additional information on IP ratings can be found in the 1976 IEC Publication: Classification of Degrees of Protection Provided by Enclosures or at www.iec.ch. Example: What is IP-67? Complete protection of live parts, protection against the penetration of dust. Additionally, protection while immersed in water.

1-800-633-0405 IEC Utilization Categories

	IEC Utilization Categories for Low Voltage Switchgear and Control Gear						
Current	Category	Typical Applications	Relevant IEC Product Standard				
	AC-1	Non inductive or slightly inductive loads, resistance furnaces, heaters					
	AC-2	Slip-ring motors: switching off					
	AC-3	Squirrel-cage motors: starting, switching off motors during running most typical industrial application					
	AC-4	Squirrel-cage motors: starting, plugging (1), inching (2)					
	AC-5a	Switching of electric discharge lamps					
	AC-5b	Switching of incandescent lamps	60047 4				
	AC-6a	Switching of transformers	00947-4				
	AC-6b	Switching of capacitor banks					
	AC-7a	Slightly inductive load in household appliances: mixers, blenders					
40	AC-7b	Motor-loads for household applications: fans, central vacuum					
AC	AC-8a	Hermetic refrigerant compressor motor control with manual resetting overloads					
	AC-8b	Hermetic refrigerant compressor motor control with automatic resetting overloads					
	AC-12	Control of resistive loads and solid state loads with opto-coupler isolation					
	AC-13	Control of solid state loads with transformer isolation	60947-5				
	AC-14	Control of small electromagnetic loads					
	AC-15	Control of AC electromagnetic loads					
	AC-20	Connecting and disconnecting under no-load conditions					
	AC-21	Switching of resistive loads, including moderate loads	60947-3				
	AC-22	Switching of mixed resistive and inductive loads, including moderate overloads					
	AC-23	Switching of motor loads or other highly inductive loads					
AC and DC	А	Protection of circuits, with no rated short-time withstand current	60047-2				
	В	Protection of circuits, with a rated short-time withstand current	00347-2				
	DC-1	Non-Inductive or slightly inductive loads, resistance furnaces, heaters					
	DC-3	Shunt-motors, starting, plugging (1), inching (2), dynamic breaking of motors					
	DC-5	Series-motors, starting, plugging (1), inching (2), dynamic breaking of motors	60947-4				
	DC-6	Switching of incandescent lamps					
	DC-12	Control of resistive loads and solid state loads with opto-coupler isolation					
DC	DC-13	Control of DC electromagnetics					
	DC-14	Control of DC electromagnetic loads having economy resistors in the circuit	60947-5				
	DC-20	Connecting and disconnecting under no-load conditions					
	DC-21	Switching of resistive loads, including moderate overloads					
	DC-22	Switching of mixed resistive and inductive loads, including moderate overloads (i.e., shunt motors)	60947-3				
	DC-23	Switching of highly inductive loads (i.e,. series motors)					

Reference material only. Please see Wiring Section in the catalog for product part number.

2-Pole 2-Wire



2-Pole 3-Wire Grounding



3-Pole 3-Wire Continued



3-Pole 4-Wire Grounding



3ø250V AC



3ø480V AC



3-Pole 4-Wire Grounding Continued



4-Pole 4-Wire

3øY120/208V AC



3øY277/480V AC



3øY 347/600V AC



1-800-633-0405 For the latest prices, please check Automation

4-Pole 5-Wire Grounding



3øY 277/480V AC





1-800-633-0405 Product Compatibility

Compatible products

Here's a brief list to help you identify compatible products.

DirectLogic	Compatible
DL05	None
DL06	None
DL105	None
DL205	None
DL305	GE Series 1 TI 305 Simatic TI 305
DL405	TI 405 Simatic TI405

Compatible communication drivers

DirectLogic	Compatible
DirectNet	CCM (GE) Hostlink (TI/Siemens)

A driver created for a compatible PLC will probably work with our PLCs. However, some of our newer CPUs have more memory than similar products offered by previous vendors. If using one of their drivers, make sure you ask if their driver performs memory range checking. If it does, then you may not be able to access all of the memory locations.

Communication protocols

Some vendors may specify a communication protocol instead of a PLC family name. Use the chart shown on this page to help you identify the protocol and PLC port usage.

	CPU/ device	Port	Protocol				
		Port 1	K-sequence, <i>Direct</i> NET and Modbus RTU slave				
	D0-05	Port 2	K-sequence slave, <i>Direct</i> NET and Modbus RTU master/slave				
DL05	50.00	Port 1	K-sequence, <i>Direct</i> NET and Modbus RTU slave				
DL06	D0-06	Port 2	K-sequence slave, <i>Direct</i> NET and Modbus RTU master/slave				
	D0 DOM	Port 1	K-sequence, <i>Direct</i> NET and Modbus RTU slave				
		Port 2	K-sequence slave, <i>Direct</i> NET and Modbus RTU master/slave				
DL105	F1-130	Only one	K-sequence slave				
	D2-230	Only one	K-sequence slave				
	D2 240	Top port	K-sequence slave				
	D2-240	Bottom port	K-sequence and <i>Direct</i> NET slaves				
		Top port	K-sequence, <i>Direct</i> NET and Modbus RTU slaves				
DI 205	D2-250-1	Bottom port	K-sequence slave, <i>Direct</i> NET and Modbus RTU master/slave				
DL205		Top port	K-sequence, <i>Direct</i> NET and Modbus RTU slaves				
	D2-260\D2-262	Bottom port	K-sequence slave, <i>Direct</i> NET and Modbus RTU				
	D2-DCM (module used with D2-240, D2-250-1, D2-260, and D2-262)	Only one	K-sequence slave <i>Direct</i> NET master/slave Modbus RTU slave				
	D3-330	Requires DCU	DirectNET slave				
	D3-330P	Requires DCU	DirectNET slave				
		Top port	DirectNET slave				
205	D3-340	Bottom port	<i>Direct</i> NET master/slave Modbus RTU slave				
DL303		Top port	K-sequence and <i>Direct</i> NET slave				
	D3-350	Bottom port	K-sequence slave, <i>Direct</i> NET and Modbus RTU master/slave				
	D3-DCM (module used with D3-350 CPU)	Only one	K-sequence slave <i>Direct</i> NET master/slave Modbus RTU slave				
		Top port (15-pin)	K-sequence slave				
	D4-430	Bottom port (25-pin)	K-sequence and <i>Direct</i> NET slave				
	D4 440	Top port (15-pin)	K-sequence slave				
	D4-440	Bottom port (25-pin)	K-sequence and <i>Direct</i> NET slave				
DL405		Phone jack	K-sequence and <i>Direct</i> NET slave				
	D4-450\D4-454	Top port (15-pin)	K-sequence slave				
		Bottom port (25-pin)	K-sequence slave, DirectNET and Modbus RTU master/slave				
	D4-DCM (module)	Only one	K-sequence slave Direct NET master/slave Modbus PTL slave				

SIdirect: System Integrator Program

Do you need local service and support for your AutomationDirect equipment?

Would you like help planning and installing an AutomationDirect project?

Check out Sldirect, The AutomationDirect System Integrator Program!

To extend our award-winning customer service and support into the field, we've formed a team of qualified system integrators who are ready to help. Whether you need an integrator to design, build, and install your next automation project, or someone to troubleshoot your existing machinery, simply contact one of our authorized system integrators. You can be assured you're dealing with a company that has the expertise and experience to tackle your automation challenges.

View our list of integrators at **www.automationdirect.com/si** or use the link on our homepage to access the System Integrator section. There, search for integrators by geographical region, product expertise or industry experience.

Not sure which integrator is right for your particular project? We'll be happy to assist you; just email us at systemintegration@automationdirect.com.

Attention Integrators!

Are you a reputable system integrator with a proven history of installing and servicing AutomationDirect components? If so, think about joining our team of integrators! At **www. automationdirect.com/si**, you can take a look at Sldirect, our authorized System Integrator Program. There you can view the benefits and requirements associated with becoming an authorized SI, and submit an application.

If your company has expertise with our wide array of industrial control components, and wants to enter into a mutually beneficial relationship with AutomationDirect, we want to hear from you!

