Instruction Manual
LX7/LX7s

LARSEN & TOUBRO LIMITED

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Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will L&T Controls be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, L&T Controls cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by L&T Controls with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances which may lead to serious personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION 	Identifies information about practices or circumstances that can lead to minor personal injury, property damage, economic loss, or product malfunction. However, depending on circumstances, failure to follow the directions accompanying this symbol may also lead to serious consequences.

Safety Instructions

Please read this manual and the related documentation thoroughly and familiarize yourself with the directions before installing, operating, performing inspection and preventive maintenance. Make sure to follow the directions correctly to ensure normal operation of the product and your safety.

WARNING

- When designing a system using this product, consider proper prevention against external environmental fluctuations, power failure and noise, etc., in accordance with installation requirements. Design and implement an external circuit that allows your system to operate continually and safely in any system failure.
- Make sure to disconnect the external power to the product before performing mounting, wiring, inspection, maintenance and cleaning. Never touch the power terminal when the power is on. Otherwise, it may cause an electrical shock.
- Do not connect AC-powered products to a DC I/O terminal. Do not connect externally- powered products to an internal 24V DC output terminal.
- If you need to perform a special operation during run, such as program editing, operation control or forced output, make sure to perform it after ensuring safety.
- Do not connect an external device or a hand-held programmer (HHP) that uses internal power to the product when running. Make sure to stop the system and ensure safety before connecting them.
- Make sure to use an external device to PLC when configuring the protective circuit breakers for emergencies.
- When the self-diagnostics functionality detects an error, such as internal arithmetic error, watchdog time error, and/or connection failure, power continues to be provided to the controller's power supply so that your system still works. Design and configure the circuits so that your system runs safely under those conditions.
- The internal 24V DC power supplied to the circuits inside the PLC may have voltage fluctuations, depending on the volume of load. These voltage fluctuations may cause malfunction of the PLC or I/O devices connected. Therefore, use the internal power within the allowed rating.

WARNING

- Do not apply an impact to the terminal blocks or the product itself when the power is ON. Otherwise, it may cause malfunction and failure of the product, or electrical shock.
- Operate and keep the product under the allowed conditions directed in product specifications. During installation, be sure that all debris (metal chips, wire stands, etc) is kept from falling into the product.
- Do not expose to high temperature, high humidity, dusty conditions, salt, metal chips, corrosive gas, inflammable gas, solvents, abrasive oil, and/or direct sunlight.
- Avoid vibrations and crashes with other subjects. Otherwise, it may cause a fire, damage, malfunction or aging to the products.
- Fix cables as directed in the wiring instructions. We recommend you do not connect the line to the terminals marked the symbol' ● '.
- When wiring with the terminal block, use the following specifications : Screw:3.0 M, Torque:0.5 N.m (5 kgf.cm) Terminal width :6.35 mm or less (0.25 in)

- Input/output and communication cables should be separated from power cables. Give at least 200 mm space between them. Otherwise, generated noise may cause product malfunction.
- We recommend installing a insulation transistor near the front of the PLC. Make sure to use twisted cables to prevent input noise.
- For frame grounding, perform class 3 grounding at 100W or less ground resistance or independent class D grounding using a $2mm^2$ or larger cable. Do not perform common grounding to high voltage devices.
- Do not disassemble or remodel the product. If you need to repair the product, contact the service center.
- This manual does not include detailed explanation on all of the instructions and functions supported by the product. Please refer to other related manuals for more information.
- When disposing the product, make sure to follow your local regulations and guidelines on industrial waste disposal.

Overview

LX7 Base Controllers

Catalog number	Input power	I/O specifications	Remarks
LX7-28ADR	100 to 240V ac power supply	16-point dc input 12-point relay output	• Built-in 9k steps memory • Several μs per step processing speed • Built-in 1 HSC input channel • Built-in 2 pulse output channels built in • 2 communication ports • Expandable to up to two expansion modules (NOTE: Some relevant contacts are unavailable when HSC input or pulse output channels are used.)
LX7-28ADT		16-point dc input 12-point TR output	
LX7-48ADR		28-point dc input 20-point relay output	
LX7-48ADT		28-point dc input 20-point TR output	
LX7-28DDR	24V dc power supply	16-point dc input 12-point relay output	
LX7-28DDT		16-point dc input 12-point TR output	
LX7-48DDR		28-point dc input 20-point relay output	
LX7-48DDT		28-point dc input 20-point TR output	
LX7-20ADR-4A	100 to 240V ac power supply	12-point dc input 8- point relay output 4 Ch. Analog input	
LX7-20ADR-6A		12-point dc input 8- point relay output 4 Ch. Analog input 2 Ch. Analog output	
LX7-20ADT-4A		12-point dc input 8- point TR output 4 Ch. Analog input	
LX7-20ADT-6A		12-point dc input 8- point TR output 4 Ch. Analog input 2 Ch. Analog output	

LX7s Base Controllers

Catalog number	Input power	I/O specifications	Remarks
LX7s-10ADR	100 to 240V ac power supply	6-point dc input 4-point relay output	• Built-in 2k steps memory • Several μs per step processing speed • Built-in 1 HSC input channel • Built-in 2 pulse output channels built in • 2 communication ports COM1: RS232C COM2: RS485 • Expansion unsupported (NOTE: Some relevant contacts are unavailable when HSC input or pulse output channels are used.)
LX7s-10ADT		6-point dc input 4-point TR output	
LX7s-14ADR		8-point dc input 6-point relay output	
LX7s-14ADT		8-point dc input 6-point TR output	
LX7s-20ADR		12-point dc input 8-point relay output	
LX7s-20ADT		12-point dc input 8-point TR output	
LX7s-28ADR		16-point dc input 12-point relay output	
LX7s-28ADT		16-point dc input 12-point TR output	
LX7s-40ADR		24-point dc input 16-point relay output	
LX7s-40ADT		24-point dc input 16-point TR output	
LX7s-48ADR		28-point dc input 20-point relay output	
LX7s-48ADT		28-point dc input 20-point TR output	

Expansion Modules

Catalog number	Input power	I/O specifications	Remarks
LX7-14EDR	24V dc power supply	8-point dc input 6-point relay output	• 8-point 24V dc input • 6-point relay output 2A per point
LX7-14EDT	24V dc power supply	8-point dc input 6-point TR output	• 8-point 24V dc input • 6-point TR output 0.4A per point
LX7-28EDR	24V dc power supply	16-point dc input 12-point relay output	• 16-point 24V dc input • 12-point relay output 2A per point
LX7-28EDT	24V dc power supply	16-point dc input 12-point TR output	• 16-point 24V dc input • 12-point TR output 0.4A per point

Programming Software

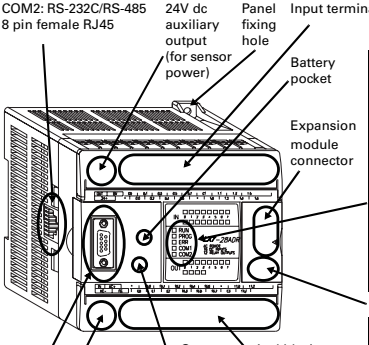
Catalog Number	Specifications	Remarks
LX Soft 4 (Windows)	Allows you to perform the following tasks on a remote computer: • PLC program editing and monitoring • file management • program backup • online editing (instruction change only) • error and status check-up • network status check-up • I/O mapping • time chart monitoring	For Windows NT/ 2000/XP

Cables

Catalog number	Specifications	Remarks
LX_CBLCPU02	PLC to PC communication (LX Soft 4) cable length: 2 m	Communication cable for both RS232C and RS485
LX_CBLCPU05	Same functions with LX_CBLCPU02 cable length: 5 m	

Hardware Features

LX7



Status LEDs

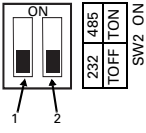
LED	Description
RUN	On when processor is in operation. Flashes when processor is pausing.
PROG	On when the program can be modified or downloaded.
ERR	On when processor fault is detected. Flashes when battery is not installed or needs to be replaced.
COM1 COM2	On when power is supplied normally. Flashes when communication is progressing via the port

Operation mode switch

Position	Description
RUN	Processor is in operation. Program editing is not allowed.
RMT	Remote program mode. Run or pause operation, program editing and downloading are allowed.
PROG	Processor is in stop mode. Program editing is allowed.

COM1 DIP Switch (SW2)

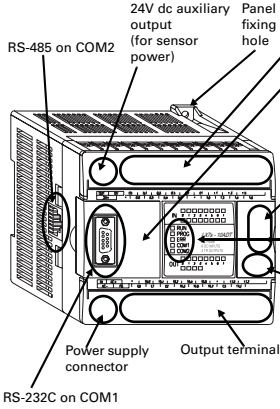
Open the communication housing case and adjust the DIP switch as follows :



No.	Status	Description
1	Off	Enables RS-232C communication for COM1
	On	Enables RS-485 communication for COM1 (Used for hand-held programmer and multi-drop connections, etc.)
2	Off	Disables termination for RS-485 communication
	On	Enables termination for RS-485 communication

Hardware Features

LX7s



Status LEDs

LED	Description
RUN	On when processor is in operation. Flashes when processor is pausing.
PROG	On when the program can be modified or downloaded.
ERR	On when processor fault is detected. Flashes when battery is not installed or needs to be replaced.
COM1 COM2	On when power is supplied normally. Flashes when communication is progressing via the port

Operation mode switch

Position	Description
RUN	Processor is in operation. Program editing is not allowed.
RMT	Remote program mode. Run or pause operation, program editing and downloading are allowed.
PROG	Processor is in stop mode. Program editing is allowed.

IMPORTANT

- Use of the COM1 DIP switch is applicable for LX7 controllers only.
  LX7s controllers only support RS-232C on COM1 and only support RS-485 on COM2.
- The baud rate is automatically detected and adjusted within the range of 4800 to 38400 bps. If there is no communication for more than one minute, the speed is automatically detected and configured again.
- Termination resistance is connected to the end of the communication line to remove mutual communication interferences or signal distortions that can occur between connected controllers and peripherals.
- Use an external connector for termination for COM2 port.

Installation

Installation Environment

ATTENTION

Do not install your PLC system if any of the following conditions are present.

- Ambient temperature outside the range of 0 to 55° C (32 to 131° F).
- Direct sunlight.
- Humidity outside the range of 30% to 85% (non-condensing)
- Chemicals that may affect electronic parts.
- Excessive or conductive dust, or salinity.
- High voltage, strong magnetic fields, or strong electromagnetic influences.
- Direct impact and excessive vibration.

ATTENTION

Electrostatic Discharges

Under dry condition, excessive electrostatic discharges may occur. Make sure to remove electrostatic discharges by touching a grounded metal piece before touching your controller system modules.

ATTENTION

Cleaning

Never use chemicals such as thinner because they melt, deform or discolor PCB boards.

ATTENTION

Precautions for use of power

- Run your PLC system only after the I/O devices and motor devices have started. (For example, first power on in the PROG mode, then change the operation mode to RUN.)
- Make sure to power off I/O devices after ensuring PLC operation is stopped.
  If you power on/off I/O devices when the PLC system is in operation, the system may malfunction because input signal noises may be recognized as normal inputs.

ATTENTION

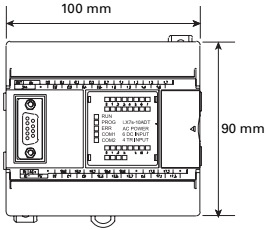
Before powering on

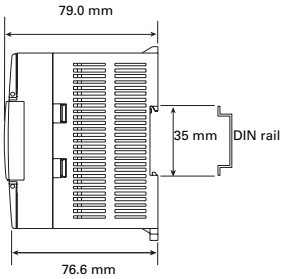
Make sure to follow these directions before powering on your PLC system.

- When installing the system, ensure that there are no metal chips or conductive fragments that stick to wiring cables.
- Ensure that power supply and I/O wirings and power supply voltage are all correct.
- Securely fasten installation and terminal screws.
- Set the operation mode switch to PROG mode.

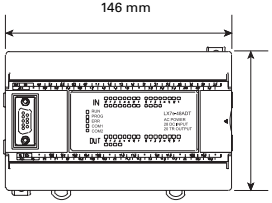
Controller Dimensions

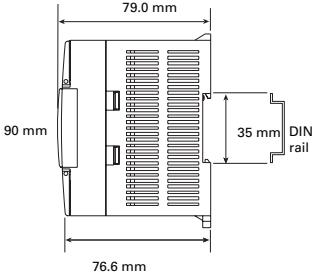
- LX7s-10xxx
- LX7s-14xxx
- LX7s-20xxx
- LX7/LX7s-28xxx





- LX7/LX7s- 40xxx
- LX7/LX7s- 48xxx
- LX7-20xxx-4A
- LX7-20xxx-6A

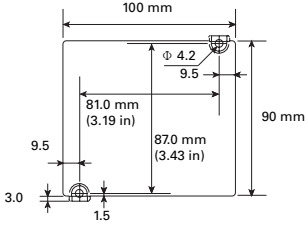




Mounting Dimensions

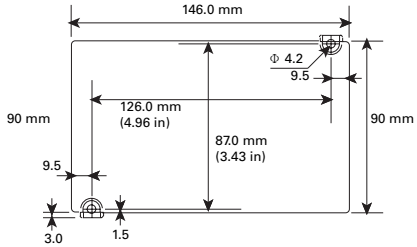
- LX7s-10xxx
- LX7s-14xxx
- LX7s-20xxx
- LX7/LX7s-28xxx
- LX7-14Exx
- LX7-28Exx

unit: mm



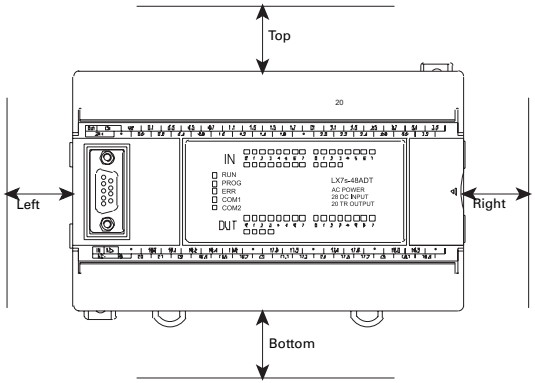
- LX7/LX7s- 40xxx
- LX7/LX7s- 48xxx
- LX7-20xxx-4A
- LX7-20xxx-6A

unit: mm



Mounting Spacing

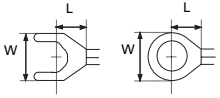
Allow at least 50 mm (2 in.) space on all sides of the controller for adequate ventilation, as shown below.



Wiring

Wire Requirements

- Use the terminals that comply with the specifications given below.
- Set terminal wiring torque to from 5 to 7kgfcm.
- Use wiring cables of #16 to #22 AWG.



Terminal size
W = 6.35 mm (0.25 in) or less
L = 6.35 mm (0.25 in) or less

Solderless terminal	Wiring torque
M3.0	0.5 to 0.7 Nm (5 to 7 kgfcm)

ATTENTION

Set terminal wiring torque to within the specified range (0.5 to 0.7 Nm) when wiring with terminal block. Otherwise, it may cause terminal block damage or contact defects leading to product damage or personal injury.

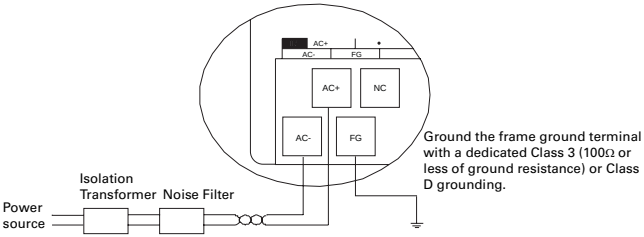
WARNING

Make sure to disconnect power to the controller system before performing installation, wiring, maintenance and cleaning. Never touch the power terminals when the power is on. Otherwise it may cause electrical shock.

Route wires of different signal characteristics by separate paths. Separate incoming power to the controller by a path separate from the I/O device wiring. Shield the signal lines to prevent noises which can cause product malfunction.

AC Power Supply Wiring

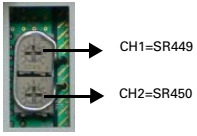
Make sure to connect to the controller system a stable power that has voltage fluctuations within 10% deviation from the rated input voltage. The frame ground terminal must be grounded with Class 3 (100Ω or less of ground resistance) or Class D grounding to prevent voltage mixing between the frame ground and the power input terminals.



NOTE: If the secondary side of the isolation transformer and the noise filter is too far from the controller system and noise becomes excessive, it does not have any significant effect.

Trim Pot for LX7s-10, 14

There are two analog Trim Pots on LX7s-10 and LX7s-14.



The 8bit-data trim pots has a range between 0 and 255. Channel 1 can be read from SR449. Channel 2 can be read from SR450.

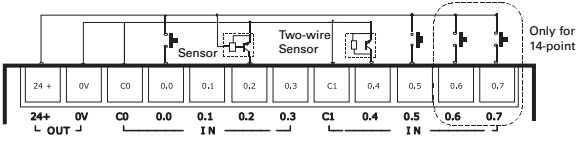
Digital Input Wiring Diagrams

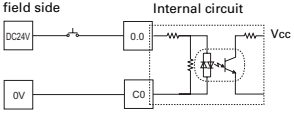
IMPORTANT

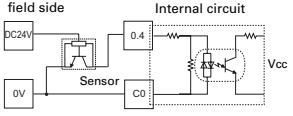
In the following input wiring diagrams,

- “NC” terminals are not intended for use as connection points.
- Using a two-wire sensor may need an additional circuit configuration so that total current consumption does not exceed the allowable current consumption.
- For all LX7 and LX7s controllers, all the commons on the input terminal block are isolated internally with each other.

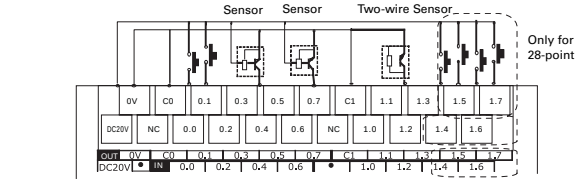
-COM Wiring Example Using a 10, 14-point Controller

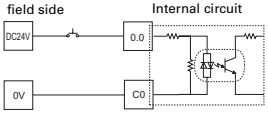


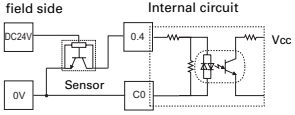




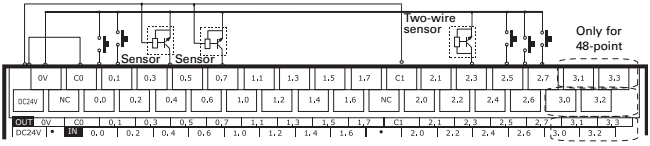
- COM Wiring Example Using a 20, 28-point Controller

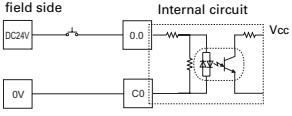


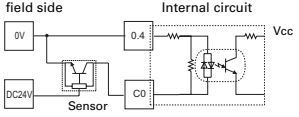




+COM Wiring Example Using a 40, 48-point Controller







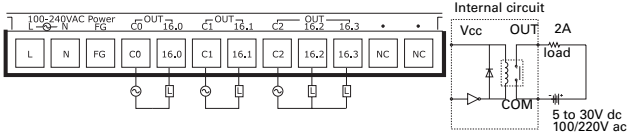
Digital Output Wiring Diagrams

IMPORTANT

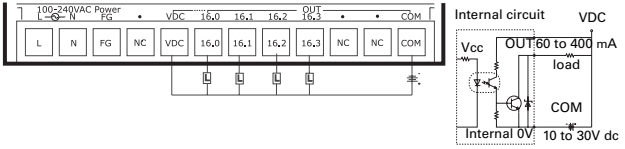
In the following output wiring diagrams,

- "NC" terminals are not intended for use as connection points.
- For all relay output controllers (LX7-xxxxR and LX7s-xxxxR controllers), all the commons on the output terminal block are isolated internally each other.
- For all transistor output controllers (LX7-xxxxT and LX7s-xxxxT controllers), all the commons on the output terminal block are connected internally, that is, they are not isolated each other.

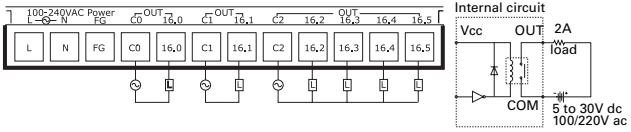
LX7s-10ADR Output Wiring Diagrams



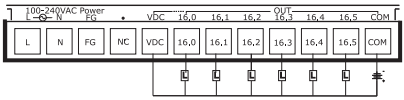
LX7s-10ADT Output Wiring Diagrams

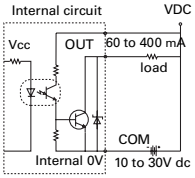


LX7s-14ADR Output Wiring Diagrams

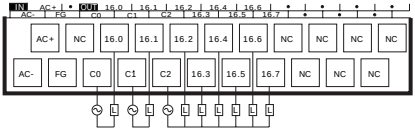


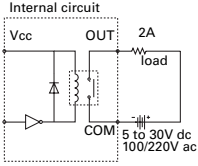
LX7s-14ADT Output Wiring Diagrams



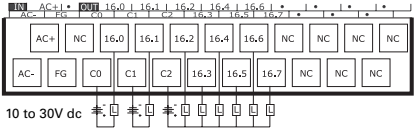


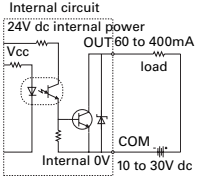
LX7s-20ADR Output Wiring Diagrams



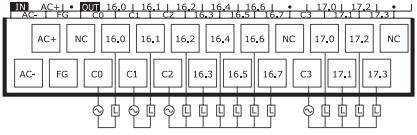


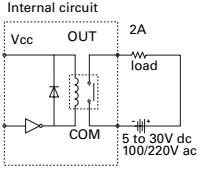
LX7s-20ADT Output Wiring Diagrams



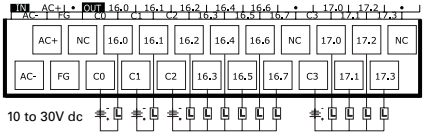


LX7-28ADR, LX7s-28ADR Output Wiring Diagrams

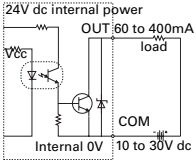




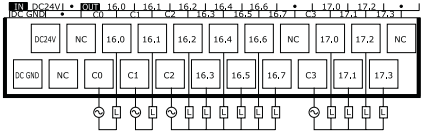
LX7-28ADT, LX7s-28ADT Output Wiring Diagrams



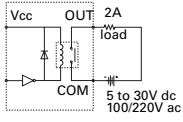
Internal circuit



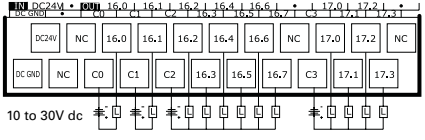
LX7-28DDR Output Wiring Diagrams



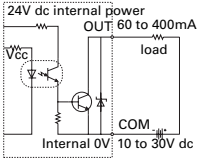
Internal circuit



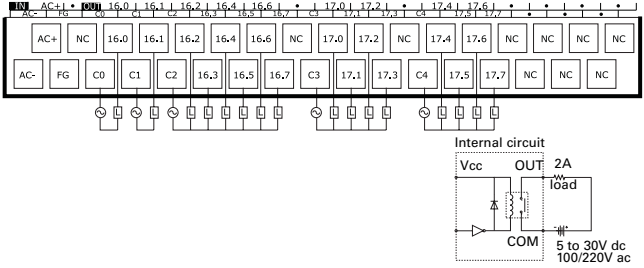
LX7-28DDT Output Wiring Diagrams



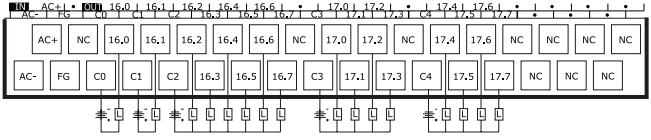
Internal circuit



LX7s-40ADR Output Wiring Diagram

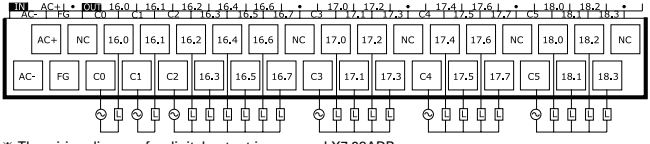


LX7s-40ADT Output Wiring Diagram



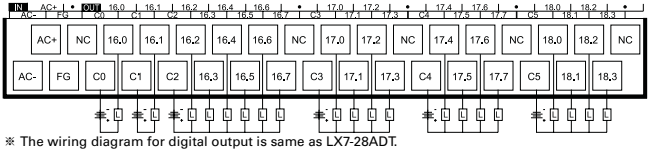
※ The wiring diagram for digital output is same as LX7-28ADT.

LX7-48ADR, LX7s-48ADR Output Wiring Diagram



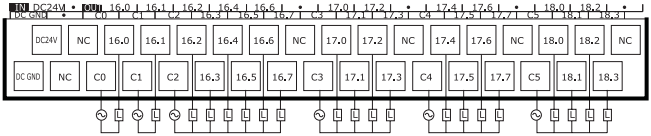
※ The wiring diagram for digital output is same as LX7-28ADR.

LX7-48ADT, LX7s-48ADT Output Wiring Diagram



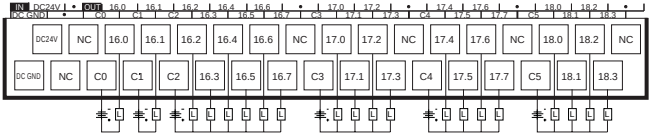
※ The wiring diagram for digital output is same as LX7-28ADT.

LX7-48DDR Output Wiring Diagram



※ The wiring diagram for digital output is same as LX7-28ADR.

LX7-48DDT Output Wiring Diagram

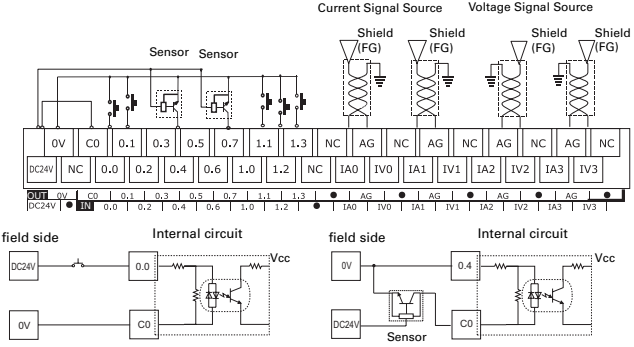


※ The wiring diagram for digital output is same as LX7-28ADT.

Analog Input Wiring Diagrams

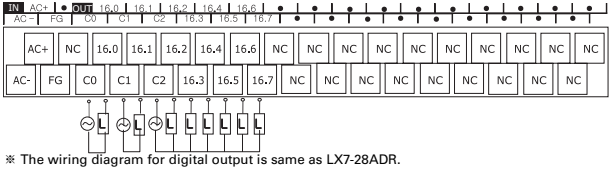
+COM/ Analog Wiring Example with the following models

- LX7-20ADR - 4A
- LX7-20ADR - 6A
- LX7-20ADT - 4A
- LX7-20ADT - 6A



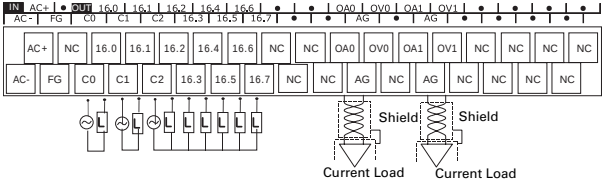
Analog Output Wiring Diagrams

Relaly/ Analog Wiring Example with LX7-20ADR-4A



※ The wiring diagram for digital output is same as LX7-28ADR.

Relay/ Analog Wiring Example with LX7-20ADR-6A

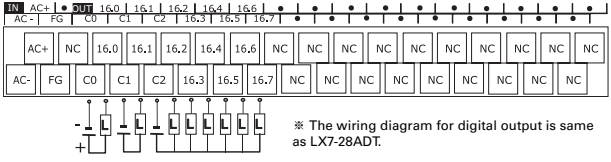


※ The wiring diagram for digital output is same as LX7-28ADR.

Current Load Device (Impedance below 500 Ω)

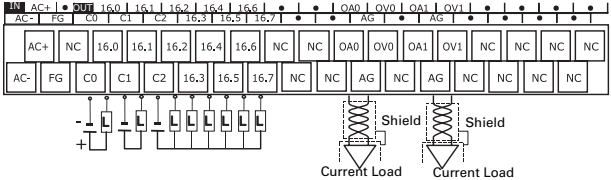
Current Load Device (Impedance below 500 Ω)

TR/ Analog Wiring Example with using LX7-20ADT-4A



※ The wiring diagram for digital output is same as LX7-28ADT.

TR/ Analog Wiring Example with LX7-20ADT-6A



※ The wiring diagram for digital output is same as LX7-28ADT.

Current Load Device (Impedance) below 500 Ω)

Current Load Device (Impedance) below 500 Ω)

Specifications

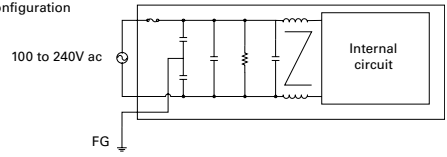
General Specifications

Item		Specifications
Temperature	Operating	0 to 55° C
	Storage	-20 to 70° C
Humidity	Operating	10 to 90% RH (Non-condensing)
Withstand voltage		1500V ac for 1 minute between external terminal (ac) and frame ground (FG)
Allowed momentary power failure		20 ms or less
Noise immunity		1500 Vp-p pulse width 50 ns, 1 μs (generated by noise simulator)
Insulation resistance		10 MΩ
Vibration immunity		10 to 55 Hz /1 min, amplitude 0.75 mm, each direction of X, Y, Z for 10 min
Dust condition		No conductive dust
Chemicals		No cutting oil and organic solvents
Corrosive gas		No corrosive gas
Shock immunity		98m/s^2 or more, 4 times X, Y, Z each direction
Grounding		Class 3 grounding (100Ω or less)
Case material		PC/ABS
Cooling method		Natural air cooling
Ambience		IP20 (No corrosive gas, no excessive dust)

Power Supply Specifications

Item	AC input power		DC input power	
Catalog Number	LX7_28Axx LX7_48Axx LX7-20Axx-4A LX7-20Axx-6A LX7s_20Axx LX7s_28Axx LX7s_40Axx LX7s_48Axx	LX7s_10Axx LX7s_14Axx	LX7_28Dxx LX7_48Dxx	LX7s_10Dxx LX7s_14Dxx
Rated voltage	100 to 240V ac, free voltage		24V dc	24V dc
Allowable voltage range	85 to 264V ac		24V ± 10% dc	24V ± 10% dc
Maximum Power Consumption	33 Watts	17.6 Watts	33 Watts	6 Watts
Input power frequency	47 to 63 Hz		-	-
Inrush current	AC 120V 25A for 8ms AC 240V 40A for 4ms		20A or less	20A or less
Rated external output	0.4A at 24V	0.3A at 24V	Same power as 24V input	-

AC power circuit configuration



Performance Specifications

Controller		LX7 SERIES	LX7s SERIES
Control method		Stored program, cyclic operation	
External Input/output		Base 20/28/48 points. 14/28 expansion points. Expandable to up to two expansion modules	Expansion unsupported
Instructions	Basic	28 types	
	Advanced	139 types	
Processing speed	Basic	Several μs per step	
	Advanced	Several to several tens of μs per step	
Program capacity		9k words	2k words
Memory size	I/O (R)	R000.00 to R31.15 (512 points, 32 words)	
	Special internal contact (R)	R032.00 to R127.15 (1436 points, 96 words)	
	Link contact (L)	L000.00 to L063.15 (1024 points, 64 words)	
	Internal contact (M)	M000.00 to M127.15 (2048 points, 128 words)	
	Keep contact (K)	K000.00 to K127.15 (2048 points, 128 words)	
	Special contact (F)	F000.00 to F015.15 (256 points, 16 words)	
	Timer/Counter (TC or TIM)	256 channels (Timer + Counter), Set value range: 0 to 65535 Timer: 0.01 second: TC000 to TC063 (64 channels) 0.1 second: TC064 to TC255 (192 channels) Counter: TC000 to TC255 (256 channels)	
	Data register (W)	-W0000 to W2047 (2048 words) -Power fail program & data backup	-W0000 to W2047 (2048 words) -Power fail program backup
	Special register(SR)	SR000 to SR511 (512 words)	

Controller		LX7 SERIES	LX7s SERIES
Communi-cations	Speed	9600, 19200, 38400, 4800 bps, auto baud. (Manual baud rate selection with CPU version 2.2 or later)	
	Port	Port1: RS232C/RS485, 9-pin female D-SUB Port2: RS232C/RS485, 8-pin modular terminal	Port1: RS232C, 9-pin female D-SUB Port2: RS485, 8-pin modular terminal
	Number of ports	2 ports	
	Supporting functions	- 2 or 4 step communications protocol (Port 1 and 2) - Modbus slave (Port 1 and 2) - User-defined communications (Port 2)	
Special functions	High-speed counter	1 channel/32 bits built-in, single phase 8K, two-phase 4K	
	Pulse output	Built-in 5 KHz 2 channels (TR output controllers) Built-in PTO Function (with firmware version 2.3 or later) Acceleration/Deceleration (with firmware version 2.3 or later)	
	Input pulse catch	4 contacts built-in	
Others	RTC	Built-in	-
	PID	Supports 8 loop PID control	
Programm-ing Tools	Programming S/W	Supports LX Soft 4 or higher for Windows	Supports LX Soft 4 or higher for Windows
Memory backup		Battery backup, Backup using flash ROM	Backup using flash memory (Battery is unnecessary for LX7s-10xxx and LX7s-14xxx.)

Input Specifications

Item		DC input
Input type		DC voltage
Insulation method		Photocoupler
Rated input voltage		12 to 24V dc
Voltage range		10.8 to 26.4V
Max. input current		10 mA or less
Min. On voltage/current		10.0V or more/3.0 mA or more
Max. Off voltage/current		5V or less/0.6 mA or less
Input impedance		Approx. 3.6 K
Response time	Off → On	2 ms or less
	On → Off	2 ms or less
Internal current consumption		50 mA or less at 5V
Polarity		None
Common method		8 points per common or 16 points per common
Status display		LED
External connection method		Terminal block (M3.0), terminal width: 6.4 mm or less
Recommended wire size		0.5 to 1.25 mm^2

Output Specifications

Relay Output

Item		Relay output controllers
Catalog number		LX7x-xxxxR
Insulation method		Relay insulation
Rated input voltage		250V ac, 30V dc
Load voltage range		85 to 264V ac, 10 to 30V dc
Max. load current		2A per point. 6A per common (for 6 points)
Response time	Off → On	10 ms or less
	On → Off	10 ms or less
Surge absorber		Not applicable
Common method		1, 4 and 6 points per common
Status display		LED
External connection method		Terminal block (M3.0), terminal width: 6.4 mm or less
Recommended wire size		0.5 to 1.25 mm^2

Transistor Output

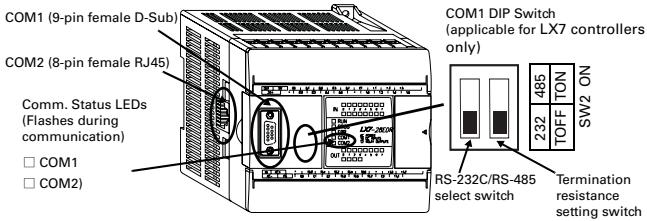
Item		Transistor output controllers
Catalog number		LX7x-xxxxT
Insulation method		Photocoupler
Rated load voltage		12 to 24V dc
Load voltage range		10 to 30V dc
Polarity		- common (Sink type, NPN)
Max. load current		0.4A per point, 1.0A per common
Max. inrush current		3A, 10 ms or less
Off state leak current		100 μA or less
Response time	Off → On	1 ms or less
	On → Off	1 ms or less
Common method		1, 4, and 6 points per common
Status display		LED
External connection method		Terminal block (M3.0), terminal width: 6.4 mm or less
Recommended wire size		0.5 to 1.25 mm^2

Analog Input/Ouput Specifications

Item	Analog Input		Analog Output	
	Voltage	Current	Voltage	Current
Input Range	0 to 10V DC	0 to 20 mA	0 to 10V	0 to 20 mA
Converter	12 Bit		12 Bit	
Channel	4 Ch.[1]		2 (LX7-20xxx-6A)[2] None. (LX7-20xxx-4A)[3]	
Input/Output Data	0 to 4095		0 to 4095	
Max. Resoultion	2.5 mV	5.0 μA	2.5 mV	5.0 μA
Accuracy	± 1.25% / F.S(25℃)			
Response time	10 ms		10 ms	
Impedance	200kΩ	125Ω	0.1Ω	1MΩ
I/O registers	4 Words		2 Words	
Isolation method	• Between Input/Ouput Channel and internal circuit : DC to DC Converter, Photocoupler • Between Input and Ouptut : non-isolation • Between two liput/Output Channels : non-isolation			

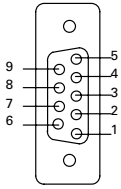
1) : For each input channel, wire to either voltage or current but not both.
2) : For each output channel, it is possible to wire to both voltage and current but the same ouput value applies to both.
3) : Models marked LX7-20xxx-4A have only 4 input channels. (No output channel)

Communication Specifications



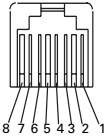
Item	Specifications
Interface	COM1: RS-232C or RS-485, 9-pin D-Sub • DIP switch • LX7s controllers support RS-232C only on COM1.
	COM2: RS-232C or RS-485, 8-pin modular • Automatically recognized (wiring method) • LX7s controllers support RS-485 only on COM2.
Baud rate	• 38400, 19200, 9600, and 4800, or auto baud (For COM2 user-defined communications, the register SR510 can be manually set to an appropriate baud rate.) • Manual setting address - COM1=SR509 - COM2=SR510 • Reset after pausing communication, for more than one minute, to change the speed for auto baud.
Protocol	Half duplex asynchronous polling
Data bit	8 bits
Parity	None
Stop bit	1 bit
Communication distance	RS-232: 15 m or less, RS-485: 1.2 Km or less
Termination resistance	COM1: adjusted by the internal DIP switch COM2: external user wiring (150 Ω resistor recommended)
Transmission cable	Twisted pair cable (Shielded cable)

PLC Port1 (COM1)
(9-pin female D-sub)



No	LX7	LX7s
1	NC	NC
2	TXD	TXD
3	RXD	RXD
4	RTS	RTS
5	GND	GND
6	485-	NC
7	485+	NC
8	CTS	CTS
9	Vcc	NC

PLC Port2 (COM2)
(8-pin female RJ45)



The terminals #1 and #3, and #2 and #4 are connected internally, respectively

No	LX7	LX7s
1	485+	485+
2	485-	485-
3	485+	485+
4	485-	485-
5	Reserved	Reserved
6	Signal GND	Reserved
7	232C/RXD	Reserved
8	232C/TXD	Reserved

IMPORTANT

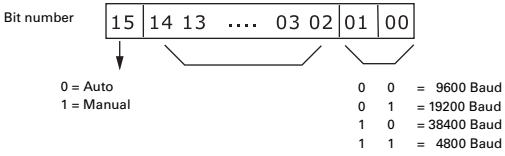
Use LX_CBLCPU02 or LX_CBLCPU05 cable from your personal computer's serial port to COM1 port. See LX7 Controllers User Manual for more information about wiring.

Baud Rate Setting

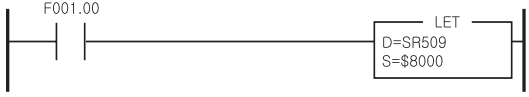
Set baud rate to improve communication speed and stability with CPU ROM 2.2 version or later.

Address of each port is as follows.

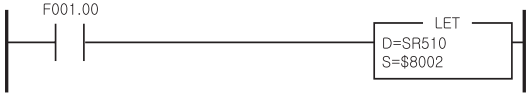
- COM 1 port baud rate : SR 509
- COM 2 port baud rate : SR 510



- Set baud rate with using ladder program or register monitor.
- Example
  -To set baud rate to 9600 bps.



  -To set baud rate to 38400 bps.



Product improvement is a continuous process at L&T.
For the latest information please contact us

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