

LK PROGRAMMABLE CONTROLLER



Overview



Performance | Modular | Expandable | Backplane | Redundancy | Low Power | Compact | Easy



Elegant & Reliable



Modular



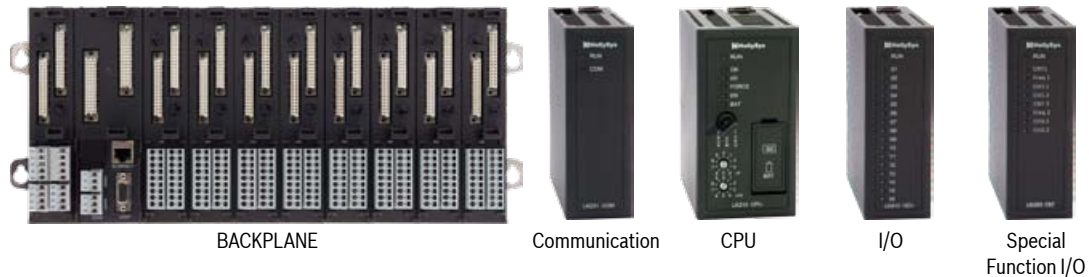
Easy Terminal



Expandable

HARDWARE ARCHITECTURE

The LK PLC consists of a set of hardware modules which includes the CPU, communication, and I/O modules that can be combined and configured on the backplane to satisfy a broad range of automation control applications.



CPU MODULES

- This is the main LK controller of the whole control system. It is responsible for execution of the programmable logic, all data communications with the modules, the HMI, and the operator stations in operation level.
- Communications with the local modules are done via internal PROFIBUS-DP data bus.
- Communications with the expansion I/O modules are done via external PROFIBUS-DP fieldbus.
- Communications with the operator level are done via Industrial Ethernet (10/100Mbps)
- At the front panel of the CPU module, you will find the LED status indicator, operating mode switches, rotary switches for addressing, SD memory card and backup battery compartment.

I/O MODULES

- Various I/O modules are available to meet different applications such as 16x DI, 8x DO (Transistor or Relay), 8x AI (Voltage/Current), 6x RTD, 8x Thermocouple, AI/AO mix, 16x SOE, and 2x Counters.

SPECIAL FUNCTION I/O MODULES

- Special purpose modules available such as sequence of events (SOE) and Counters.

COMMUNICATION MODULES

- Provide system expansion and other third-party product communication.
- Various popular communications are available such as PROFIBUS-DP, MODBUS, OPTICS-FIBER LINK, etc.

BACKPLANES & TERMINALS

- Two main types are available, the local backplane and expansion backplane.
- Build-in Interfaces for 24VDC parallel input power, Ethernet ports, PROFIBUS-DP, RS-485/RS-232, modems, etc.
- Build-in Input and Output terminal points.

POWER SUPPLY MODULE

- LK910 redundant capable power supply (1+1) to provide reliable parallel (24VDC) input power to backplane. Every backplane has its own power supply to power-up the modules.

FEATURES HIGHLIGHT

High Performance Processor

- Industrial level 533MHz / 266MHz / 100MHz processor with ultra-fast processing speed.
- Large memory capacity:
 - Program: 16MB / 8MB / 4MB, Data: 64MB / 16MB / 8MB
- 1MB / 1MB / 512KB power-loss protection.
- Fast analog and digital signal processing.

Expandable I/O Control

- Flexible system expansion capability.
- Depending on application, the I/O control points are scalable according to user's needs.
- 533MHz CPU Controller can support up to 2,000 digital I/O or 1000 analog I/O.
- 266MHz and 100MHz CPU Controller can support up to 1000 digital I/O or 500 analog I/O.

Various Communication Protocol

- Supports a wide variety of communication protocol (TCP/IP, PROFIBUS-DP, MODBUS, etc.)

Backplane Architecture

- The local backplane provides all the communication link with all the local modules. (CPU, I/O, communication, special function)
- PROFIBUS-DP local data bus up to 12Mbps baud rate.

Redundancy System

- Parallel power supply redundancy.
- CPU controller redundancy.
- Ethernet redundancy*.
- PROFIBUS-DP redundancy.

Hot-Swappable Modules

- All modules are hot swappable for easy maintenance.

Low Power Consumption

- Low power consumption, CPU module draws around 5 watts, I/O module draws around 2~5 watts depending on the models.

In-built Diagnostic

- Self-diagnostic and fault diagnostic.

Compact Structural Design

- Integrated design saving installation space.

Easy and Time-saving Installation

- Backplane provides safety insertion-keys preventing incorrect module insertion.
- Spring-cage wiring terminal.
- Backplane mounting with screws.

Standard Programming Languages

- The programming software supports IEC-61131-3 standard, 6 types of programming language. (LD, IL, FBD, ST, SFC, CFC)

Graphical HMI Designer

- Large Graphical Libraries.
- Alarms, reports, logs, and historical trend.
- User friendly interface.

* Ethernet redundancy available on the redundancy backplane

CERTIFICATIONS

The LK PLC and modules are awarded both the CE Mark for the European Community and the UL Mark for US and Canada.

EUROPE

EC (European Community) Directives
CE MARK



UNITED STATE AND CANADA

UL (Underwriter's Laboratories, Inc.)
UL LISTING MARK



SYSTEM ARCHITECTURE & COMMUNICATIONS

ARCHITECTURE

OPERATOR LEVEL



10/100 Redundant Industrial Ethernet Networking

LK REDUNDANT CPU CONTROLLER

LK SINGLE CPU CONTROLLER

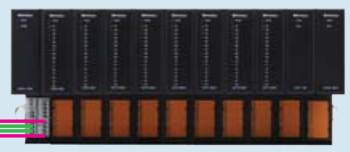


Modbus[®] (RTU/ASCII) Network

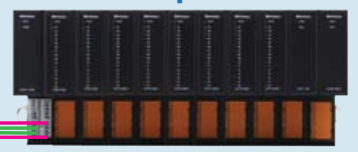
SERIAL BUS RS-2485 / RS-232 Network

Redundant PROFIBUS[®] DP Network

Expansion I/O Backplane

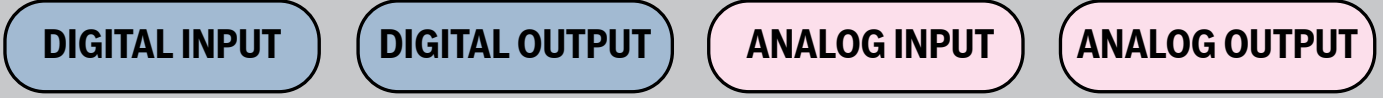


Expansion I/O Backplane



- Expand up to a maximum of 125 I/O Modules (DP address 2 ~ 126)

CONTROL LEVEL

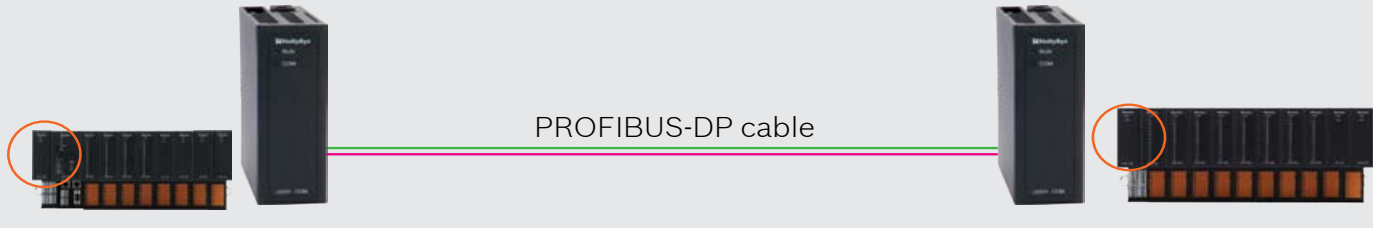


INSTRUMENTS & DEVICES



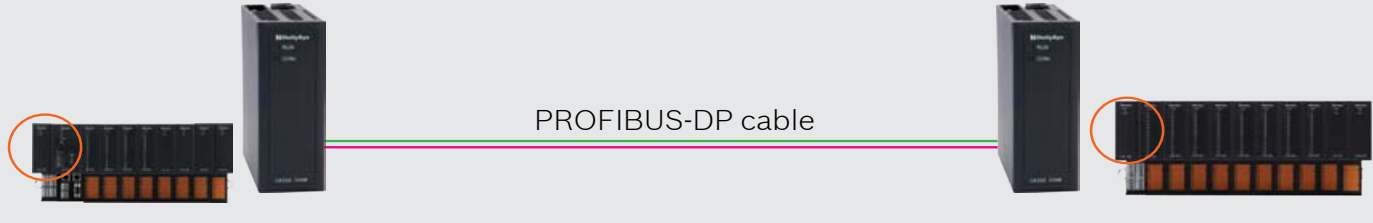
LK231 -- PROFIBUS-DP communication adapter module

Complies with PROFIBUS-DP specification. ideally, within 200 meters.
Short distance DP communication. Example, within same cabinet of local and expansion backplane(s).



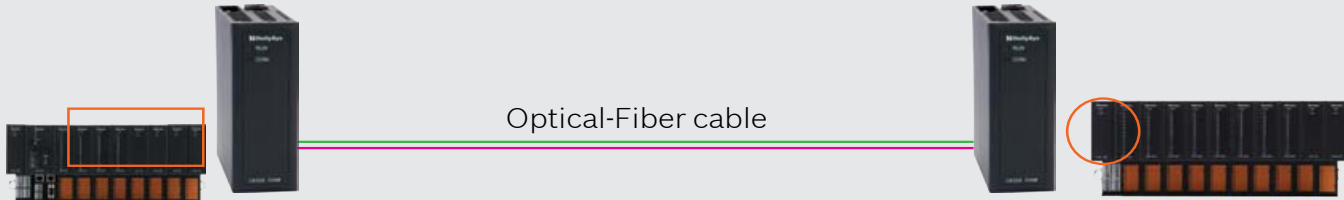
LK232 -- PROFIBUS-DP communication adapter module with DP-Repeater

Complies with PROFIBUS-DP specification. able to boost the DP signals.
Medium distance DP communication. Example, within one cabinet to another remote cabinet of backplane(s).



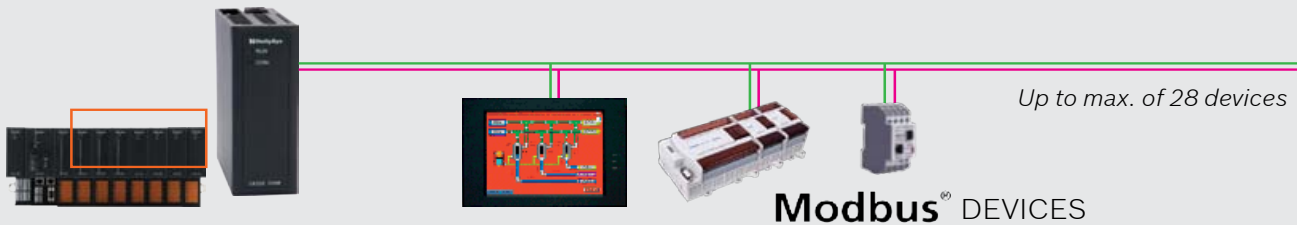
LK233 -- DP-to-Optical-fiber interface communication module

Complies with PROFIBUS-DP specification. able to translated DP signals over optic-fiber and vice versa.
Long distance DP communication. Example, within maximum distance of not more than 5km.



LK239 -- MODBUS communication module (Master/Slave)

For communication using MODBUS RTU/ASCII protocol with MODBUS devices.



LK255 -- PROFIBUS-DP Slave Interface Module







Provides communication interface to other third-party PROFIBUS-DP Master



PRODUCT FAMILY





P
R
O
D
U
C
T

COMMUNICATION MODULES

	Model: LK231 PROFIBUS-DP Communication Master / Slave Module		Model: LK232 PROFIBUS-DP Repeater Module		Model: LK233 Optic Fiber DP Interface module
	Model: LK239 MODBUS Master/Slave Module		Model: LK250 PROFIBUS-DP Backplane Expansion Module		Model: LK255 PROFIBUS-DP Slave Interface module

	Model: LK210 CPU: 533MHz Flash : 16MB SDRAM: 64MB Power-loss Protection: 1MB Redundancy: Supported
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BACKPLANES


<p>LOCAL BACKPLANE</p>  <p>LK101 / LK102 - 10x slots Single CPU</p>  <p>LK121 / LK122 - 11x slots Redundancy CPU</p>	<p>EXPANSION BACKPLANE</p>  <p>LK111 / 114 - 11x slots expansion</p>  <p>LK112 - 5 slots expansion</p>
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POWER SUPPLY

	Power Supply Model: LK910
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DIGITAL INPUT MODULES / DIGITAL OUTPUT MODULES

	Model: LK610 16 channels Digital Input 12 / 24 VDC		Model: LK710 16 channels Transistor Digital Output		Model: LK720 8 channels Relay Digital Output
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CPU MODULES



Model: **LK207**
 CPU: 533MHz
 Flash : 16MB
 SDRAM: 64MB
 Power-loss
 Protection: 1MB



Model: **LK205**
 CPU: 266MHz
 Flash : 8MB
 SDRAM: 16MB
 Power-loss
 Protection: 1MB



Model: **LK202**
 CPU: 100MHz
 Flash : 4MB
 SDRAM: 8MB
 Power-loss
 Protection: 512KB

LK SERIES PLC



SPECIAL FUNCTION



Model: **LK620**
 2 channels
 1MHz High-Speed
Counter Module



Model: **LK630**
 16 channels
 Resolution: 1ms
SOE Module

Transmission Rate	Cable Type A	Cable Type B
	Range per Segment	Range per Segment
9.6Kbps, 19.2Kbps, 93.75Kbps	1200 meters	1200 meters
187.5Kbps	1000 meters	600 meters
500Kbps	400 meters	200 meters
1.5Mbps	200 meters	70 meters

ANALOGUE INPUT MODULES / ANALOGUE OUTPUT MODULES



Model: **LK410**
LK411
LK412
LK414
 8 / 6 channels
 Voltage or Current
Analog Input



Model: **LK430**
LK431
LK441
LK442
 8 / 6 channels
 TC or RTD
Analog Input



Model: **LK510**
LK511
 4 channels isolation
 Voltage / Current
Analog Output

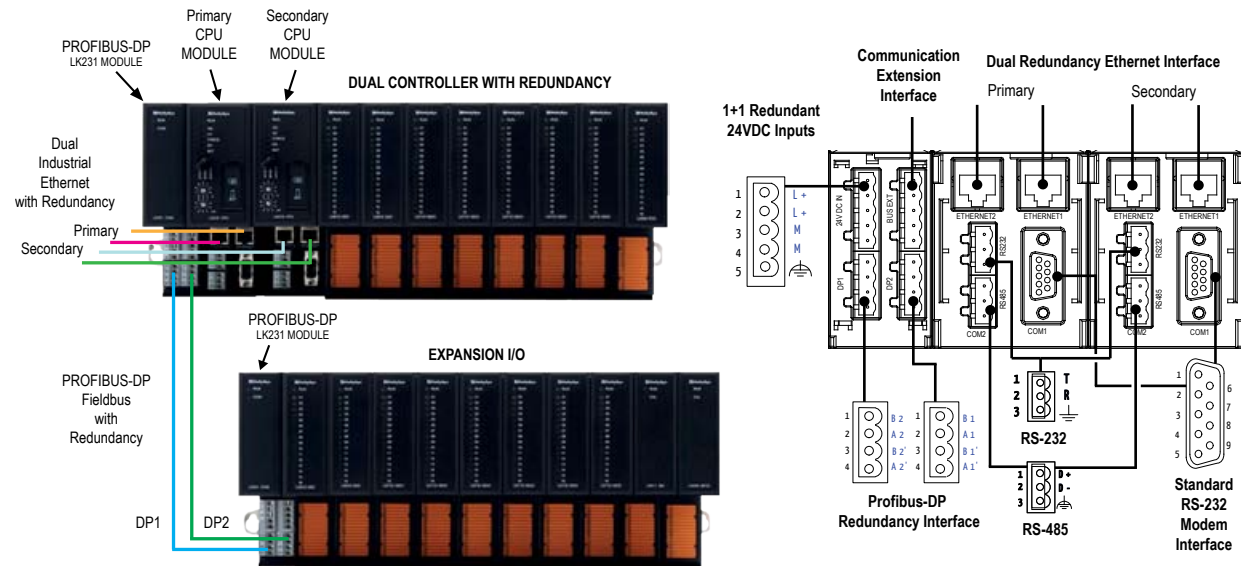


Model: **LK810**
 4 channels
Analog Input ;
 2 channels
 Voltage or Current
Analog Output

MAXIMIZE RELIABILITY USING REDUNDANCY

Redundancy is much needed in certain automation application which requires high availability and reliability. A good example of such application is continuous process control. Major economic losses can happen if redundancy are not available causing equipment downtime.

The LK PLC provides user with the following redundancy solution such as power supply, controller, Ethernet, and PROFIBUS-DP field-bus communication. Controller redundancy is achieve by using the backplane with dual controller slots. Sub-system comprises of using two controllers, the I/O modules, the communication module, and the expansion I/O backplanes with modules installed.



CONTROLLER REDUNDANCY

- Two controller modules with redundancy support are required to be installed on the local redundancy backplane.
- Upon powering on, the two controllers will be automatically configured as primary and secondary controller based on its slot position. (left-most slot is the primary controller and the slots on the right is secondary controller.)
- The primary controller starts executing the program logic and control all the I/Os, and communications.
- The secondary controller act as a backup controller and will switch over if any failure occurs on the primary controller therefore ensuring continuous process.

INDUSTRIAL ETHERNET REDUNDANCY

- Ethernet Redundancy is available on the Redundancy backplane. Four RJ-45 interfaces Ethernet ports are located on the backplane and each controller is supported by two of the Ethernet port. The Industrial Ethernet complies with the IEEE802.3/u international standard with a communication baud rate supporting either 10Mbps or 100Mbps.

PROFIBUS-DP REDUNDANCY

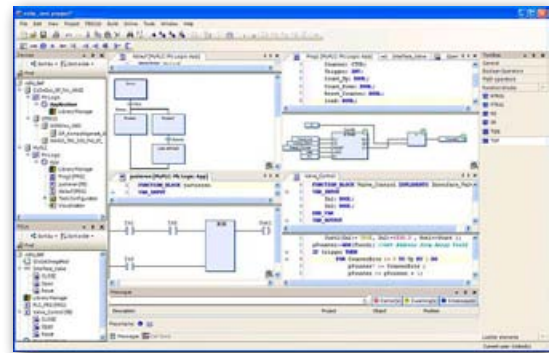
- The LK controller can supported two PROFIBUS-DP port and both the interfaces are located directly on the backplane.
- PROFIBUS-DP provides the fieldbus networking and is used for all communications with the expansion I/O modules.
- The PROFIBUS-DP complies with the IEC61158 international standard and the EN50170 European standard with a communication speed of 9.6Kbps up to 1.5Mbps depending on cable length and type.

REDUNDANCY

POWERPRO PROGRAMMING SOFTWARE

PowerPro is the programming software designed for LK PLC. Based on Windows environment, PowerPro complies with IEC61131-3 standard delivering an off-line simulation and online debugging functions. It allows the user to test the logic prior any program test run, providing convenience in programming and debugging.

- Fully comply with programming standard of IEC61131-3 standard.
- Powerful operation capability (example, 32-bit floating point operation, optimized PID algorithm, etc.)
- Expansion library with support for user defined library.
- Software simulation, online debugging, and user code functions check.
- View, alarm, and logging functions.
- Password protection for user program.



Flexible Programming Method

- Supporting 6 types of programming languages editor
 - Instruction List (IL)
 - Structural Text (ST)
 - Function Block Diagram (FBD)
 - Ladder Diagram (LD)
 - Sequence Function Chart (SFC)
 - Continuous Function Chart (CFC)
- Depending on variable requirements, programmers can choose the relevant programming languages to work with. While working with FBD, LD, or IL, programmers are allowed to switch in between these programming languages.
- Support different programming languages among subroutines and subroutine interactive call.

Instructions Library

- Over 400 instructions and function blocks can be employed according to variable requirements of user.

- Common instructions include arithmetic, evaluation, boolean, shift, selection, compare, data type conversion, addressing, call, strings and etc.
- Common function blocks include enhanced PID controller, signal generator, function manipulator, analog processing, MODBUS, PROFIBUS-DP, Ethernet, real-time clock, and watchdog, etc.

User-defined Library

- User can write their own function blocks, functions, and subroutines; and store them into an internal library.
- The user-defined library can be invoked in different projects.

Software Simulation

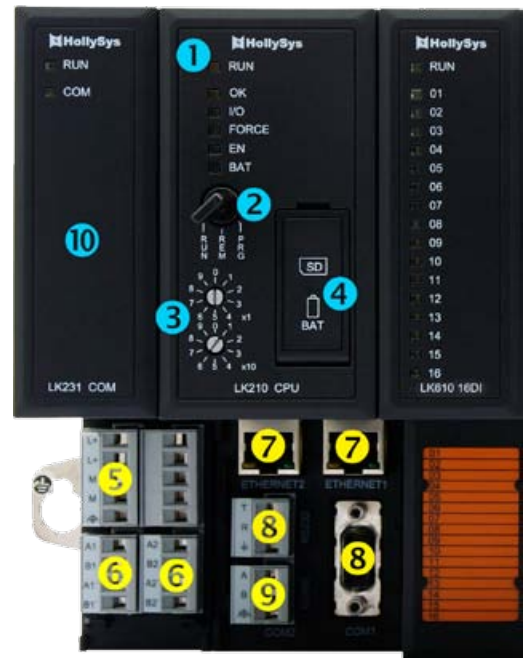
- Support offline simulation and online debugging
- Graphical display of the simulation result.
- Convenient programming and flexible break point debugging.

HOLLYVIEW SCADA FOR PLC

- Graphical Libraries**
- User Friendly Interface**
- Alarms**
- Reports**
- Logs**
- Historical Trend**



CPU MODULES - SINGLE & DUAL CPU CONTROLLER



Description

CPU controller is the brain of the whole PLC control system. It is installed only on the local backplane and communicates with all the modules that it link via the PROFIBUS-DP. LK controllers is available two types of models, Single CPU or Dual CPU with redundancy. The variation of the CPU speed available are 533MHz, 266MHz, and 100MHz.

Features

- High performance controller
- 533MHz at 13 nanoseconds processing speed.
- Large Memory Capacity.
- LK210 supports two cpu in redundancy mode.
- Support SD memory card for program logic backup.
- Backup battery is available in case of power loss.
- Easy configuration, Station ID selectable switch.
- Easy Operating Mode Selection via switch knob.

- 1 LED status indicator
- 2 Operating Mode Selectable Switch (RUN, REM, PRG)
- 3 Station ID Selectable Switches
- 4 Compartment slot for SD card and backup battery
- 5 Power Supply Input Terminals
- 6 PROFIBUS-DP Terminals
- 7 10/100Mbps Ethernet ports
- 8 RS-232 interface port
- 9 Rs-485 interface terminal
- 10 Communication module

CPU

LK
202
205

Operating Mode Selectable Switch Knob

Swich Dial Position	Operating Mode	Definition
RUN	Running Mode	<ul style="list-style-type: none"> • CPU is in running mode. • Cannot stop the operation via software. • Cannot change the PLC program, including downloading of PLC program. • Variables cannot be forced to a new value, re-written, reset, or soft-reset. • User program cannot be cleared.
REM	Remote Control Mode	<ul style="list-style-type: none"> • The CPU maintain its running status from either "RUN" mode to "REM" mode or "PRG" mode to "REM" mode. • User can stop or starts the CPU operation using software. • User can change the PLC program while online. • Variables are forcable to a new value, rewritable, resetable, or soft-resetable. • User program can be cleared.
PRG	Programmable Mode	<ul style="list-style-type: none"> • CPU STOPS ITS OPERATION. • User cannot starts its operation using software. • User can change and download the PLC program. • Variables are forcable to a new value, rewritable, resetable, or soft-resetable. • User program can be cleared.

LED Status Indicators

Indicator	Status	Definition
RUN Yellow or Green	GREEN - ON	Active CPU - User program in operation.
	GREEN - Fast Flashing	Standby CPU - User program in operation. Flash four times per second. (4Hz)
	GREEN - Slow Flashing	Single CPU Only - User program in operation, Flash once per second. (1Hz)
	YELLOW - ON	Active CPU - User program STOPPED.
	YELLOW - Fast Flashing	Standby CPU - User program STOPPED. Flash four times per second. (4Hz)
	YELLOW - Slow Flashing	Single CPU Only - User program STOPPED, Flash once per second.
OK Red or Green	RED - Fast Flashing	System in initialize mode after power is on. Flash four times per second. (4Hz)
	RED - Slow Flashing	PLC user program is not found. Flash once per second. (1Hz)
	GREEN - ON	Controller operating normally.
	GREEN- Fast Flashing	Downloading of PLC program or the Remote Panel is synchronizing data under redundancy. Flash four times per second. (4Hz)
	GREEN - Slow Flashing	Controller Operating Normally but the symbol database file is not found. (Symbol database is used to predefine the periodic data communication) Flash once per second. (1Hz)
I/O Yellow or Green	OFF	I/O not configured or no communication.
	GREEN - ON	Active CPU - Communicating normally with one or more I/Os.
	GREEN - Slow Flashing	Active CPU - Not communication with any I/Os. Flash once per second. (1Hz)
	YELLOW - Slow Flashing	Standby CPU - Communicating normally with one or more I/Os. Flash once per second. (1Hz)
FORCE Yellow	OFF	There is no force value data.
	YELLOW - ON	Force value data is available.
EN Green	OFF	Outputs are inhibited
	GREEN - ON	Outputs are enabled
BAT Red	OFF	Backup battery power is OK, operation is normal.
	RED - ON	Backup battery not installed or its power is less than 90% of the rated value. Change the battery immediately.

CPU

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CPU MODULES - SINGLE & DUAL CPU CONTROLLER

Model		Single CPU LK202	Single CPU LK205	
CPU Speed		100 Mhz	266 MHz	
Storage Memory	FLASH: Programmable	4 MB	8 MB	
	SDRAM: Data	8 MB	16 MB	
	SRAM: Power-loss protection	512 KB	1 MB	
	EEPROM	256 Byte		
	SD memory card	512 MB		
Backup Battery	Voltage and current	3.0V, constant 120mAh		
	Power-loss protection timing	6 months		
	Low battery voltage alarm	Supported, alarm when voltage < 2.7V (3.0V x 90%)		
Cycle Time	Binary operation, minimum	0.08 μS per step	0.03 μS per step	
	Floating-point operation, maximum	1.06 μS per step	0.4 μS per step	
C O M M U N I C A T I O N	Ethernet	Protocol	TCP/IP, IEEE802.3/u	
		Type of interface via backplane	1x RJ45 interface	
		Redundancy	Not Supported!	Not Supported!
		Communication baud rate	10 M/100 Mbps, auto-adaptive	
		Network Topology	Star or Ring	
	Fieldbus	Protocol	PROFIBUS-DP	
		Type of interface via backplane	2-channel, 2 interface socket (either 4-pins type or DB9)	
		Type of cable used	PROFIBUS-DP cable type A or B, shielded or unshielded twisted pair cable	
		Redundancy	Supported	
		Communication baud rate	1.5 Mbps, 500 Kbps, 187.5 Kbps, 93.75 Kbps, 45.45 Kbps, 31.25 Kbps, 19.2 Kbps, 9.6 Kbps	
	Standards	IEC61158-3 Type 3, EN50170		
	Serial Port Expansion	RS-232 port (COM 1)	1-channel, 9-pins D-type interface (female)	
		RS-232 / RS-485 port (COM 2)	1-channel, 2x 3pins terminal connector socket, configurable as either RS-232 or RS-485, programmable as freeport mode or MODBUS master/slave mode.	
	Supporting CPU Redundancy		NO	
	Support Hot Swap		YES	
	Watchdog Timer		Supported, 0.1s ~ 25.5s configurable	
Counters		maximum counting range: 15 bits		
Timers		Unlimited instructions: 1ms to max. of 49 days		
Real-time Clock (RTC)		YES, yyyy-mm-dd hh:mm:ss, BCD format		
Input Power Supply Voltage		24VDC (20.4 ~ 28.8 VDC)		
Module Power Consumption		250mA @ 24VDC, max.		
Program Execution	Periodic	Supporting a max. of 32 task		
	Events			
Programming Languages		Comply with IEC61131-3 international standard: Ladder Diagram (LD), Instruction List (IL), function Block Diagram (FBD), Structural Text (ST), Sequence Function Chart (SFC), Continuous Function Chart (CFC), 6 types of programming languages		
Physical Characteristic	Module dimension	52.5 x 100 x 100 mm (Wx H x D)		
	Weight	280g		
Environmental Specification	Operating temperature	0 °C ~ 60 °C		
	Relative humidity	5% ~ 95% (non-condensing)		
	Storage temperature	-40 °C ~ 70 °C, 5% ~ 95% (non-condensing)		
	IP Protection	IP20, IEC60529		

CPU
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TECHNICAL SPECIFICATION

Model		Single CPU LK207	Redundancy CPU LK210	
CPU Speed		533 Mhz		
Storage Memory	FLASH: Programmable	16 MB		
	SDRAM: Data	64 MB		
	SRAM: Power-loss protection	1 MB		
	EEPROM	256 Byte		
	SD memory card	512 MB		
Backup Battery	Voltage and current	3.0V, constant 120mAh		
	Power-loss protection timing	6 months		
	Low battery voltage alarm	Supported, alarm when voltage < 2.7V (3.0V x 90%)		
Cycle Time	Binary operation, minimum	0.013 μS per step		
	Floating-point operation, maximum	0.02 μS per step		
C O M M U N I C A T I O N	Ethernet	Protocol TCP/IP, IEEE802.3/u		
		Type of interface via backplane	1-channel x RJ45 interface	2-channel x RJ45 interface
		Redundancy	Not Supported!	
		Communication baud rate	10 M/100 Mbps, auto-adaptive	
		Network Topology	Star or Ring	
	Fieldbus	Protocol PROFIBUS-DP		
		Type of interface via backplane	2-channel, 2 interface socket (either 4-pins type or DB9)	
		Type of cable used	PROFIBUS-DP cable type A or B, shielded or unshielded twisted pair cable	
		Redundancy	Supported	
		Communication baud rate	1.5 Mbps, 500 Kbps, 187.5 Kbps, 93.75 Kbps, 45.45 Kbps, 31.25 Kbps, 19.2 Kbps, 9.6 Kbps	
Serial Port Expansion	Standards IEC61158-3 Type 3, EN50170			
	RS-232 port (COM 1)	1-channel, 9-pins D-type interface (female)		
	RS-232 / RS-485 port (COM 2)	1-channel, 2x 3pins terminal connector socket, configurable as either RS-232 or RS-485, programmable as freeport mode or MODBUS master/slave mode.		
Supporting CPU Redundancy		NO	YES	
Support Hot Swap		YES		
Watchdog Timer		Supported, 0.1s ~ 25.5s configurable		
Counters		maximum counting range: 15 bits		
Timers		Unlimited instructions: 1ms to max. of 49 days		
Real-time Clock (RTC)		YES, yyyy-mm-dd hh:mm:ss, BCD format		
Input Power Supply Voltage		24VDC (20.4 ~ 28.8 VDC)		
Module Power Consumption		250mA @ 24VDC, max.		
Program Execution	Periodic	Supporting a max. of 32 task		
	Events			
Programming Languages		Comply with IEC61131-3 international standard: Ladder Diagram (LD), Instruction List (IL), function Block Diagram (FBD), Structural Text (ST), Sequence Function Chart (SFC), Continuous Function Chart (CFC), 6 types of programming languages		
Physical Characteristic	Module dimension	52.5 x 100 x 100 mm (Wx H x D)		
	Weight	280g		
Environmental Specification	Operating temperature	0°C ~ 60°C		
	Relative humidity	5% ~ 95% (non-condensing)		
	Storage temperature	-40°C ~ 70°C, 5% ~ 95% (non-condensing)		
	IP Protection	IP20, IEC60529		

CPU
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LOCAL BACKPLANES

PRODUCT CODE	LOCAL BACKPLANE		EXPANSION BACKPLANE	
	LK101	LK121	LK111	LK112
Total number of slots	10	11	11	5
Number of slots for Comm. Module	1	1	1	1
Number of slots for CPU module	Single CPU	Dual CPU	----	----
Number of slots for I/O module	8	8	10	4
PROFIBUS-DP Interface Type	Terminal Pins	Terminal Pins	Terminal Pins	Terminal Pins
Application	General Industries	General Industries	General Industries	General Industries
Dimension (WxHxD) with modules installed (mm)	367.5 x 166 x 117	420 x 166 x 117	385 x 166 x 117	175 x 166 x 117
Backplane weight (g)	1360g	1940g	1740g	880g

COMMUNICATION MODULES

PRODUCT CODE	LK231	LK232	LK250	LK255	LK233	LK239
Application	PROFIBUS-DP	DP-Repeater	DP-Expansion	DP-Slave Interface (Interface with 3rd Party DP-Master Controllers)	DP Optical-fiber interface	MODBUS (Master/Slave)
Install on	First Slot #0 of any backplane	First Slot #0 of any backplane	First Slot #0 of expansion backplane	Any I/O module slot		
PROTOCOL	PROFIBUS-DP				Optical Fiber	MODBUS RTU
Cable Distance (meters) or max. stations	1.2KM / 1KM / 400M / 200M				5KM	Max. 28 slave device
Current Consumption	50mA @ 24VDC	60mA @ 24VDC	100mA @ 24VDC	60mA @ 24VDC	80mA @ 24VDC	80mA @ 24VDC
Dimension (WxHxD) (mm)	35 x 100 x 100					
Weight (g)	170g					

ANALOG INPUT MODULES

ANALOG INPUT PRODUCT CODE	Voltage Input LK410	Current Input LK411	LK414	Voltage/Current Input LK412
Install On	Any local or expansion backplane I/O module slot			
Total number of Analog Channels	8	8	8	6
Input Range	±10.25V / 0~5.125V / 0~10.25V	4~20.58mA / 0~20.58mA (4-wired/2-wired current signal)	4~20.58mA (2-wire current signal)	±10.25V / 0~5.125V / 0~10.25V 4~20.58mA / 0~20.58mA
Isolation in-between Channels	No			Yes
Current Consumption	100mA @ 24VDC	60mA @ 24VDC	50mA @ 24VDC	150mA @ 24VDC
Dimension (WxHxD) (mm)	35 x 100 x 100			
Weight (g)	190g			

ANALOG RTD / THERMOCOUPLE MODULES

ANALOG INPUT - RTD/TC PRODUCT CODE	RTD		Thermocouple w/ cold-end compensation	
	LK430	LK431	LK441	LK442
Install On	Any local or expansion backplane I/O module slot			
Total number of Analog Channels	6	4	8	6
Isolation in-between Channels	No	Yes	No	Yes
Input Range	Pt100/200/500/1000; Ni100/120/200/500; Cu10/50	Pt100/200/500/1000; Ni100/120/200/500; Cu10/50	B,C,E,J,K,N,R,S,T or -12mV~78mV / 12mV~32mV	B,C,E,J,K,N,R,S,T or -12mV~78mV / 12mV~32mV
Current Consumption	65mA @ 24VDC	65mA @ 24VDC	60mA @ 24VDC	
Dimension (WxHxD) (mm)	35 x 100 x 100			
Weight (g)	180g			

ANALOG OUTPUT & ANALOG MIX I/O MODULES

ANALOG OUTPUT		Voltage	Current	ANALOG MIX I/O	
PRODUCT CODE	LK510	LK511	PRODUCT CODE	LK810	
Install On	Any local or expansion backplane I/O module slot		Install On	Any local or expansion backplane I/O module slot	
Analog Output Channels	4	4	Analog Input Channels	4	
Output Range	$\pm 10.25V / 0 \sim 5.125V / 0 \sim 10.25V$	$4 \sim 20mA / 0 \sim 21mA$	Input Range	$\pm 10.25V / 0 \sim 5.125V / 0 \sim 10.25V / 4 \sim 20.58mA / 0 \sim 20.58mA$	
Isolation in-between Channels	Yes		Analog Output Channels	2	
			Output Range	$\pm 10.25V / 0 \sim 5.125V / 0 \sim 10.25V / 4 \sim 20.58mA / 0 \sim 20.58mA$	
Load Capability	$\geq 2K\Omega$	$\leq 750\Omega$	Load Capability	$\geq 2K\Omega$ (Voltage); $\leq 600\Omega$ (Current)	
Current Consumption	125mA @ 24VDC	180mA @ 24VDC	Current Consumption	150mA @ 24VDC	
Dimension (WxHxD) (mm)	35 x 100 x 100		Dimension (WxHxD) (mm)	35 x 100 x 100	
Weight (g)	180g		Weight (g)	180g	

DIGITAL INPUT MODULES

DIGITAL INPUT		SOE	
PRODUCT CODE	LK610	LM630	
Install On	Any local or expansion backplane I/O module slot	Any local or expansion backplane I/O module slot	
Total number of Digital Channels	16	16 SOE or (15 SOE + 1x timepulse)	
Input Range (Voltage)	Rated Value	12/24VDC	24VDC
	ON-state	10 ~ 31.2VDC	10VDC @ 2mA ~ 31.2VDC @ 10mA
	OFF-state	< 5VDC	0 ~ 5VDC @ 1.5mA
Input Range (Current)	ON-state	2 ~ 10mA	-----
	OFF-state	< 1.5mA	-----
Input Delay Time	OFF -> ON	Hardware delay: 50 μ S; programmable filter: 1/3/5/10/15/20/25/30ms	Hardware delay: 50 μ S
	ON -> OFF	Hardware delay: 50 μ S; programmable filter: 1/3/5/10/15/20/25/30ms	
SOE Resolution	-----	1ms	
Sampling Period	-----	0.833 μ S	
SOE time sync. Mode	-----	GPS Sync. (default) or CPU Controller Sync	
Time Sync Interval	-----	1 min.	
SOE Data Storage	Primary Cache	-----	Max. of 42 events saved when CPU does not readout the SOE
	Sec. Cache	-----	During comm. Failure to timely report the SOE, a max. of 1023 events can be saved.
Current Consumption	50mA @ 24VDC	80mA @ 24VDC	
Dimension (WxHxD) (mm)	35 x 100 x 100		
Weight (g)	180g	195g	

DIGITAL OUTPUT MODULES

DIGITAL OUTPUT		TRANSISTOR	RELAY
PRODUCT CODE		LK710	LK720
Install On		Any local or expansion backplane I/O module slot	Any local or expansion backplane I/O module slot
Total number of Digital Channels		16	8
Output Type		MOSFET Transistor	Relay, Normally Open
Output Voltage	Rated Value	24VDC	-----
	Allowed Range	10 ~31.2VDC	10 ~265VAC @ 47~63Hz or 5~125VDC
Output Current	Per channel	0.5A @ 40°C 0.4A @ 60°C	-----
	Per module	8A @ 40°C 6.4A @ 60°C	-----
Output Delay Time	OFF -> ON	1ms, Max	10ms, Max
	ON -> OFF	1ms, Max	10ms, Max
Current Consumption		70mA @ 24VDC	150mA @ 24VDC
Dimension (WxHxD) (mm)		35 x 100 x 100	
Weight (g)		180g	210g

COUNTER MODULES

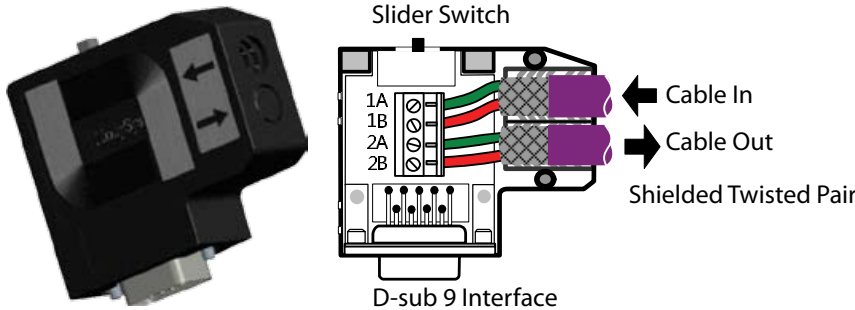
PRODUCT CODE		LK620
Install On		Any local or expansion backplane I/O module slot
Total number of Input Counters		2 counters
Voltage Pulse Range	ON	10~26.4VDC
	OFF	2mA~7mA
Current Pulse Range	ON	0~2VDC
	OFF	≤250μA
Max. Pulse Input Frequency		1MHZ (without software filter)
Counting Range		0 ~ 4,294,967,295 (32-bit)
Counting Error		±1 digit
Current Consumption		80mA @ 24VDC
Dimension (WxHxD) (mm)		35 x 100 x 100
Weight (g)		185g

POWER SUPPLY

PRODUCT CODE	LK910
Install On	EXTERNAL, 32mm DIN Rail
Input Range	88~132VAC / 176~264VAC, Switch Selectable (47Hz ~ 63Hz)
Output Range	Adjustable 24~28VDC ±5%, 5A, 120W
Ripple Noise	<240mVp-p
Load Regulation	< ±5%
Voltage Regulation	< ±2%
1+1 Parallel Redundancy	Supported
Protection Alarm	Overload, Overvoltage, Over Temperature
Certification	UL508, TUV EN60950, CE
Size	65.5mm x 125.2mm x 100mm (WxHxD)
Weight (g)	790g

LK230

- PROFIBUS-DP connector adapter for interconnection between LK 102/122 and LK114. It provides a convenience way of cabling, increase protection from EMC interference, and cabling reliability.



LKX002

- PROFIBUS-DP cable (3 meters) for used with LK PLC.



LKF003

- Rotational Tools for the Backplane's mechanical key

LKF006

2GB SD card for LK PLC for backup of programming logic. This SD card is preformatted for LK usage.



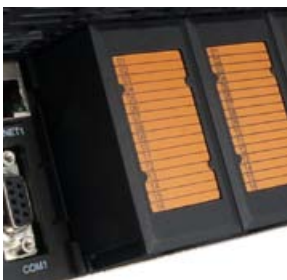
LKC131

Dummy module without any electronic boards. It is used to fill in the unused LK module slots.



LKC170

- Terminal cover to protect the terminal points.



LKS001

- CD contains PowerPro programming software for LK PLC and other documentations.



LKX006

- RS-232 cable for LK239 MODBUS module usage.



LKX007

- RS-485 cable for LK239 MODBUS module usage.

PRODUCT SELECTION LIST

SELECTION

Module Type		Model	Description
Backplane with I/O terminal	Local Backplane	LK101	Local backplane, Single CPU slot, 10 slots, 367.5 x 166 x 35mm (WxHxD)
		LK102	Local backplane, Single CPU slot, 10 slots, DB9 (Profibus-DP) Interface, 367.5 x 166 x 35mm (WxHxD)
		LK121	Local backplane, Dual Redundant CPU slots, 11 slots, 420 x 166 x 35mm (WxHxD)
		LK122	Local backplane, Dual Redundant CPU slots, 11 slots, DB9 (Profibus-DP) Interface, 420 x 166 x 35mm (WxHxD)
	Expansion Backplane	LK111	Expansion backplane, 11 slots, DB9 (Profibus-DP) Interface, 385 x 166 x 35mm (WxHxD)
		LK112	Expansion backplane, 5 slots, 175 x 166 x 35mm (WxHxD)
CPU Module	LK202	100MHz CPU Module, for single CPU backplane, Computation Speed: 0.08µs per step, program: 4MB, data: 8MB+512KB power-loss prot.	
	LK205	266MHz CPU Module, for single CPU backplane, Computation Speed: 0.03µs per step, program: 8MB, data: 16MB+1MB power-loss prot.	
	LK207	533MHz CPU Module, for single CPU backplane, Computation Speed: 0.013µs per step, program: 16MB, data: 64MB+1MB power-loss prot.	
	LK210	533MHz CPU Module, for redundant CPU backplane, Computation Speed: 0.013µs per step, program: 16MB, data: 64MB+1MB power-loss prot.	
Communication Modules	LK231	PROFIBUS-DP Communication Adapter Module (support max. of 125 modules or DP-slave nodes)	
	LK232	PROFIBUS-DP Bus Repeater Module	
	LK233	PROFIBUS-DP Optical Fiber Interface module	
	LK239	MODBUS Communication Module (Master or Slave)	
	LK250	PROFIBUS-DP Interface Module (For expanding max. of 30 modules per DP-slave node)	
	LK255	PROFIBUS-DP Slave interface module, LK act as DP slave system connecting with 3rd party.	
AI Modules	LK410	8-channel AI Module, Voltage Input, 16 bits, ±10V / 0~10V / 0~5V, no isolation	
	LK411	8-channel AI Module, Current Input, 16 bits, 4~20mA / 0~20mA, no isolation, 2 or 4-wired transmitter	
	LK412	6-channel AI Module, Voltage/Current Input, 16 bits, ±10V / 0~10V / 0~5V or 4~20mA / 0~20mA, channel isolation	
	LK414	8-channel AI Module, Current Input, external powered, 16 bits, 4~20mA, no isolation, 2-wired transmitter	
	LK430	6-channels AI Module, RTD Input, 16 bits, Pt100/200/500/1000, Ni100/120/200/500, Cu10/50	
	LK431	4-channels AI Module, RTD Input, Isolated channels 16 bits, Pt100/200/500/1000, Ni100/120/200/500, Cu10/50	
	LK441	8-channels AI Module Thermocouple with cold-end compensation, 16 bits, -12mV~+78mV, -12mV~+32mV, TC Type: B,C,E,J,K,N,R,S,T	
	LK442	6-channels AI Module Thermocouple with cold-end compensation, Isolated Channels, 16 bits, -12mV~+78mV, -12mV~+32mV, TC Type: B,C,E,J,K,N,R,S,T	

Module Type	Model	Description
AO Modules	LK510	4-channels AO Module, Voltage Output , 14 bits, $\pm 10V / 0\sim 10V / 0\sim 5V$, isolation in-between channels
	LK511	4-channels AO Module, Current Output , 12 bits, $4\sim 20mA / 0\sim 20mA$, isolation in-between channels
AI/AO Modules	LK810	4-channels AI / 2-channels AO Module , input: $\pm 10V / 0\sim 10V / 0\sim 5V$ or $4\sim 20mA / 0\sim 20mA$, output: $\pm 10V / 0\sim 10V / 0\sim 5V$ or $4\sim 20mA / 0\sim 20mA$
DI Module	LK610	16-channels DI Module, 12/24VDC, sink, no isolation
DO Modules	LK710	16-channels DO Module, 10~30VDC, transistor DC output ,
	LK720	8-channels DO Module, 10~265VAC / 5~125VDC, relay, normally open
SOE Module	LK630	16-channels SOE Module, 12/24VDC SOE input, sink type , no isolation, SOE, 1ms resolution
Counter Module	LK620	2-channels counter module (<500KHz), Profibus-DP , Counting Range: $0 \sim 4,294,967,295$. Freq. Measurement Range: $0.1 \sim 1MHz$
Power Supply	LK910	Power Supply input 115/230VAC, output: 24VDC, 5A, 120W
Accessories	LK230	PROFIBUS-DP Connector for DB9 Backplane (For use with LK102, LK122, LK114)
	LKX002	LK series PLC, PROFIBUS-DP expansion cable , 3 meters
	LKX006	LK series PLC, Serial RS-232 communication cable (For LK239)
	LKX007	LK series PLC, Serial RS-485 communication cable (For LK239)
	LKF003	LK series PLC, Rotational tools for backplane's mechanical key
	LKF006	LK series PLC, SD card, 2GB
	LKC131	LK Series PLC, Dummy Empty Module
LKC170	LK Series PLC, Terminal Point Cover	
Software	LKS001	LK series PLC, PROGRAMMING SOFTWARE , English

* For SCADA software, please refer to HollyView product catalogue



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