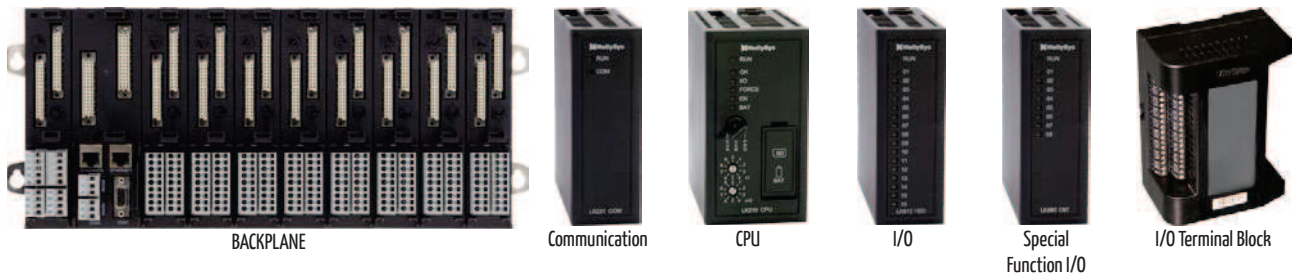# LK Programmable Logic Controller

OVERVIEW CATALOGUE

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.

| BACKPLANE | Communication | CPU | I/O | Special Function I/O | I/O Terminal Block |

CPU MODULES

- This is the main 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 data bus supporting at normal or high-speed baud rate.
- Communications with the expansion I/O modules are done via the PROFIBUS-DP fieldbus.
- Communications with the operator level are done via Industrial Ethernet.
- 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 digital and analog I/O modules available such as sink/source, AC/DC, transistor/triac/relay, current/voltage/RTD/thermocouple to meet different scenarios of applications.

SPECIAL FUNCTION I/O MODULES

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

COMMUNICATION MODULES

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

BACKPLANES

- Two main types are available, the local backplane and expansion backplane.
- Two variations are available, the backplanes with build-in I/O terminal points and the backplanes without I/O terminal but extended via cabling using I/O terminal blocks. (Launching Soon.)

I/O TERMINAL BLOCK

- This is required for the backplanes without I/O terminal but extended via cabling. It provides the I/O terminal points to connect to the field devices.

POWER SUPPLY MODULE

- Provides the power supply to the LK panel.

FEATURES HIGHLIGHTS

High Performance Processor

- Industrial level 533MHz processor with 13 nanoseconds processing speed.
- Large memory capacity:
  - Program: 16MB, Data: 64MB
- 1MB 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.
- Total digital I/O control points reaching up to a maximum of 57,344 points.
- Total analog I/O control points reaching up to a maximum of 3,584 points.

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)
- The backplane's normal data bus supports up to 12Mbps baud rate while the high-speed data bus supports up to 32Mbps baud rate.

Redundancy System

- Power supply redundancy.
- CPU redundancy.
- Ethernet redundancy.
- PROFIBUS-DP redundancy.

Low Power Consumption

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

Easy to Use and Maintain

- All modules supports hot-swap.
- Self-diagnostic and fault diagnostic.
- Backplane provides safety insertion-keys preventing incorrect module insertion.

Compact Structural Design

- Integrated design saving installation space.

Easy and Time-saving Installation

- Spring-cage wiring terminal.
- Backplane mounting with screws.

Standard Programming Languages

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

Graphical HMI Designer

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

CERTIFICATIONS

CPU Modules

I/O Expansion Modules

LK PLC modules are certified based on European standards EN61131-2 for electromagnetic compatibility testing and safety testing, EN60950-1:2001 low-voltage directives. The certification indicates that LK PLC products are in compliance with the safety, health, environmental and consumer protection requirements of the Member States of the European Union.

SYSTEM ARCHITECTURE

A Typical Single LK Controller System Architecture

Operation Level

Programming Station
Engineering Stations
HMI / Operator Stations
Server Station
Web Server Station

Redundancy 10M / 100MB Industrial Enternet Networking

Control Level

Single LK Controller PLC
LK231

Single LK Controller PLC
LK231

Connects to any other RS-232 / RS-485 devices

RS-232 / RS-485 SERIAL COMMs.

Expansion I/O Backplane
LK231

PROFIBUS-DP Slave

LM Micro Series PLC

LM Micro Series PLC using MODBUS Communication module (Slave Station)

Connects to any other MODBUS devices (Slave Station)

MODBUS (RTU/ASCII) Network

Redundant PROFIBUS-DP Network

Up to a maximum of 125 Expansion I/O backplane

Expansion I/O Backplane
LK250
LK231

Up to a maximum of 30 I/O Modules

Redundant PROFIBUS-DP Network

Redundant PROFIBUS-DP Network

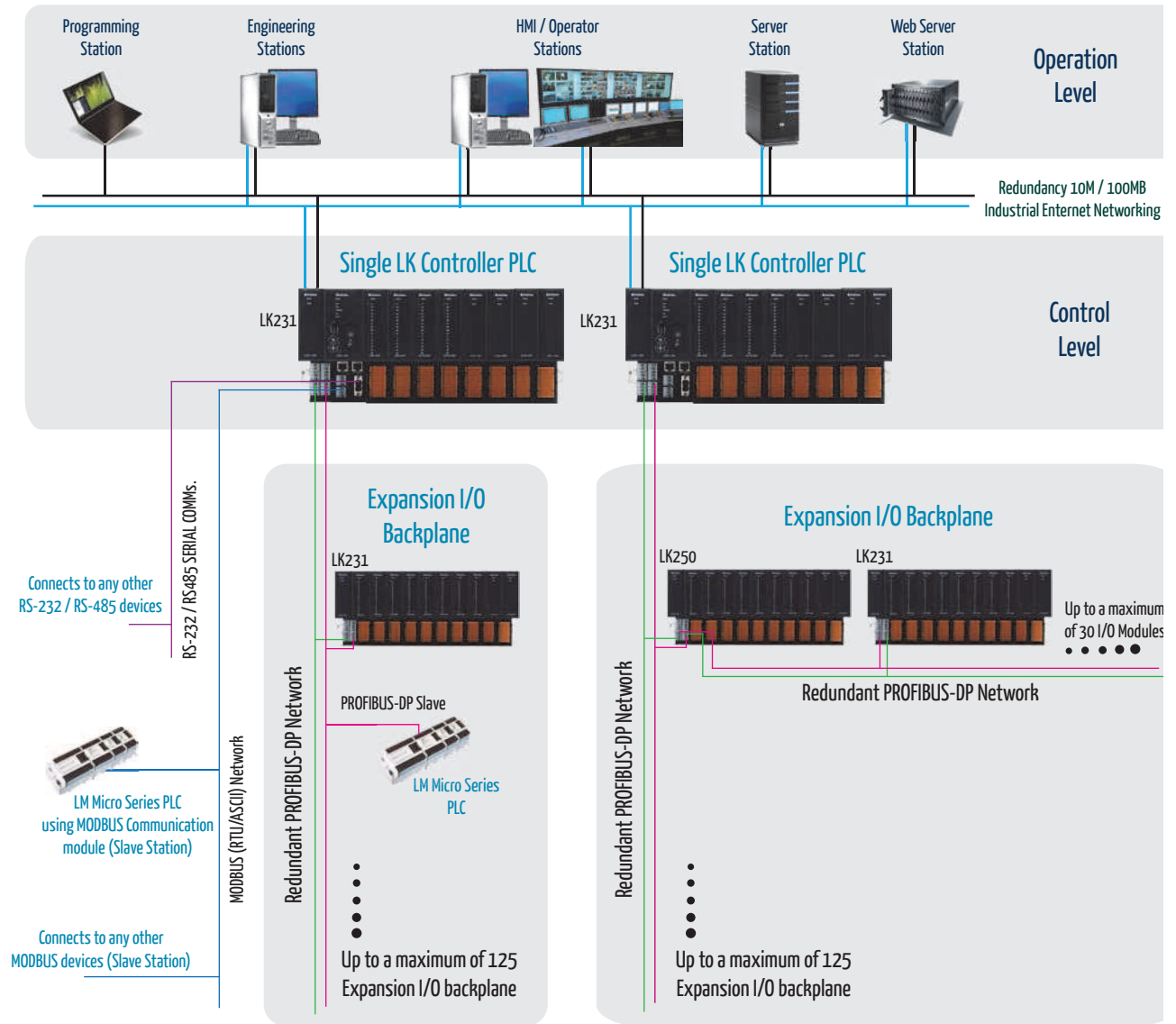Up to a maximum of 125 Expansion I/O backplane

Figure 1: Single LK Controller System Architecture

A Typical Dual LK Controller Redundancy System Architecture

Programming Station

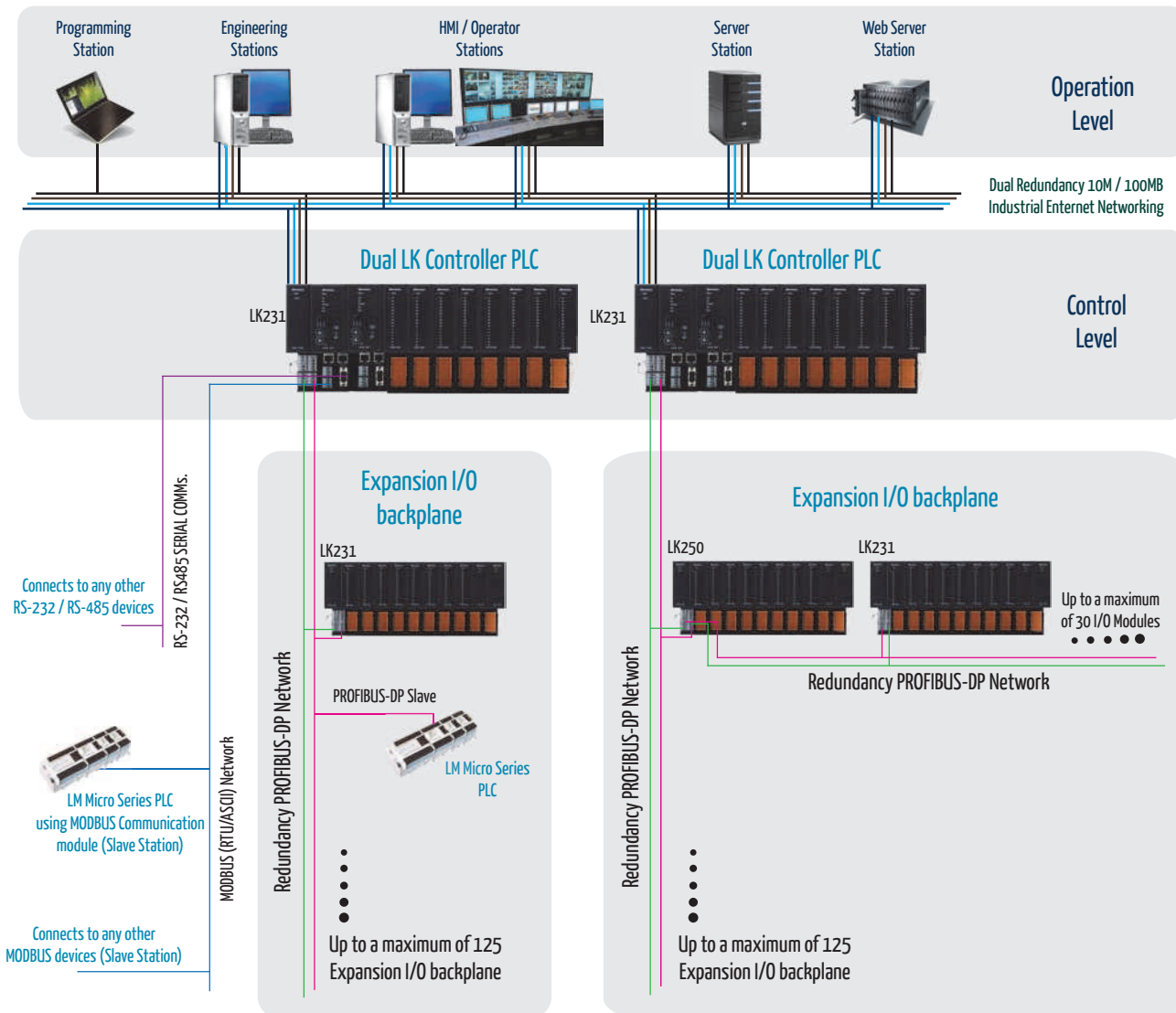Engineering Stations

HMI / Operator Stations

Server Station

Web Server Station

Operation Level

Dual Redundancy 10M / 100MB Industrial Enternet Networking

Dual LK Controller PLC

Dual LK Controller PLC

LK231

LK231

Control Level

Expansion I/O backplane

Expansion I/O backplane

LK231

LK250

LK231

Up to a maximum of 30 I/O Modules

Connects to any other RS-232 / RS-485 devices

RS-232 / RS485 SERIAL COMMs.

PROFIBUS-DP Slave

Redundancy PROFIBUS-DP Network

MODBUS (RTU/ASCII) Network

Redundancy PROFIBUS-DP Network

LM Micro Series PLC

Redundancy PROFIBUS-DP Network

LM Micro Series PLC using MODBUS Communication module (Slave Station)

Connects to any other MODBUS devices (Slave Station)

Up to a maximum of 125 Expansion I/O backplane
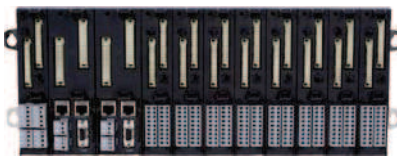
Up to a maximum of 125 Expansion I/O backplane

Figure 2: Dual LK Controller Redundancy System Architecture

PRODUCT FAMILY
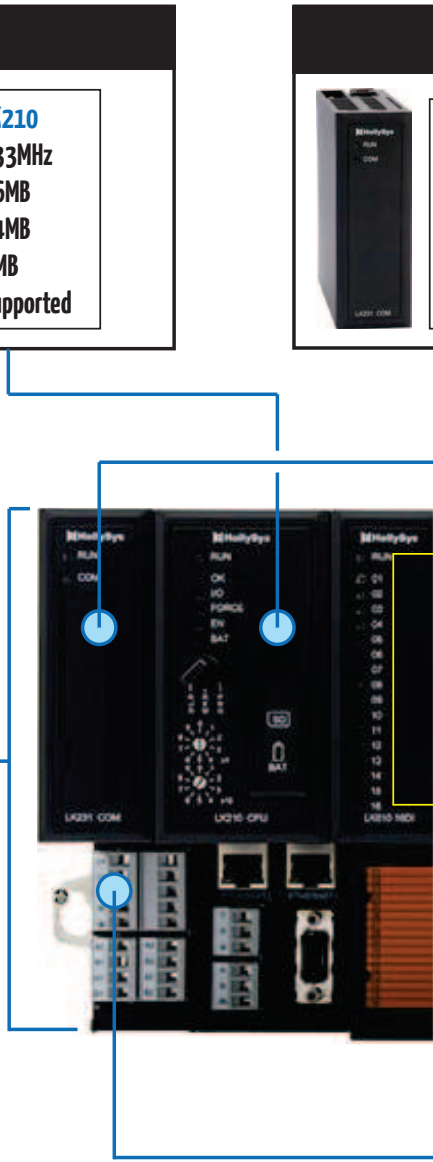
CPU MODULES

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

Model:	**LK210**
CPU:	533MHz
Flash (Programmable):	16MB
SDRAM (Data):	64MB
Power-loss Protection:	1MB
Redundancy:	**Supported**

BACKPLANES AND TERMINALS

LK101 - 10x slots Single CPU

LK121 - 11x slots Redundancy CPU

LK111 - 11x slots expansion

Standard I/O
Terminal Module
Model: LK3310

Local Backplane with terminals
Model: LK101 / LK120 / LK121

Expansion Backplane with terminals
Model: LK111 / LK113

Launching Soon

Local Backplane for terminal block
Model: LK125

Expansion Backplane for terminal block
Model: LK115 / LK116

I/O Terminal Block
Model: LK3310

* : high-speed modu

DIGITAL INPUT MODULES / DIGITAL OUTPUT MODULES

Model:	**LK610**
	LK611
	LK612
	LK650*
	LK651*
	LK652*

16 channels
Digital Input
12 / 24 / 48 VDC

Model:	**LK613**
	LK614
	LK615

16 channels
Digital Input
24 / 120 / 230 VAC

Model:	**LK710**
	LK750*

16 channels
Transistor
Digital Output

Model:	**LK711**
	LK712
	LK720

8 channels
Triac / Relay
Digital Output

COMMUNICATION MODULES

Model: LK231
LK232
LK250
PROFIBUS-DP
Communication
Master / Slave

Model: LK252

MODBUS
Communication
RTU / ASCII

SPECIAL FUNCTION I/O MODULES

Model: LK680*

2 channels
1MHz High-Speed
Counter Module

Model: LK630

16 channels
Resolution: 1ms
SOE Module

	Cable Type A	Cable Type B
Transmission Rate	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

PROFIBUS-DP: Transmission rate and range
for cable type A and B

LK PLC

POWER SUPPLY

Power Supply
Model: LK910

...le supporting up to 32Mbps data bus on the local backplane only.

ANALOGUE INPUT MODULES / ANALOGUE OUTPUT MODULES

Model: LK410
LK411
LK414
LK415

8 / 6 channels
Voltage or Current
Analog Input

Model: LK430
LK440
LK441

8 / 6 channels
TC or RTD
Analog Input

Model: LK510
LK511

4 channels
Voltage or Current
Channels Isolation
Analog Output

**Model: LK810**
LK850*

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 during 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.
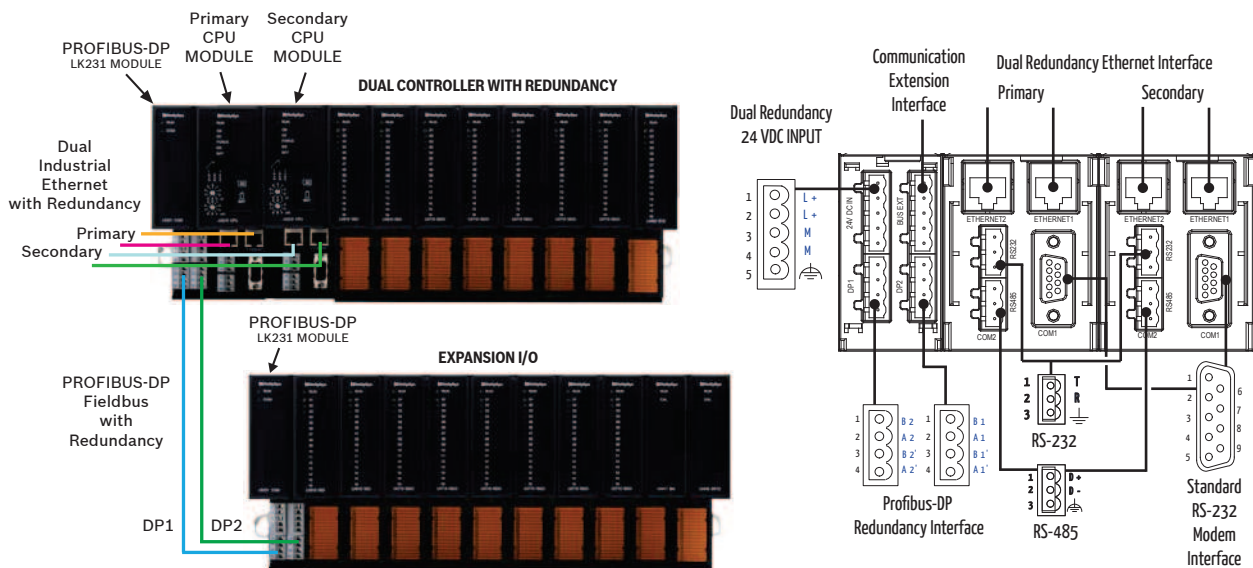
CONTROLLER REDUNDANCY

- 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

- 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.

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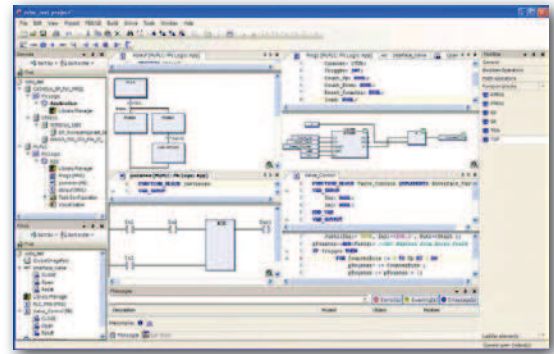
- Fully comply with programming standard of IEC61131-3 standard.
- Powerful operation capability (example, 32-bit floating point operation, optimized PID algorithm, etc.)
- Expansion library with support for user defined library.
- Software simulation, online debugging, and user code functions check.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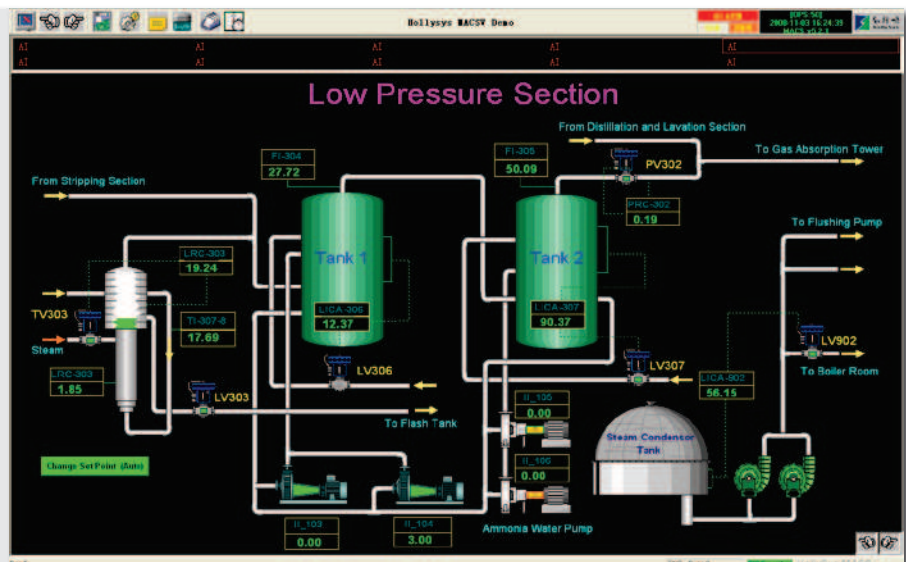
Software Simulation

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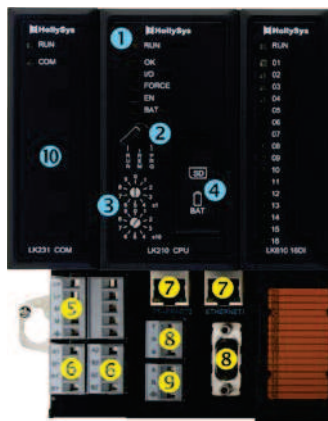- Convenient programming and flexible break point debugging.

HMI DESIGNER SOFTWARE

Graphical Libraries
User Friendly Interface
Alarms
Reports
Logs
Historical Trend

CPU MODULES

❶ LED status indicator

❷ Operating Mode Selectable Switch (RUN, REM, PRG)

❸ Station ID Selectable Switches

❹ Compartment slot for SD card and backup battery

❺ Power Supply Input Terminals

❻ PROFIBUS-DP Terminals

❼ 10/100Mbps Ethernet ports

❽ RS-232 interface port

❾ Rs-485 interface terminal

❿ Communication module

Model			LK207	LK210
CPU Speed			533 MHz	
Storage Memory		FLASH: Programmable	16 MB	
		SDRAM: Data	64 MB	
		SDRAM: Power-loss protection	1 MB	
		EEPROM	256 MB	
		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 > 3.0V x 90%	
Cycle Time		Binary operation, minimum	0.013 µS per step	
		Word operation, minimum	0.013 µS per step	
		Floating-point operation, maximum	0.2 µS per step	
COMMUNICATION	Ethernet	Protocol	TCP/IP, IEEE802.3/u	
		Type of interface via backplane	1x RJ45 interface	2x RJ-45 interfaces
		Redundancy	--	Supported
		Communication baud rate	10 M/100 Mbps, auto-adaptive	
		Network Topology	Star or Ring	
	Fieldbus	Protocol	PROFIBUS-DP	
		Type of interface via backplane	2x ports, 4-pins each, terminal connector socket, 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	RS-232 port (COM 1)	1x port, 9-pins D-type interface (female)	
		RS-232 / RS-485 port (COM 2)	1x port, configurable as RS-232 or RS-485, terminal connector socket, freeport mode, MODBUS master/slave mode	
	Local backplane high-speed bus**	Communication speed, CPU to I/O modules	32 Mbps, 2.6 µS per byte	
		Maximum module load capacity for highspeed **	maximum of 8 modules	
Supporting Redundant CPU Backplane			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		Supported backplane	Single CPU Local backplane	Redundant CPU Local Backplane
		Module dimension	52.5 x 100 x 100 mm (Wx H x D)	
		Weight	280g	
Environmental Specification		Operating temperature	0 ℃ ~ 60 ℃	
		Storage temperature	-40 ℃ ~ 85 ℃	
		Relative humidity	5% ~ 95% (non-condensing)	

** Highspeed communication bus only applies to I/O modules that support highspeed

BACKPLANES WITH I/O TERMINALS

	Backplanes with I/O Terminals	LK101	LK120	LK121	LK111	LK113
Local Backplane and Expansion Backplane	Total number of slots	10	3	11	11	6
	Number of slots for CPU module	1	2	2	--	--
	Number of slots for I/O modules	8	--	8	10	5
	Number of slots for Communication Modules	1	1	1	1	1
	Applications	Local Backplane Single CPU	Local Backplane Dual CPU redundancy	Local Backplane Dual CPU redundancy	Expansion Backplane	Expansion Backplane
	Dimension (WxHxD) with modules installed	367.5mm x 166mm x 117mm	140mm x 166mm x 117mm	420mm x 166mm x 117mm	385mm x 166mm x 117mm	210mm x 166mm x 117mm

BACKPLANES WITHOUT I/O TERMINALS

	Backplanes without I/O Terminals	LK125	LK115	LK116
Local Backplane and Expansion Backplane	Total number of slots	11	11	6
	Number of slots for CPU module	1	--	--
	Number of slots for I/O modules	8	10	5
	Number of slots for Communication Modules	2	1	1
	Applications	Local Backplane Dual CPU redundancy	Expansion Backplane	Expansion Backplane
	Dimension (WxHxD) with modules installed	420mm x 166mm x 117mm	385mm x 166mm x 117mm	210mm x 166mm x 117mm

I/O TERMINAL BLOCK

	I/O Terminal Block	LK3310
I/O Terminal Block	Terminal Pins	36 pins (18 pins x 2 rows)
	Mounting	Standind 35mm DIN rail

*Applicable for LK125, LK115, and LK116 only.

ANALOG I/O MODULES

Analog Input Modules	LK410	LK411	LK414	LK415
Input Type	Voltage Input	Current Input	Current Input	Voltage/Current Input
Analog Channels	8	8	8	6
Resolution	16 bits	16 bits	16 bits	16 bits
Range	±10V / 0~5V / 0~10V	0~20mA / 4~20mA	4~20mA	±10V / 0~5V / 0~10V or 0~20mA / 4~20mA

8 Channel Voltage Analog Input
8 Channel Current Analog Input
6 Channel Voltage/Current Analog Input

Analog RTD /TC Modules	LK430	LK440	LK441
Input Type	RTD input	Thermocouple	Thermocouple with cold-end compensation
Analog Channels	6	8	8
Resolution	16 bits	16 bits	16 bits
Range	Pt100/200/500/1000; Ni100/120/200/500; Cu10/50	B,C,E,J,K,N,R,S,T or -12mV~+78mA or -12mV~+32mV	B,C,E,J,K,N,R,S,T or -12mV~+78mA or -12mV~+32mV

6 Channel RTD Input
8 Channel Thermocouple Input
8 Channel Thermocouple Input with cold-end compensation

Analog Output Modules	LK510	LK511
Output Type	Voltage Output	Current Output
Analog Channels	4	4
Resolution	14 bits	12 bits
Range	±10V / 0~5V / 0~10V	0~20mA / 4~20mA

4 Channel Voltage Analog Output
4 Channel Current Analog Output

Analog AIAO Modules	LK810
Input Type	Voltage/Current Input
Analog Input Channels	4
Resolution	16 bits
Range	±10V / 0~5V / 0~10V or 0~20mA / 4~20mA
Output Type	Voltage/Current Input
Analog Output Channels	2
Resolution	14 bits
Range	±10V / 0~5V / 0~10V or 0~20mA / 4~20mA
Highspeed Local bus communication	32Mbps

4 Channel Analog Input and 2 Channel Analog Output

Analog Highspeed AIAO Modules	LK850
Input Type	Voltage/Current Input
Analog Input Channels	4
Resolution	16 bits
Range	±10V / 0~5V / 0~10V or 0~20mA / 4~20mA
Output Type	Voltage/Current Input
Analog Output Channels	2
Resolution	14 bits
Range	±10V / 0~5V / 0~10V or 0~20mA / 4~20mA
Highspeed Local bus communication	32Mbps

4 Channel Analog Input and 2 Channel Analog Output (High-Speed Local Data Bus)

DIGITAL INPUT MODULES

16 Channel DC Input, Sink or Source Type	Digital Input Modules		LK610	LK611	LK612
	Input Type		DC, Sink	DC, Source	DC, Source
	Digital Channels		16	16	16
	Input Voltage	Rated value	12/24VDC	12/24VDC	48VDC
		ON-state	10 ~ 31.2VDC	10 ~ 31.2VDC	30 ~ 60VDC
		OFF-state	<5VDC	<5VDC	<10VDC
	Input Current	ON-state	2 ~ 10mA	2 ~ 10mA	2 ~ 7mA
		OFF-state	<1.5mA	<1.5mA	<1.5mA
	Input Delay Time	OFF→ON	Hardware delay: 50µs: programmable filter: 1/3/5/10/15/20/25/30ms, configurable		
		ON→OFF	Hardware delay: 50µs: programmable filter: 1/3/5/10/15/20/25/30ms, configurable		

16 Channel DC Input, Sink or Source Type (High-Speed Local Data Bus)	Digital Highspeed Input Modules		LK650	LK651	LK652
	Input Type		DC, Sink	DC, Source	DC, Source
	Digital Channels		16	16	16
	Input Voltage	Rated value	12/24VDC	12/24VDC	48VDC
		ON-state	10~31.2VDC	10~31.2VDC	30~60VDC
		OFF-state	<5VDC	<5VDC	<10VDC
	Input Current	ON-state	2 ~ 10mA	2 ~ 10mA	2 ~ 7mA
		OFF-state	<1.5mA	<1.5mA	<1.5mA
	Input Delay Time	OFF→ON	Hardware delay: 15µs~30µs: Software filtering: 0/0.1/0.5/3/20ms, configurable		
		ON→OFF	Hardware delay: 30µs~45µs: Software filtering: 0/0.1/0.5/3/20ms, configurable		
	Highspeed Local bus communication		32Mbps		

16 Channel AC Input, 24VAC, 120VAC, 230VAC	Digital Input Modules		LK613	LK614	LK615
	Input Type		AC	AC	AC
	Digital Channels		16	16	16
	Input Voltage	Rated value	24VAC	120VAC	230VAC
		ON-state	14~27VAC	74~132VAC	159~265VAC
		OFF-state	<5VAC	<20VAC	<40VDC
	Input Current	ON-state	3 ~ 6.2mA	2.8 ~ 5.4mA	1.5 ~ 2.5mA
		OFF-state	<1.5mA	<1mA	<0.5mA
	Input Delay Time	OFF→ON	Hardware delay: <10ms; software filtering: 9/18ms, configurable		Hardware delay: <15ms; software filtering: 9/18ms, configurable
		ON→OFF	Hardware delay: <10ms; software filtering: 9/18ms, configurable		Hardware delay: <10ms; software filtering: 9/18ms, configurable

DIGITAL OUTPUT MODULES

	Digital Output Modules		LK710	LK711	LK712
16 Channel Transistor Output 8 Channel TRIAC Output	Output Type		MOSFET Transistor	TRIAC	TRIAC
	Digital Channels		16	8	8
	Output Voltage	Rated value	24VDC	24VAC	110/230VAC
		Allowed Range	10 ~ 31.2VDC	10~60VAC	74~265VAC
	Output Current	Per channel	0.5A @ 40℃ 0.4A @ 60℃	0.5A @ 60℃	1A @ 60℃
		Per module	8A @ 40℃ 6.4A @ 60℃	4A @ 60℃	6.4A @ 60℃
	Output Delay Time	OFF➔ON	1ms, max	8.3ms @ 60Hz, 10ms @ 50Hz	8.3ms @ 60Hz, 10ms @ 50Hz
		ON➔OFF	1ms, max	8.3ms @ 60Hz, 10ms @ 50Hz	8.3ms @ 60Hz, 10ms @ 50Hz

	Digital Output Modules		LK720
8 Channel Relay Output	Output Type		Relay, Normally Open
	Digital Channels		8
	Output Voltage - allowed range		10~265VAC @ 47~63Hz or 5~125VDC
	Output Delay Time	OFF➔ON	10ms, max
		ON➔OFF	10ms, max

	Digital Highspeed Output Modules		LK750
16 Channel Transistor Output (High-Speed Local Data Bus)	Output Type		MOSFET Transistor
	Digital Channels		16
	Output Voltage	Rated value	24VDC
		Allowed Range	10 ~ 31.2VDC
	Output Current	Per channel	0.5A @ 40℃ 0.4A @ 60℃
		Per module	8A @ 40℃ 6.4A @ 60℃
	Output Delay Time	OFF➔ON	1ms, max
		ON➔OFF	1ms, max
	Highspeed Local bus communication		32Mbps

SPECIAL FUNCTION MODULES

16 Channel Digital SOE Input	Digital SOE Modules		LK630
	Input Channels		16
	Input Voltage	ON state	10 ~ 31.2VDC
		OFF state	0 ~ 5VDC
	Input Current	ON state	2mA ~ 10mA
		OFF state	<1.5mA
	Input Delay Time	OFF➜ON	1ms / 3ms / 5ms; programmable filter: 10ms/15ms/20ms/25ms/30ms configurable
		ON➜OFF	1ms / 3ms / 5ms; programmable filter: 10ms/15ms/20ms/25ms/30ms configurable
	Sequence Of Event Resoultion		1 ms

2 Channel Input Counter (High-Speed Local Data Bus)	Counter Modules		LK680
	Number of Counter		2
	Operating Mode	Counter Frequency Range	0Hz ~ 1MHz 0.1Hz ~ 1MHz 0Hz ~ 250KHz 0Hz ~ 50Hz
	Counting Range		0 ~ 4,294,967,295 (32 bits)
	Highspeed Local bus communication		32Mbps

COMMUNICATION MODULES

2 Channel Input Counter (High-Speed Local Data Bus)	Communications Modules	LK231	LK232	LK250	LK252
	Usage Purpose	Standard	Repeater, for third-party devices	Expansion	Max. 31 slave station
	Protocol	PROFIBUS-DP			MODBUS RTU/ASCII
	Isolation	-	Yes, with third-party device	Yes	Yes
	Redundancy	Yes	Yes	Yes	-
	Baud rate	1.5Mbps, 500Kbps, 187.5Kbps, 93.75Kbps, 45.45Kbps, 31.25Kbps, 19.2Kbps, 9.6Kbps			2.4Kbps ~ 115.2Kbps

POWER SUPPLY MODULES

24VDC Input Power Supply	Power Supply	LK910
	Input	100VAC ~ 240VAC, 47Hz ~ 63Hz
	Output	24VDC ±5%, 5A
	Power	120W

PRODUCT SELECTION LIST

Module Type	Model	Description	Specification
Controller Module	LK207	Controller Module, for single controller backplane	533Mhz, 0.013ms/K, program: 16MB, data: 64MB+1MB power-loss zone, SRAM, for single controller backplane.
	LK210	Controller Module, for dual controller redundancy backplane	533Mhz, 0.013ms/K, program: 16MB, data: 64MB+1MB power-loss zone, SRAM, for dual controller redundancy backplane.
AI Module	LK410	8-channels AI Module, voltage input	16 bits, ±10V / 0~5V / 0~10V, no isolation
	LK411	8-channels AI Module, current input	16 bits, 0~20mA / 4~20mA, no isolation, 2 or 4-wired transmitter
	LK414	8-channels AI Module, current input, external powered	16 bits, 4~20mA, no isolation, 2-wired transmitter
	LK415	6-channels AI Module, voltage/current input	16 bits, ±10V / 0~5V / 0~10V or 0~20mA / 4~20mA, no isolation
	LK430	6-channels AI Module, RTD	16 bits, Pt100/200/500/1000, Ni100/120/200/500, Cu10/50
	LK440	8-channels AI Module, thermocouple	16 bits, -12mV~+78mV, -12mV~+32mV, B,C,E,J,K,N,R,S,T thermocouple type
	LK441	8-channels AI Module thermocouple with cold-end compensation	16 bits, -12mV~+78mV, -12mV~+32mV, B,C,E,J,K,N,R,S,T thermocouple type with cold end compensation
AO Module	LK510	4-channels AO Module, voltage output	14 bits, ±10V / 0~5V / 0~10V, isolation in-between channels
	LK511	4-channels AO Module, current output	12 bits, 0~20mA / 4~20mA, isolation in-between channels
AI/AO Module	LK810	4-channels AI / 2-channels AO Module	16 bits input: ±10V / 0~5V / 0~10V or 0~20mA / 4~20mA, 14 bits output: ±10V / 0~5V / 0~10V or 0~20mA / 4~20mA.
DI Module	LK610	16-channels DI Module, 12/24VDC, sink	12/24VDC, sink type, no isolation, hardware delay: 50µS, software filtering: 0/1/3/5/10/15/20/30 ms selectable configuration
	LK611	16-channels DI Module, 12/24VDC, source	12/24VDC, source type, no isolation, hardware delay: 50µS, software filtering: 0/1/3/5/10/15/20/30 ms selectable configuration
	LK612	16-channels DI Module, 48VDC, source	48VDC, source type, no isolation, hardware delay: 50µS, software filtering: 0/1/3/5/10/15/20/30 ms selectable configuration
	LK613	16-channels DI Module, 24VAC	24VAC, hardware delay: <10ms, software filtering: 9/18ms selectable configuration
	LK614	16-channels DI Module, 120VAC	120VAC, hardware delay: <10ms, software filtering: 9/18ms selectable configuration
	LK615	16-channels DI Module, 230VAC	230VAC, hardware delay: <10ms, software filtering: 9/18ms selectable configuration
DO Module	LK710	16-channels DO Module, 10~30VDC, transistor	10~30VDC, transistor output, Max. current output per channel: 0.4A
	LK711	8-channels DO Module, 10~60VAC, triac	10~60VAC, triac output, Max. current output per channel: 0.5A
	LK712	8-channels DO Module, 74~265VAC, triac	74~265VAC, triac output, Max. current output per channel: 1A
	LK720	8-channels DO Module, relay	10~265VAC / 5~125VDC, normally open relay contact, Max. output delay: 10ms, max. current output per channel: 2A
Special Functions	LK630	16-channels DI Module, 12/24VDC, sink, SOE	12/24VDC, sink type, no isolation, SOE, 1ms resolution
	LK680	2-channels high-speed counter module	0.1Hz to 1Mhz High-speed Counter Module, HIGHSPEED Comms.

Module Type	Model	Description	Specification
HIGHSPEED I/O Modules - 32Mbps local data bus communication with the controller used on local backplane only.	LK850	4-channels AI / 2-channels AO Module, HIGHSPEED	16 bits input: ±10V / 0~5V / 0~10V / 0~20mA / 4~20mA, 14 bits output: ±10V / 0~5V / 0~10V / 0~20mA / 4~20mA, HIGHSPEED Comms.
	LK650	16-channels DI Module, 12/24VDC, sink, HIGHSPEED	12/24VDC, sink type, no isolation, hardware delay: 15µS~30µS, software filtering: 0/0.1/0.5/3/20 ms optional configuration, HIGHSPEED Comms.
	LK651	16-channels DI Module, 12/24VDC, source, HIGHSPEED	12/24VDC, source type, no isolation, hardware delay: 15µS~30µS, software filtering: 0/0.1/0.5/3/20 ms optional configuration, HIGHSPEED Comms.
	LK652	16-channels DI Module, 48VDC, source, HIGHSPEED	48VDC, source type, no isolation, hardware delay: 15µS~30µS, software filtering: 0/0.1/0.5/3/20 ms optional configuration, HIGHSPEED Comms.
	LK750	16-channels DO Module, transistor, HIGHSPEED	10~30VDC, transistor output, Max. current output per channel: 0.5A, high-speed communication
Communication Modules	LK231	PROFIBUS-DP communication interface module	Standard PROFIBUS-DP Communication
	LK232	PROFIBUS-DP communication interface module for third-party devices	Repeater function, you can change the topology
	LK250	PROFIBUS-DP Slave or Master communication interface module	Configured as Slave station with the PROFIBUS-DP card while configured as Master station with the expansion backplane. This increases the I/O capacity.
	LK252	MODBUS communication interface module	Communicates through the backplane to the main controller, MODBUS (RTU / ASCII) comminication interface. Maximum of 31 slave station.
Backplanes with I/O terminals	LK101	10 slots local backplane for single controller	Max 10 slots local backplane with single controller slot, 367.5mm x 166mm x 117mm (WxHxD)
	LK120	3 slots local backplane for dual controller with redundancy	Max 3 slots local backplane with two controller reduandancy slots, 140mm x 166mm x 117mm (WxHxD)
	LK121	11 slots local backplane for dual controller with redundancy	Max 11 slots local backplane with two controller reduandancy slots, 420mm x 166mm x 117mm (WxHxD)
	LK111	11 slots expansion backplane	Max 11 slots expansion backplane, 385mm x 166mm x 117mm (WxHxD)
	LK113	6 slots expansion backplane	Max 6 slots expansion backplane, 210mm x 166mm x 117mm (WxHxD)
Backplanes without I/O termnials using cabling interface	LK125	11 slots local backplane with dual controller redundancy using cabling for I/O terminals	Max 11 slots local backplane with dual controller reduandancy slots, 420mm x 166mm x 117mm (WxHxD)
	LK115	11 slots expansion backplane using cabling for I/O terminals	Max 11 slots expansion backplane with frontal cabling, 385mm x 166mm x 117mm (WxHxD)
	LK116	6 slots expansion backplane using cabling for I/O terminals	Max 6 slots expansion backplane with frontal cabling, 210mm x 166mm x 117mm (WxHxD)\
Terminals Block for backplanes using cabling interface	LK3310	Standard I/O Terminal Block (36 terminal pins)	For use with LK 115, LK116, or LK125
Power Supply Module	LK910	Power Supply Module	input 120/230VAC, output: 24VDC, 5A
Cables & Accessories	LKX001	LK series PLC, programming cable, 5 meters	
	LKX002	LK series PLC, PROFIBUS-DP expansion cable, 3 meters	
	LKF0001	LK series PLC, Removable SD memory card	
	LKF0002	LK series PLC, Backup battery	
	LKF0003	LK series PLC, Rotational tools for backplane's mechanical key	
	LK-SW-DONGLE	LK series PLC, Software Dongle Key	
Software	LK-SW-PROG	LK series PLC, PROGRAMMING SOFTWARE, English version	
	LK-SW-HMIDESIGN	LK series PLC, HMI DESIGNER SOFTWARE, English version	

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