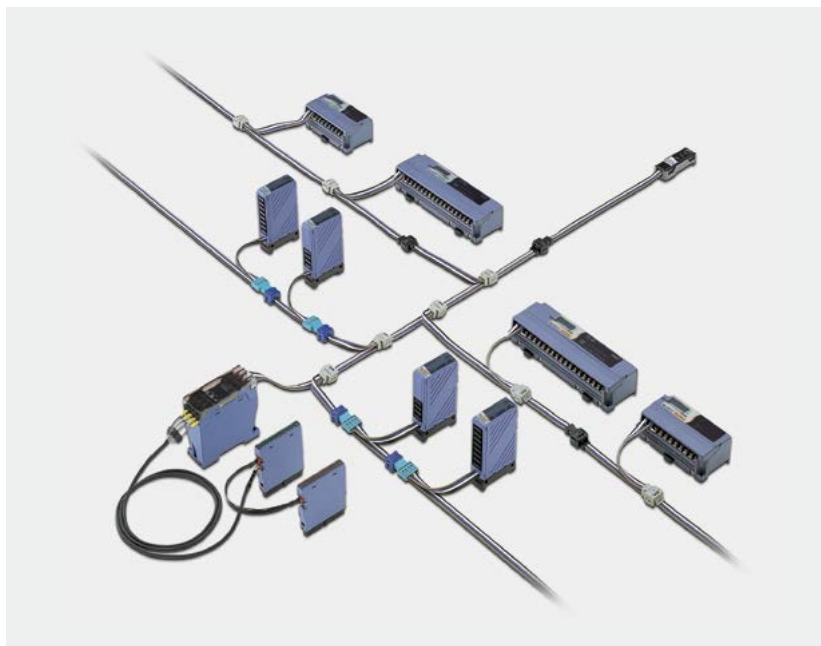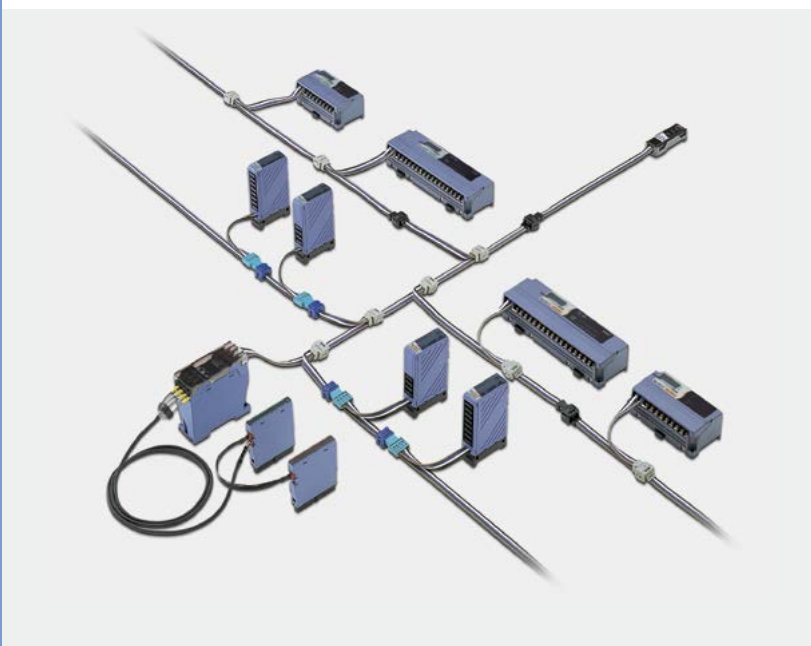# Flexible Wire-saving System
S-LINK V

S-LINK V

CE

UL Recognition
(Some models only)

> • Never use this product in a device for personal protection.
> • Handle safety related or emergency stop signals without passing them through the **S-LINK V** system due to fail-safe considerations.

> This product is introduced to only limited countries. Please contact our office for details.

Connecting to the future…
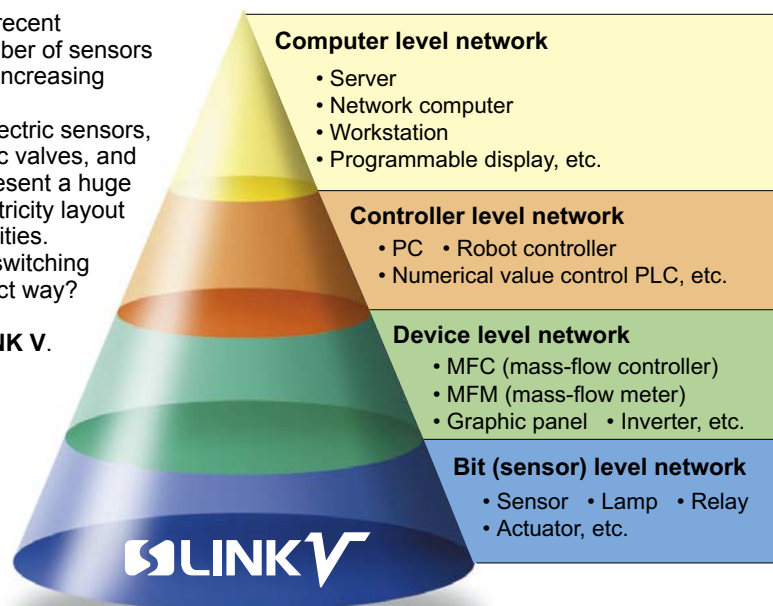## our next generation wire-saving system

Ideal wire-saving system that meets the strict demands of the FA worksite

Because of the high degree of evolution of recent automation-unmanned technology, the number of sensors and actuators at work in the FA worksite is increasing evermore.

ON/OFF switching devices such as photoelectric sensors, inductive proximity sensors, electromagnetic valves, and the like, though simplistic in character, represent a huge burden on the workplace in the form of electricity layout design and wiring when used in large quantities.

Can ever increasing quantities of ON/OFF switching devices be wired in a fast, easy and compact way? Panasonic Industry's as the leading FA sensor maker, has the answer the **S-LINK V**.

Computer level network
- Server
- Network computer
- Workstation
- Programmable display, etc.

Controller level network
- PC • Robot controller
- Numerical value control PLC, etc.

Device level network
- MFC (mass-flow controller)
- MFM (mass-flow meter)
- Graphic panel • Inverter, etc.

Bit (sensor) level network
- Sensor • Lamp • Relay
- Actuator, etc.

LINK V

Design a layout with complete control and freedom

With no limit to the number of branches, layout design can be done simply without any wiring constraints thanks to the multiplication of control points (maximum of 512 points and 256 nodes, the largest in its class).

Super adaptability to the worksite

Because there are 3 different communication modes to choose from, you never have to change models even if the worksite or the equipment changes.
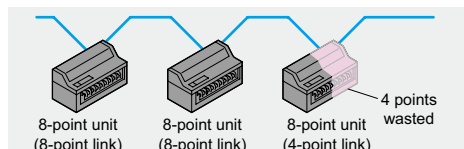
Truly dependable features

Simple and dependable communication protocols enable fast communication speed. We've also realized an extended communication range of 800 m 2,624 ft maximum (when in C mode).

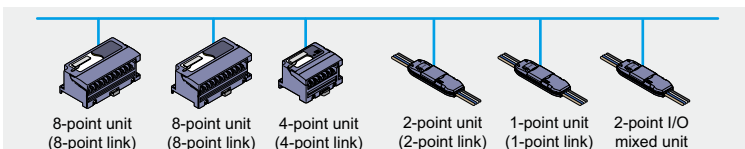## Multiplication of control points now a reality

With the maximum I/O control point count is 512.
In addition, there are 256 connection nodes and, because of a variegated 1, 2, 4, 8, 16, and 32 point I/O unit lineup, you can efficiently mount up to 512 control devices to correspond to the quantity of I/O devices desired.

Conventional wire-saving system (remote I/O etc.)

8-point unit
(8-point link)　　8-point unit
(8-point link)　　8-point unit
(4-point link)　　4 points
wasted

S-LINK V　Operates with superb cost, space, and I/O point count efficiency.

8-point unit
(8-point link)　8-point unit
(8-point link)　4-point unit
(4-point link)　2-point unit
(2-point link)　1-point unit
(1-point link)　2-point I/O
mixed unit

Alleviates the burden laid on engineer for designing and wiring

Labor-saving hook-up connectors are used enabling multiple "T"-branch hookups wherever desired. Because there are no branch-count restrictions or main cable / branch cable differentiations, it goes without saying that cascade wiring (bus wiring) as well as multiple branch wiring (star wiring) is also possible.

Star wiring　　　　"T"-branch　　　　Cascade wiring
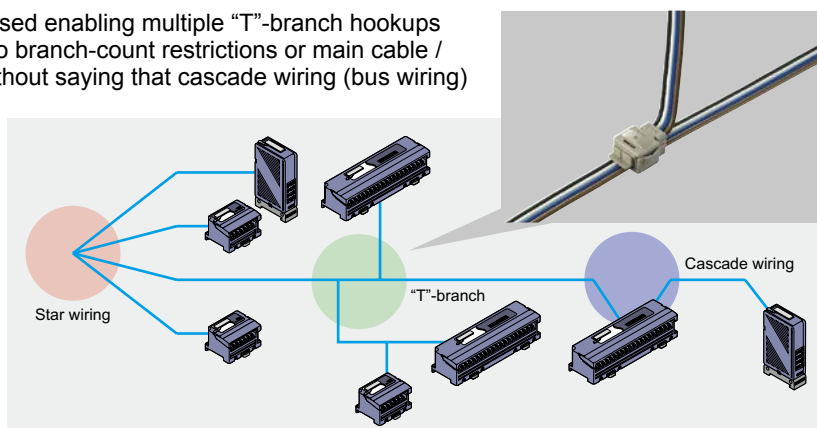
## A bit level network without the need to specifying upper-level networks

The flexible wire-saving system **S-LINK V** can be connected to various foreign or domestic PLC. Also available are a computer control board and a bus direct connection controller and controllers supporting open network and serial communications. Any upper-level network connection is possible without specifying it.

For open network			For RS-485/RS-232C	For PLC I/O connectors
S-LINK V gateway controller for open network for CC-Link **SL-VGU1-C**	for DeviceNet **SL-VGU1-D**	for EtherCAT **SL-VGU1-EC**	For RS-485/RS-232C **S-LINK V** gateway controller **SL-VGU1-485**	**S-LINK V** controller **SL-VCU1** PLC I/O connectors **SL-VS□**, **SL-VP□**

For bus direct connection			
For **FP2** / **FP2SH** series PLC bus direct connection controller **SL-VFP2**	Mitsubishi Electric Corp. MELSEC-Q series PLC bus direct connection controller **SL-VMEL-Q**	PCI bus **S-LINK V** control board **SL-VPCI** Windows® 7 - compatible	VME bus **S-LINK V** control board **SL-VVMES2**

* CC-Link is a registered trademark of Mitsubishi Electric Corporation. DeviceNet is a registered trademark of ODVA (Open DeviceNet Vender Association, Inc.). EtherCAT is a registered trademark of Beckhoff Automation GmbH.

Commercially available cables and connectors can also be used

Available for the **S-LINK V** is an exclusive 4-core flat cable and exclusive hook-up connectors for your labor-saving needs. On the other hand, they are also compatible with commercially available 4-core VCTF cables (without shield) and connectors enabling hookup with the cables you have already in stock. For worksites already wired-up, new wiring work does not have to be performed making these highly efficient devices help greatly reduce material and labor costs.
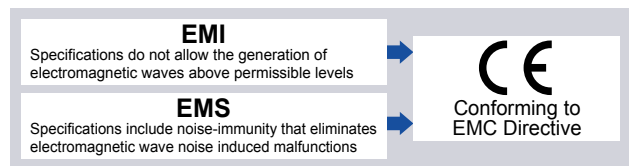
S-LINK V exclusive flat cable　　**S-LINK V** hook-up connector　　Commercially available 4-core VCTF cable (without shield)　　Commercially available connectors
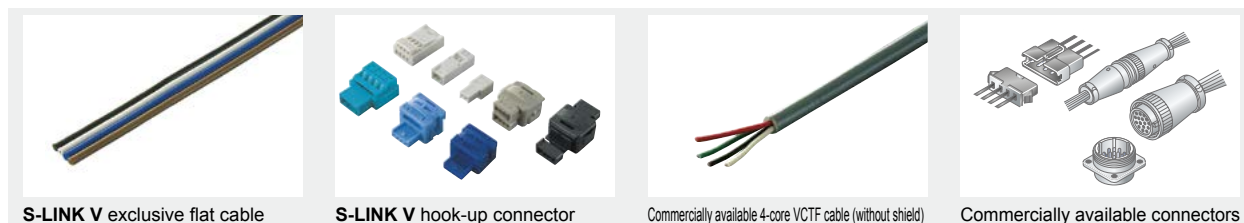
All models conform to CE marking (EMC Directive)
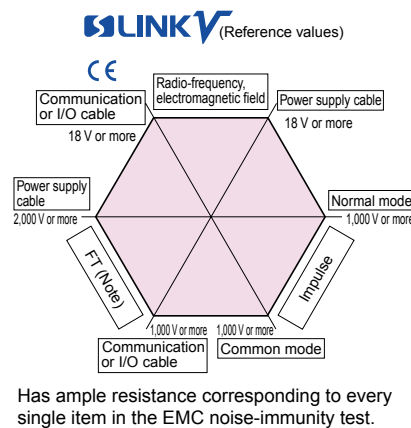
EMI standard EN 61000-6-4
EMS standard EN 61000-6-2
In noisy FA worksites, conforming to CE marking (EMC Directive) is the very least of its operating conditions.
All **S-LINK V** units have withstood testing criteria that went above and beyond those reserved for field devices (sensors) that have passed the strictest of CE marking.

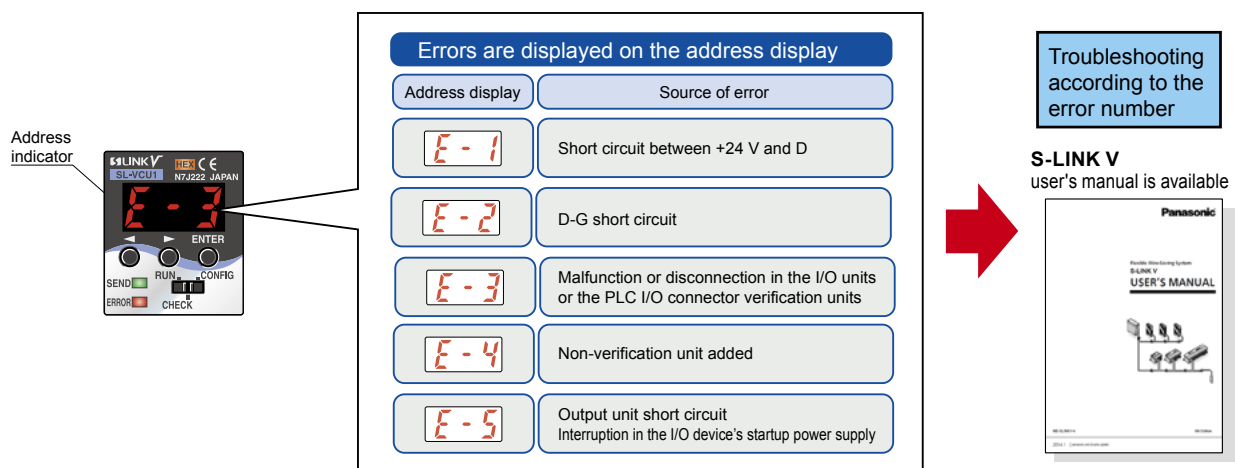| **EMI** Specifications do not allow the generation of electromagnetic waves above permissible levels	→	CE Conforming to EMC Directive
EMS Specifications include noise-immunity that eliminates electromagnetic wave noise induced malfunctions	→	

Superior noise-immunity performance

We've strengthened the conventional simple waveform noise resistance and enhanced reliability by eliminating the lost flexibility when setting up and the lost freedom and control when designing a layout.

LINK V (Reference values)

CE

- Radio-frequency, electromagnetic field
- Communication or I/O cable — 18 V or more
- Power supply cable — 18 V or more
- Power supply cable — 2,000 V or more
- Normal mode — 1,000 V or more
- FT (Note) — 1,000 V or more
- Impulse
- Communication or I/O cable — 1,000 V or more
- Common mode

Has ample resistance corresponding to every single item in the EMC noise-immunity test.

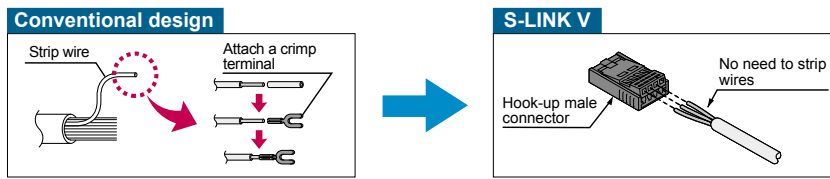Note: FT represents first transient burst noise.

Enhanced maintainability

The system is consistently monitoring communications. In the unlikely event that a problem should arise, it lets the operators know immediately so that appropriate measures can be performed without delay. This feature enables quick and accurate troubleshooting. As error outputs for each abnormality causes can be gained, it is possible to immediately check the cause of problems in case of trouble. Replacement of input / output units due to a fault is easy with connector connection.

Address indicator

LINK V HEX CE
SL-VCU1 N7J222 JAPAN
ENTER
SEND RUN CONFIG
ERROR CHECK

Errors are displayed on the address display

Address display	Source of error
E - 1	Short circuit between +24 V and D
E - 2	D-G short circuit
E - 3	Malfunction or disconnection in the I/O units or the PLC I/O connector verification units
E - 4	Non-verification unit added
E - 5	Output unit short circuit Interruption in the I/O device's startup power supply

Troubleshooting according to the error number

S-LINK V user's manual is available

Panasonic

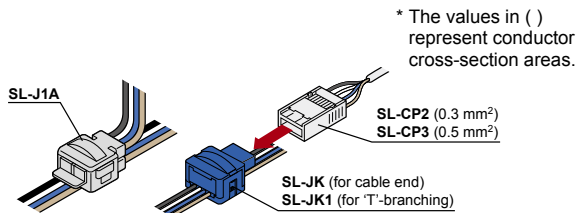Flexible Wire-Saving System
S-LINK V
USER'S MANUAL

Easy and flawless connections

Every type of hook-up connector is made available enabling a one-touch connection between the **S-LINK V** I/O units and the main cable or I/O devices such as sensors.

Conventional design
Strip wire

Attach a crimp terminal

S-LINK V
Hook-up male connector

No need to strip wires

Branch cable to main cable connection and S-LINK V I/O unit to main cable connection

* The values in ( ) represent conductor cross-section areas.

SL-J1A

SL-CP2 (0.3 mm^2)
SL-CP3 (0.5 mm^2)

SL-JK (for cable end)
SL-JK1 (for 'T'-branching)

Using the 4-core flat cable, one-touch branching and extensions with hook-up connectors make overwhelming labor-saving possible. Also, in order to enhance the reliability of the connection, exclusive pliers are made available so that anyone can do it with ease.

Link from connection device to S-LINK V I/O unit

Using snap connectors renders wiring even for sensors and all types of I/O devices simple and easy.

* The values in ( ) represent conductor cross-section areas.

SL-VT8J
SL-VTP8J
SL-VT4J
SL-VTP4J
SL-VTαE
(For e-CON)

SL-CP1 (0.08 to 0.2 mm^2)
SL-CP2 (0.3 mm^2)
SL-CP3 (0.5 mm^2)
Complies with the e-CON specification.

I/O device

Connection device extensions

* The values in ( ) represent conductor cross-section areas.

4 and 3-wire devices
SL-CJ1 (0.08 to 0.2 mm^2)
SL-CJ2 (0.3 mm^2)

SL-CP1 (0.08 to 0.2mm^2)
SL-CP2 (0.3 mm^2)
SL-CP3 (0.5 mm^2)
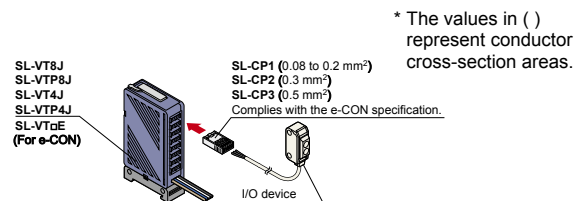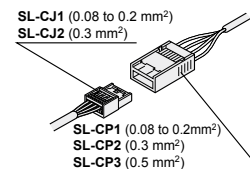
2-wire device and thru-beam type photoelectric sensor emitter
SL-CP12 (0.08 to 0.2 mm^2)
SL-CP22 (0.3 mm^2)

SL-CJ12 (0.08 to 0.2 mm^2)
**SL-CJ22** (0.3 mm^2)
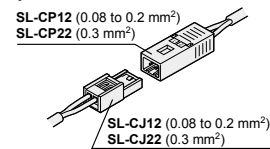
Merit of the 4-core flat cable

Easy wiring thanks to a flexible cable

The ribbon-shaped 4-core flat cables are light, flexible, don't take too much space and can be used for easy wiring in the narrow spaces inside machines, along extended production lines, etc. They can be manipulated easily for branching, extensions, and even additional wiring.
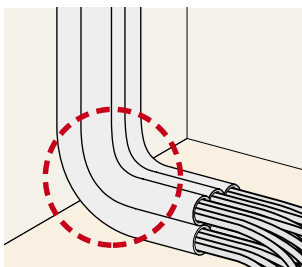

Conventional cable
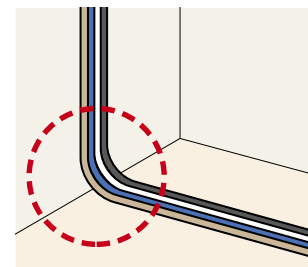
4-core flat cable

Wire-saving can be achieved simultaneously

Its exclusive 4-core flat cable makeup consists of 2 signal wires (white / black) and 2 power supply wires (brown / blue). Now, only by wiring with these exclusive 4-core flat cables, power can be supplied to all I/O units scattered throughout the system as well as to every connected device.

Power supply
Signal
Signal
Power supply
Hook-up connector
Signal
Power supply
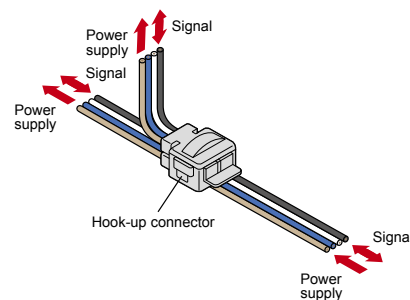
3 different selectable communication modes

Operating only the controller, communication modes can be selected for the entire system. Thanks to the three A, B, or C selectable modes, you don't need to reconfigure or modify the controller or the I/O units depending on the communication speed or the size of your system. By selecting a communication mode corresponding to the speed and communication range, the desired communication speed/range environment can also be realized.

Main items Comm. Mode (Note 4)	A-mode	B-mode	C-mode
Refresh time (Note 1)	**1.5 ms** or less (for 32 points) **3.3 ms** or less (for 128 points) **10.3 ms** or less (for 512 points)	6.0 ms or less (for 32 points) 13.1 ms or less (for 128 points) 41.3 ms or less (for 512 points)	24.0 ms or less (for 32 points) 52.3 ms or less (for 128 points) 165.2 ms or less (for 512 points)
Max. communication range (Note 2)	50 m 164.042 ft	200 m 656.168 ft	**800 m** 2624.672 ft
Total cable length	100 m 328.084 ft	400 m 1312.336 ft	**1600 m** 5249.344 ft
I/O control points	32 to **512 points** (set in 32 point step)(Note 3)		
Number of connected nodes	Maximum 256 nodes		

Notes: 1) This value represents the maximum refresh time.
2) The maximum communication range varies depending on the cables' conductor cross-section area as well as the node count.
3) 16 units of measure settable by software in the control board (**SL-VPCI**, **SL-VVMES2**).
4) Communication modes cannot be changed while a communication is in progress.

Reduce the wiring of your existing system

The **S-LINK V** system can be connected to any maker's PLC. It can even be connected to PC expansion slots, open networks, etc. Because it is compatible to any controller and network, the **S-LINK V** can be introduced to variegated systems as they are already setup. Also, even when the control configuration has been changed (PLC to PC, etc.), conformance can be achieved only by changing the controllers. In this way, the **S-LINK V** is a system that allows you to utilize to the fullest your worksite's layout investment accumulated until now. Even if changing your present system for the **S-LINK V**, its features, including a reduced amount of cables, compact units, and 'T'-branching, make the addition of I/O devices as well as layout modifications simple and easy. Only by switching the controller's communication mode, you can change the entire system. Purchasing each unit that conforms to specifications or changing the layout itself is absolutely unnecessary.

High reliability for trouble-free operation

Because 4-core flat cables and hookup connectors enable the reduction of wires, the occurrence of faulty wiring or disconnections also goes down. In addition, all **S-LINK V** units conform to CE marking (EMC Directive). This certification ensures high reliability against adverse effects from noise meaning that you can use them with reassurance in the most demanding of worksites.

World-class noise-immunity performance

CE
Conforming to
EMC Directive

Specialized knowledge not required

Because communication occurs via hardware, program communication controls are absolutely unnecessary. Even worksites that are first-time users can put this system to work immediately after introduction.

Modular design for easy customization

A control module that can control **S-LINK V** systems with custom boards and I/O modules that can connect I/O devices with custom boards are available so that you can choose the components that best suit your project's specifications.

Control module
SL-VMC1

I/O modules
SL-VM8
SL-VM16
SL-VMP8
SL-VMP16

Method of supplying power selectable

With the I/O arrayed terminal units (**SL-VTB□**, **SL-VTBP□**), the mounting or removal of short brackets enables the collective or separate supply of power from the system (**S-LINK V**) power supply and the load (I/O devices) source to be selected at will.

SL-VTBP16   Load power supply   SL-VTBP16

Output diveces
Short-circuit metal joint

Output diveces
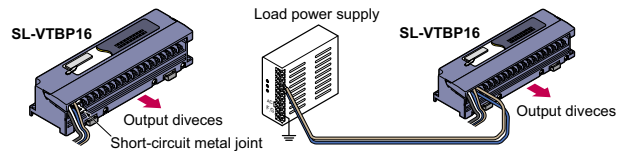
The system (**S-LINK V**) power supply and load (I/O devices) power supply can be made to supply power collectively. Therefore, electrical wiring used for the load (I/O devices) can be greatly reduced.

The system (**S-LINK V**) and load (I/O devices) power supplies can be made to supply power separately. This is not a wire-saving of power supply line method, however, the I/O devices only can be stopped without having to halt communications.

Installation and removal of mid-system communication cables possible

In case of large-scale equipment, many times we construct each unit right on site in manufacturing facilities or in subcontract factories. Because the **S-LINK V** enables the easy removal of main or branch cables even in midsystem with commercially available connectors and intermediate terminal blocks, when constructing new units, if the electric wiring is already setup, assembly can be done just by installing those units at the time of delivery and connecting the **S-LINK V** wiring.
Additionally, the ability to use the handy monitor **SL-VHM1** to check electrical wiring on a unit-by-unit basis improves productivity while facilitating the clear division of responsibility with subcontract factories.

Equipment 4

S-LINK V
I/O unit

Commercially available connectors

S-LINK V
controller

Equipment 1   Equipment 2   Equipment 3
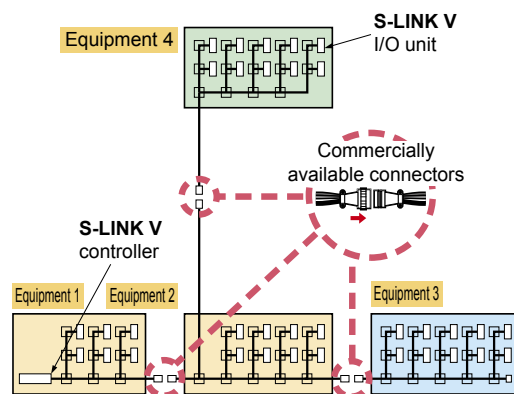
Support for fast system launch

The **SL-VHM1** can operate and monitor all units that are connected to the system, putting efficient debugging (checking) of I/O devices installed in remote locations at your fingertips.

Handy monitor
SL-VHM1

## Greatly reducing labor when installing

Labor saving is realized thanks to the 4-core flat cable and hook-up connectors. Because the work of peeling cable coverings, mounting crimp terminals, tightening screws, wiring cable ducts, etc. is rendered unnecessary, installation time is minimized. This enables the leadtime to be shortened resulting in more equipment completed in less time. In addition, the overall stress level of onsite personnel is relieved and morale goes up. Surplus auxiliary materials (cables, intermediate terminal blocks, etc.) are unnecessary making for reduced total cost. Also, using connectors to add on or change sensors and units is made easy. No wastes from peeled off cable ends meaning you are left with a wire-saving, environmentally friendly system.

Worksite installation friendly and easily connectable terminal blocks

Ample +COM and −COM terminals are imbedded in the I/O terminals rendering intermediate terminal blocks unnecessary.

Common remote I/O

Remote I/O slave terminal

Intermediate terminal block (commercially available)

Input device
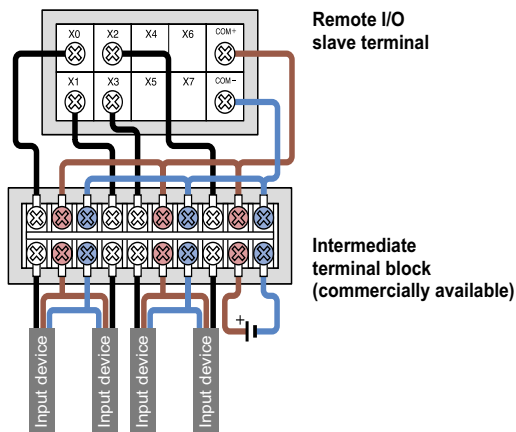
I/O terminal block diagram
(Pictured: 8-channel input terminal)

S-LINK V terminal block

SL-VTB8

Input device
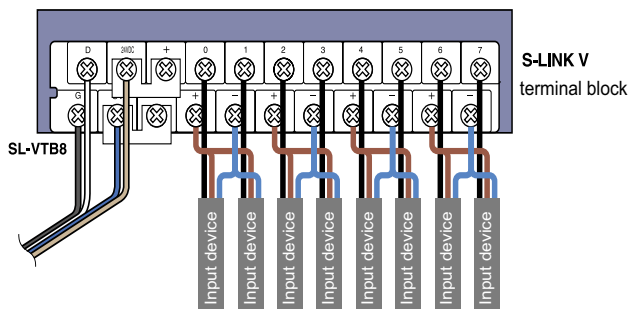
• The unit provides a large number of +COM and –COM terminals.

• The connection of 2 or 3-wire sensors was not envisioned with a low amount of COM terminals
(There are few makers that provide +COM terminals or make 3-wire sensor connections possible.)
• The present situation among current users is to prepare separate connecting terminal blocks and reconnect anew the remote I/O terminals. It is neither wire-saving nor labor-saving.

Less time required means lower construction costs

In recent years, many production processes have been moved overseas and cases where equipment had to be set up in those new foreign worksites have increased dramatically.
It goes without saying that the period of time needed for setting up the worksite equals the period personnel must remain in those countries. A long installation period means an overextended stay bringing up overall costs.
The **S-LINK V** promises a short installation time period making for great reductions in labor costs for electricians.

Shipment and installation

Construction

Conventional
(remote I/O, etc.)

Greatly reduced setup costs

Shipment and installation

Construction

S-LINK V
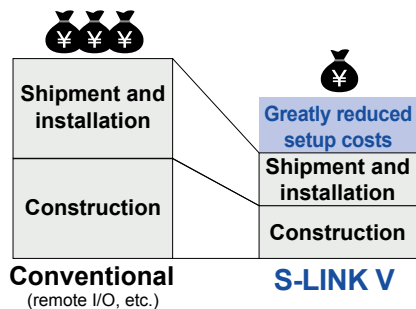
Comparison with conventional wiring

Setting conditions

■ Estimated workload for wiring a control box to 3 processing machines.
■ The control box is 10 m 32.808 ft, 15 m 49.213 ft, and 20 m 65.617 ft away from the machines respectively.
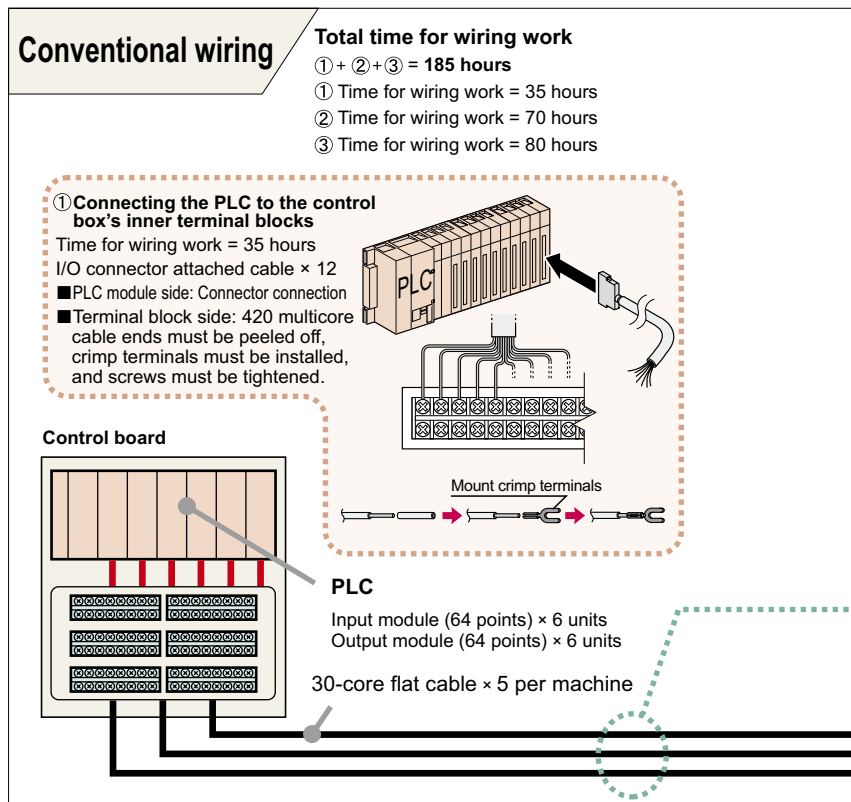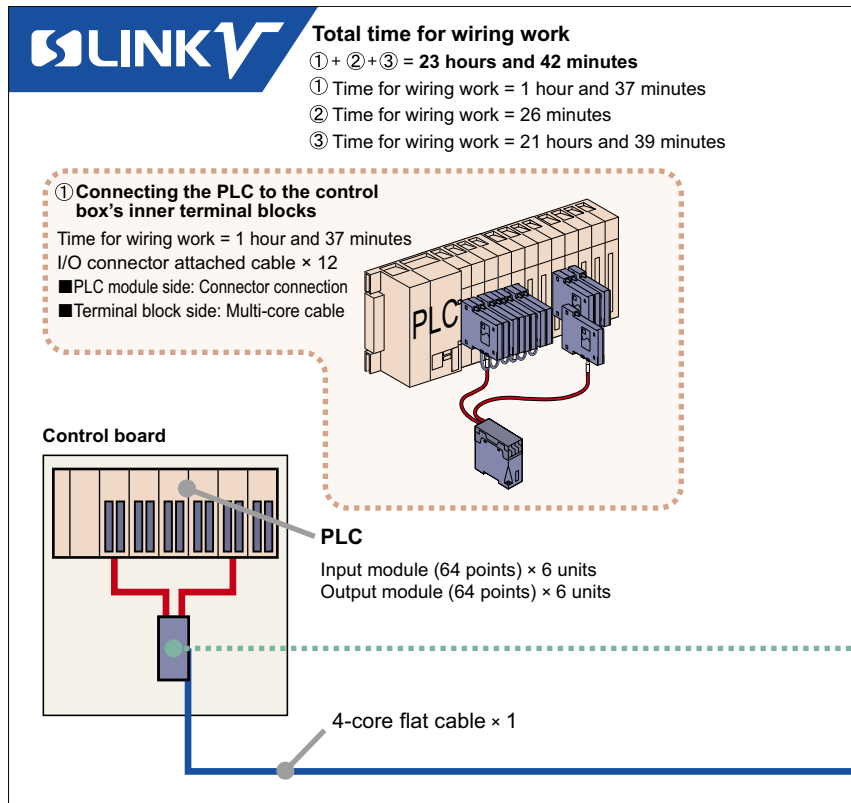■ Each machine has 128 I/O points for a total of 384 points.

Estimate results

The S-LINK V system was completely setup in 161 hours and 18 minutes (about 20 days*).

* 8 hours/day

Time needed for wiring work
○ If using **S-LINK V**: 23 hours 42 minutes
● If using conventional wiring: 185 hours

SLINKV

Total time for wiring work
① + ② + ③ = **23 hours and 42 minutes**
① Time for wiring work = 1 hour and 37 minutes
② Time for wiring work = 26 minutes
③ Time for wiring work = 21 hours and 39 minutes

①**Connecting the PLC to the control box's inner terminal blocks**
Time for wiring work = 1 hour and 37 minutes
I/O connector attached cable × 12
■PLC module side: Connector connection
■Terminal block side: Multi-core cable

Control board

PLC
Input module (64 points) × 6 units
Output module (64 points) × 6 units

4-core flat cable × 1

Conventional wiring

Total time for wiring work
① + ② + ③ = **185 hours**
① Time for wiring work = 35 hours
② Time for wiring work = 70 hours
③ Time for wiring work = 80 hours

①**Connecting the PLC to the control box's inner terminal blocks**
Time for wiring work = 35 hours
I/O connector attached cable × 12
■PLC module side: Connector connection
■Terminal block side: 420 multicore cable ends must be peeled off, crimp terminals must be installed, and screws must be tightened.

Mount crimp terminals

Control board

PLC
Input module (64 points) × 6 units
Output module (64 points) × 6 units

30-core flat cable × 5 per machine

③**Inside machine (S-LINK V I/O units to I/O)**

Time for wiring work = 21 hours and 39 minutes
Use **S-LINK V** 8 channel I/O units
■**S-LINK V** units connected to 4-core flat cable
  with hook-up connectors.
■Each I/O device connected to **S-LINK V**
  units with snap male connectors.

Snap male connector
Do not peel off end

Machine 3   I/O: 128 points

End unit
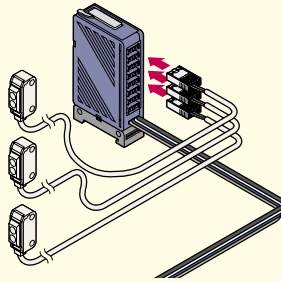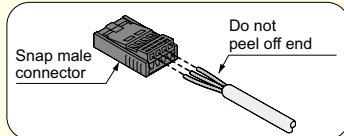
② **Control box (S-LINK V controller) to machine**

Time for wiring work = 26 minutes
S-LINK V exclusive 4-core flat cable
■Use hook-up connectors to
  each machine and branch them.

Power supply unit

Machine 2   I/O: 128 points

Machine 1   I/O: 128 points

Hook-up connector

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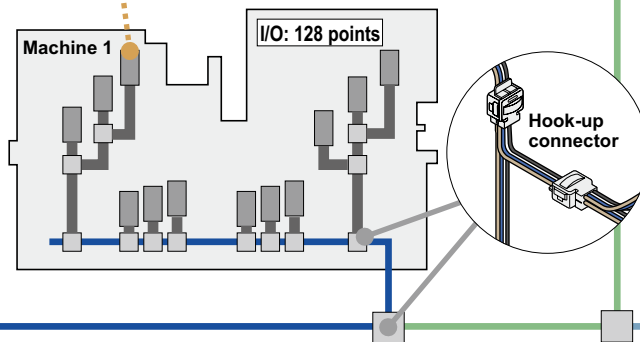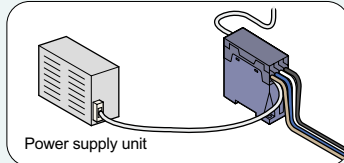
③ **Inside machine (Control box terminal blocks to I/O)**

Time for wiring work = 80 hours
Connect the 128-point I/O device cables in one machine to the terminal blocks
■For each output device cable the ends must be peeled off, the
  lead wire end must be arranged, crimp terminals must be
  installed, and screws on the terminal block must be tightened.

Mount crimp terminals

Machine 3   I/O: 128 points
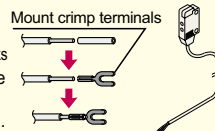
② **Terminal connections between inside
the control box and inside machines**

Time for wiring work = 70 hours
In order to arrange either ends of 140 lead wires
for each machine, 280 wires are required. For 3
machines, 840 wires.

↑ PLC side

↓ To machine
1, 2, and 3

Peel off ends   Mount crimp terminals

Machine 2   I/O: 128 points

Machine 1   I/O: 128 points
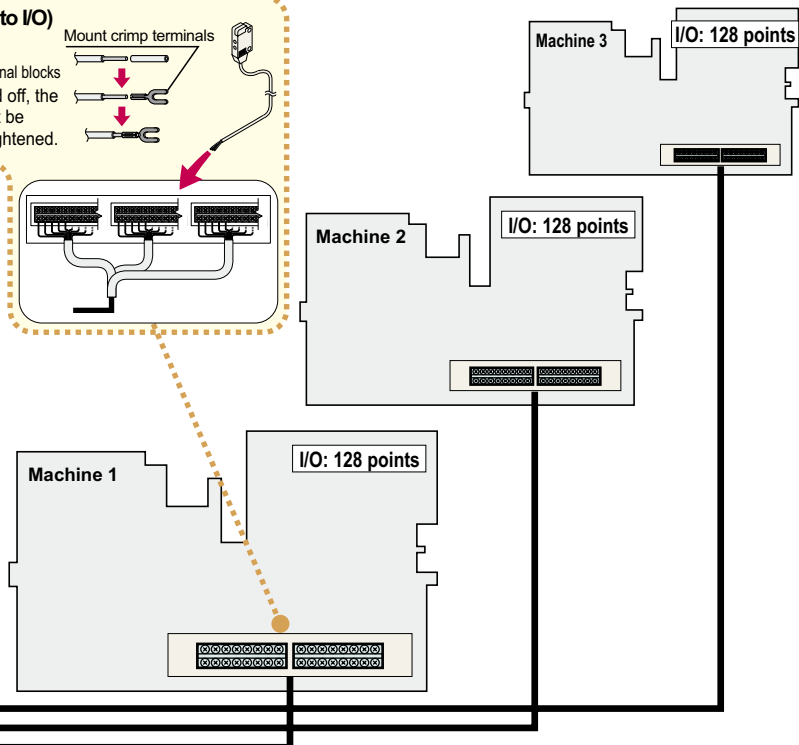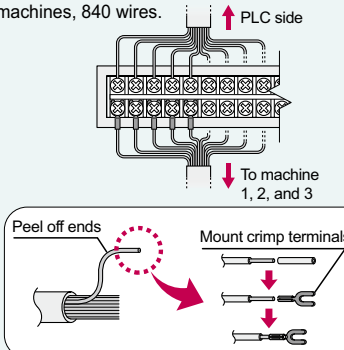
SYSTEM LAYOUT

Control units

SL-VF70 (Length 70 mm 2.756 in)
SL-VF150 (Length 150 mm 5.906 in)
SL-VF250 (Length 250 mm 9.843 in)

SL-VS□ (PLC input connnector)
SL-VP□ (PLC output connnector)

SL-VC1000 (Length 1 m 3.281 ft)
SL-VC2000 (Length 2 m 6.562 ft)

SL-VCU1

SL-RCM100□ (Length 100 m 328.084 ft)
SL-RCM200 (Length 200 m 656.168 ft)

SL-J1A [Main cable branch]

Error output

Power supply unit

PLC

SL-VFP2

Bus direct-connection controller

For FP2 / FP2SH series

SL-VMEL-Q

Bus direct-connection controller

Mitsubishi Electric Corp. MELSEC-Q series

Output units

SL-J3A [Flat cable extension]

SL-VTP4J

SL-J1A
[Case where I/O units are "T"-branched using a 4-core flat cable]

SL-CP1 (0.08 to 0.2 mm^2)
SL-CP2 (0.3 mm^2)
SL-CP3 (0.5 mm^2)
*The values in ( ) represent conductor cross-section area.

Output devices

SL-J1A

SL-VTP16C1

SL-VTP8J

Output devices

SL-J1A
SL-J1A

SL-JK
SL-CP3

SL-VTPR8

MIL connector (20 pin) commercially available

Output devices

SL-VTPR4

SL-VTP4E
SL-VTP8E
Can be connected using an e-CON-compatible connector.

Commercially available e-CON connector

SL-VTBP8

SL-VTBP32

SL-J1A

SL-J1A

SL-J1A

SL-VTDA1
Analog input device can be connected.

Analog output

SL-J1A

SL-J1A

SL-VTBP4

SL-VTBP16

SL-VCH11 (1 channel)
SL-VCH22 (2 channel)

Indicator

SL-JK

SL-CP1

4-core VCTF cable (without shield) (commercially available)

Case where **S-LINK V** I/O units are connected using intermediate terminal blocks (commercially available)

I/O mixed units

SL-VPK01

SL-VPK02

SL-JK1

SL-JK1

SL-JK1

SL-CP3

Picking sensor
NA1-PK3

SL-VCH21
(Input: 1 channel
Output: 1 channel)

SL-JK1

SL-JK

Connection device extension

| 4 pin type | *The values in ( ) represent conductor cross-section area. |

SL-CP1 (0.08 to 0.2 mm^2)
SL-CP2 (0.3 mm^2)
SL-CP (0.5 mm^2)
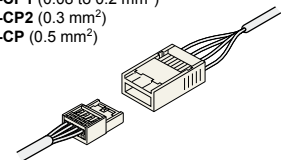
SL-CJ1 (0.08 to 0.2 mm^2)
SL-CJ2 (0.3 mm^2)
SL-JK (0.5 mm^2)

2 pin type

SL-CP12 (0.08 to 0.2 mm^2)
SL-CP22 (0.3 mm^2)
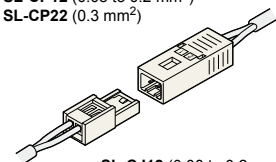
SL-CJ12 (0.08 to 0.2 mm^2)
SL-CJ22 (0.3 mm^2)

Partner makers products

Koganei Corporation.
Manifold electromagnetic valves

SMC Pneumatics
Manifold electromagnetic valves

CKD Corporation.
Manifold electromagnetic valves

SL-VPCI

PCI bus

SL-VVMES2

VME bus

Open network

For CC-Link
SL-VGU1-C

For DeviceNet
SL-VGU1-D

For EtherCAT
SL-VGU1-EC

RS-485 / RS-232C
SL-VGU1-485

Input units

SL-VT4J

SL-CP1 (0.08 to 0.2 mm^2)
SL-CP2 (0.3 mm^2)
SL-CP3 (0.5 mm^2)

*The values in ( ) represent conductor cross-section area.

Input devices

SL-VT16C1

MIL connector (20 pin) commercially available

Input devices

SL-JK1
SL-CP3

[Case when the installation or removal of a unit is desired]

Analog input

SL-J1A

SL-J1A

SL-VTAD1
Analog output device can be connected.

SL-J1A
[Hook-up of connector I/O unit]

SL-J1A

SL-VT8J

SL-T8PW (Note)

SL-J1A

Emitter of thru-beam type photoelectric sensor

Commercially available e-CON connector

SL-J1A

SL-VT4E
SL-VT8E
Can be connected using an e-CON-compatible connector.

SL-J1A

SL-VTB16
SL-VTB32

SL-VTB8

SL-J1A

SL-VTB4

SL-J1A

SL-J1A

SL-VCH10
(1 channel)
SL-VCH20
(2 channel)

SL-JK

Reflective photoelectric sensor

SL-CP1

SL-J3A [**SL-VEU** end unit connection]

SL-VEU

Note: Because the exclusive 4-core flat cable allows a +24 V-0 V DC power supply, thru-beam type sensor emitters can be connected easily with low installation work.

PCB mounting

Control module
SL-VMC1

I/O module

Input
SL-VM8 (8-point)
SL-VM16 (16-point)

Output
SL-VMP8 (8-point)
SL-VMP16 (16-point)

Debugging tool

Handy monitor
SL-VHM1

APPLICATIONS

Semiconductor manufacturing equipment

Manufacturers are under even greater pressure to save space in clean rooms to prepare for the dawning of the 300 mm 11. 811 in wafer era. Thanks in part to their compact design, **S-LINK V** I/O units can be used to implement wire-saving systems across the board, including for power supply lines helping to reduce your equipment's footprint (installation area).

Automated assembly equipment

Equipment used to manufacture devices such as hard disks, DVDs, and mobile phones must accommodate quick progression from generation to generation as well as rapid growth in demand. Because the **S-LINK V** wire-saving system delivers a high degree of design freedom in every aspect of its operation, it can be used to save man-hours not only in manufacturing, but also in development and design work.

Distribution and conveyance equipment

Since it supports total wiring lengths of up to 1,600 m 5249.344 ft, **S-LINK V** can be used on long lines such as distribution lines. In addition, all models are CE Mark compliant, ensuring their ability to deliver the level of noise resistance you demand in a high-reliability wire-saving system.

ORDER GUIDE
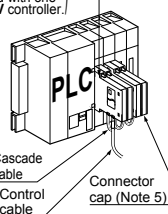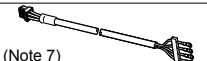
Control units

Designation	Appearance (Note 1)	Model No.	Description
S-LINK V controller	CE	**SL-VCU1**	It can control the signal transmission of the complete system. It also monitors the signal transmission line and specifies the addresses of the disconnected devices if the breaks, etc.
S-LINK V control board for PCI bus	CE	**SL-VPCI** (Note 2)	It can be fitted into the expansion slot (PCI bus) of a personal computer to control the **S-LINK V** system.
S-LINK V control board for VME bus	CE	**SL-VVMES2**	It can be directly connected to the VME bus line to control the **S-LINK V** system. It provides two **S-LINK V** ports, each allowing 512 I/O points maximum, so that a total of 1,024 I/O points can be controlled.
S-LINK V gateway controller for open network	CE	**SL-VGU1-C**	**S-LINK V** gateway controller for connection open network CC-Link, promoted by CC-Link Association.
	CE	**SL-VGU1-D**	**S-LINK V** gateway controller for connection open network DeviceNet, promoted by ODVA.
	CE	**SL-VGU1-EC**	**S-LINK V** gateway controller complied with the high speed communication system EtherCAT
S-LINK V gateway controller for RS-485/ RS-232C	CE	**SL-VGU1-485**	**S-LINK V** gateway controller that supports both RS-485 and RS-232C serial communications.
PLC bus direct connection controller for **FP2 / FP2SH** series	CE	**SL-VFP2**	It can be directly connected to the **FP2 / FP2SH** series main (CPU) motherboard or expansion motherboard to control an **S-LINK V** system.
Mitsubishi Electric Corp. **MELSEC-Q** series bus direct hook-up controller	CE	**SL-VMEL-Q**	Directly connects with Mitsubishi Electric Corp.'s **MELSEC-Q** series base unit to control the **S-LINK V** system.

Notes: 1) Components with "CE" mark conform to the CE marking EMC Directive.
2) Driver software not included. Please download driver software from our website.

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PLC related units

Designation	Appearance (Note 1)		Model No.		Description			
			For input	For output	Manufacturer	PLC (Note 2)	PLC input module (Note 3)	PLC output module (Note 3)
PLC input connector / PLC output connector	PLC I/O connectors (Note 4) — Max. 16 PLC I/O connectors can be cascaded with one **S-LINK V** controller. Cascade cable / Control cable / Connector cap (Note 5) — If connecting 9 PLC connectors or more to the **S-LINK V** controller, use 2 control cables and separate them into 2 stems for a parallel connection.	FUJITSU COMPONENT connector specs. / MIL connector specs. PLC input connectors PLC output connectors (same shape) (Note 6) C€ — The listed PLC I/O modules (NPN only) allow the mating PLC I/O connector to be plugged on them for signal transmission between the PLC and the **S-LINK V** controller. / The PLC I/O connector converts I/O data from serial to parallel, and vice versa. I/O points: 32 points per connector	SL-VS1	SL-VP1	Panasonic Industry Co., Ltd.	**FPΣ** (Excluding the FPG-C32T)	**FPG-XY64D2T** (X side)	**FPG-XY64D2T** (Y side)
						FP2	FP2-X32D2	FP2-Y32T
					Toshiba Machine Co., Ltd.	TC200	TC64DI	TC64DON
			SL-VS2	SL-VP2	Fuji Electric Co., Ltd.	NS series	NS-X64-1 NS-XY64-1(X side)	NS-Y64-T1 NS-XY64-1(Y side)
						F55	NV1X3204 NV1X3204-W NV1X3206	NV1Y32T05P1
						F70	NC1X3204 NC1X3204-3 NC1X3206 NC1X6404 NC1X6406 NC1W6406T(X side)	NC1Y32T05P1 NC1Y64T05P1-1 NC1W6406T(Y side)
						F80H, F120H F120S F140S F15XS	FTU125A FTU126A FTU127C FTU612A(X side)	FTU222A FTU227C FTU612A(Y side)
			SL-VS3	SL-VP3	Mitsubishi Electric Corp.	AnS	A1SX4, A1SX41-S1 A1SX42, A1SX42-S1 A1SH42(X side) A1SH42-S1(X side)	A1SY41 A1SY42 A1SH42(Y side) A1SH42-S1(Y side)
						AnN, AnA, AnU QnA, QnAs	AX42 AH42(X side)	AY42 AH42(Y side)
						Q	QX41, QX42 QH42P(X side)	QY41P, QY42P QH42P(Y side)
						A2CJ	AJ35TC1-32D	AJ35TC1-32T
					Fuji Electric Co., Ltd.	SX series	NP1X3206-W NP1X6406-W	NP1Y32T09P1 NP1Y64T09P1
			SL-VS4	SL-VP4	Sharp Manufacturing Systems Corp.	JW20 JW20H JW30H	JW-234N JW-264N	JW-232S JW-262S
						JW50H	JW-34NC JW-64NC	JW-32SC JW-62SC
			SL-VS5	SL-VP5	Omron Corp.	CJ1 series	CJ1W-ID231 CJ1W-ID261 CJ1W-MD261(X side)	CJ1W-OD231 CJ1W-OD261 CJ1W-MD261(Y side)
						CS1	CS1W-ID231 CS1W-ID261 CS1W-MD261(X side)	CS1W-OD231 CS1W-OD261 CS1W-MD261(Y side)
						CVM1, CV, C500, C1000HC2000H	C500-ID219	C500-OD213
						C200H series	C200H-ID216 C200H-ID217	C200H-OD218 C200H-OD219
						CQM1	CQM1-ID213	CQM1-OD213
					Yokogawa Electric Corp.	FA500	XD64-6N WD64-6N(X side)	YD64-1A WD64-6N(Y side)
						FA-M3 FA-M3R	F3XD32-3N F3XD64-3N	F3YD32-1A F3YD64-1A
					Hitachi Industrial Equipment Systems Co., Ltd.	EH-150 series	EH-XD32	EH-YT32
					Toshiba Corp.	T3	DI-335, DI-335H	DO-335
					Yasukawa Electric Corp.	GL20,GL40S GL60S,GL60H GL70H	——	B2604
			SL-VS6	SL-VP6	Hitachi Industrial Equipment Systems Co., Ltd.	H series	XDC24D2H XDC24D3H	YTR24DH YTR24D3H
			SL-VS7	——	Yasukawa Electric Corp.	GL20, GL40S GL60S, GL60H GL70H	B2605	——
			SL-VS8	SL-VP8	Rockwell Automation (Allen-Bradley)	SLC500	1746-IV32	1746-OV32
Cascade cable	(Note 7)		SL-VF70		Length: 70 mm 2.756 in		It links two PLC I/O connectors	
			SL-VF150		Length: 150 mm 5.906 in			
			SL-VF250		Length: 250 mm 9.843 in			
Control cable	(Note 7)		SL-VC1000		Length: 1 m 3.281 ft		It links the **S-LINK V** controller and the first PLC I/O connector.	
			SL-VC2000		Length: 2 m 6.562 ft			

Notes: 1) Components with " C€ " mark conform to the CE marking EMC Directive.
2) For the production status of conforming PLCs, please contact the manufacturer.
3) X side and Y side indicate the input and the output connectors, respectively, of the compound input/output module.
4) PLC I/O connectors are connectable to **S-LINK V** controller **SL-VCU1** only.
5) The connector cap is attached with the PLC I/O connector.
6) The PLC I/O connectors use FUJITSU COMPONENT connectors. However, **SL-VS1**, **SL-VS6**, **SL-VS8**, **SL-VP1**, **SL-VP6** and **SL-VP8** connectors use MIL connectors.
7) The cascade cable and the control cable do not conform to CE marking.

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I/O units

Designation		Appearance (Note 1)	Model No.		Description
1 channel input unit			**SL-VCH10**	1 NPN input	Scattered low count I/O units can be connected easily by 1 channel increments. The connection with the I/O units can be done using hook-up connectors greatly reducing wiring work.
2 channel input unit			**SL-VCH20**	2 NPN inputs	
2 channel I/O mixed unit			**SL-VCH21**	1 NPN input and 1 NPN output	
1 channel output unit			**SL-VCH11**	1 NPN output	
2 channel output unit			**SL-VCH22**	2 NPN outputs	
Relay output terminal unit	4 relay output terminal		**SL-VTPR4**	4 relay outputs	A 3A maximum high capacity load can be connected. The relays can be replaced easily one channel at a time.
	8 relay output terminal		**SL-VTPR8**	8 relay outputs	
Connector I/O unit	4 channel snap-connector input unit		**SL-VT4J**	4 NPN inputs	4, 8 input or 4, 8 output devices are connectable with snap male connectors. The output unit is incorporated with an output signal hold function, which retains the output state just prior to an error on the signal transmission line.
	8 channel snap-connector input unit		**SL-VT8J**	8 NPN inputs	
	4 channel snap-connector output unit		**SL-VTP4J**	4 NPN outputs	
	8 channel snap-connector output unit		**SL-VTP8J**	8 NPN outputs	
	16 channel MIL connector input unit		**SL-VT16C1**	16 NPN inputs	Since connection can be made with an MIL connector, 16 input or 16 output devices can be connected to this slim I/O unit. The output unit is incorporated with an output signal hold function, which retains the output state just prior to an error on the signal transmission line.
	16 channel MIL connector output unit		**SL-VTP16C1**	16 NPN outputs	
e-CON-compatible connector I/O units	4 channel snap-connector input unit		**SL-VT4E**	4 NPN inputs	4, 8 input or 4, 8 output devices are connectable with an e-CON-compatible connector. The output unit is incorporated with an output signal hold function, which retains the output state just prior to an error on the signal transmission line. *Requires separate purchase of a commercially available connector that complies with the e-CON standard.
	8 channel snap-connector input unit		**SL-VT8E**	8 NPN inputs	
	4 channel snap-connector output unit		**SL-VTP4E**	4 NPN outputs	
	8 channel snap-connector output unit		**SL-VTP8E**	8 NPN outputs	
I/O arrayed terminal unit	Input terminal		**SL-VTB4**	4 NPN inputs	They are screw-on terminal units to which 4, 8, 16 or 32 input devices are connectable. Since power supply terminals have been provided for two input channel, neat wiring is possible. (Note 2)
			SL-VTB8	8 NPN inputs	
			SL-VTB16	16 NPN inputs	
			SL-VTB32	32 NPN inputs	
	Output terminal		**SL-VTBP4**	4 NPN outputs	They are screw-on terminal units to which 4, 8, 16 or 32 output devices are connectable. The output unit is incorporated with an output signal hold function, which retains the output state just prior to an error on the signal transmission line.
			SL-VTBP8	8 NPN outputs	
			SL-VTBP16	16 NPN outputs	
			SL-VTBP32	32 NPN outputs	
Analog input unit			**SL-VTAD1**	1 analog input	It can perform A/D conversion of an analog signal at the location of measurement. Since the length of analog wiring is minimized, variations in measurement data due to phenomena such as voltage dips can be reduced.
Analog output unit			**SL-VTDA1**	1 analog output	It can perform D/A conversion of digital signals. By combining electro-pneumatic regulator control and motor control capabilities in a single unit, it allows wiring to be reduced.

Notes: 1) Components with "CE" mark conform to the CE marking EMC Directive.
2) 4, 8, and 16-point unit

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I/O units

Designation	Appearance (Note)	Model No.	Description
Picking switch		**SL-VPK01** CE	This picking switch can be installed on pipes. Its compact size (just 90 mm 3.543 in wide) allows it to be installed on small-sized shelving used with compact parts, while its cable with integrated connector and magnetic (Hall element) contactless switch simplify installation and provide freedom in terms of switch operation (back and forth, left and right, and vertically). The address configuration remote control can be used to set and check the unit's address as well as to select its lamp color [green (default), red, blue, two-stage indication]. Up to 256 units can be connected to a single **S-LINK V** control unit.
For shutter		**SL-VPK02** CE	*Use requires address configuration remote controller **SL-VAR1**. *For **SL-VPK02**, The dual-end shutter support fixture **MS-PK02-W** is available (Optional).
Address setting remote controller		**SL-VAR1**	This address setting remote controller is designed for use with the picking switch **SL-VPK0□**, which simplifies setting and checking of the switch's address and selection of its lamp color. A single address setting remote control can be used with multiple **SL-VPK0□** switches.

Note: Components with " CE " mark conform to the CE marking EMC Directive.

PCB mounting module

Designation	Appearance (Note)	Model No.		Description
Control module	CE	**SL-VMC1**		Your in-stock original board can be used as a substitute for the **S-LINK V** controller.
I/O module	CE	**SL-VM8**	8 NPN inputs	Your in-stock original board can be used as a substitute for the **S-LINK V** I/O unit. Select the most suitable board corresponding with the quantity of I/O devices to be connected.
		SL-VM16	16 NPN inputs	
		SL-VMP8	8 NPN outputs	
		SL-VMP16	16 NPN outputs	

Note: Components with " CE " mark conform to the CE marking EMC Directive.

Connectors

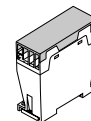| Designation	Appearance (Note)	Model No.	Description	
Hook-up connector		**SL-J1A** (Gray) 10 pcs. per set	It creates a "T"-branch connection between two **S-LINK V** exclusive flat cables. For 0.5 mm² flat cable to 0.5 mm² flat cable connection Compatible crimping pliers: **SL-JPS**	
Cable extension hook-up connector		**SL-J3A** (Black) 10 pcs. per set	It can extend the **S-LINK V** exclusive flat cable. For 0.5 mm² flat cable to 0.5 mm² flat cable connection Compatible crimping pliers: **SL-JPS**	
Cable end socket-branch hook-up connector		**SL-JK** (Light blue) 10 pcs. per set	Hook-up connector (**SL-CP□**) for linking the ends of exclusive flat cables (0.5 mm², 4-core) to I/O devices using snap male connectors Compatible crimping pliers: **SL-JPS**	
"T"-branch hook-up connector		**SL-JK1** (Blue) 10 pcs. per set	Hook-up connector (**SL-CP□**) for linking mid-system exclusive flat cables (0.5 mm², 4-core) to I/O devices using snap male connectors Compatible crimping pliers: **SL-JPS**	
4-pin type snap female connector		**SL-CJ1** (White) 10 pcs. per set	For 0.08 to 0.2 mm² (Conductor cross-section area) Wire dia.: ø0.7 to ø1.2 mm ø0.028 to ø0.047 in	Snap female connector to connect with the snap male connector **SL-CP1** and **SL-CP2** Compatible crimping pliers: **SL-JPC**
		SL-CJ2 (Black) 10 pcs. per set	For 0.3 mm² (Conductor cross-section area) Wire dia.: ø1.1 to ø1.6 mm ø0.043 to ø0.063 in	
4-pin type snap male connector		**SL-CP1** (White) 10 pcs. per set	For 0.08 to 0.2 mm² (Conductor cross-section area) Wire dia.: ø0.7 to ø1.2 mm ø0.028 to ø0.047 in	Snap male connector to link I/O devices with connector I/O units **SL-VT4J** / **SL-VT8J** and **SL-VTP4J** / **SL-VTP8J** and to link the **S-LINK V** I/O units to hook-up connectors **SL-JK** / **SL-JK1**. Compatible crimping pliers: **SL-JPC** (for **SL-CP1** / **SL-CP2**), **SL-JPE** (for **SL-CP3**)
		SL-CP2 (Black) 10 pcs. per set	For 0.3 mm² (Conductor cross-section area) Wire dia.: ø1.1 to ø1.6 mm ø0.043 to ø0.063 in	
		SL-CP3 (Greenish blue) 10 pcs. per set	For 0.5 mm² (Conductor cross-section area) Wire dia.: ø1.7 to ø2.5 mm ø0.067 to ø0.098 in	

Note: For UL compatibility, please contact our office.

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End unit

| Designation	Appearance (Note)	Model No.	Description
End unit	(image) CE	**SL-VEU**	Connect to the end of the main cable. At least one end unit is required for each system. (For more information, refer to the user's manual.) Use the included **MS-CH** DIN rail mounting bracket for DIN rail installation. The DIN rail mounting bracket can be affixed with screws.

Note: Components with " CE " mark conform to the CE marking EMC Directive.

Accessory

- **NPS-CV** (Protection cover for SL-VCU1)
- **MS-SL-2** (Connector I/O unit mounting bracket)
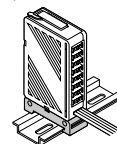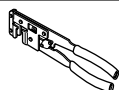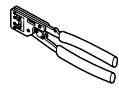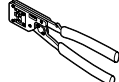

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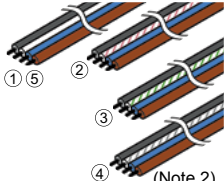
Designation	Model No.	Description
Connector I/O unit mounting bracket / 8-branch connector tap mounting bracket	**MS-DIN-3**	It is a DIN rail mounting bracket which can be fitted on the mounting base of **SL-VT□J**, **SL-VT□E**, **SL-VTAD1** and **SL-T8PW**

Connector I/O unit mounting bracket / 8-branch connector tap mounting bracket
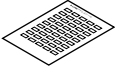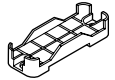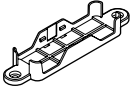- **MS-DIN-3**

Others

Designation	Appearance (Note 1)	Model No.	Description	
Handy monitor	(image) CE	**SL-VHM1**	Can monitor and operate all units connected to the **S-LINK V** system. Highly efficient for debugging I/O units (I/O check)	
8-branch connector tap	(image)	**SL-T8PW**	Since a +24 V-0 V DC power supply can be provided by the dedicated 4-core flat cable, up to 8 thru-beam type sensor emitters can be easily connected.	
2-pin type snap female connector	(image) (Note 2)	**SL-CJ12** (White) 10 pcs. per set	For 0.08 to 0.2 mm² (Conductor cross-section area) Wire dia.: ø0.7 to ø1.2 mm ø0.028 to ø0.047 in	2-wire type device optimal for cable relays to the thru-beam type beam sensor emitters
	(image) (Note 2)	**SL-CJ22** (Black) 10 pcs. per set	For 0.3 mm² (Conductor cross-section area) Wire dia.: ø1.1 to ø1.6 mm ø0.043 to ø0.063 in	
2-pin type snap male connector	(image) (Note 2)	**SL-CP12** (White) 10 pcs. per set	For 0.08 to 0.2 mm² (Conductor cross-section area) Wire dia.: ø0.7 to ø1.2 mm ø0.028 to ø0.047 in	
	(image) (Note 2)	**SL-CP22** (Black) 10 pcs. per set	For 0.3 mm² (Conductor cross-section area) Wire dia.: ø1.1 to ø1.6 mm ø0.043 to ø0.063 in	
Exclusive flat cable (4-core)	(image) ①⑤ ② ③ ④ (Note 2)	**SL-RCM100**	Length: 100 m 328.084 ft	D line: White: ①	**S-LINK V** exclusive flat cable (4-core) Conductor cross-section area: 0.5 mm² Outer diameter: ø2.5 mm × 4 ø0.098 in × 4
		SL-RCM100-PK		D line: White with pink stripe: ②	
		SL-RCM100-GN		D line: White with green stripe: ③	
		SL-RCM100-GY		D line: White with gray stripe: ④	
		SL-RCM200	Length: 200 m 656.168 ft	D line: White: ⑤	
Exclusive cabtyre cable (4-core)	(image)	**SL-CBM100**	Length: 100 m 328.084 ft	**S-LINK V** exclusive cabtyre cable (4-core) Conductor cross-section area: 0.5 mm² Outer diameter: ø7.4 mm ø0.291 in (Hook-up connectors cannot be used)
		SL-CBM200	Length: 200 m 656.168 ft	
Exclusive pliers	(image)	**SL-JPS**	Hook-up connector (**SL-J□**) can be connected in one grip.	
SL-CP3 exclusive pliers	(image)	**SL-JPE**	4-pin type snap male connector (**SL-CP3**) can be connected in one grip.	
Snap male / female connector exclusive pliers	(image)	**SL-JPC**	Snap female connector (**SL-CJ□**) and snap male connector (**SL-CP1**/**CP2** and **SL-CP12**/**CP22**) can be connected in one grip.	

Notes: 1) Components with " CE " mark conform to the CE marking EMC Directive.
2) For UL compatibility, please contact our office.

■ ORDER GUIDE

Others

Designation	Appearance	Model No.	Description
Address label		**SL-VMA1-SET** 2 pcs. (1 circuit) × 4 colors	Set of address stickers in 4 colors (white, pink, green, and gray). Use with multiple circuits for easy visual identification.
DIN rail mounting bracket for **SL-VCH□**		**MS-CH×10** 10 pcs. per set	Mounting bracket enabling the **SL-VCH** series I/O units to be mounted onto a 35 mm 1.378 in width DIN rail. They can also be affixed with screws. (When affixing with screws, arrange two M4 pan-head screws separately.)
I/O unit holder for **SL-VCH□**		**MS-SLH** 5 pcs. per set	It is used to mount the **SL-VCH** series. (Please arrange two M4 pan-head screws separately.)

## ■ PRECAUTIONS FOR PROPER USE

⚠️
- Never use this product in a device for personal protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- Handle safety related or emergency stop signals without passing them through the **S-LINK V** system due to fail-safe considerations.
- Before touching this product, remove any electrostatic charge that may be present on your body. There is a danger of this product getting damaged due to the electrostatic charge.

The flexible wire-saving system **S-LINK V** are not mutually interchangeable with the sensor & wire-saving link system **S-LINK** and cannot be mixed or matched. Please exercise caution.

[Nevertheless, any of the exclusive 4-core flat cable, connectors, hook-up pliers, or **SL-T8PW** 8-branch connector taps can be used.]

Please make use of this system's 'User's Manual'

For more detailed information pertaining to the flexible wire-saving system **S-LINK V** , please refer to its detailed "User's Manual".
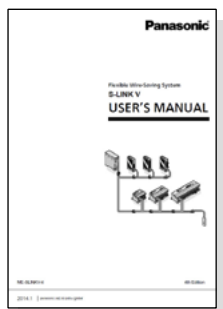
S-LINK V User's Manual
This manual provides information about **S-LINK V** design and installation.
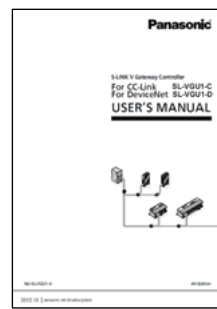
S-LINK V Gateway Controller User's Manual
This manual provides information about open networks and **S-LINK V** design and installation.

Information about S-LINK V partner makers

Refer directly to our partner makers for more details pertaining to the **S-LINK V** compatible devices introduced here.

[**S-LINK V** direct hook-up Manifold electromagnetic valves]

Koganei Corporation	SMC Pneumatics	CKD Corporation

Panasonic

INDUSTRY

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