YASKAWA

VIPA SLIO

The smart control and I/O system

A brief overview

SLIO is a modular and extremely compact control and I/O system. It can be universally combined and deployed with each of our established systems and nearly all those of other producers.

We set a further milestone in the automation industry with the newly developed system SLIO.
SLIO combines high performance and new functionalities with a clever mechanical concept in an extremely compact design. SLIO stands for slice input and output. SLIO is very compact and is exactly adapted to the demands of the application slice by slice.

Many interface modules are available for use as an IO system like PROFINET, PROFIBUS, EtherCAT, DeviceNet, CANopen, EtherNet/IP as well as Modbus TCP are also available. Both the SLIO CPUs and all SLIO interface modules support up to 64 electronic modules on the SLIO backplane bus.

A module unit consists of terminal and electronic modules that are connected with a safe slide and lock mechanism. The terminal module combines clamps, intake for the electronic module, and the SLIO backplane bus connector.

When servicing only the electronic module is exchanged by simply pulling it out from the terminal module. The wiring and mounting on the 35mm standard profile rail remain unchanged.

The electronic modules are supplied with voltage and separated – if required - in potential groups by the power modules.

The cage clamps on the terminal module, which are arranged in the shape of staircases with the proven and particularly tight-contacting cage clamp technology, enable a fast, clear and safe wiring.

With the integrated status LEDs and the user friendly front labeling strips of the electronic modules the channel accurate assignment and the readability of the channel status are clear and precise.
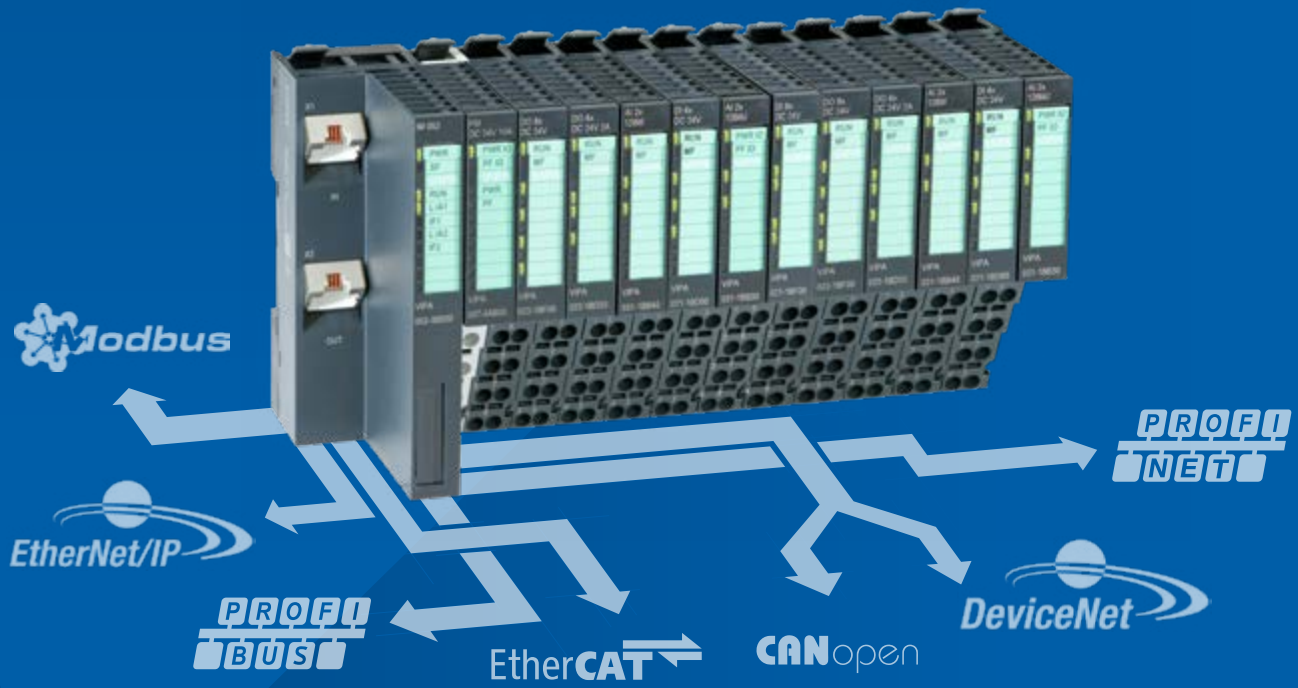The new SLIO backplane bus concept

with a speed of up to 48 Mbit/s ensures very short reaction times.

With the new SLIO CPU the I/O system has become one of the most advanced centralized control systems on the automation market. With the introduction of the SetCards the customer can configure a suitable CPU within seconds. Besides expandable work memory you can also select between different field bus connections.

SLIO speaks many languages

Talent of languages – knowing many languages has clear advantages

High-performance backplane bus

Fast backplane bus concept with 48 MBit/s offers a fieldbus indepentend switching to exactly +/-1µs

Modular expandable

Up to 64 signal and function modules per interface module

Integrated power module

The bus interface and the connected periphery modules are supplied via the integrated power module for power supply

To get on worldwide!

Suppose a German mechanical engineer supplies his plant which is equipped with SLIO and, for example, the CPU 315 to a worldwide production company. In Europe his customer requires PROFINET as a communication basis. In the USA the type of controller has to be an American one which only communicates via EtherNet/IP. And in Asia for example everything works via EtherCAT. SLIO can be used easily for all: only the coupler needs to be exchanged.

The facts

High-performance bus

- Transmission rates of up to 48 Mbit/s
- Very fast reaction time of up to 20µs
- One terminal module for all signal and function modules

Easy installation and servicing

- Easy mounting by safe slice mechanism
- Click connection for fast mounting and easy shielding
- Error protection due to coding
- Unique two stage concept consisting of terminal modules and electronic modules allowing simple and fast maintenance

Space saving connection technology

- Space saving staircase-shaped wiring with cage clamps
- Easy exchange of modules due to unique wiring concept
- High modularity due to 2, 4 and 8 channel modules
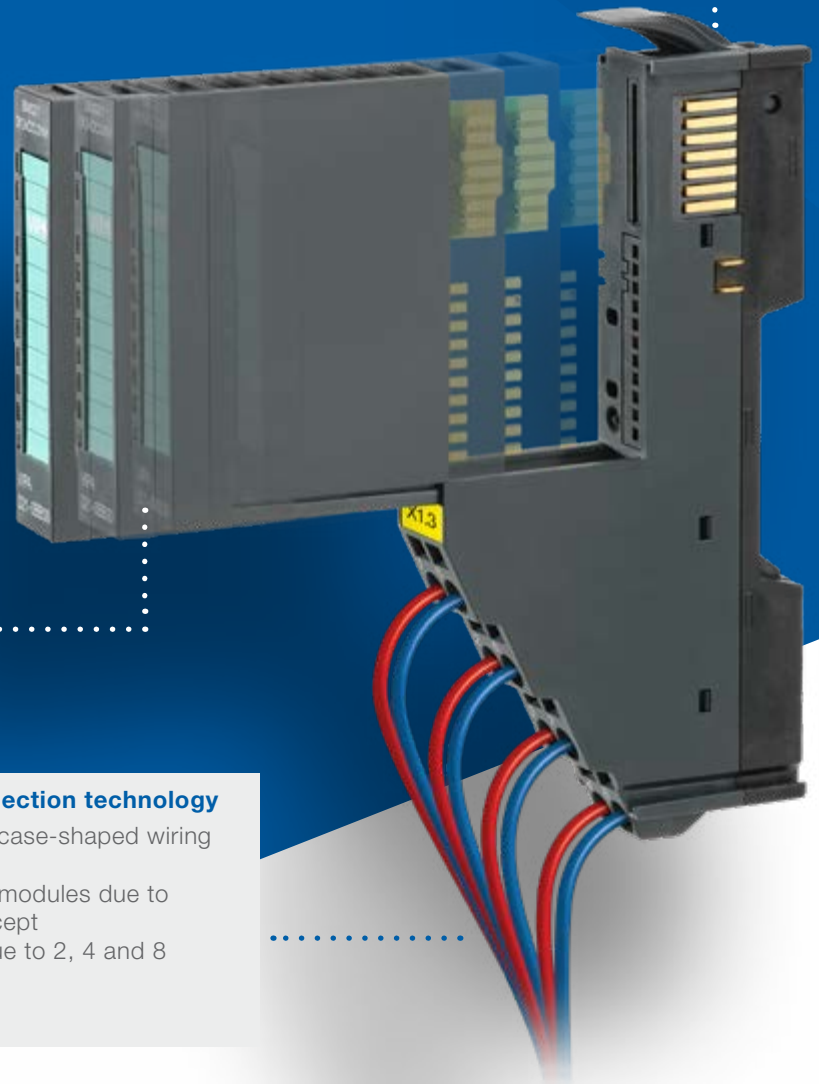
Significantly simplified ordering process

- You receive everything that is necessary for operation with one order number
- All modules can be ordered individually
- The power module is included with the order
- SLIO does not need a terminal resistor (so there is nothing extra that you have to think about when ordering)

Clear status and diagnosis monitoring

- Monitoring of diagnosis and channel status via LEDs
- Clear allocation and readability of the channel status
- Detailed diagnosis of each electronic module in the system
- Provision of labeling templates

Clever, user friendly labeling

- Labeling strips for individual indication per channel
- Status LEDs with direct allocation on the labeling strip
- Terminal assignment and terminal graph on each module

All modules at a glance

Fieldbus coupler

053-1CA00	CAN coupler
053-1DN00	DeviceNet coupler
053-1DP00	PROFIBUS coupler
053-1EC00	EtherCAT coupler
053-1IP00	EtherNet/IP coupler
053-1MT00	Modbus TCP coupler
053-1PN00	PROFINET coupler

Digital Input modules

021-1BB00	DI2xDC24V
021-1BB10	DI2XDC24V2µs...4ms
021-1BD00	DI4xDC24V
021-1BD10	DI4XDC24V2µs...4ms
021-1BD40	DI4xDC24V_3-wire
021-1BD50	DI4xDC24VNPN
021-1BD70	DI4xDC24V, Time stamp
021-1BF00	DI8xDC24V
021-1BF01	DI8xDC24V 0,5ms
021-1BF50	DI8xDC24VNPN
021-1DF00	DI8xDC24V, Diagnosis
021-1SD00	DI4xDC24V_Safety

Analog Input modules

031-1BB10	AI2x12Bit_0(4)...20mA_ISO, 2-wire isolated
031-1BB30	AI2x12Bit_0...10V
031-1BB40	AI2x12Bit_0(4)...20mA
031-1BB60	AI2x12Bit_0(4)...20mA, 2-wire
031-1BB70	AI2x12Bit_+-10V
031-1BB90	AI2x16Bit_Thermocouple
031-1BD30	AI4x12Bit_0...10V
031-1BD40	AI4x12Bit_0(4)...20mA
031-1BD70	AI4x12Bit_+-10V
031-1BD80	AI4x16Bit_R_RTD, 2x3/4-wire
031-1BF60	AI8x12Bit_0(4)...20mA
031-1BF74	AI8x12Bit_+-10V
031-1CA20	AI1x16Bit_DMS, 1x4/6-wire
031-1CB30	AI2x16Bit_0...10V
031-1CB40	AI2x16Bit_0/4...20mA
031-1CB70	AI2x16Bit_+-10V
031-1CD30	AI4x16Bit_0...10V
031-1CD35	AI4x16Bit_0...10V
031-1CD40	AI4x16Bit_0/4...20mA
031-1CD45	AI4x16Bit_0/4...20mA
031-1CD70	AI4x16Bit_+-10V
031-1LB90	AI2x16Bit_Thermocouple
031-1LD80	AI4x16Bit_R_RTD, 2x3/4-wire
031-1PA00	AI1x3Ph 230/400V 1A, SLIO_Energy measuring clamp

Power supply modules

007-1AB00	DC24V10A
007-1AB10	DC24V4A, 2.DC24V+5V/2A
007-0AA00	DC24V

Distribution modules

001-1BA00	Potential distribution module_8xDC24V
001-1BA10	Potial distribution module_8xDC0V
001-1BA20	Potential distribution module_4xDC24V_4xDC0V

Digital Output modules

022-1BB00	DO2xDC24V0,5A
022-1BB90	DO2xDC24V0,5A, PWM
022-1BD00	DO4xDC24V0,5A
022-1BD20	DO4xDC24V2A
022-1BD50	DO4xDC24V0,5ANPN
022-1BD70	DO4xDC24V0,5A, Time stamp
022-1BF00	DO8xDC24V0,5A
022-1BF50	DO8xDC24V0,5ANPN
022-1DF00	DO8xDC24V0,5A, Diagnosis
022-1HB10	DO2xRELAIS, DC30V/AC230V/3A
022-1HD10	DO4xRELAIS, DC30V/AC230V/1,8A
022-1SD00	DO4xDC24V0,5A_Safety

Analog Output modules

032-1BB30	AO2x12Bit_0...10V
032-1BB40	AO2x12Bit_0(4)..20mA
032-1BB70	AO2x12Bit_+-10V
032-1BD30	AO4x12Bit_0...10V
032-1BD40	AO4x12Bit_0(4)..20mA
032-1BD70	AO4x12Bit_+-10V
032-1CB30	AO2x16Bit_0...10V
032-1CB40	AO2x16Bit_0(4)..20mA
032-1CB70	AO2x16Bit_+-10V
032-1CD30	AO4x16Bit_0...10V
032-1CD40	AO4x16Bit_0(4)..20mA
032-1CD70	AO4x16Bit_+-10V

Function and communication modules

040-1BA00	RS232C, ASCII,STX/ETX,3964R,Modbus,PtP
040-1CA00	RS422/485, ASCII,STX/ETX,3964R,Modbus,PtP
050-1BA00	1x32Bit(AB)DC24V, DO1xDC24V0,5A
050-1BA10	1x32Bit(AB)DC5V2MHz
050-1BB00	2x32Bit(AB)DC24V
050-1BB30	2x32Bit(AB)DC24V_ECO
050-1BB40	2x24BitDC24V600kHz, Frequency measurement
050-1BS00	1xSSI,RS422,8...32 Bit, 1xDI,1xCO,1xCI
054-1BA00	1xStepper_24V1,5A, 1CH(2DO),Feedback(2DI)
054-1CB00	2xDC_Mot_24V1,5A, 2CH(2DO),Feedback(2DI)
054-1DA00	1xPulseTrain_RS422, 0-1000kHz,24VDC,Feedback(2DI)
060-1AA00	Line Extension, Extention module Master
061-1BA00	Line Extension, Extention module Slave

The new benchmark

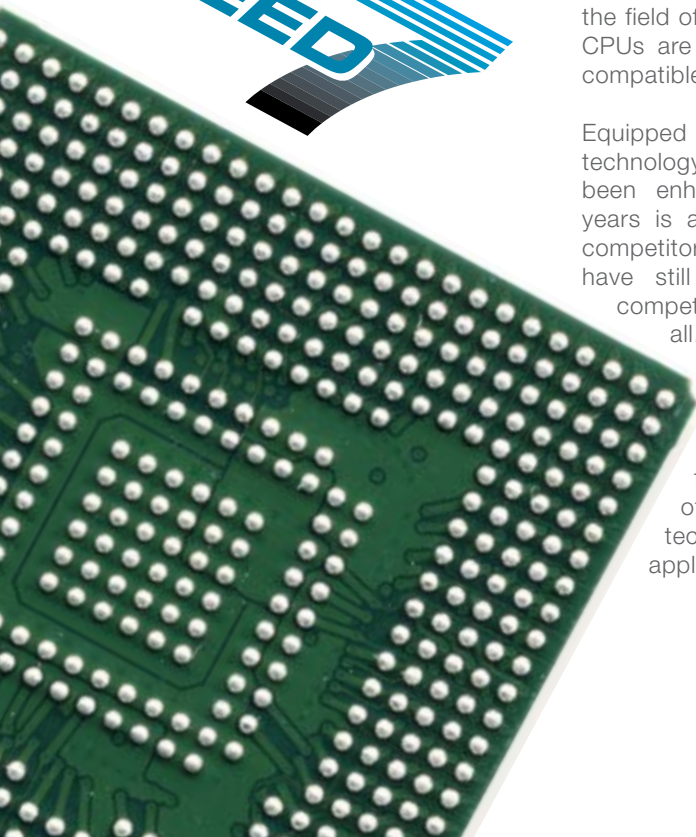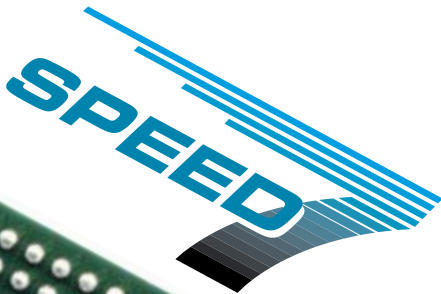## Trimmed performance and compatibility

In addition to the SLIO IO system series we also offer you one of the most advanced and modern control systems on the market. In the development of the system we already made sure that with the powerful CPUs a completely new benchmark can be created in the field of compact CPUs. The SLIO CPUs are still one of the fastest S7 compatible CPUs on the market.

Equipped with the proven SPEED7 technology - which has continuously been enhanced for more than 15 years is a challenge for many large competitors. We offer features that have still to be acquired by the competition or are not available at all. These include Integrated Ethernet interfaces, the high-performance backplane bus, or the expandable work memory that gives you the option of expanding your control technology together with your application.
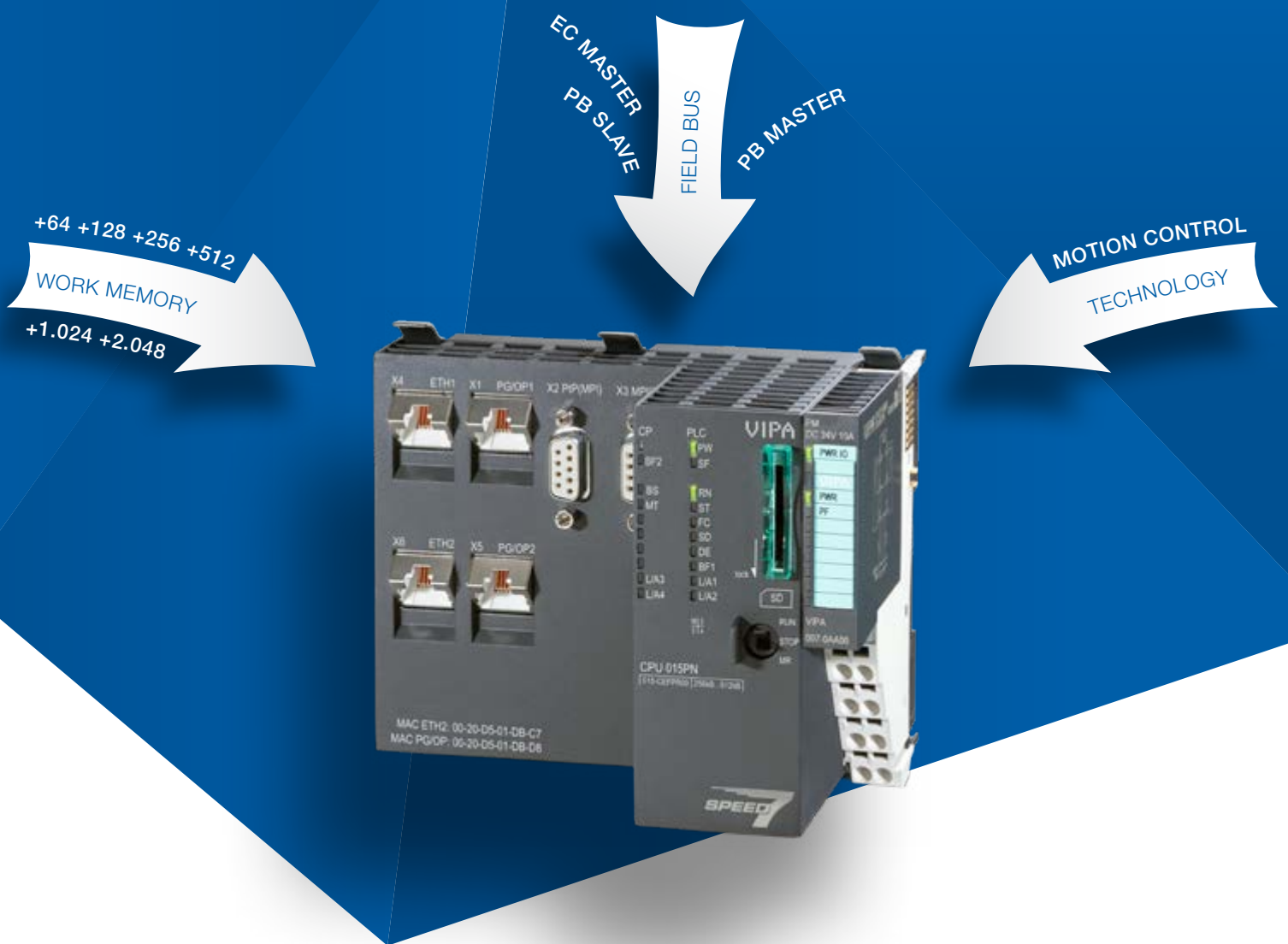
Our own field busses such as PROFIBUS, PROFINET and EtherCAT, are the standards with which we communicate and so can cover an additional field of applications. Whether it is a matter of small programs where re a CPU with integrated input and output channels is sufficient or a CPU that can cover larger applications thanks to EtherCAT and Motion Control: with SLIO CPUs you are always right.

The highlights of all SLIO CPUs

- 100% compatible with S7 programming language
- programmable with SPEED7 Studio, TIA, Simatic Manager, WinPLC7
- extremely fast cycle times
- up to 64 I/O modules in a line
- proven SPEED7 technology
- deployable without memory card

A unique concept

EC MASTER
PB SLAVE

FIELD BUS

PB MASTER

+64 +128 +256 +512
WORK MEMORY
+1.024 +2.048

MOTION CONTROL
TECHNOLOGY

A configuration concept that has yet to be matched

With the SLIO CPUs we have been taking completely new paths from the very beginning. And we have shown that it works.

You configure exactly the CPU that fits to your application. No more and no less. And as in a good relationship adjustments always have to be made. This is easy with the SLIO CPU. Upgrades can be undertaken at anytime. Simply decrease your storage costs by reducing the number of basic CPUs in stock. Just activate the CPU you need via the SLIO configuration concept. As of now: easy ordering, optimal logistics, and very flexible configuration.

Choose from over 100 different combination options. And the list of new technology functions and features is growing and growing.

What do you have to do? Simply insert the SetCard which is provided by us into your SLIO CPU and activate the features in your CPU and you have the matching CPU for your installation. Activation takes a maximum of 10 seconds. The fastest users can do it in 5!

The highlights of the configuration concept

• considerable reduction of storage costs
• flexible reacting by splitt second configuration
• always well prepared in case of error

„Now you decide what is inside your CPU and no one else!"

Smart and compact

① ④ ⑤ ⑥ ⑧

48 Mbit/s
up to 64 modules

③

⑩ ⑨

Now available

+ **Web**server

+ PROFI NET®

SPEED7 Performance as compact as ever before

In one casing, the compact CPU 013C combines a programmable logic controller with integrated SPEED7 technology, and digital and analog input and output channels as well as specific channels with special technological functions.

Integrated I/O channels save money and space

New in the SLIO class is the design of the SLIO compact CPU with integrated input/output channels which for example allows a particularly space saving setup within the serial mechanical engineering installations. The attractive price of the new compact CPU reduces the initial costs and also permits considerable space saving.

Features of the SLIO compact CPU

- High clock rates by the proven SPEED7 technology and fast backplane bus with 48Mbit/s transmission rate

- Expansion options for up to 64 modules, all module types of the SLIO system deployable

- CPU configuration via VSC for memory sizes and optional PROFIBUS master or slave interface

- PROFINET controller & I-Device

- Webserver/WebVisu for secure access to user specific websites (incl. user- and access management)

- 2 Port Ethernet switch for active Ethernet and S7 communication, PROFINET

- Serial interface for MPI communication, switchable for PtP communication and optional via VSC activation as PB-DP master or PB-DP slave interface

- Integrated I/O channels: 16 x DI, 12 x DO, 2 x AI

- 6 channels for technology functions: 4 counter/frequency measurement, 2 PWM/PTO

The intelligent modular ones

48 Mbit/s

up to 64 modules

① **2 Port Ethernet switch**

Always integrated. This allows easy programming and flexible communication with a touch panel or with Panel PCs.

② **PROFINET / EtherCAT controller**

With our SLIO 015 CPUs you receive either a high-performance and flexibly deployable PROFINET or EtherCAT controller for connection of up to 128 (PN) or 128 (EC) users. Of course you can also use this interface as an active Ethernet interface (standard with the SLIO 014 CPU).

③ **Active Ethernet- / PROFINET interface**

Both the SLIO 015 CPUs as well as the new SLIO 017 CPU have a additional interface. With the SLIO 015N (SLIO Motion Controller) the interface for the active Ethernet communication is used. The SLIO 015PN and the SLIO 017PN uses this interface for PROFINET communication (2 Port switch with -X4).

④ **Multi-program-**

mable

You are not tied to one system. Use the engineering tool you are most familiar with: SPEED7 Studio, SIMATIC Manager, or TIA Portal. We are open - we stay open!

⑤ **Full-fledged serial interface**

Also a standard of all our SLIO CPUs: ASCII, STX/ETX, USS, 3964(R), MPI and Modbus RTU master/slave.

⑥ **MPI - For us a must**

Of course, you can expand this interface with a PROFIBUS SLAVE or a MASTER. Exactly upon your wish.

⑦ **Web interface / web server**

Each of our SLIO CPUs has a web interface. With this you can read out dialog information and the status of your modules. Remote access to this page is of course possible. A simple connection to your network and you have access to your web interface.

⑧ **Exchangeable power module**

We provide you with the power module directly to your CPU. In the event of a fault we simply change the electronic module and you can continue working. We have obviulsy thought of you here.

⑨ **SD card and SD card locking**

Higher performance and security with the use of SD cards, including a unique SD card lock. You can only find it here!

⑩ **Highspeed backplane bus**

Our high-speed backplane bus with 48 Mbit/s allows you to achieve extremely fast reaction times of up to 20µs. Use the full capacity of all modules from the SLIO IO system. You can connect up to 64 modules in series.

⑪ **Work memory expandable**

Known from the globally unique SPEED7 technology, we have of course also made sure that you can expand the work memory. Your CPU simply grows with your application.

SLIO Motion Controller

EtherCAT®

The clever expansion of the SLIO principle

With the EtherCAT network integration the SLIO Motion Controller extends the existing SLIO diversity and now offers you - in combination with SPEED7 Studio - modern Motion Control functions in accordance with PLCopen standards. You can start right away with project engineering and programming after the activation of the Motion Control functions with the SetCard.

With a few clicks straight to the perfect Motion Control application

Our SLIO 015N CPU opens a new, highly efficient way of drive configuration. Here, our Motion Control concept focuses on the automation task.

Machine functions can also be configured without special system knowledge with the Motion Control library in accordance with PLCopen standards and coupled with the familiar S7 programming. The advantages are considerably simplified processes and reduced development effort - special drive, field bus and communication programming is not required any longer for Motion Control applications.

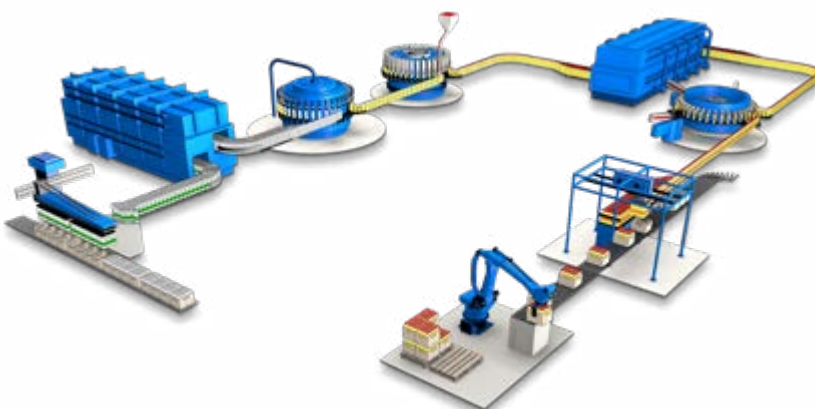The best of the YASKAWA control and

drive world such as Sigma-5, Sigma-7, A1000, V1000 and virtual positioning and rotational speed axes are now combined.

EtherCAT connects

You simply build up a direct connection in SPEED7 Studio to the YASKAWA servo drives or frequency inverters via EtherCAT. High-performance cycle synchronicity and multi-axis applications are now possible with EtherCAT and the new SLIO Motion Controller.

Key features of the SLIO Motion Controller

- One CPU for standard and Motion Control applications
- Fully integrated EtherCAT master
- Proven SPEED7 technology for the highest clock rates
- Cycle synchronicity and multi-axis applications via EtherCAT
- Programmable with SPEED7 Studio
- Solutions from a single source for the control and drive part
- Up to 20 controllable axes

All CPUs at a glance

013C

014

015PN

017PN

Now available

+ **Web**server

+ **PROFI NET** ®

Technical data

	013C	014	015N	015PN	017PN
Load memory [kB]	128	256	512	512	2048
Work memory [kB]	64 - 128	128 - 256	256 - 512	256 - 512	512 - 2048
Ethernet fieldbus	Modbus TCP / PROFINET	Modbus TCP / PROFINET	Modbus TCP / EtherCAT / PROFINET I-Device	Modbus TCP / PROFINET	Modbus TCP / PROFINET
Serial fieldbus	PROFIBUS / MPI	PROFIBUS / MPI	PROFIBUS / MPI	PROFIBUS / MPI	PROFIBUS / MPI
ASCII, STX/ETX, 3964(R), USS master, Modbus master/-slave	yes	yes	yes	yes	yes
Digital inputs	16	-	-	-	-
Digital outputs	12	-	-	-	-
Counters	4	-	-	-	-
Analog inputs	2	-	-	-	-
RJ45 interface	2	2	4	4	4
Max. Number of the expansion modules	64	64	64	64	64
Web server	yes	yes	yes	yes	yes
ENGINEERING TOOL	SPEED7 Studio SIMATIC Manager TIA Portal WinPLC7	SPEED7 Studio SIMATIC Manager TIA Portal WinPLC7	SPEED7 Studio SIMATIC Manager TIA Portal	SPEED7 Studio SIMATIC Manager TIA Portal	SPEED7 Studio SIMATIC Manager TIA Portal

PROFI BUS ®   **EtherCAT** ®   **Modbus**   **PROFI NET** ®

This is who we are

250 EMPLOYEES

IN OVER **60** COUNTRIES

over **30** YEARS OF EXPERIENCE

3200 DIFFERENT ARTICLES

250,000 INSTALLED CPUs

YASKAWA