CSMIO-MPG module for manual axis operation (JOG)

CSMIO-MPG is a 6-axis JOG module, in connection with rotary encoder provides easy, effortless and most of all intuitive machine axes moving. It was designed for professional CNC machines operation. This way a user can get not expensive, precise tool for fast configuration of a material base, a tool magazine and also for fast manual treatment or fast manual rides. Operation stability is provided by connection of the CSMIO-MPG module with a CSMIO/ IP controller through CAN bus. It guarantees correct and fast transmission even in tough industrial environment. Great advantage of CAN bus is resistance to interference also in case of much distance between devices, the resistance is assured by differential transmission and CAN bus termination (120 Ohm resistor at the beginning and at the end of the CAN bus). Another advantage of the CAN bus is ability to detect collisions and data loss thanks to strict control of transmission. All CSMIO-MPG requires is connection of a manual handwheel encoder, power supply and CAN bus. Instead of the handwheel you can just use an operator panel with proper elements mounted in (switches of axis selection, step size and encoder).

CSMIO-IO module for additional inputs/outputs

CSMIO-IO is an expansion module of additional digital inputs and outputs. During retrofit of a machine it may show up that digital inputs and outputs number available in CSMIO/IP-S or CSMIO/IP-A controller is not enough. In this situation CSMIO-IO module is the solution as it has additional 16 digital inputs and 8 digital outputs. In extreme situations we can use up to 16 of these IO modules. CSMIO-IO module is supported only by CSMIO/IP-S and CSMIO/IP-A controllers. Operation stability is provided by connection of the CSMIO-IO module and CSMIO/IP -(S or A) controller through CAN bus. CSMIO-IO modules are great solution for distributed systems.

CSMIO-ENC module for threading

CSMIO-ENC is a module for position reading from three incremental encoders. The module was designed as, in case of Mach3, there was no possibility to work with high resolution encoders. The initial module task was to read current spindle revs on Mach's screen and precise G32 tapping with turning knife. Now the module also provides rigid tapping (without compensation holder) with taps in lathes and milling machines. The CSMIO-ENC module is supported by 6-axis controllers only (CSMIO/IP-S, CSMIO/IP-A). Just like in case of the other expansion modules its working stability is provided by connection with a CSMIO/IP controller through CAN bus. CSMIO-ENC only requires encoder, power supply, CAN bus connection and proper configuration.

simDrive™ ServoDriveSystem

simDrive™ AC servo drives with CSM motors.
750W (325V) and 400W (325V) servo drive systems available.

simDrive™ is a servo drive for CNC control systems. Due to relatively narrow range of application configuration process is simplified so a user – an operator doesn't have to break through all the dozens of parameters which he won't use anyway. Configuration parameters were divided into functional groups what makes the configuration fast and clear. The only more difficult thing for not experienced users is PID regulator tuning and configuration of parameters needed when using brushless motors. Knowledge and experience are in this case highly valuable, nevertheless reading simDrive™ manual carefully even less experienced users will be able to set the simDrive™ device properly. To set the drive you will only need csServoManager configuration utility for configuration and diagnostics. The simDrive utility software csServoManager is provided as a convenient software installer what basically makes the installation process runs automatically and you do not have to struggle through all the parameters and settings to run the drive. There are just some basic settings you need to do. There are also configuration profile templates in the csServoManager available for CSM 400W and 750W motors ready to load. These profiles contain all electric parameters of a motor, an encoder and hall sensors. Using these ready settings you can save a lot of time and avoid many uncertainties.

simCNC Control Software

SimCNC is innovative control software for CSMIO/IP controllers. The software provides dynamics and precision of motion not seen before in other proprietary CNC control software. This was achieved by using the S-curve profile as well as sophisticated algorithms for motion trajectory optimization. It means that a machine can be fast, dynamic and precise at the same time and a treatment process is smooth and steady. It highly affects processing time, extends life of tools and of mechanics of a machine. simCNC license is now available in CS-Lab's online store.

For more detailed information and documentation visit: www.cs-lab.eu

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CS-Lab is a manufacturer of CNC control systems, most of all well-known and popular in the world market CSMIO/IP motion controllers but also simDrive AC servo drives and own CNC control software - simCNC.

The CSMIO series – motion controllers and expansion modules provide efficient, stable and flexible CNC control system. They assure precision and speed previously unheard of in this price sector. CSMIO/IP controllers use CS-Lab's own control software simCNC which guarantees high speed and great dynamics of work. CSMIO/IP controllers also support Mach3 and Mach4 software.

On CS-Lab's offer you will also find servo drives, motors, power supply units, converters and many more useful CNC accessories.

CSMIO/IP-S 6-axis CNC Motion Controller (step/dir)

CSMIO/IP-S is a 6-axis CNC motion controller. In combination with a PC and control software (simCNC, Mach3/Mach4) it's an ideal system for CNC machines control. CSMIO/IP-S is especially for professionals, CNC automation manufacturers, retrofit specialists and hobbyists, who want to equip their machine tool with efficient, stable and flexible CNC control system.

Operation stability provided by connection with PC via Ethernet, which guarantees reliable and fast transmission even in tough industrial environment.

Easy installation – CSMIO/IP-S does not require any external electronics for correct operation. Input/output signals are optically isolated, filtered, protected against short circuit, overheating. All signals are adapted to industry 24V standard. The device is enclosed in a compact housing, mounted on a DIN-rail, what makes mechanical and electronic installation in a control cabinet take less time and is even easier. CSMIO/IP-S controller works with simCNC, Mach3/ Mach4 software. Control signal is a popular „step/dir" standard, This way you can control both – stepper motor drives and the most modern servo drives. Frequency of stop signal that reaches up to 4MHz (Mach3) or 8MHz (simCNC, Mach4) provides maximum advantage of stepper division in stepper motors the same reducing resonance and significantly improving performance of a propulsion system. It also provides full advantage of encoders with large number of pulses per rotation in servo drives and the same such precision and speed, which previously were unavailable in this price sector.

How does it work? In short – control software (simCNC, Mach3, Mach4) installed on a PC is the brain and CSMIO/IP controller is the heart of the entire control system. The control software changes gcodes into motion trajectory and sends it through network connection to the CSMIO/IP controller. Basing on the trajectory the controller generates accurate step/dir signal for all axes. This division of tasks makes PC is less loaded than if using a classic parallel LPT port.

Main advantages of CSMIO/IP-S controller

- Step/dir signal – smooth and precise work of motors provided by high quality step/dir signal and data buffer which stores a small part of trajectory sent by control software (simCNC, Mach3, Mach4). The trajectory buffer provides uninterrupted operation of a CNC machine, even in case of temporary problems with network connection or control software.
- Slave axis support – up to 3 slave axes support with gantry geometry correction.
- Safety system – constantly watches over safety of a user and a machine. It consists of many independent algorithms and watchdogs which react very fast in case of forbidden or alarm situations. RESET support for axis drives, support of FAULT signals from servo drives (immediate stop of a machine in case of any axis accident).
- Solid aluminum housing dissipates heat and protects electronic circuits very well. Readable led controls on a front panel make it easier to instal and simplify diagnostics in case of any problems with switches or other external devices.
- VB macros – you can control all digital and analog signals using macros.
- Industry standard – CSMIO/IP-S controller is adapted to worldwide standards applied by servo and stepper drive manufacturers.

CSMIO/IP-A 6-axis CNC Motion Controller (+/10V)

CSMIO/IP-A is a 6-axis CNC motion controller with +/-10V drives control signal and feedback signal from scales or encoders. This way CNC installers can use analog servo drives (vellocity mode) which we can find in older machines. CSMIO/IP-A is also a very good choice for new machines equipped with precise analog drives. A big advantage of CSMIO/IP-A controller in new machines is even the fact that once referenced machine doesn't require another homing as long as it wasn't turned off. Max. input frequency of feedback signal that reaches 6MHz lets you to use encoders with large pulses number what in combination with high resolution, up to 16 bit DAC converter provides great accuracy, machine smoothnes and significantly improves driving system performance. This way many CNC machnists replace their original or other brand controllers with CSMIO/IP-A.

Detailed technical data of the controller in the table next page.

CSMIO/IP-M 4-axis CNC Motion Controller (step/dir)

CSMIO/IP-M is a 4-axis motion controller. In combination with a PC and control software (simCNC, Mach3, Mach4) it's an ideal system for CNC machines control. CSMIO/IP-M was designed for professionals, CNC automation manufacturers, retrofit specialists and hobbyists, who want to equip their machine tool with efficient, stable and flexible CNC control system. CSMIO/IP-M is for those who need as accurate and reliable controller as his bigger brother CSMIO/IP-S spending much less money. As for control signal the choice is the popular step/direction (step/dir) standard. This way you can control both – stepper motor drives and the most modern servo drives. Frequency of stop signal up to 125KHz provides adequate stepper division in stepper motors the same reducing resonance and significantly improving performance of a propulsion system. It also provides full advantage of encoders with average number of pulses per rotation (10.000 p/rev) and large number of pulses per rotation using only small electronic ratio.

Detailed technical data of the controller in the table next page.

CSMIO/IP controllers Technical data specification

PARAMETER	CSMIO/IP-S	CSMIO/IP-A	CSMIO/IP-M
Number of axes	6	6	4
Digital inputs number	32	24	12
Digital outputs number	16	16	4
Relay outputs number	-	-	2
Analog inputs number	4	4	2
Analog outputs number	2	6 (+/- 10V) 2 (0-10V)	2
Supply voltage	24VDC +/-10%	24VDC +/-10%	24VDC +/-10%
Power consumption	5W	5W	5W
Maximum voltage on in/out lines	30VDC	30VDC	30VDC
Maximum load of output line	250mA	250mA	250mA
Voltage range of analog inputs	0-10VDC	0-10VDC	0-10VDC
Maximum load of analog outputs	5mA	5mA	5mA
Axis drive control type	Step/Direction (STEP/DIR)	Analog +/- 10V	Step/Direction(STEP/DIR)
Maximum frequency of STEP signal (Mach3/simCNC, Mach4)	4MHz/8MHz	-	125kHz
STEP signal duty cycle	50%	-	50%
PC connection type	Ethernet10/100Mb	Ethernet10/100Mb	Ethernet10/100Mb
Ambient temperature range	0°C to +60°C	0°C to +60°C	0°C to +60°C
Relative humidity (without condensation)	10% - 95%	10% - 95%	10% - 95%
CSMIO-MPG module support	✓	✓	✓
CSMIO-IO module support	✓	✓	×
CSMIO-ENC module support	✓	✓	×
Backlash compensation	✓	✓	×
Homing on INDEX	✓	✓	×
Slave axes*	✓	✓	*no gantry geometry correction ✓
THC analog mode	✓	✓	✓
Spindle axis	✓	✓	×
#G32# threading	✓	✓	×
Rigid tapping	✓	✓	×
Closed Loop Spindle Control	✓	✓	×
Feedback	×	✓	×