

# PLC AC500: CI511-ETHCAT and CI512-ETHCAT EtherCAT bus modules for decentralized cam switches

**EtherCAT**®



## Become the fastest producer of top quality

In mass production of commodity, high-speed automation enables production in high-cost countries. With accurate timing, the automation system makes sure that top quality only is produced.

For low-cost countries this means they must use top-performance automation, too. Low-cost is no longer sufficient. PLC AC500 and EtherCAT can help in both economic scenarios. With top speed and top quality.

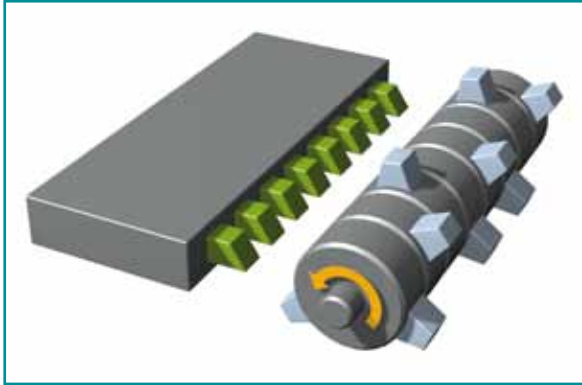
## Decentralized electronic cam switches

The cam switch principle offers improved control. Instead of the cam shaft, we also may think of transportation belts and other linear motion as time base-devices.

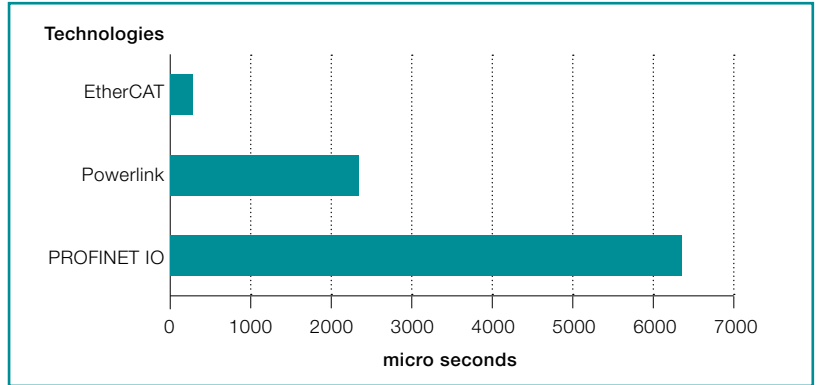
Often electric events are to be triggered at the correct moment. An example would be when we are running sheet metal through a machine and needs to be cut in pieces.

Round tables can be the assembly base and here this means many cams become active depending on the rotary table's position. Such process requires prompt actions at several different places - this application requires high decentralized performance!

# CI511-ETHCAT, CI512-ETHCAT, CM579-ETHCAT AC500 manages fastest communication for factory automation



An example is the mechanical cam switch



Realtime Ethernet Performance

## Why to use EtherCAT®?

It is the fastest of the realtime Ethernet protocols.

The protocol works independently from CPU performance.  
We also can say: the CPU power remains available for control.

Areas of application are machine controls, e.g. semiconductor tools, metal forming, packaging, injection molding of plastics, assembly systems, printing machines and robotics. Everything which runs at high speed and requires coordinated motion and prompt I/O.

## Why to use PLC AC500 for cam switches?

Most engineering tasks benefit from the convenient software setup to administer cam timings, HMI, PLC I/O and drives. With ABB's engineering tool PS501 Control Builder Plus this is possible by one tool!

## PLC AC500 teams with EtherCAT bus modules

CI511-ETHCAT and CI512-ETHCAT are EtherCAT bus modules.

They extend ABB's many other fieldbus solutions to uncomplicated electronic cam switches and similar speed-demanding synchronous applications.

CM579-ETHCAT is AC500's EtherCAT master. AC500 can control a maximum of four CM579-ETHCAT masters and a total of 800 slave devices.

## CI511-ETHCAT:

- integrated digital and analog I/O
- fast counter via EtherCAT
- cam switch functionality

## CI512-ETHCAT:

- integrated configurable digital I/O
- fast counter via EtherCAT
- cam switch functionality

Outputs can be assigned conveniently to virtual cams by PS501 Control Builder Plus.

## Channel overview

Designation	Channels
CI511-ETHCAT	8 DI, 8 DO, 4 AI, 2 AO AI includes: 0...10 V -10...+10 V 0/4...20 mA Pt100 -50 °C...+ 70 °C Pt100 -50 °C...+400 °C Pt1000 -50 °C...+400 °C Ni1000 -50 °C...+150 °C digital signals, if desired
CI512-ETHCAT	8 DI, 8 DO, 8 DC
minimal bus cycle	1 ms
clamp-to-clamp	2 ms typical

Larger decentralized I/O extensions are available by other AC500 realtime Ethernet solutions or classic fieldbusses like CS31. They can run in parallel to EtherCAT with their own timing.

### Cam switches made easy

CI511-ETHCAT provides 8 outputs and 32 cams  
 CI512-ETHCAT provides 16 outputs and 32 cams

Each cam consists of:

- switch on and switch off action
- the 32 cams can be mapped to any digital output
- an output can be mapped to one, several or none cams
- PLC program can disable or overwrite the cam state
- mapping is done during configuration

Each cam has the following parameters:

- enable Input for the cam
- first on position (in 1/100 degree of a rotation)
- last on position (in 1/100 degree of a rotation)
- dynamically adjusting parameter (Comp time: factor for in/ decreasing regarding the speed)
- axis ref contents information of the connected device and cam

### Uncomplicated configuration and diagnostics

The engineering tool PS501 Control Builder Plus is the dedicated configurator tool for CM579-ETHCAT, CI511-ETHCAT and CI512-ETHCAT. Configuration follows the EtherCAT standard. As close as possible follow all fieldbus configuration procedures the same GUI and same philosophy.

Diagnostics is setup automatically. Diagnostics goes down to the individual port of each CI511-ETHCAT and CI512-ETHCAT.

### Software support – libraries with engineering tool

Function blocks in PS501 Control Builder Plus:

- CANopen over EtherCAT protocol application
- management of EtherCAT synchronization
- diagnostics
- cam switch application CS\_BLOCKS\_AC500

### Quality HW design: fast results, self-protecting

Unused channels can be left open-circuited. This saves time and money for the OEM.

The inputs/outputs are electrically isolated from the EtherCAT bus.



Simplified diagram

In cases of short circuit or overload, the digital outputs are turned off. The module performs reactivation automatically. Thus an acknowledgement of the errors is not required.

The error message is signaled via the LED. All I/O channels (digital and analog) are protected against reverse polarity, reverse supply, short circuit and continuous overvoltage up to 30 V DC.

### Emergency-off included free

By separate UP3 power supply, digital outputs can be switched off externally for emergency-off.

### Logistics

Order Code	Designation	Channels
1SAP 220 900 R0001	CI511-ETHCAT	8 DI, 8 DO, 4 AI, 2 AO
1SAP 221 000 R0001	CI512-ETHCAT	8 DI, 8 DO, 8 DC
1SAP 214 200 R0001	TU507-ETH	screw-type terminals
1SAP 214 000 R0001	TU508-ETH	spring-type terminals
1SAP 170 902 R0001	CM579-ETHCAT	n.a.
1SAP 192 100 R0001	PS552-MC	PLCopen library

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