# CIP Sync™

Solve your time synchronization challenges with a low-cost solution

Leveraging your existing Ethernet infrastructure, CIP Sync offers a low-cost solution to provide a common system clock throughout your architecture, useful in applications such as tracking and tracing, first fault detection, event tracking, historical logging, etc.



## Improve the fault tolerance of your architecture

CIP Sync is a multimaster time network that self-arbitrates to identify the best time source in the control system, providing a more fault-tolerant architecture. Time is distributed throughout the architecture via standard ControlLogix Ethernet 1756-EN2T modules, helping to eliminate the need for special synchronization hardware.

## Identify the root cause of failures

Tracing the root cause of a failure can be critical. Unfortunately, typical diagnostics systems record and log the time of failures in serial order based on when the HMI receives the data. That means, for example, that an alarm triggered 100 milliseconds after the root cause could get time-stamped as occurring before the root cause simply because that data was received first.

CIP Sync, a time synchronization extension to the Common Industrial Protocol, helps to solve this issue. Based on and fully compliant with the IEEE-1588 Version 2 Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems, CIP Sync provides high-precision time synchronization so that I/O or controllers can provide very accurate first fault detection.

## Simplify controller clock setting

Large plants often have more than 1,000 controllers, all with wall clocks that need to be maintained. CIP Sync uses Coordinated System Time (CST) to streamline wall clock setting to offer high-precision time stamping and help you to coordinate the wall clocks across your control architecture. Simply set one master clock and you're done – all the controllers will report alarms and events using the same system time.

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## Log data historically for event recreation and simulation

Many common industrial applications require that large volumes of data be logged in a common, open historical database for event tracking and recreation. For example, tracking and tracing applications require knowledge of when a new product was introduced to the rest of the architecture. All of this data is meaningless, however, without a common reference as to when it was generated. CIP Sync provides time-stamped data logging to solve this issue.



## Achieve system-wide motion registration with a single input

Most networked I/O cards cannot send registration on/off information quickly enough for the controller to accurately generate an axis position. With CIP Sync, time stamps made directly on the I/O card establish when the mark was in front of the photo eye. A lookup function in the motion planner then returns axis positions that equate to the registration time, allowing a single time stamp to be passed to all axes in the system and returning position.[1]



## Schedule outputs

CIP Sync allows you to schedule outputs, useful in diverter applications to trigger multiple outputs simultaneously or to trigger a reject at the precise moment at which a product is at a reject station. Due to network latency and controller code scan rates, firing multiple outputs simultaneously is extremely difficult and very controller intensive. Similarly, acting at the exact moment a part is in front of a reject station on a high-speed packaging machine can seem impossible. By identifying when a product will be a known position, you can solve these issues using time and CIP Sync to schedule the output in advance.

[1]This is a specialty application. In some cases, the actual scan time of a distributed I/O card will not be sufficiently rapid. (Some applications require 1ms capture.)

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