TRIAMEC

Redefining
Motion Control

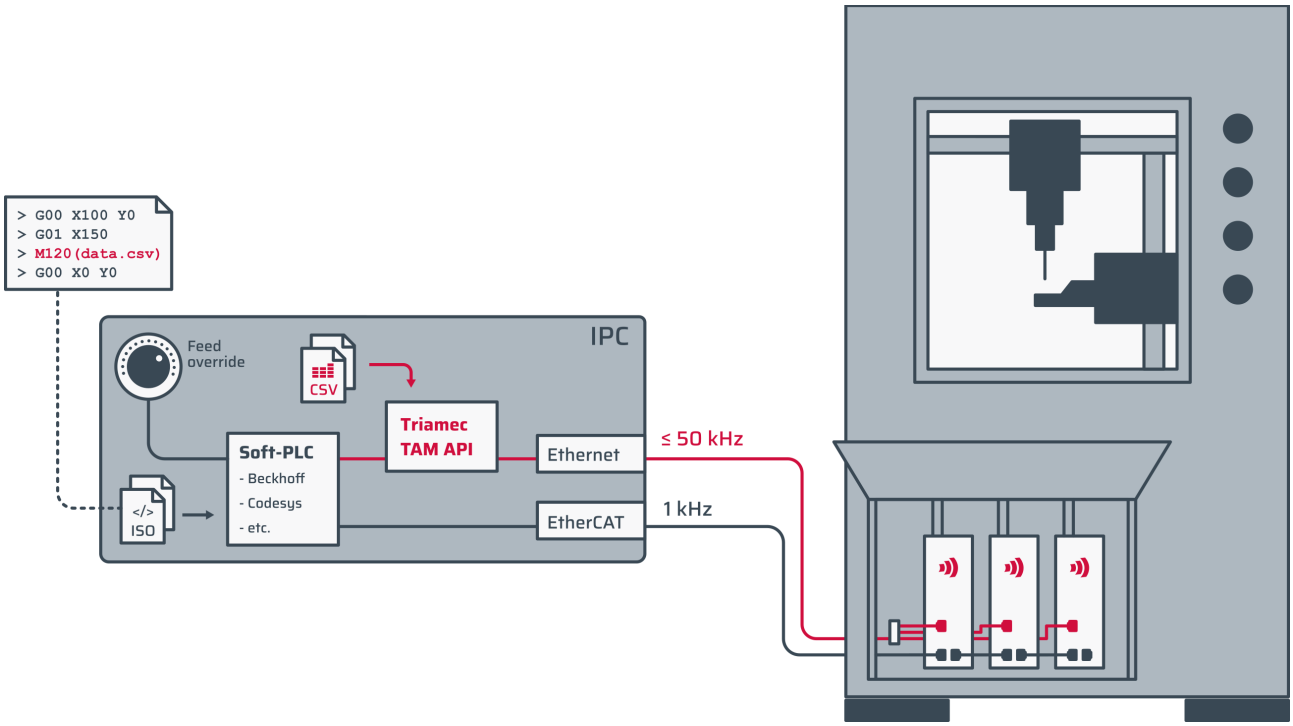
TraSt EtherCAT Integration

Seamless PLC Integration of 50 kHz Trajectory Streaming

The **TraSt EtherCAT Integration** enables **50 kHz Trajectory Streaming** within your PLC environment. It allows the execution of precomputed high-precision multi-axis trajectories at ultra-high sampling rates while ensuring the smooth transition between different PLC modes.

Use Trajectory Streaming as a G-Code Command

Continue to operate your machine as usual within your PLC architecture. Whenever a process step requires maximum precision, the precomputed trajectories are executed as a dedicated motion block at sampling rates of up to 50 kHz. The execution only requires a **simple G-code command** within your existing program. The command initiates the streaming of position data to the drives and executes the motion with multi-axis synchronization at drive level.



Clear Ownership and Safe Operation

Trajectory Streaming integrates into the existing control architecture without changing machine ownership. The PLC remains the master of the system at all times and controls interlocks, safety logic, and the overall process state machine. Safety-relevant functions, including motor-level protection and the stream-loss action, are handled directly by the drive.

The transition between standard PLC positioning and Trajectory Streaming is explicit and deterministic. The PLC activates and supervises the streaming mode and can abort the motion at any time. After completion, control returns seamlessly to PLC positioning.

Triamec Motion AG · Lindenstrasse 16 · 6340 Baar · Swtizerland
Tel. +41 41 747 4040 · info@triamec.com · www.triamec.com

TRIAMEC

Redefining
Motion Control

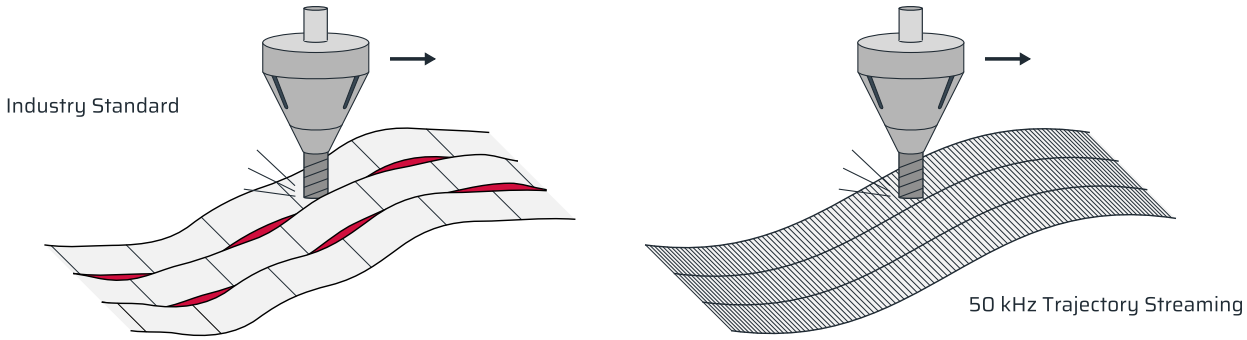
Highest Precision Where It Matters

The integration of Trajectory Streaming applies ultra-high sampling rates where they are needed. The standard PLC continues to handle referencing and non-critical movements without requiring high EtherCAT cycle rates. The trajectory for the precision-sensitive step is calculated offline and stored as a CSV file. There is no need for real-time interpolation or additional computational load within the PLC.

This separation of responsibilities enables maximum precision without increasing the complexity or demand on the overall control system, while achieving sampling rates of 50 kHz.

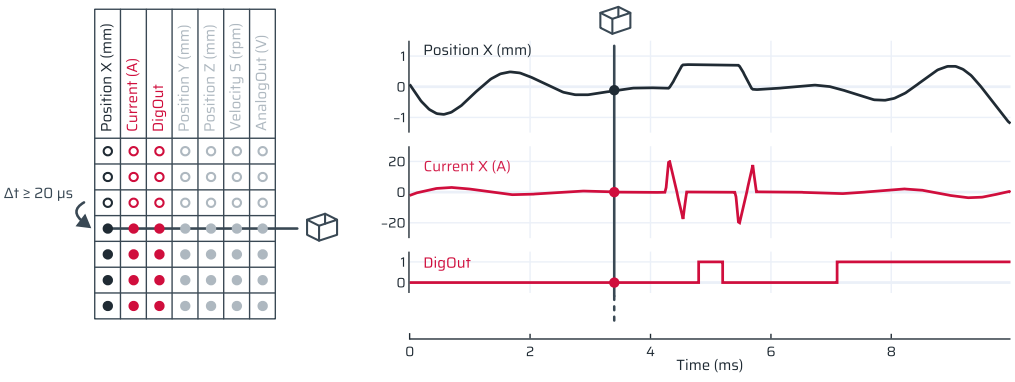
From Toolpath Lines to Smooth Surfaces

In precision machining, the visible surface quality is not determined by one toolpath alone, but by the consistency between neighboring paths. Even very small interpolation deviations and delays can lead to line-to-line shifts that become visible on the final surface. By executing dense, precomputed trajectory points, Trajectory Streaming helps preserve the intended surface geometry more directly, leading to an improved consistency across the machined surface.



Synchronous Control During Processing

In streaming mode, **extension variables** can be transmitted alongside the position data. These synchronized signals allow coordinated control of both internal drive functions and external devices. Internally, these signals can be used for advanced feedback strategies and feed-forward control. Externally, position-synchronized outputs can be used to trigger process equipment and lasers via our pulsing unit or via the analog and digital outputs of the drive.



Triamec Motion AG · Lindenstrasse 16 · 6340 Baar · Swtizerland
Tel. +41 41 747 4040 · info@triamec.com · www.triamec.com