TR3090 - Outline

TwinCAT 3 Vision (3 days)

Attention - The following topics are not addressed during this class

- **Vision Hardware Setup and Recommendations**
- PLC programming
- Motion Control
- TwinSAFE

Prerequisites:

- Sound knowledge of programming in structured text (ST)
- Experience configuring TwinCAT 3 software
- One of the following programming and TwinCAT configuration courses is recommended:
  - TR3020, TR3025, TR3028, or TR3030

Topics Covered:

- Live Camera Setup
  - Connecting to a Live Camera with Camera Initialization Assistant
  - Configuration and Image Formatting with Configuration Assistant
    - Setting the Region of Interest (ROI)
    - Changing the Exposure Time
    - Horizontal Binning
    - Chroma Considerations
  - Live Camera in Simulation Mode
    - Creating a Camera Stream File
    - Connecting to a pre-existing Camera Stream File
- Image File Source (Camera) Setup
- Introduction to the PLC Vision Library
  - Understanding the Camera as a State Machine
  - Convert processing image to color display image
  - Filter image colors for ease of processing
  - Find contours on process image
  - Utilizing containers in PLC programming
  - Write text and add shapes to the displayable image
  - Perform measurement on objects
  - Code Reading
- Hardware Concepts (theoretical information only - no recommended setups)
  - Camera
  - Optics and Color Theory
  - Lighting
- Vision Scope Project
  - Histogram of pixel color values
  - Camera Handling and Triggers
- Performance Optimization Options
  - Processing Contour Hierarchies

- Image Processing Watchdog
- Blob Detection and Filtering
- Vision Job Tasks and Parallelization Functionality

- Camera Calibration and Distortion Compensation