Beckhoff TwinCAT Connector

Devices compatible with TwinCAT PLC/IO

- Name: TwinCAT
- Version 2.5.1.1
- Protocol: ADS
- Interface: TCP/IP
- Runtime: .NET 4.8 (Windows)
- Configuration:
  - Devices / Protocols

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Overview

TwinCAT supports Solution Import Tags Reference to setup automatically the mapping.

For more information go to Beckhoff TwinCAT Tag Importer.

> The TwinCAT communication driver is supported only in Windows Solutions.

Nodes Configuration

Station Configuration

Stations syntax: *<AmsNetID> ; <AmsSrvPort>*

Where :

- ***<AmsNetID>*** = AmsNet ID of the PLC
- ***<AmsSrvPort>*** = Port number used for communication.

E.g.: ***192.168.1.1.1.1; 801***

Points Configuration

Address

The syntax for the TwinCAT communication points is:

- ***<DeviceTagName>***

<DeviceTagName>: Tag Name in PLC.

E.g.: ***.TAGNAME***

Address Prefixes

The software platform supports two specific prefixes in the Address field in the DevicePoints table: `TEMPLATE:` and `DATE:`. The `TEMPLATE:` prefix is used before the PLC address when the point references a UserType or an array. The `DATE:` prefix is used when the point represents a TwinCAT `DATE` or `DATE_AND_TIME` variable.

When working with arrays that contain `DATE` or `DATE_AND_TIME` types and are also part of a DataTemplate, both prefixes are combined in the following order:

`TEMPLATE:DATE:<my_address>`

In the **RelativeAddress** field of a UserType, used for tag template expansion, only the `DATE:` prefix is applied, without the `TEMPLATE:` prefix.

Arrays

If an array is not zero-indexed, the Address field in the DevicePoints table must include the array's **starting index** in brackets.

Example 1:
If the TwinCAT array is defined as `intArray : ARRAY[2..5] OF INT`,
then the value in the Address column should be:
`TEMPLATE:intArray[2]`

Example 2:
If the TwinCAT array is defined as `intMatrix : ARRAY[2..5, 0..3, 4..7] OF INT`,
then the value in the Address column should be:
`TEMPLATE:intMatrix[2][0][4]`

For **zero-indexed arrays** (e.g., `ARRAY[0..N]`), it is not necessary to specify the initial index in the address. In those cases, you can simply use the array name (e.g., `intArray`) in the Address column.

Arrays with Non-Zero-Based Indexing inside Structs

When defining a UserType for a TwinCAT struct that includes an array with a non-zero starting index, the initial index must be specified in the **Relative Address** column of the corresponding UserType member, following the same approach demonstrated in the examples above. The TwinCAT Tag Importer handles this automatically.

Connection Handling

ADS Router Restart Recovery

The TwinCAT communication driver reaches the PLC through the local **ADS Router** service. If the router restarts — for example after a TwinCAT runtime stop/start, a system update, or a manual `TcSystemServiceUi` reload — the existing ADS connection handles are invalidated and any in-flight request fails with an ADS error.

The driver detects the router-restart condition automatically. On the next read cycle after the router becomes responsive, the driver re-resolves the AmsNet ID, re-opens the ADS notification handles for all subscribed symbols, and resumes normal communication without any user action. The Communication Driver Status transitions through “Disconnected” while the router is down and back to “Running” once recovery completes. Tags retain their last good value during the outage; their quality changes to *Bad* until the first successful read after recovery.

No additional configuration is required to enable this behavior. To observe the recovery sequence, enable the **TwinCAT** and **Debug** checkboxes in the **Trace Window** settings — each router restart and the subsequent re-subscription is logged with timestamps.

Driver Revision History

TwinCAT Revision History	
Version	**Notes**
2.5.1.1	Fixed array handling in the Tag Provider and Import Tags: arrays are no longer created with an extra element (which caused invalid array index errors), arrays that do not start at index 0 and Date/DT array elements are read and written correctly, and struct members typed as named array types are no longer dropped on import; the connection now recovers after an ADS router or PLC runtime restart instead of failing every read until the Device module is restarted; the Designer no longer crashes when the TwinCAT ADS runtime is not installed; in remote engineering, Test Connection now states that the test ran on the Designer machine.
2.5.1.0	Added automatic recovery after ADS Router restart: driver detects the router-down condition, re-resolves the AmsNet ID, and re-subscribes notification handles without user action.
2.5.0.1	Initial release on new documentation standards.

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