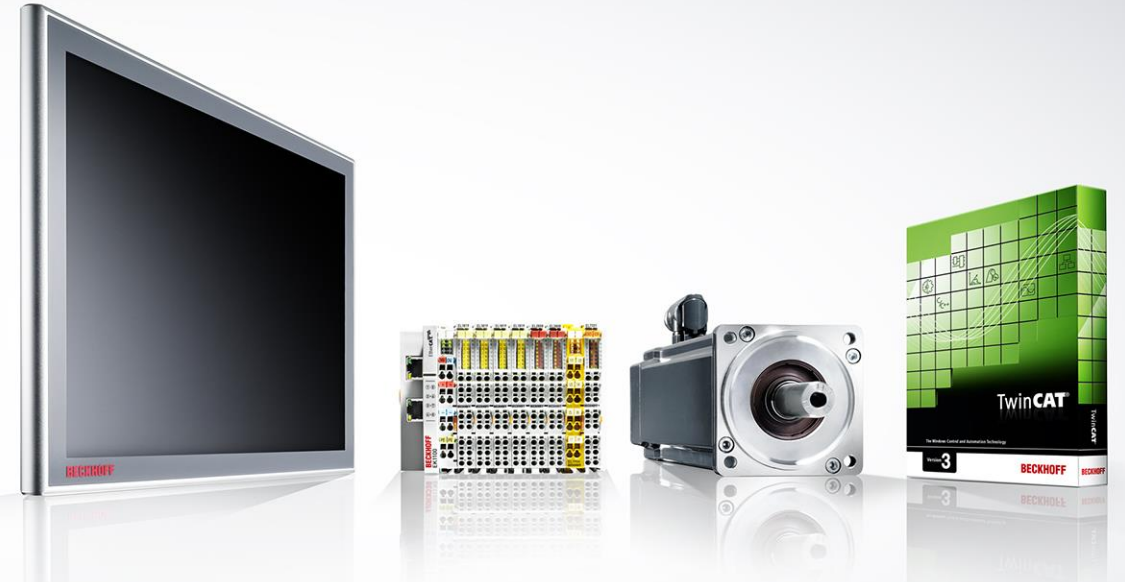


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Standalone System Manager

Tim Hildebrandt
TwinCAT Product Management



- Configuration changes in TwinCAT need a Visual Studio with TwinCAT integrated
 - Windows as Operation System required
 - Lot of system resources are required to run Visual Studio
 - Long execution times due to Visual Studio start and end
- In-behind the System Manager generates the CurrentConfig.xml and binary files
 - Changes can only be done by the System Manager itself
 - but no direct access to System Manager available
- TwinCAT Automation Interface requires DTE-Interface of Visual Studio
 - Visual Studio needs to run in the background
 - Entry point for Automation Interface

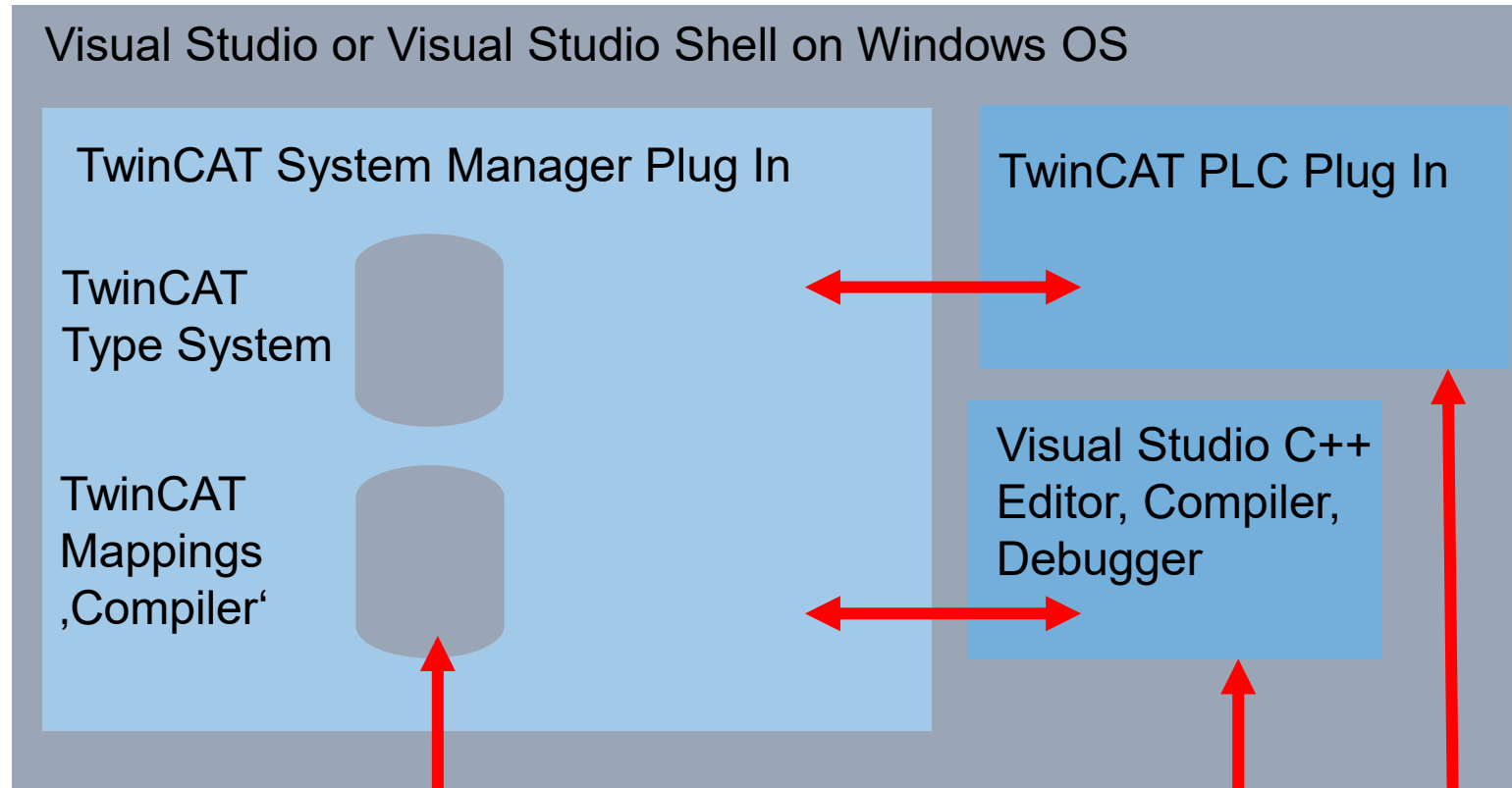
- Access to Automation Interface functionalities without DTE-Interface of Visual Studio
- Standalone System Manager is a DLL
 - can be used via PowerShell or C++/C#
 - can be used via command line
- Limited resources – no Visual Studio needed
 - Faster access to Automation Interface
 - No need to start Visual Studio Instance
- Can be used on Windows systems and systems without TwinCAT

- **Scenario 1:** Systems without TwinCAT XAE installed
- **Scenario 2:** Build Systems
- **Scenario 3:** TwinCAT/BSD Systems (in future)
- **Scenario 4:** Reduction of Automation Interface execution time
- ...

Standalone System Manager Interface Architecture XAE/XAR

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TwinCAT XAE



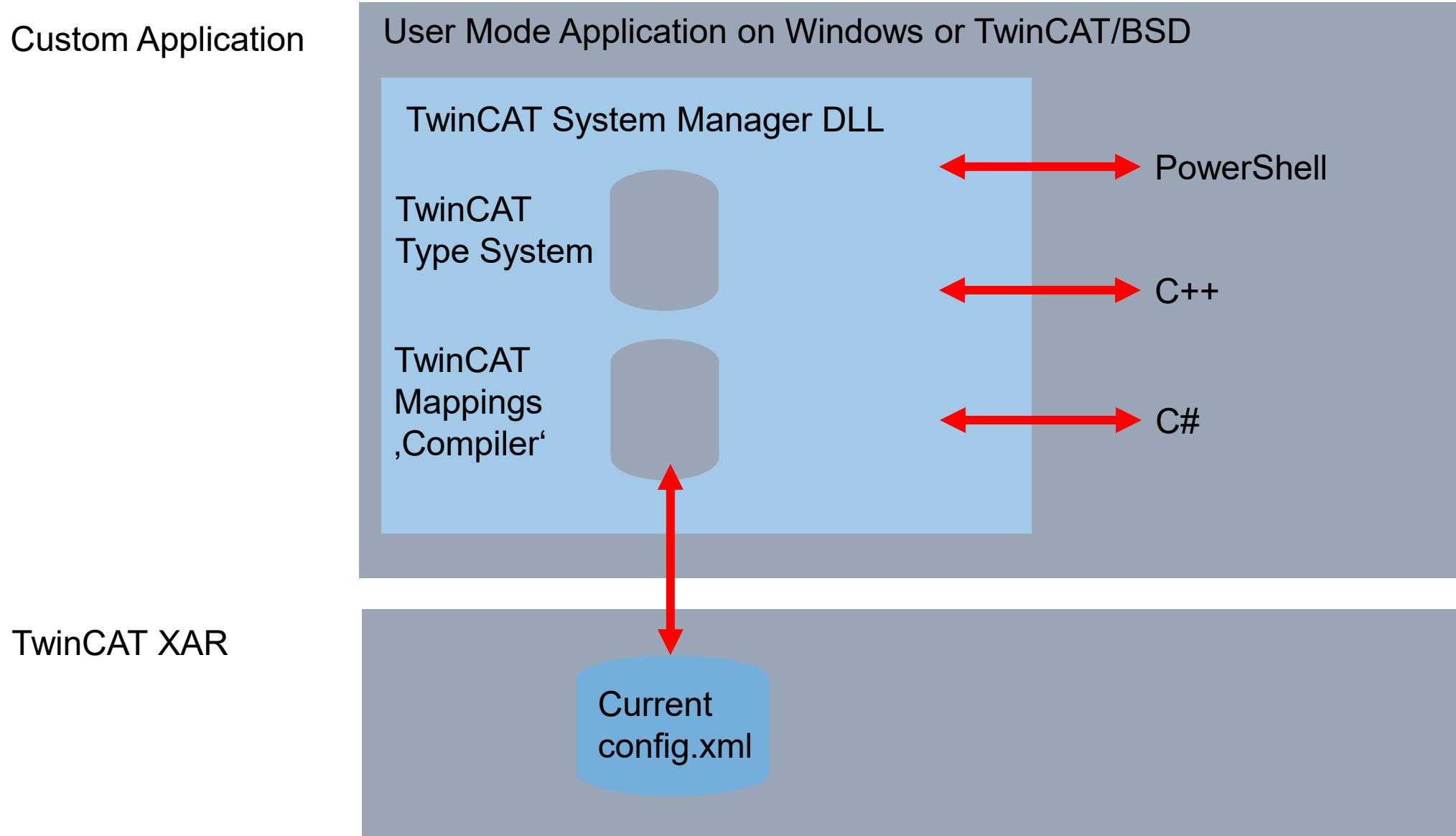
TwinCAT XAR



Standalone System Manager Interface

Architecture Standalone System Manager

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- New entry point to access Standalone System Manager
 - TcSysManagerDll

```
var systemManagerRM = Activator.CreateInstance(Type.GetTypeFromProgID("TcSysManagerRM",  
throwOnError: true)!) as ITcSysManagerRM;  
var stSysManager = systemManagerRM.CreateSysManager15();
```

- Afterwards access to well-known AI Interfaces

```
ITcSmTreeItem io = stSysManager.LookupTreeItem("TIID") as ITcSmTreeItem;  
  
ITcSmTreeItem ecMaster = io.CreateChild("EC Master", 111);  
  
string xml = ecMaster.ProduceXml();  
  
ITcSmTreeItem newEk1100_1 = ecMaster.CreateChild("EK1100-1", 9099, "", "EK1100");  
ITcSmTreeItem newTerm1 = newEk1100_1.CreateChild("EL2004-1", 9099, "", "EL2004");
```

Standalone System Manager Interface

How it works?

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- via PowerShell

```
$rm = new-object -com TcSysManagerRM
$sm = $rm.CreateSysManager15()
$filename = "C:\temp\SysManTest\TwinCAT Project5\TwinCAT Project5\TwinCAT Project5.tsproj"
$filenameOut = "C:\temp\SysManTest\TwinCAT Project2.tsproj"
$sm.OpenConfiguration($filename)

#$tiid = $sm.LookupTreeItem("TIID")
#$ecat = $tiid.CreateChild("MyECat", 111, $null, $null)
#$ek = $ecat.CreateChild('EK1111', 9099, 'EK1100-0000-0017')
#$xtiFile = "C:\temp\SysManTest\EL1809.xti"
#[void] ($ek.ImportChild($xtiFile, "", 1, "Terminal"))

$sm.SetTargetNetId("192.168.4.1.1.1")
$rt = $sm.LookupTreeItem("TIRS")

$rtSettingsPath = "C:\temp\SysManTest\RtSettings.xml"
$rtSettings = Get-Content -Path $rtSettingsPath -Raw

#$rt.ConsumeXml($rtSettings)

$sm.ActivateConfiguration()
$sm.StartRestartTwinCAT()

$sm.SaveConfiguration($filenameOut)
```

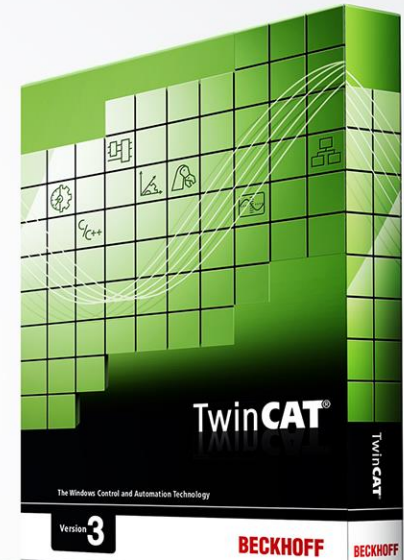
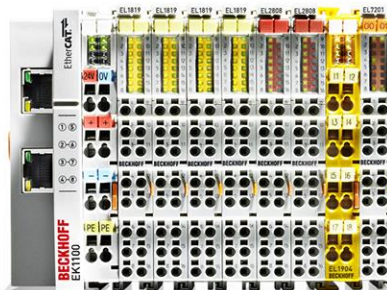

- Create new projects / open existing projects
- System configuration
 - Tasks
 - Cycle times
 - TcCOM objects
 - ...
- I/O configuration
 - Scan devices
 - Add devices
 - Configure devices (consume/produceXml)
 - ...
- Activate Configuration
 - Set target net id
 - start/restart TwinCAT

- PLC functionalities
 - No access to PLC interfaces
 - No access to PLC elements
 - POU's, DUT's, etc.
 - everything that is stored inside the PLC project

- Standalone Approach
 - Reference a standalone PLC project (possible via Standalone System Manager)
 - Configure PLC project before referencing
 - Create mappings via Standalone System Manager OR
 - use pre-configured set of mappings (MappingInfo)

Thank you for your attention!

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